

# **Commentary on the Portfolio of Compositions**

by

Elis Czerniak

A portfolio of musical compositions, written commentary and accompanying media materials, submitted of the requirements of the degree of Doctor of Philosophy

Written Commentary

Department of Music

School of Drama, Film and Music

Trinity College Dublin

January 2018

I declare that this thesis has not been submitted as an exercise for a degree at this or any other university and it is entirely my own work. I agree to deposit this thesis in the University's open access institutional repository or allow the Library to do so on my behalf, subject to Irish Copyright Legislation and Trinity College Library conditions of use and acknowledgement.

---

## **Abstract**

This thesis, comprised of a portfolio of compositions accompanied by media examples and commentary, traces the evolution of the author's compositional approach in the search for a manner to present unstable sound that allows its natural acoustic phenomena and their interrelations to be experienced at the forefront. The controlling factors discussed are not just the physical properties of sound, but also how it is perceived. The written commentary presents, in detail, specific examples of how and why this has been achieved, with the main focal points being: limited unstable timbral palettes, different forms of listening and perception, collaboration and performative aspects, controlled improvisation and notation abandonment.

With regard to these elements, a point must be made that, although there are developments within each, the musical goal remains the same, with the exploration of unstable sound and the complex timbres within, and its correlation with the unification of composer, performer and listener, being the main goal within the musical environment.

## **Acknowledgements**

I would like to thank my supervisor, Dr. Evangelia Rigaki, for her support throughout my PhD. Her hard work and positivity helped me reach my desired targets, guiding me throughout my compositional evolution. I am also thankful to the Trinity Music Department and the House 5 staff for supporting me financially during my studies, the Contemporary Music Centre for representation, and the Irish Composers Collective for providing me with performance opportunities.

Thank you to all of the musicians who I have collaborated with over the past three years: Crash Ensemble, Tonnta Vocal Ensemble, Hermes Experiment, Co-Orch Orchestra, Kirkos Ensemble. Their dedication has been inspirational to me, both musically and spiritually.

I would like to thank my friends and family for their support throughout my musical career: my good friend and peer Paul McGuire who always has answers for my tedious questions; my fellow musicians Brian, Tim, Ciarán, Neil, Barry and Osgar who have played alongside me throughout the years all over the world; my former teacher, Jonathan Cole, for his guidance at crucial points of my career — always setting me on the right path. Finally, I want to thank Susan, who has stuck with me through everything — always providing love, support and positivity.

## **Contents**

<b>Abstract</b>	<b>i</b>
<b>Acknowledgements</b>	<b>ii</b>
<b>List of Figures</b>	<b>iv</b>
<b>List of Compositions</b>	<b>v</b>
<b>Media Track List</b>	<b>vi</b>
<b>Chapter 1    Sound Itself</b>	<b>1</b>
1.1    Natural Acoustic Phenomena - Formation and Perception	1
1.2    Limited Unstable Timbral Palettes	15
1.3    Reiteration and the Memory	24
1.4    Silence and the Threshold of Perception	33
<b>Chapter 2    Collaboration and Performance</b>	<b>39</b>
2.1    Creator - Composer or Performer?	39
2.2    Improvisation and Collaboration - Compositional Performance	51
2.3    The Visual in Performing - Eye versus Ear	70
<b>Chapter 3    Reverberations</b>	<b>80</b>
<b>Bibliography</b>	<b>91</b>

## List of Figures

### Chapter 1

- Fig. 1.1.1: Colour trills in adjacent frequencies in *Hiraeth*: Bassoon, bars 65-70 7
- Fig. 1.1.2: The bow position clef in Rebecca Saunders' *Ire*: Cello solo, bars 33-37. 9
- Fig. 1.1.3: An array of techniques applied to the Cello in *Reheal* showing the bow position clef above. 9
- Fig. 1.2.1: Examples of timbre exploration and changes in syllabic embouchure in *Terricrepe*: Flute, bars 4-6. 19
- Fig. 1.2.2: Resonance durations on an upper stave in Giacinto Scelsi's *Okanagon*: Bass and Harp, bars 1-5. 22
- Fig. 1.2.3: Piano preparation showing threads and wires. Each pitch cluster is marked with tape. 23
- Fig. 1.3.1: Edmund Husserl's Temporal Span Diagram. 25
- Fig. 1.3.2: Horațiu Rădulescu's sound compass. 32
- Fig. 1.3.3: My adapted sound compass used in *Stupa*. 32
- Fig. 1.4.1: Opening fragments of *Aberrate* displaying the high unstable partial's freedom to evolve. 36

### Chapter 2

- Fig. 2.1.1: Complex notation in Brian Ferneyhough's *Time and Motion Study 2*: page 13. 43
- Fig. 2.1.2: Strict tablature 'decoupling' the instrument and body in Aaron Cassidy's *A Painter of Figures in Rooms*: bars 38-43. 44
- Fig. 2.1.3: Free notation in Earle Brown's *String Quartet*: page 4. 46
- Fig 2.2.1: Volatile sounds and ambiguous techniques in *Reheal* urge the performer to experiment and fill in the gaps. 56
- Fig. 2.3.1: Extract from Jaap Blonk's sound poem *Sound* (1990). 72
- Fig 2.3.2: Moving between graphic and conventional notation in *Reheal*. 75
- Fig. 2.3.3: Continuing a sound through graphic notation in Mark Applebaum's *56 1/2 feet*: Horn and Trumpet, bars 36-37. 76
- Fig. 2.3.4: Graphics influencing the performer's sound in *Meridian*. 77

## List of Compositions

1. *Terricrepe* (2013) – For solo clarinet, flute, violin, cello and piano.
2. *Hiraeth* (2013) – For solo bassoon and orchestra.
3. *Two Cello Pieces* (2014)
  - (i) *Aberrate* – For solo cello.
  - (ii) *Rotate* – For cello and live electronics.
4. *Reheal* (2014) – For detuned cello, flute, clarinet, violin and viola.
5. *String Quartet No. 1* (2015).
6. *Baruopa* (2015) – For soprano, clarinet, harp and bass.
7. *Stupa* (2015) – For solo violin and any number of microtonal instruments.
8. *Three Graphic Pieces* (2015)
  - (i) *Circles, Lines and Squares* – For two amplified flutes and live electronics.
  - (ii) *Meridian* – For clarinets and live electronics.
  - (iii) *Delphinidae* – For percussion and live electronics.
9. *Loam* (2016) – For piano, percussion, detuned strings and plinkafone.

## Media Track List

### Audio CD: Recordings of Compositions

Track no.	Title and Details	Length
1	<i>Terricrepe</i> (2013) For solo clarinet, flute, violin, cello and piano. Performed by Mediocre Ensemble.	6:26
2	<i>Hiraeth</i> (2013) For solo bassoon and orchestra. Performed by Co-Orch Orchestra. Conducted by John Doyle.	18:38
3-4	<i>Two Cello Pieces</i> (2014) (i) Aberrate For solo cello. Performed by Elis Czerniak	11:04
	(ii) Rotate For cello and live electronics. Performed by Crash Ensemble.	12:56
5	<i>Reheal</i> (2014) For detuned cello, flute, clarinet, violin and viola. Performed by Mediocre Ensemble.	8:40
6	<i>String Quartet No. 1</i> (2015) Excerpt pages A-D. Performed by Elis Czerniak	7:38
7	<i>Baruopa</i> (2015) For soprano, clarinet, harp and bass. Performed by Hermes Experiment.	6:12
8	<i>Stupa</i> (2015) For solo violin and any number of microtonal instruments. Performed by Mediocre Ensemble.	21:48
9-11	<i>Three Graphic Pieces</i> (2015) (i) Circles, Lines and Squares For two amplified flutes and live electronics. Performed by Elis Czerniak.	4:29



	(ii) Meridian	8:04
	For clarinets and live electronics. Performed by Elis Czerniak.	
	(iii) Delphinidae	3:25
	For percussion and live electronics. Performed by Alex Petcu and Elis Czerniak.	
12	<i>Loam</i> (2016)	6:58
	Excerpt pages 1-2. For piano, percussion, detuned strings and plinkafone. Performed by Mediocre Ensemble.	
		<hr/>
		114:18



## Chapter 1 - Sound Itself

This commentary will begin by addressing the two fundamental aspects of sound which we, as humans, encounter on a regular basis — formation and perception. With regard to formation, the principal focus is upon the primal nature of sound anatomy and its timbral compartmentalisation when driven to a more unstable state. The reasoning behind the emphasis on instability stems from the desire to display sound's resulting natural acoustic phenomena, and their interconnecting relationships, most evidently, as it is with these inner phenomena — and the many forms they can spawn both individually and combinatorially — that my key interest in sonic studies lies. I will then consider the importance of psychoacoustics and how the clarity of a sound's configurations — its internal workings, relationships and morphologies — can depend upon the level of both our consciousness and concentrative focus during an aural experience. The resultant questions posed therefore are: (1) in what manner or form can unstable sound be presented, so that the subsidiary or less immediate phenomena are more readily accessible and (2) to what degree does this rely upon the intensity of our perception? The examination of formation and perception will then provide reasoning behind my compositional aesthetic, focusing on facets such as unstable sound selection, limitation and reiteration of material, microtonality, and silence.

### 1.1 Natural Acoustic Phenomena - Formation and Perception

It was necessary to 'enter into' the sound, to rediscover the ocean of vibrations that Pythagoras had scrutinised two thousand years ago.<sup>1</sup>

Sound is an energy born of vibrations. Out of these vibrations stem waves, similar to those seen in bodies of water — the fluttering of a stream or the ripples on a pond. However, instead of being waves on the ocean surface, these exist only by travelling through structured mediums, primarily air. This phenomena in air can be defined, in general terms, as 'mechanical radiant energy that is transmitted by pressure waves in a material medium.'<sup>2</sup> Curtis Roads, the American electroacoustic composer, describes:

---

<sup>1</sup> Horațiu Rădulescu, *Sound Plasma – Music of the Future Sign*, (Munich: Edition Modern, 1975).

<sup>2</sup> Curtis Roads, *Microsound*, (Massachusetts: The MIT Press, 2001), 6.

When the particles line up in rapid succession, they induce the illusion of tone continuity that we call pitch. As the particles meander, they flow into streams and rivulets. Dense agglomerations of particles form swirling sound clouds whose shapes evolve over time.<sup>3</sup>

Due to this micro particle composition, there are many natural phenomena that can occur within sound, both physical (how it travels through and around mediums) and perceptual (what we hear as a result of these travels). Phenomena on a global level such as absorption, refraction and diffraction can all occur as a result of sound waves adapting to their surrounding environment. Each of these phenomena are a result of how sound travels; however, it appears to be within its internal structure that the malleability of sound originates: its interior evolution. This notion, along with the study of methods in which sound can be presented in order to bring these internal formations and their resulting ‘internal phenomena’ to the forefront of our perceptive field, is where the focus of this chapter lies.

It is known that we have the cognitive capacity to differentiate relatively between the frequency and amplitude of successive sounds, so that we can perceive qualities such as intervals as relatively the same (for example an octave or a fifth) even if at completely different registers. Attributes such as pitch and dynamic, those which are commonly at the forefront of our perception of sound, stem from the physical properties of wave vibration speed and wave amplitude respectively. However, as time passes and these subside, we can begin to decipher the final attribute: its wave shape or timbre.<sup>4</sup> The research carried out by John Grey in his text *An Exploration of Musical Timbre* influenced the thinking that the two most significant perceptual structures of timbre are: its distribution of spectral energy, and the evolution of this energy over time.<sup>5</sup> Gareth Loy categorises these into two types of spectra: (1) Static: the average intensities of the partials over the duration of a sound and (2) Dynamic: a more detailed spectral evolution of these partials through time.<sup>6</sup> He explains:

Much of the aliveness we hear in a musical tone is communicated to us by the way the instrument’s timbre changes instant by instant. The scrape of the bow on a violin string before the note sounds, or the puff of air that precedes an alto saxophone tone,

---

<sup>3</sup> Roads, *Microsound*, vii.

<sup>4</sup> Gareth Loy, *Musimathics: The Mathematical Foundations of Music*, Vol. 1 (Massachusetts: The MIT Press, 2006), 3.

<sup>5</sup> John Grey, ‘An Exploration of Musical Timbre’ (Ph.D. diss., Stanford University, 1975).

<sup>6</sup> Loy, *Musimathics*, 32–33.

or the characteristic way the overtones of a trumpet tone change strength during the course of a note provide important clues about what we are hearing.<sup>7</sup>

In other words, timbre can denote the semantic quality of a sound. If the timbral qualities of successive sounds remain unaltered, this will strengthen the listener's tendency to relate them back to a relative source. Frequency and amplitude, on a macro-level, can be altered within these sounds without our perception of the source changing; birdsong which fluctuates rapidly in pitch and volume will always be birdsong. It is only when the timbral qualities begin to shift, that sounds start to become their own individual entity. Therefore, if we want to find the true singularity, we must look toward the primary contributors to a sound's timbral qualities, namely: the distribution of partials (harmonic content or sound quality) and how they change throughout its duration (attack/decay, vibrato, and the occurrence of inharmonicity or noise). For sustained tones, the most important of these is the harmonic content, the number and relative intensity of the upper harmonics and overtones present in the sound. The attack and decay are formed from a rise and fall in amplitude; the ear can instantly perceive the rapid increase and slow decline in amplitude within a plucked or struck sound. Vibrato is a result of periodic changes in the frequency of the tone; if the harmonic content of a sustained sound from a voice or wind instrument is reproduced precisely, the ear can readily detect the difference in timbre due to the absence of vibrato. The natural essence of a sound can therefore be expressed as a result of the interaction between these basic timbral components which gives it its own unique voice in nature making it identifiably independent to the perceiver. The importance, here, is what comes about during these interactions — the natural acoustic phenomena of sound.

The psychoacoustic research carried out by L'Institut de Recherche et Coordination Acoustique/Musique (IRCAM) during the end of the twentieth century, examined how 'listening organises the physical world by differentiation and integration.'<sup>8</sup> One such illustration of aural integration is that of pitch perception, which involves the 'unconscious integration of many different harmonic partials (frequencies within the harmonic series) into a single sound object'; a psychoacoustical phenomenon aptly named 'fusion.'<sup>9</sup> We may then ask what needs to be done to a sound or, in what manner can it be presented, in order for us break apart this fusion and perceive the timbral composition within that sound's internal

---

<sup>7</sup> Loy, *Musimathics*, 33.

<sup>8</sup> Georgina Born, 'Music Research and Psychoacoustics,' *The Sound Studies Reader*, Jonathan Sterne (ed.), (New York: Routledge, 2012), 419–426 (423).

<sup>9</sup> Born, 'Music Research and Psychoacoustics,' *The Sound Studies Reader*, 423.

formation? Is it merely down to psychoacoustical reasoning, or can the physical properties of a sound's structure also have an effect on what we hear? For example, this study on harmonic fusion has brought about the contrasting perception of inharmonics (sounds with noisier qualities, like bells or drums, that are not constructed from a single harmonic series). Georgina Born states:

Research has shown that we do not hear these as fused single objects; rather, we search unconsciously within them for patterns of the harmonic series, and hear them as a set of overlapping, incomplete harmonic pitches.<sup>10</sup>

In addition to this, another psychoacoustical phenomenon known as 'virtual pitch' can occur when perceiving a pattern of higher harmonics within an inharmonic, where 'the brain projects a phantom fundamental' to replace this missing frequency.<sup>11</sup> Here, we have examples of how both the physical attributes and the manner in which our brain deals with them, can have an effect on our perception of sound. Therefore, it appears that a balance may be needed between the physical and the psychoacoustical in order for us to uncover the further phenomena within the acoustical structuring of sound — its formation and perception.

Particle movement is consistent in all sound as this is its fundamental principle, yet, as discussed above, the evidence of their interaction can often be hidden within certain sound classes, namely, ones with a more stable nature; infinite partials fuse to form one stable sound. In order for us to experience the fundamentals of timbral formation with a higher level of coherence, the particles need to be interacting with each other in a manner that draws attention; a more directly perceivable particle interaction. Prime examples of this would be a multiphonic on a wind instrument — evident in *Terricrepe* (2013) and *Meridian* (2015) — which allows integer multiples of the fundamental to shine through, or the wolf tone of a bowed instrument, heard in *Two Cello Pieces* (2014), where the pitch matches the natural resonating frequency of the cello's wooden body, causing an oscillated beating. Furthermore, for these inner phenomena to occur and, additionally, expand, the generated sound needs to be constantly moving so as to give more malleability to its formative timbral properties. For example, the timbral potentialities of the wolf tone can further reveal themselves when the bow's point of contact is moved or the pressure is altered. Due to the particles being driven to this fluctuated state of motion, the overall sound will be more

---

<sup>10</sup> Born, 'Music Research and Psychoacoustics,' *The Sound Studies Reader*, 423.

<sup>11</sup> *Ibid.*, 423.

unstable in nature. Instability, here, refers to an unpredictability within the evolution of a sound's timbral qualities; a stochastic behaviour within the sound full of transient, chaotic, and periodic fluctuations — movement causes instability and vice versa. Here, it is best to refer back to Roads's depiction of microsonic particle formation. He continues:

Molecular materials alter the terrain of composition. Pliant globules can be molded into arbitrary object morphologies. The presence of mutating sound objects suggests a fluid approach to compositional mesostructure, spawning rivulets, streams, and clouds as well as discrete events.<sup>12</sup>

Therefore, it appears to be more productive in looking towards dealing with sounds on the opposite side of the spectrum — those that present a more volatile or unstable state, as it is here that both timbral interactivity and natural phenomena are seemingly most available.

Modern western instruments have been developed to produce responsive, harmonically rich and stable sounds; however, my intention of exploring instability obviously means implementing the other, often relegated, voices that belong to these instruments. This instability and fragility is key to the way my work comes together, with the rite of passage becoming the various practices in pushing modern instruments and their stable design to unsafe and volatile territories. The later compositions of the Italian composer Luigi Nono are fruitful in this method of dealing with intentionally unstable sounds. It is within the body of work from the last decade of his life, where Nono distanced himself from the political expression within his music, and adapted a more spiritual and philosophical approach, letting the sound evolve in a much more organic and gradual way.<sup>13</sup> This led to working with sounds that presented natural imperfections, governed by their instability, fragility and constant movement. His string quartet *Framente – Stille, an Diotima* (1979) displays numerous layers or waves of unstable sound which seamlessly weave in and out of each other in a constant state of flux and evolution between the borders of pitch, noise and silence. Within each instrument Nono explores a great variety of fragile timbres and articulations constantly moving between bowing techniques such as *arco normale*, *col legno*, *col crini*, *gettato*, *flautando*, *tremolo* and *pizzicato*, combining these with varying degrees of finger pressure (producing unstable harmonic sounds), different areas of the bow (point, middle, frog) and its point of contact with the string: on the fingerboard (*tasto*), near the

---

<sup>12</sup> Roads, *Microsound*, 40.

<sup>13</sup> Michael Gorodecki, 'Strands in 20th-Century Italian Music: 1. Luigi Nono: A History of Belief,' *The Musical Times* 133/1787 (January 1992): 10–17 (16).

bridge (*ponte*) or behind the bridge (*dietro il ponte*).<sup>14</sup> In addition to this, Nono deals with certain extremities of dynamics and register, forming a consistent foundation that can push instrument, sound and its timbral interactions to a more fragile state of formation. Forcing timbres to these extremities whether it be high, low, soft or loud will, naturally, lead the inner workings and their evolution being more volatile. In Nono's final piece, "*Hay Que Caminar*" *Soñando* (1989), for two violins, we can see that the act of requesting the performer to implement actions beyond their comfort zone, such as playing *pppppp* on the highest note of a violin in a *sul ponticello* position, with the wood and hair of the bow, can produce unpredictable and exciting results. The strain on both the performers and the sounds they are attempting to produce, will lead to all of the imperfections in quality of sound becoming much more evident.<sup>15</sup> Here, Nono is constantly moving the sound, through the implementation of certain techniques, upon timbres that are already within the class of a fragile, brittle and unstable nature. By juxtaposing these layers of texture, both vertically and horizontally within a sound world thinly joined together by its sparsity of construction, simple intervallic movement, long pauses of sound, bordering on imperceptibility, and silences, Nono has, as his student Helmut Lachenmann describes:

[...] taken us into earthquake zones of human experience where no buildings can remain standing, because their foundations are constantly shifting and being destroyed, and only massive ruins remain as an indication of the forces of which, one way or the other, will have the last word in all projects and constructions created by the human spirit.<sup>16</sup>

Therefore, by starting with these unstable classifications, there appears to be a greater opportunity at understanding and, as a result, perceiving, the internal relationships of sound's timbral compartmentalisation. Acting on a sound, in the attempt to reveal these small-scale natural phenomena of transients, rhythmic beats, difference tones, subtones, harmonics, fluctuations in harmonics-to-noise ratio, can all come about through two main types of sound treatment — individual and combinatory. The Romanian composer Horațiu Rădulescu has discussed this type of treatment in his text *Sound Plasma - Music of the Future Sign*, where he displays the importance of dealing with unstable sound sources and their

---

<sup>14</sup> Carola Nielinger-Vakil, *Luigi Nono: A Composer in Context*, (Cambridge: CUP, 2016), 162.

<sup>15</sup> John Warnaby, "'Only Travelling Itself': Reflections on Luigi Nono (1924-1990)," *Tempo, New Series* 176/1 (March 1991): 2–5 (4).

<sup>16</sup> Helmut Lachenmann, "Touched by Nono," *Contemporary Music Review* 18/1 (1999): 17–30 (30).



initial organisation, with an interest lying in the interaction of the resulting natural phenomena.<sup>17</sup> The texture thus produced is called the ‘Sound Plasma’ and comes about through two different treatments of timbres: (1) Micro: the multiphonic treatment of an individual timbre causing it to fluctuate according to its own nature and (2) Macro: the interaction of different timbres (for example the human voice with instruments, or electronics mixed with natural sounds); here, opposing sounds relate with one another to form a single spectrum.<sup>18</sup> Consequently, it can be said that this plasma displays the interaction of a sound’s timbral components most evidently and, as a result, can reveal elements of its structural formation: the length of its waves (either in relation to itself or another source), the hierarchy of its partial content, and the ratio of pitch to noise.

Thus, each timbre or sound quality chosen within my compositions is a result of its malleability and the ease with which it can be manipulated into displaying its timbral properties. In order to encourage the transpiration of these properties and the ensuing phenomena, a constant movement is needed, both within the raw original sound and the way it is subsequently treated. This movement is evident within all of my compositions, for example, *Terricrepe* (2013), in which the strings are given a bow position clef allowing them to move the sound in a more constant and freeing manner, or *Hiraeth* (2013), where the solo bassoon is asked to implement consistent bisbigliando to adjacent frequencies, creating a rapid change in colour (fig. 1.1.1).<sup>19</sup>

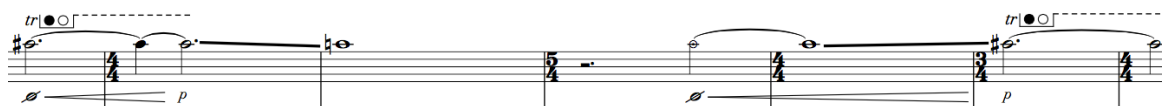


Fig. 1.1.1: Colour trills in adjacent frequencies in *Hiraeth*: Bassoon, bars 65-70.

In my piece *Reheal* (2014), the main operation in play is the exploration of rich textures and timbres available from the fourth string of the cello when it is scordatura down one octave. The timbral potential and sound possibilities are altered radically, due to the lowered tension of the string, with the main effects being pitch variation (due to bow pressure),

<sup>17</sup> ‘Wild Ocean’: an interview with Horatiu Radulescu (<http://www.horatiuradulescu.com/interview.html>, 24 March 2017).

<sup>18</sup> Rădulescu, *Sound Plasma – Music of the Future Sign*.

<sup>19</sup> This is something I first discovered in Helmut Lachenmann’s *Pression* (1969), for cello, where the composer indicates at what place on the instrument the right hand (bowing) and the left hand should operate. This was further developed by Rebecca Saunders in her Cello Concerto, *Ire* (2012), where the solo cello is given its own clef for the free movement of bow from *sul tasto* to *sul ponticello* (fig. 1.1.2).

delayed dynamics (as a result of slower string vibration), and noise interference with different bow speeds and positions. This gives the cello an almost laboured and out-of-breath feel with sounds ranging from whispered warmth to violent screeches. A number of techniques are then applied to this already unstable timbre, which are used to obtain the most extreme and diverse qualities available. These are: a rhythmically uneven trill moving toward *sul pont.* with lessening finger pressure and a fast, smooth glissando; varying degrees of tremolo and vibrato; fluid vertical bow movement with extremes of bow speed and varying bow contact points (fig. 1.1.3). With a mixture of these techniques, elemental timbres are achieved full of instability, fragility and constantly moving sound, with sonorities such as noise interference, unpredictable harmonic partials, and the fusion of contrasting warmth sounds with distorted, harsh material. The reason for working with sounds of these varieties, is to display how their timbral components interact and integrate over time: the partial amalgamations, the fluctuation of micro-particles — revealing that sound is a malleable, inconsistent entity.<sup>20</sup>

Nevertheless, allocating the timbral qualities of a sound relies greatly upon the level of our concentration at the moment of perception. Sound is perceived by all organisms on earth: humans, animals, insects, etc. This experience of sound will differ greatly, not only between species but also within the species themselves. We, as humans, can only judge the cultural study of sound from the position of people, and this can be described in multiple ways from individual positions; some may choose to hear a sound, whereas others may not. Listening is a very personal experience, therefore, the aspects of sound perceived will differ greatly from person to person. For this reason it can be argued that the fate of sound phenomena allocation not only relies on the physical attributes of air vibration, but also on the understood possibilities of the capability of hearing.<sup>21</sup> The qualities of a sound can become heterogeneous depending on how an individual perceives them; therefore, as people change, ‘so too will sound by definition.’<sup>22</sup>

---

<sup>20</sup> ‘Imperfect’ here, refers to the inner workings of a sound shining through.

<sup>21</sup> Jonathan Sterne, ‘Sonic Imaginations,’ *The Sound Studies Reader*: 1–12 (7).

<sup>22</sup> *Ibid.*, 7.

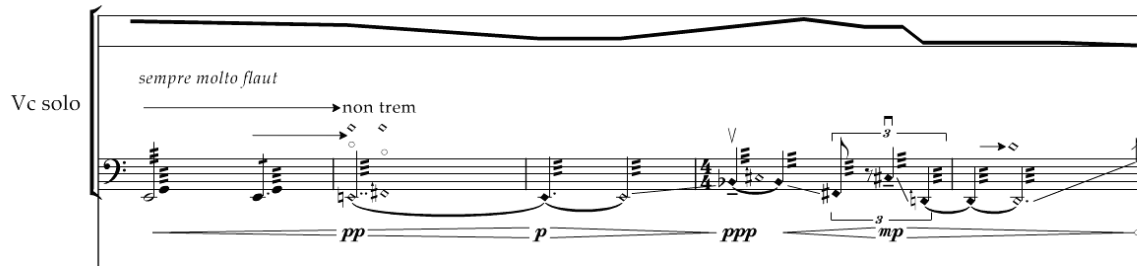


Fig. 1.1.2: The bow position clef in Rebecca Saunder's *Ire*: Cello solo, bars 33-37.<sup>23</sup>

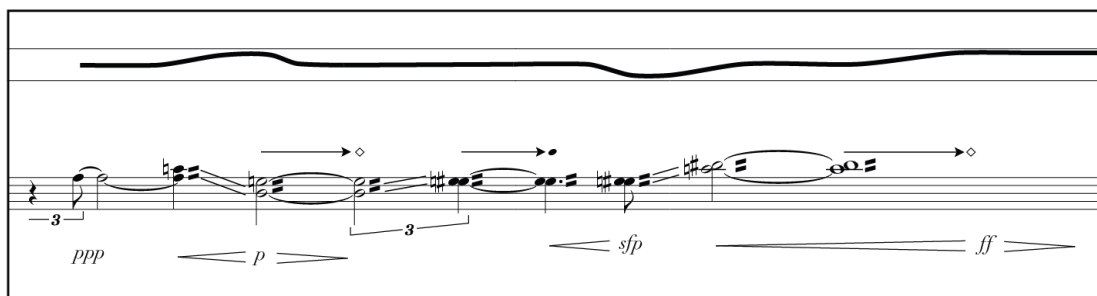


Fig. 1.1.3: An array of techniques applied to the Cello in *Reheal* showing the bow position clef above.

The examination of sound begins with a phenomenology.<sup>24</sup> This deals with how one consciously experiences the signal one's ears have received, and can differ greatly with regard to how much allocation of concentration the brain has allowed toward the signal at the moment of experience. When first encountering a sound, we naturally attach its timbral qualities to a relatable source; therefore, initially being experienced as a sound of things — the flow of water, the crunch of bark or the pluck of a string. However, the deeper significations, although not being absent from the first listening, may not always immediately reveal themselves fully.<sup>25</sup> We must then implement a phenomenological reduction in order to allow the more concealed properties within sound — those sometimes rendered inconspicuous by others — to become all the more evident. This practice of phenomenological reduction, developed by Edmund Husserl at the turn of the twentieth century, developed the way in which we perceive and study sound, influencing composers such as Pierre Schaeffer, in his development of *musique concrète*, R. Murray Schafer, with his implementation of 'ear cleaning' exercises that challenge how we listen to our acoustic

<sup>23</sup> Rebecca Saunders, *Ire*, (Edition Peters Group, 2012).

<sup>24</sup> Don Ihde, *Listening and Voice: Phenomenologies of Sound*, 2nd edn (SUNY Press, 2012), 17.

<sup>25</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 86.

environment, as well as the more meditative customs of Iancu Dumitrescu and Horațiu Rădulescu from the Romanian ‘avant-garde’ school.<sup>26</sup> Pierre Schaeffer coined the term ‘reduced listening’ which identifies a listening mode that can ‘focus on the traits of the sound itself, independent of its cause and meaning.’<sup>27</sup> When implementing certain intensified types of listening it is possible to rid a sound of its meaning, and even its source, shifting our concentration to its content; when purpose or origin are truant, only sonic properties are able to be considered. Dumitrescu and Rădulescu use phenomenological reduction as a technique of philosophical meditation which:

Aims at a fusion between perceiver and perceived, to get to a point where the hierarchy between matter of thought and the thought itself vanishes, to be less a composer than a sculptor who works from within his block of marble. With this technique sound can no longer be experienced in a linear fashion but as a pool into which the listener plunges.<sup>28</sup>

Reduced listening is also further enhanced by acousmatic sound studies, which involves the sound source being invisible to the listener. The reason behind this is that an image can lead to the brain relying on the visual to influence the ear. Michel Chion explains:

Acousmatic sound draws our attention to sound traits normally hidden from us by the simultaneous sight of the causes — hidden because this sight reinforces the perception of certain elements of the sound and obscures others.<sup>29</sup>

When we see the source, our brain immediately relates it to our past experiences of that object, which can then affect the purity of the sound experience. This comprehension can become a problem when examining sound, mainly due to the already existing competing knowledges of sound in the world, which have their own politics, cultural and historical territories, and can ‘exert their effect on everything we study.’<sup>30</sup> Therefore, we must attempt

---

<sup>26</sup> R. Murray Schafer, *A Sound Education: 100 Exercises in Listening and Sound-Making*, (Ontario: Arcana Editions, 1992), 12; Brian Kane, ‘L’Objet Sonore Maintenant: Pierre Schaeffer, Sound Objects and the Phenomenological Reduction,’ *Organised Sound* 12/1 (April 2007): 15–24 (16); Guillaume Ollendorff, ‘At the Heart of Chaos,’ *Cosmic Orgasm: The Music of Iancu Dumitrescu*, Andy Wilson (ed.), (Unkant Publishers, 2013): 163–169 (163).

<sup>27</sup> Pierre Schaeffer, *Traité des Objets Musicaux*, (Paris: Seuil, 1966), 270.

<sup>28</sup> Ollendorff, ‘At the Heart of Chaos,’ *Cosmic Orgasm*, 163.

<sup>29</sup> Michel Chion, ‘The Three Listening Modes,’ *The Sound Studies Reader*, Jonathan Sterne (ed.), 48–53 (52).

<sup>30</sup> Sterne, ‘Sonic Imaginations,’ *The Sound Studies Reader*, 8.

to place this way of knowing in tension seceding from pre-given notions of sound relations (both visual and aural), and not ‘automatically take any discourse about sound in its own terms, but rather interrogate the terms upon which it is built.’<sup>31</sup>

However, acousmatic listening usually requires the fixing of sounds, as one has to listen multiple times to gain a ‘descriptive inventory’ of what one hears.<sup>32</sup> This may conflict with the nature of unstable sound that I choose to explore which, as discussed, is to naturally fluctuate due to its ever moving internal relations. In recordings, the sound is forever fixed, whereas, in a performative setting this practice of live reduced listening — to an unfixed sound or even a sound re-iterated with minute differences — can really come to fruition; here, the chance of divulging the true essence of its formation should heighten. Iancu Dumitrescu is certainly influential in his thought process towards studying movement, talking of the necessities in examining unfixed sound, saying:

There is definitely not the idea of perfecting something, of making the sounds fixed and perfect for all time. The point is to find out how they can be different every time but in exactly the way that is right for that particular time.<sup>33</sup>

His compositional process begins with a phenomenology of a chosen sound, usually obtained by ‘trying things out on instruments,’ before gradually stripping away everything that is not part of the original sound, until all that is left is a concentrated or crystallised matter in which all compositional material can then stem from.<sup>34</sup> Owing to the source of the chosen sound coming from performers (and not acousmatically), each iteration lives through the individual interpreter, leading to multiple phenomenologies of homogeneous sounds. This can then reveal to the composer all the instability and micro-movement within one sound class, and how it can be subtly different at a specific point in time.

Here, Dumitrescu is also referring to the temporality within experiencing sound. The passing of time plays a significant role in the perception of sound, as what one hears first within the auditory dimension can further develop timefully in experience. In other words, the temporal movement of sound can propose further significations other than the first existential level of perception, which is usually to verify the source and then relate it to our surrounding environment. The initial hearing of a sound may not reveal its deeper

---

<sup>31</sup> Sterne, ‘Sonic Imaginations,’ *The Sound Studies Reader*, 9.

<sup>32</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 50.

<sup>33</sup> Tim Hodgkinson, ‘Interview with Iancu Dumitrescu,’ *Cosmic Orgasm: The Music of Iancu Dumitrescu*, 95–106 (97).

<sup>34</sup> *Ibid.*, 96–97.

conveyances but, as time passes and the reflective experience progresses, the object-subject relationship or previous knowledge retreats as the unfamiliar phenomena become more evident. With fixed sounds, the risk of the listener falling into a more assured listening increases, due to the reliance on direct memory of patterns, which can lead to a shift in focus towards a graspable ‘solution’ of the sound; we eventually hear one instant followed by another. On the other hand, unfixed sounds provoke us to provide descriptions of certain nuances which, at the beginning of perception, we may not even be able to produce appropriate terminology for. In this situation, as time continues, the listener can gradually begin to gain a progressively finer sense of discrimination concerning the sound in which she is experiencing.<sup>35</sup>

For example, in my *String Quartet No. 1* (2015) and *Stupa* (2015), the anomalous unstable sounds used may cause the listener to second guess what is happening within the proposed auditory dimension. The repeated homogeneous cello multiphonics (and all their micro variations) in the *String Quartet No. 1*, juxtaposed with similar timbral entities from the remaining instruments, can challenge both the listener’s aural expectations (or pre-existing knowledge) and their visuality of performance, as the blending and transferring of resulting phenomena — resonances, beatings, microtonal frequencies — between all sounding bodies causes one to refocus concentration, not asking where each individual sound is coming from, but how it is forming, developing, relating and evolving within the auditory dimension. Similarly, in *Stupa*, the conglomeration of timbral instabilities and constant micro-movement of multiple analogous sounds, causes one to perceive a solid protean mass, which has the ability to exceed the sum of its parts generating an immersive environment where sound and visual may not always correlate. The longer one is exposed to these experiences, the easier it may become to discern certain phenomenological entities that reveal themselves more and more over a prolonged period. In this place, sound can embody the sense of time.

Yet, the notion of visual influence and memory becomes more difficult with this method of live reduced listening as, whether it be an instrumentalist or a speaker playback, the sound source is usually always visible to the audience, meaning these connective thoughts and relations to past experiences will forever be present. Sight is generally a culturally preferred sense as its potentialities of experience are more firmly planted within

---

<sup>35</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 86.

the practice of interpretation.<sup>36</sup> If an entity within the sonic environment is confusing or disruptive to what is in sight (what direction it is coming from or what is making it), visual memory has free rein to rush forward with explanations, drawn from individual or collective experience.<sup>37</sup> It, therefore, may be more productive to use this natural human reaction as a practice in present perception. In other words, using the current visual in conjunction with the images and metaphors we pull from our memory, in trying to make sense of what is presently unfolding before us. The cello multiphonic and its echoing timbres may appear to be emanating from all members of the string quartet within the visual field. Over time the chance that the perceiver may accept this enigma heightens, as the focus shifts towards greater sonic forces at play. Now, the audience can judge the sound visible to them, however alien it may be to their past notions of that specific sound source, by comparing and contrasting the standard with the enigmatic.

This visual in meaningful sound, and the accompanying listening that acknowledges memory's role in perceiving the unfamiliar, can also be immediately linked to the nature of surprise, and where it leads. During the perception of a live sound, one's memory, both of physical events and of feeling, and one's current perception, have the ability to fuse to form a greater whole. Within this whole, entities that were previously insignificant or unimportant become more strikingly audibly 'visible'. This surprise or shock is a response to being momentarily ambushed, where one's unobtrusive perception is suddenly arrested. This, however, does not have to be the obvious loud bang. It can be delivered in more subtle, disorientating shifts, where the dynamics of a familiar environment, both in sound and image, can be defied; suddenly something is awry, because we know what 'should be' from memory, and the 'world of our experience shifts its bounds.'<sup>38</sup> The polyphonic cacophony produced by the solo violin in *Stupa* confuses the senses, as its familiarity is now replaced with an uncertainty, whose subtle alterations further persuade the listener in deciphering. Consequently, in this moment of deciphering, our concentration has the ability to slow perception's normal course, causing it to halt temporarily in its forward stream and,

---

<sup>36</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 86.

<sup>37</sup> Katherine Norman, 'That Passing Glance: Sounding Paths Between Memory and Familiarity,' *The Routledge Companion to Sounding Art*, Marcel Cobussen, Vincent Meelberg and Barry Traux (eds.), (Abingdon, Oxon: Routledge, 2016), 179–190 (183).

<sup>38</sup> *Ibid.*, 187. Memory in perception will be further elaborated upon later in the chapter.

as a result, to become more analytical; creating conditions for exact attention.<sup>39</sup> The British sound artist and writer Katharine Norman elaborates on this notion:

Engrossed in actively “figuring out” a noisy, impenetrable process we can become involved to such an extent that the flow of time appears to drift (from our normal comprehension of it), checked in its course by the effort of intense concentration. It is as if perception, while not materially different in manner from usual, is temporarily operating on a keener, microscopic scale.<sup>40</sup>

This discrimination can be achieved with two principal methods of what Don Ihde, the American philosopher and post-phenomenologist, labels ‘perceptive concentration’. The first deals with hearing the sound as an enduring gestalt, where all phenomena are given equal concentration leading to the perception of a ‘fused’ entity; no particle is more important than another. With this method, the listener is aware of the overall sound-world. Ihde describes this:

When I listen to someone speak, I do not ordinarily hear a syllable at a time, or even a word, but I hear the larger melody and flow of speech as an ongoing rhythmic unity.<sup>41</sup>

The second method involves a more focused concentration, in order to seek out individual phenomena. This can bring about the finer details within a sound that may not be accessible with only the first method of perceptive concentration. However, this auditory focal attention can lead to all other phenomena being placed in the background of our aural awareness. If we concentrate on just one syllable of speech, the overall sentence becomes lost. Therefore, it is beneficial to transition between the two methods of concentration in order to see both the organism as a whole and the particles from which it is made. This coincides with the American composer Pauline Oliveros’ practice of Deep Listening, that encourages one to aurally engage with their surroundings through two forms of attention: focal, in which attention needs to be renewed moment by moment in order to follow a stream of some sort and, global, where one is urged to expand their listening and include everything that surrounds them. She explains:

---

<sup>39</sup> Norman, ‘That Passing Glance: Sounding Paths Between Memory and Familiarity,’ *The Routledge Companion to Sounding Art*, 182.

<sup>40</sup> *Ibid.*, 183.

<sup>41</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 89.



When we do this, and we expand almost infinitely to include, and this is what I call inclusive listening, everything that is possible to listen to. Most of the time we are discarding what is going on as not important, but in order to do what I call Deep Listening we have to include everything.<sup>42</sup>

These forms of perception, whether they be reduced, deep or inclusive listening, methods of perceptive concentration or phenomenological reduction — all aid in the discovery of what unstable sounds can contain, and how they exist, and even adapt, to their surrounding environment. Openness in listening is essential to unlocking the relationships in complex timbral sounds, both internally and externally. Here stands a listening that is creative, alert to the present moment, and to the chances it may provide — an improvised listening.<sup>43</sup> The study of unstable sound thrives on a perception of this intensity, as it urges engagement — in the promise of discoverable moments — which introduce new ways of seeing and hearing sounds, spaces, environments, and the relationships between sonic moments contained therein.

With this philosophy, I begin to approach the practice of musical composition. Each element within my compositions aids in the creation, discovery and perception of a sound's unstable timbral components with the interest lying in the many ways they can interact, both internally (with themselves) and externally (with other sound sources).

I will now proceed in discussing how my main practices of limitation of unstable timbres, narrow frequency bands, reiteration and silence, provide time and space to sound — giving both its formation and perception a greater chance of displaying (and in turn a greater chance of one perceiving) the complexity and diversity of natural phenomena originating from inside.

## 1.2 Limited Unstable Timbral Palettes

In placing the study of unstable sonorous energy at the forefront, I naturally draw my compositional material from a small palette of unstable sounds. As mentioned previously, what makes these palettes unstable is their natural tendency to be governed by timbral

---

<sup>42</sup> Jenny Gottschalk, *Experimental Music Since 1970*, (London: Bloomsbury, 2016), 107.

<sup>43</sup> Andra McCartney, 'How Am I to Listen to You?' *Negotiated Moments: Improvisation, Sound and Subjectivity*, Gillian Siddall and Elen Waterman (eds.), (Durham: Duke University Press, 2016): 37–54 (41). This term 'improvised listening' can include the forms of perception discussed, i.e. reduced, deep, perceptive concentration, intimate listening. Its main attributes are openness, creativity and an alertness when listening.

qualities — their plasmatic formation.<sup>44</sup> Every composition within the portfolio is a study of selected unstable timbral palettes, and the various ways they can be utilised, implementing both individual and combinatory treatment of sounds within — micro and macro plasma.<sup>45</sup> The limitation of timbral elements is an incredibly important factor during the sound selection process as, out of this limitation, naturally stems reiteration, which readily lends itself to more intense forms of listening. In a similar vein to that of Schaeffer's reduced listening or Dumitrescu's 'concentrated or crystallised matter' aesthetic, limitation allows a greater deal of space for each sound to be perceived. Space, in this context, deals with the perceptive concentration of the listener and refers to sparsity within their temporal focus; if there are fewer entities to concentrate on, the divided proportions of our focus will, naturally, be larger. Within auditory temporality, the temporal span is evident as 'containing a multiplicity of auditory events that are intentionally graded.'<sup>46</sup> The allocation of certain phenomena is dependent on where, within this span, one aims one's focal attention. Husserl characterises the temporal field as 'one which presents itself in terms of what are here field-like characteristics bounded by horizons,' which is exclusively orientated toward the movement into the sense of the past.<sup>47</sup> Ihde builds upon this when he introduces 'futurally orientated protentions' within the temporal span.<sup>48</sup> For example, the sole focus on expectation of sound commencement will direct one's attention to the 'futural-edge' of the temporal span — a sprinter awaits the crack of a starting pistol.<sup>49</sup> Conversely, once one is exposed to the anticipated sound, attention to the source point may become faded, as focus now lies in concentration on its tonal or timbral qualities, for these are more evident within the later stages of the temporal span. Here, once again, there is a balance to be achieved, by shifting our focal attention throughout the temporal span and between all the events it may contain. If the aural plane is crowded with consistent events, each containing

---

<sup>44</sup> Rădulescu, *Sound Plasma: Music of the Future Sign*.

<sup>45</sup> It is important to note that I always commence composition with the sound source at my grasp and a phenomenological reduction of the selected sounds is usually completed before commencing any organisation or notation. This usually involves improvisatory reiterations of the sounds and gathering as much information as I deem necessary on the numerous evolutions that can occur. These improvisations are always governed by the three elements found in Nono's late works: instability, fragility and constant movement, which not only create unstable sound but can also push it to a volatile state revealing its natural phenomena.

<sup>46</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 90.

<sup>47</sup> *Ibid.*, 91. This will be further elaborated upon in subchapter 1.3. For a more detailed insight of Husserl's 'Temporal Field' see: Edmund Husserl, *The Phenomenology of Internal Time Consciousness*, trans. James Churchill (Bloomington, Ind.: Indiana University Press, 1964).

<sup>48</sup> *Ibid.*, 91.

<sup>49</sup> *Ibid.*, 93.

multiple sound classes, it becomes much harder for us to distribute our focal attention evenly between these and, as a result, some may go unnoticed. However, if an aural plane is limited to fewer sound classes, a sparser environment is created, in which we can naturally allocate more attention to each entity — a ‘silent’ room is filled with the sound of a ticking clock. Therefore, the perception of a sound’s formation, the timbral components within, and the relationships it can build with outer forces, is strengthened within a more limited environment, as the nuances that appear with each iteration of the selected timbral palette will be brought to the forefront of the listener’s attention.

This practice is evident in the compositions of Rebecca Saunders with pieces such as, *Molly’s Song 3* (1996) and *Quartet* (1998), using a restricted amount of timbral material, that each instrument is allowed to explore through repetition, combination and fragmentation. The unifying factor between these two works is the focus on a reduced palette of sounds and the building of entire structures from their acoustical exploration. Saunders states:

In a chosen constellation of instruments lies a very reduced palette of sounds, which I am drawn to and try to push to the limits of their potential. Taking a sound to its edge has an extraordinary tension. A group of instruments can provide an infinite palette of sounds, so I initially seek to reduce or condense the material as far as possible, to find something like its “essence”. I want to only hear what I can make of the very reduced selection of sounds, within each different palette I have found.<sup>50</sup>

In correlation with this thought process, my composition *Terricrepe* (2013) displays a limited nature, with all material generating from four microtonally adjacent clarinet multiphonics (which are naturally full of instability and moving sound). The aim within this sound world is the attempt at fracturing the multiphonic object and dividing the pieces among other sound sources — providing a chance at both the global and individual perception of its timbral formation. The remaining performers are asked to carry out a small number of gestures that lead to a wide range of subtly changing timbral material, all of which can relate back to the sonorous clarinet chords, with regard to both pitch relationships and unstable timbral qualities. The global or fused timbre is obviously stated by the clarinet multiphonics but, also through the blending of material by the ensemble matching the frequencies and timbral components, reminiscent of the clarinet, such as distorted choleric attacks and fluctuations, mixed with expressive vibrating sustains. In creating these timbral palettes that

---

<sup>50</sup> *Interview with Rebecca Saunders* (<http://www.james-saunders.com/interview-with-rebecca-saunders/>, 10 January 2016).

would echo the clarinet, both individually and through combination, I ask performers to find instability within their instruments, again by moving the sound, (i.e. the performer's touch interacting with the dynamic elements of the instrument and its spectrum, leading to a sonically unstable entity) by: blowing too hard or too soft, playing over the fingerboard or the bridge, letting the bow move around its axis, playing infinitely slowly or, playing pitches at extremely low registers of the instrument, due to the scordatura.<sup>51</sup>

As a result of the multiphonic fracturing, the individual timbral components which make up this echoing global timbre are also perceptibly accessible at any moment the listener chooses to shift her attention. The primary intention of this piece is the study of the unstable qualities of the clarinet multiphonic; however, once these qualities are embodied by other sources, their individual formative properties also come to fruition. For example, the transient properties of the clarinet are fabricated through the sharp biting pizzicato of the flute and violin, and the battuto slaps and hammered clusters on the cello and piano respectively. The beating properties are created by tone pulses, formed through two or more instruments playing just off perfect unison, so that beating interferences are produced. This is mainly done with extremely quiet sustained sounds, reminiscent of the slow decaying clarinet chords, which allow these interferences and imperfections to shine through. The flute material is similar, in that it focuses on the fluctuations in pitch, air and partial formation obtained whilst applying contrasting levels of breath. By doing so, resulting noisy tones are achieved, containing subtle alterations in timbre due to the embouchure change that comes about when applying different vowels and consonants (fig. 1.2.1).<sup>52</sup> This, in turn, spawns numerous levels of relative material, as each instrumental palette that is used to echo the clarinet has its own timbral compartmental formation. These levels of sound formation can be seen to correlate with those of perceptive concentration from micro — individual components of individual instruments, to macro — the combination of individual instruments and their timbral components, to form global timbres. Due to the limitation and reiterative nature of construction it is easier for the listener to shift her focus up and

---

<sup>51</sup> Loy, *Musimathics*, 32.

<sup>52</sup> The performer is asked to speak certain syllable fragments of the word 'Terricrepe' into the flute. Another phenomenon that occurs from this is the wide range of upper partials sounded with each iteration of a similar pitch.

down these levels relating sounds not only to repetitions of themselves, but also to juxtapositions of other mimicking sound sources.<sup>53</sup>



1.2.1: Examples of timbre exploration and changes in syllabic embouchure in *Terricrepe*: Flute, bars 4-6.

Another element which is evident here, and is a consistent practice throughout my portfolio in the use of unstable sounds, is the bond, both in sonic qualities (frequency, timbre, dynamic) and performative influence (the consequence of one performer reacting to another) that can be formed between their sources i.e. where the sound is coming from and who is controlling it. This notion of global relationships between two instruments, or even a whole ensemble, is evident in the music of the French composer Éliane Radigue, whose compositions rely on the timbral bond between sources and the enigmatic sonorities that can come about from players' attempt at entering into each other's sound. Her philosophy embodies:

The freedom to be immersed in the ambivalence of continuous modulation with the uncertainty of being and/or not being in this or that mode or tonality. The freedom to let yourself be overwhelmed, submerged in a continuous sound flow where perceptual acuity is heightened through the discovery of a certain slight beating, there in the background, pulsations, breath.<sup>54</sup>

For me, this bonding process is an effective way of experimenting with the relationship patterns of unstable sound, that can form externally to its configurations. This, in turn, can promote certain phenomena, in their bleeding into each other to form hybrid amalgamations; the resonant *ponticello* effect formed between clarinet multiphonic and the undulating cello in *Terricrepe*, or the noisy fluctuations of two string instruments in my *String Quartet No. 1*, heightening internal and external phenomena relationships as they ring and

<sup>53</sup> This can relate back to the point on pg. 11 of applying reduced listening to unfixed sound or a sound re-iterated with minute differences.

<sup>54</sup> Cat Hope and Carol Robinson, 'OCCAM HEX II: A Collaborative Composition,' *TEMPO* 71/282 (October 2017), 18–28 (20). The music and ethos of Radigue's practice will be discussed further in chapter 2.

beat off each other — combining and evolving. In this interconnecting environment, instruments stimulate one another enabling the audibility of new voices, for which there appears to be no direct source; they are in-between sounds — the ephemera that transition back and forth between instruments and their performers.<sup>55</sup>

In correlation with reducing the instrumental palettes, the restriction of other musical elements, primarily pitch, can aid in the identification of plasma within the unstable nature of a sound's formation. Like most micro-organisms, certain plasma is more evident within specific entities. In the musical realm, these can be identified as 'narrow frequency bands,' a fundamental pitch consisting of one or more frequencies that oscillate within any interval between 1/4 and 3/4 of a tone. This band produces the harmonic series of the fundamental, which are isolated and/or amplified in the sound, enriching the sonic texture forming a 'spectrum pulse'.<sup>56</sup> Therefore, the pitch selection within my compositions mainly deals with frequencies that are situated within a close range. The resulting microtonality not only forms a narrow frequency band, resulting in macro and micro plasma which provides particle movement (and in turn instability), but it also limits pitch to just a single frequency or adjacent frequencies and their microtones.

Pitch, and harmony, are elements that listeners are primarily drawn to within a piece of music, as it is frequently the basis of our musical upbringing. Hearing melodies, triads and chord progressions from a young age deeply embeds harmonic stability within our subconscious.<sup>57</sup> When exposed to a new piece of music, a listener's natural reaction is to relate this to a past memory in order to understand their current experience, and using the nostalgic personal associations with pitch and harmony is the most efficient way in doing so.<sup>58</sup> If this stability is rejected, the listener must then find other methods of deciphering the sound. This reliance, on pitch and harmony, mainly refers to harmonic stability and not just tonality, with expressions varying greatly from minimalism to spectralism.<sup>59</sup> With his composition of *Quattro Pezzi per Orchestra (su una nota sola)* (1959), the Italian composer Giacinto Scelsi first offered a different perspective to the listener by almost complete

---

<sup>55</sup> This notion will be elaborated upon in chapter 2.

<sup>56</sup> Rădulescu, *Sound Plasma: Music of the Future Sign*.

<sup>57</sup> Laurel J. Trainor and Becky M. Heinmiller, 'The Development of Evaluative Responses to Music: Infants Prefer to Listen to Consonance Over Dissonance,' *Infant Behavior and Development* 21/1 (May 1998), (77–88) 85–86.

<sup>58</sup> Norman D. Cook and Takefumi Hayashi, 'The Psychoacoustics of Harmony Perception,' *American Scientist* 96/4 (July 2008), (311-319), 318–319.

<sup>59</sup> Tim Rutherford-Johnson, *Music After the Fall*, (Oakland: University of California Press, 2017), 55.

abandonment of a harmonic dimension. This allowed Scelsi to confront other dimensions — what he called the ‘depth of sound’ — and to redirect the attention of the listener to new sonic refinements.<sup>60</sup> Tristan Murail explains:

It is primarily a question of working with timbre, taken in the broadest sense: the global timbre of the orchestra as a whole. The composer is thus concerned with dynamics, densities, registers, internal dynamism and the timbral variations and micro-variations of each instrument: attacks, types of sustain, spectral modifications and alterations of pitch and intensity.<sup>61</sup>

Limiting pitch to the narrow frequency band, as well as driving sound to a more fluctuating state, rids it of any tonal relationships and can, therefore, shift the listener’s focus to something beyond these relatable states of mind, aiding in the phenomenological reductive process. That is to say, treating the timbre palettes, and their limitations within, as sound-objects, rather than relying on a connective source (pitch, melody, gesture, instrument associations). This should direct one’s attention away from the traditions linked with the physical object of the source, back towards the content of the perception itself heightening the chance for one to create one’s own relationship with the sound.<sup>62</sup>

For example, my compositions *Baruopa* (2015) and *Loam* (2016), both are an exploration of low, narrow frequency instrumental sounds both individually and combinatorially. *Baruopa* examines the resonance found in the steel core, wire-wrapped low strings of the harp, which is tuned chromatically in order to create deep resonating clusters — the ‘spectrum pulse.’ These sonic qualities are enforced with varying degrees of resonance being applied, through the use of a resonator, against certain strings.<sup>63</sup> The main goal here was to apply a fragility and instability to the deep and stable resonating clusters, obtaining a sound that is constantly moving and never static. This technique is evident again in Giacinto Scelsi’s piece *Okanagon* (1968), which uses the idea of resting an ‘instrument’ against already resonating strings. Here, he has the performer use a ‘metal bar or tuning

---

<sup>60</sup> The attitude of directing the listener’s attention to these sonic refinements can also be compared to that of the minimalists where the relinquishment of the timbral and harmonic parameters compel the listener to concentrate on the evolving rhythms, or rather, on the evolution of combinatorial figures made up of very simple elements.

<sup>61</sup> Tristan Murail, ‘Scelsi, De-composer,’ *Contemporary Music Review* 24/2 (June 2005): 173–180 (176).

<sup>62</sup> Again, here, the use of memory and knowledge (or lack thereof) can aid in present perception.

<sup>63</sup> The resonator can be any implement; however, I found what gives the most effective result is something else metallic correlating with the metallic qualities found in the strings.

key' against the vibrating strings, by notating the resonating durations as rhythms on an upper staff (fig. 1.2.2).<sup>64</sup> The timbral palette of the double bass was chosen to create relationships with the sound qualities of the harp, again, in an attempt to blend sounds together through both sonorous qualities and low sounding frequencies having the resonance beat off one other. As well as the deep frequency relationships, timbral ones are formed with the warm to harsh ratio, created through bow position and pressure relating to that of the resonated harp notes. With these micro-parts that shift to join and split, a global instrument is created, containing both comparative and contrasting attributes, which is rich in continuously moving timbral qualities.

Fig. 1.2.2: Resonance durations on an upper staff in Giacinto Scelsi's *Okanagon*: Bass and Harp, bars 1-5.<sup>65</sup>

Similarly, *Loam* studies the resonance of adjacent piano strings when they are stimulated in different ways. They can be plucked, hit or scraped with the finger; hammered with mallet or brush; bowed with thread; changing all types of minute details of the sound, such as *sul tasto*, *sul ponticello*, nail and skin.<sup>66</sup> With the piano preparation I took from Rădulescu's sound icon the threading of rosined bow hairs and threads through selected strings of the instrument (fig. 1.2.3). The inspiration came from an interview with Bob Gilmore where Rădulescu describes the process:

<sup>64</sup> Giacinto Scelsi, *Okanagon*, (Editions Salabert, 1968).

<sup>65</sup> Ibid.

<sup>66</sup> Rădulescu describes this as getting 'a tremendous thunder sound on the low strings and an "aura" on the fine threads of the high-register strings.' *Wild Ocean* (<http://www.horatiuradulescu.com/interview.html>, 26 April 2016).



To go with a little bow, a V, like a ray, into a field of strings. It means you have just one hair from the whole hair of the bow, threading it all around one string. Each string can be tuned differently. It maybe the richest instrument timbrally.<sup>67</sup>



Fig. 1.2.3: Piano preparation showing threads and wires. Each pitch cluster is marked with tape.

The main goal of the remaining instruments, similar to *Terricrepe*, is to mimic and echo the resonance of the piano strings, both in frequency and timbre. For example, the cello is detuned to acquire similar frequencies to that of the piano, and is asked to explore the resonant spectra that form when playing micro-intervallic frequencies. Relating to timbral material, they are asked to investigate the rich textures available whilst implementing a variety of techniques including glissando, trills, finger pressure, bow pressure and speed. The percussion set up is, again, of a limited timbral palette, consisting of a floor tom (tuned again to a similar frequency) and a thunder maker. Drum instruments, like the floor tom, are ideal agents for the creation of complex and unfamiliar textures, owing to their noise-heavy resonances and their ability to project subtle gestures at a relatively high volume. One sound is used upon the floor tom which is: the dragging of superbball mallets (a mallet with a large synthetic rubber head) along the skin, creating a deep resonating tone, full of noise and squeaks, that traverses the timbral cloud, stimulating and bonding with qualities of the other instruments.

These pieces are, therefore, governed by the limitation of both unstable sound palettes and the frequencies they wield, with their ability to enforce and provoke phenomena such as — beating, subtones, harmonic spectra, fluctuations and transient noise — being a central focus. I intentionally create these limited conditions, curbing the qualities

---

<sup>67</sup> Ibid.

of sound in order to provide a more efficient form of perceiving these phenomena. With this limitation, and through the study of the selected reduced material's fecundity, a reiterative construct is purposively formed in order to facilitate the potentiality of the numerous sonic possibilities, as well as the many ways they can be perceived. As a result, this reiterative aesthetic lends itself kindly to these types of phenomenological experiences i.e. improvised listening, perceptive concentration, etc.<sup>68</sup> The listener, therefore, should have a greater chance of experiencing the minutely different formations, in which similar sounds can appear, as they are being exposed to a reiterative aural plane. At this point, what needs to be addressed are the occurrences that can happen, both outside and inside the listener's head when coming in contact with a sound world that is governed by this limited, reiterative and sonically unstable material.

### **1.3 Reiteration, Memory and the Immersive State**

Within a reiterative environment, the perceiver's memory can become increasingly important. This memory does not refer to a relative memory, connecting a sound to past experiences, but a more present memory, posing the question as to what has precedently been heard. In memory, one may even be able to recall something that never was — a distortion, deception or even an imagination. Again, referring back to auditory temporality, Husserl describes the temporal span displaying itself as, 'Structured according to the onset of features coming into perception, protension, and the phasing and passing off of features fading out of presence; retention.'<sup>69</sup> For Husserl, the direction of temporal sound is from the future, stemming from a source point, toward the past — retentions that can be characterised as reverberations or echoes that dissolve into the just-past. There is a point in the temporal span that transforms the initial retention into the recollection of the perceiver and it is here where the first occurrence of memory is evident (fig. 1.3.1).

This 'trailing off' or 'echoing' of a sound is subsequently prolonged through memory, as the listener can hold on to what has just been heard and juxtapose it with present sounds. If these present sounds are iterations that are subtly different from one another — for example in pitch, timbre or dynamic — a doubling can occur in the form of a synthesised gestalt. That is to say, there is a momentary co-presence of the 'now' with the

---

<sup>68</sup> For a more detailed explanation of improvised listening see pg. 15.

<sup>69</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 89.

‘just-past,’ that creates an echo, as the sounds that were dissolving return as mutations, allowing the perceiver to compare and contrast. The longer this happens, the more one is expected to store within one’s memory and it is here that auditory imagination comes into existence. This is in the form of our inner voice, something that is completely individual in every living being; it is for that one person alone. Here, the inner voice, being heavily aided by the reiterative nature of the aural experience, can create a synthesis of perceived and imagined sound, with memories gradually becoming more distorted. In a sound world that is built from limitation and, as a result repetitive forms, the perceiver is presented with a greater chance of multiple phenomenologies, from primary perception through to auditory imagination. It can be said that this imaginative state is the furthest form of evolution a sound can reach, as it rests solely on the individual’s capability to recall aural memories.

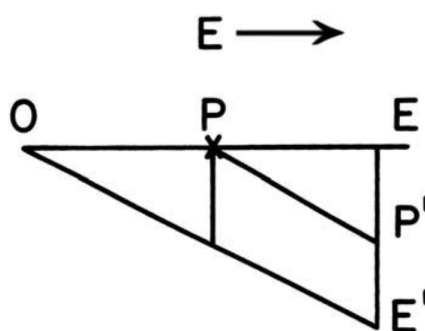


Fig. 1.3.1: Husserl’s Temporal Span Diagram. OE is the series of now-points, the temporal span in this context; OE’ is the depth of the span that contains within it the reverberations and sinking back phenomena of those points that trail off in retention until they disappear.<sup>70</sup>

In correlation with this, instructive text pieces such as Pauline Oliveros’s *Any Piece of Music* (1980) or Bill Drummond’s *STOP* (2008), have used imagination to create music that exists solely as internalised impressions evoking ‘memories of past sounds, constructions of a present unvoiced sonic experiences, or imaginations of potential future sounds.’<sup>71</sup> On the other hand, there is memory and imagination that occur with present aural encounters, challenging the listener to balance inner and outer voice: the doubled synthesised gestalt. Indeed, memory and imagination occur within all aural encounters yet, one that is more static, on a global level, invites the listener not just to uncover elements of its formation — the phenomena, the plasma, the timbral components — but to create alternate versions of

<sup>70</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 92.

<sup>71</sup> Gottschalk, *Experimental Music Since 1970*, 123.

the present and just-past, still relative to the original source, that can only occur within the individual — they are out of the reach of composer and performer. The American composer Max Neuhaus's installation *Three to One* (1992) plays with this idea of aural memories, involving three glass-walled rooms on top of one another connected by stairways, each containing a distinct sound colour. According to Neuhaus's design:

Passing up the stairway for the first time, the differences between colour are subtle but distinct. Returning down the stairs, aural memories begin to fuse the distinctions into one differentiated whole.<sup>72</sup>

Within this piece, it is evident that Neuhaus's sound world is built upon the reiteration of subtly changing material from three different sources. Due to both the similarities in colour and the layout of the installation, the listener becomes vulnerable to juxtaposing memories of one sound with the present experience of another.

This reiteration of subtly changing material, which leads to memory investigation and auditory imagination, is also very prominent in the music of Morton Feldman, especially his later pieces such as *For John Cage* (1982) and *Piano and String Quartet* (1985). Whilst composing he would sit and write repetitions of chords with very slight changes occurring, until he would forget the original chords repeated before. He would then proceed to construct an entire section from this, rearranging earlier progressions and changing the number of times a particular chord was repeated.<sup>73</sup> This act of organising memory became a way to extend original ideas, an alternate to development within music, with a compositional concentration that focuses solely on which pattern should be reiterated and for how long. He would repeat chords with similar pitches, each time rearranging and inverting to extend material (fig. 1.3.2). He says:

Actually I just try to repeat the same chord. I'm reiterating the same chord in inversions ... there is a suggestion that what we hear is functional and directional, but we soon realise that this is an illusion.<sup>74</sup>

My piece *Hiraeth* (2013), for bassoon and orchestra, follows a similar approach being composed of three sound entities (bassoon, strings and wind/brass), again containing limited

---

<sup>72</sup> Max Neuhaus, *Three to One* (<http://www.max-neuhaus.info/images/ThreeToOne.gif>, 26 May 2017).

<sup>73</sup> Morton Feldman, 'Crippled Symmetry,' *Anthropology and Aesthetics* 2/1 (Autumn, 1981): 91–103 (93).

<sup>74</sup> Morton Feldman, *Essays*, ed. Walter Zimmermann, (Cologne: 1985), 230.

unstable timbres, that are juxtaposed in a reiterative manner. Thus, the composition becomes monolithic, as the entirety of the musical material and its unfolding are experienced and extended outward as a large, single block. Throughout rehearsal mark A, the bassoon states six fragments of subtly shifting material. These differences are on both a micro-level (changes within the actual sounds themselves) and macro-level (changes from one fragment to the next). If we look at bars 1-16 we can see how, through the stating material containing minute gradual changes in both pitch and timbre, both the listener's memory and imagination, the inner voice, becomes an increasingly important factor within the perception of the music. The first fragment begins on F#, bending down to the 1/4 tone below before commencing with a timbral trill; the next begins identically only, this time, glissandos up to a G and again commences with a timbral trill; we then have a G sliding back down to the F#, before bending up to the 1/4 tone with the omission of the timbral trill; this is followed by a longer fragment that combines the first two with an F# bending down a 1/4 tone before sliding up to a G, which also bends down microtonally; the last fragment sees an F# with the return of the timbral trill. Within this aural environment, the 'trailing off' point of one sound — the echoes in one's memory — has a much greater chance of merging with the commencement of proceeding sounds. The longer one is exposed to this form of sound structure, the higher probability there is of auditory imagination occurring, leading to the formation of inner voice entities such as altered 'now' sounds and combined 'just-past' sounds. The significance of this stems from the notion of how far the evolution of a sound can proceed. With the importance of my compositional aesthetic resting on the study of unstable sound and how far it can be pushed, both physically and cognitively, it is undeniable that, within each individual's perception, memory and imagination provide the next step in evolution for presented sounds. Once the physicality of a sound has diminished, its life depends upon psychoacoustics in order to sustain its evolution and, with this reduced reiterative method of presentation, the prospect of 'cognitive phenomena' occurring — memory distortion, synthesised perception, aural imagination — is substantially heightened.

In the same manner as limiting an aural plane to fewer sounds, reiteration of these sounds over time can heighten one's senses in experiencing what these have to offer. An intimacy can come about in an auditory environment built upon reiterative means, not in relation to the obvious repetitiveness but, with regard to a comfortability forming between listener and subject, enabling them to look past the primary perception and construct a more personal relationship in experience. The British-Canadian sound artist, Andra McCartney, has dedicated her research in exploring this notion of intimate listening with

her practice of ‘soundwalking’ — a social and aesthetic practice that involves the development of a heightened awareness of surrounding sound through prescribed, or partially preplanned, group walks around certain environments, i.e., neighbourhood, seaside, forest, etc.<sup>75</sup> With these repeated walks around an area she presents the notion of how ‘listening over time,’ a practice involving many repeated listenings paying attention to variation, is an important aspect of knowing a person or place, resting upon deep levels of care and attention.<sup>76</sup> When challenged about the monotony or uniformity of this practice, she responds:

I realised then that much of what interests me about the sound environment is engendered through repetition of listening, taking soundwalks over and over again in the same place. For instance, the seemingly mundane sounds of the electrical trams achieved depth for me through repeated listening...I found pleasure in discerning these differences that only became apparent through repeated listening.<sup>77</sup>

Similar to Neuhaus’s design, these soundwalks juxtapose memory and inner sound with present recurrence and, what seemed perfectly ordinary or uneventful at first, can reveal its unique features with every iteration. Here is where it becomes the listener’s choice as to how much of a connection is desired with the surrounding environment. Yet, if the attempted goal is intimate listening, one that values minute differences and wants connection, the perceived sound within the listener’s auditory field will react in such a way as to respond to this connection; it will display its complexity, its inner workings and intricate details. The finer objectivities of these two partial forces rely on interconnections — the forming of an intimate relationship.<sup>78</sup>

Limitation and reiteration may also lead to an immersive state which can occur in a listener when subjected to this type of aural experience. The American composer Laurie Spiegel, in her piece *The Expanding Universe* (1975), talks of the sensitisation of one’s ear as a result of these gentle reiterative sound worlds. The listeners are drawn into the repetitive nature of the sound as it invites them to let their guard down and be fully attentive. She writes:

---

<sup>75</sup> A term first used in the 1970s by members of the World Soundscape Project under the leader of Canadian composer R. Murray Schafer.

<sup>76</sup> McCartney, ‘How Am I to Listen to You?’ *Negotiated Moments*, 48.

<sup>77</sup> *Ibid.*, 48.

<sup>78</sup> This point will be expanded upon in the final chapter.

With continuity and gentleness, the ear becomes increasingly re-sensitised to more and more subtle auditory phenomena within the sound that immerses us. Instead of being swept along, as with cascades of many running notes in suddenly changing blocks of time, [...] we open up our ears more and more to minute phenomena that envelops us.<sup>79</sup>

The act of drawing listeners into a surrounding bubble, somewhere they feel safe enough to practice different forms of perception, is something I always attempt to manifest within my compositions. This can be done in numerous ways: loud sounds that catch the listener's attention, quiet sounds that move between the borders of silence making the listener more aware of the surrounding environment, or subtly shifting sounds that are almost unnoticeable asking a question of one's ear. The unifying factor at play here is unity within the overall sound world; a sense of continuity, where sounds can gradually morph which, effectively, immerses the listener in an entirely transformed sense of place. It is never for the purpose of controlling an experience but, rather, an attempt at 'creating a catalyst for shifts in frame of mind.'<sup>80</sup>

These continuities can narrow one's attention to the point that a typical object of focus, such as surface pitch or rhythmic movement, does not hold the attention but instead, its results do. Within this consistent existence the sounds presented can become the fringes or containers which hold other entities. My *Three Graphic Pieces* (2015), for instruments and electronics, display these unified sound worlds each focusing on one timbre of an individual instrument, which is extended through electronic manipulation. The first of these, *Circles, Lines and Squares*, concentrates on the timbre of flute whistles, which are enforced by live amplification, juxtaposition, and manipulation of similar sampled material.<sup>81</sup> Manipulation refers to speed alteration, granulation, filtering and equalisation, and is used to extend sonorities by drawing out the imperfections found within the sounds being explored. The audio samples can be stretched or compressed to create different pulses, tones and timbres all which relate back to the original material.<sup>82</sup> The juxtaposition of the flute timbre with

---

<sup>79</sup> Laurie Spiegel, *The Expanding Universe Booklet* (<http://www.bussigel.com/technosonics/wordpress/wp-content/uploads/2016/07/Laurie-Spiegel-The-Expanding-Universe-UW09booklet.pdf>, 25 May 2017).

<sup>80</sup> Max Neuhaus, *Notes on Place and Moment* (<http://www.max-neuhaus.info/soundworks/vectors/place/notes>, 26 May 2017).

<sup>81</sup> With each of these pieces the electronics are an altered version of the organic material being performed live.

<sup>82</sup> I choose to keep electronic material as close to the source as possible in order to extend upon the live element within the composition; organic samples hold an inconsistency that is sometimes unobtainable with synthesised waves and noise generators, as their sound quality moves in a more

extended electronic samples, establishes merged objects that can have an enveloping quality. Through subtly changing details in sound formation, the listener is drawn to this immersive state where perception can create individual interaction with time, place and memory. In a similar fashion, the sounds explored in *Delphinidae* are limited to two timbral categories: wooden (guiros) and resonant (cymbals, gongs, crotales, plate bells, toms). Similar to *Circles, Lines and Squares*, it delves into many of the possible outcomes from combination, differentiation and manipulation. Pulses are created through the speed alteration of dragging the stick along the guiros. This, combined with the electronics, creates a sound world that could lure one's mind to a place reminiscent of nature, with textures of wind, insects and trees; whereas, the resonant instruments form contrasting sounds with their sharper metallic qualities, comparable to man-made machines. These sounds create an encapsulating environment, which can seem familiar at first, with the brain creating a relatable source with which to connect with; however, because of the reiterative quality, fused with the sporadicness of the timbral component links, one can start to see past these obvious connections to a form of perception where all the subtle nuances in sound formation are evident. Every guiro fragment or bell strike can become its own entity, whilst also being relatable on a global scale to material on either side. Because of the rich sonorous qualities of the presented sounds, there are multiple entities that are accessible to each listener. The experience always rests upon how one chooses to perceive; however, with reiteration of unstable timbral palettes I attempt at presenting a greater opportunity for a way of perceiving sound that feels natural to each individual listener.

A reiterative and immersive state of listening can also be likened to meditational practices, where one can absorb the surrounding environment and focus on elements that feel necessary at that moment in time. Here, both the onset of auditory events and their reverberations can become less distinctive, as individual focal points for the multiple onsets, protensions and retentions, of subtly different material, begin to amalgamate towards a spherical aural plane. Within this state, time can become suspended, in a similar fashion to how our focused concentration can slow perception's normal course, as the listener's focal attention can now extend throughout the temporal span, ridding the auditory event of its

---

unpredictable manner from one sonority to another. I find this is something that you can exploit in greater detail through sonic manipulation. This can be related to Stockhausen's *Kontakte* (1958-60) where tape loops are sped up and slowed down to obtain different timbres, rhythms and pitches; however here, the sounds were artificially synthesised through electronic means using equipment designed for radio station maintenance and measurement, such as impulse noise generators, sine wave tone generators and noise generators.



sense of direction. In this form, it then becomes easier to ‘enter the sound,’ as its linear state has now transformed into a three-dimensional or spherical structure.<sup>83</sup> Here, in this repetitive durational sphere, focal attention is granted more time and space to stretch to the very boundaries of sound, encapsulating the micro-particles and their relations — to one another and to the greater mass of sound — gaining a more extensive knowledge of the spatial signification of the auditory dimension. Focus is not individually occupied with the ‘leading’ or ‘trailing’ edge of the temporal span, nor is it barraged with a multiplicity, where minute distinctions appear less clearly; it is able to shift between both forms of perceptive concentration, examining the patterns of interaction between the individual phenomena and the total field of perception.

This philosophy which, again, stems from Horațiu Rădulescu’s *Sound Plasma*, explores the spatiality of an auditory event and how its direct communication with the listener centres around the way one perceives an aural experience. Speaking on how to govern differing sounds and their relationships, his solution is to create a compass which joins opposites that represent a definition of the space in which sound occurs. These are from noise to sound on the Y-axis, and from wide to narrow on the X-axis. Fig 1.3.2 displays two examples of the sound compass, with the first showing the extreme limits of the sound space, and the second showing the placing of traditional musics and natural sounds within that space. My composition *Stupa* (2015), for violin and ensemble, uses the idea of a compass as a way to navigate through a surrounding sound world, and move around freely in a three-dimensional way. Here, I placed the elements of sound that are the main focal point within my compositions, instability and fragility, into the sound compass using these and their opposites on each axis. Therefore, on the Y-axis we have instability and stability, and on the X-axis we have fragility and durability (fig. 1.3.3). Within a musical setting instability can refer to unpredictability, fluctuating movement and sudden changes in dynamics. Stability is the opposite — the harmonically rich and stable sounds (linear streams of microsonic particles that are more fixed in nature).<sup>84</sup> Fragility refers, mainly, to natural occurrences due to micro changes (bow position, multiphonics, extended techniques) and extreme dynamics. Durability is the opposite, consisting of solid and strong waveforms. Within the sound compass I can also explore different textures, ranging from dense to thin. These occur on a micro-level, acting on the solo instrumental timbres themselves and, on a macro-level, blending together the different instrumental timbres. The spherical formation

---

<sup>83</sup> Rădulescu, *Sound Plasma: Music of the Future Sign*.

<sup>84</sup> Roads, *Microsound*, vii.

of this composition prompts one to become enveloped in the sound, losing the sense of time — in relation to both its temporal direction and its duration — and causing one’s mind to submit to this immersive state of listening; letting go of the familiar relative connectivity between sound and the brain, the structural or procedural expectancies governed by harmonic, rhythmic or dynamic forces, and focusing on other entities that can be present within a listening experience. Don Ihde explains the enigmas of sound’s temporality within these conditions:

Although I may be “immersed” in this “sphere” of sound, I cannot find its boundaries spatially. The spatial signification of a horizon is obscure. How “far” does sound extend, given some recognition of relative distance? Where is its threshold, even if I can follow a sound until it disappears? And although sounds may come from any direction how far do they “extend”? I find no clear sense of horizontal boundary such as that of the “roundness” of the visual field.<sup>85</sup>

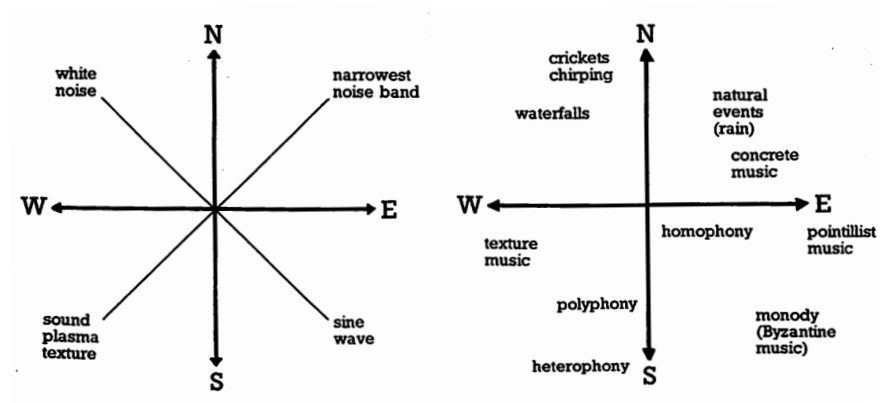


Fig. 1.3.2: Horațiu Rădulescu’s sound compass.

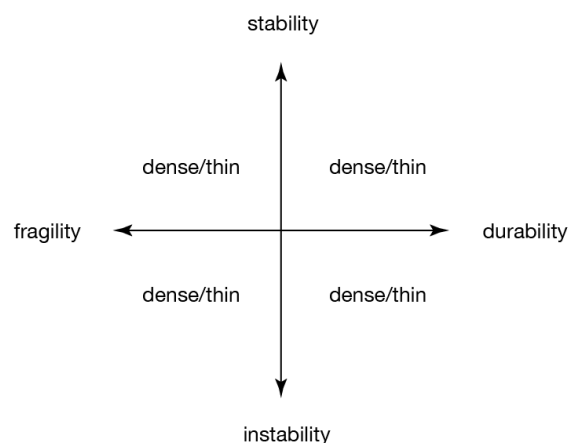


Fig. 1.3.3: The adapted sound compass used in *Stupa*.

<sup>85</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 102.

Whether it be timbral components, acoustic phenomena, combining inner memories and imagination with outer auralities, the goal is consistently to provide these elements of sound with the opportunity to become the focal point within a limited, reiterative and immersive environment. My approach here does correlate with Feldman and Saunders, as it uses reiterative means to present material in a certain way; however, it is within the material itself that I find my individual voice is heard as the focus is upon the internal evolution of the sounds, building the levels up from the micro-particles to the global structuring of the composition as a whole. Unstable sound demands an intimate connection with the perceiver and, for me, the main purpose of limitation and reiteration is to provide an opportunity for this bond to occur between formation and perception, the physical and the cognitional.

#### 1.4 Silence and the Threshold of Perception

There are many perspectives of silence. Silence is empty intention. Silence is the sound of time passing. It is a dimension of the auditory horizon, which lies hidden along with the sounding that presents itself — the other side of sound. The forms in which silence can show itself are subjective to the individual, resting on how much from the environment one allows to enter one's auditory horizon; as John Cage visited the anechoic chamber at Harvard which, supposedly offers the experience of true silence, all he could hear were the sounds of his own nervous system and his blood in circulation.<sup>86</sup> When thought of in this manner, silence appears to be 'a place where the mind-body duality collapses.'<sup>87</sup> This correlates with Rebecca Saunders seeing silence as an already full palette, a 'dense knot of noise, frequencies, and sounds' and 'from this surface of apparent silence' she tries to 'draw out and mould sound and colour.'<sup>88</sup> In her composition, *Stirrings Still* (2006), she 'imagines that a seemingly empty page is already full, indeed saturated, with silence before starting to write.'<sup>89</sup>

However one chooses to view silence, it can safely be said that it is ceaseless. We can close our eyes to shut off visual reality but there are no lids for our ears, as they remain

---

<sup>86</sup> John Cage, *Silence*, (New Hampshire: Wesleyan University Press, 1973), 8.

<sup>87</sup> Rutherford-Johnson, *Music After the Fall*, 68.

<sup>88</sup> Rebecca Saunders, 'Stirrings Still,' sleeve notes for compact disc WER 6694 2, 2008.

<sup>89</sup> *Interview with Rebecca Saunders* (<http://www.james-saunders.com/interview-with-rebecca-saunders/>, 10 January 2016).

forever open.<sup>90</sup> So long as one experiences, there is a perceptually continuous sound presence. Although this presence may be at the very edges of our consciousness, the sounds are neither totally absent, nor escapable. Throughout our lives the ebb and flow of noise is continuous so, therefore, it may be more practical to think in terms of dynamics; what is louder and what is quieter? What catches our attention and what passes by unnoticed? If the urban landscape is too loud it can become invasive, sometimes so penetrating that one can't 'hear oneself think,' resulting in a move to the countryside, in search of silence. The rustling of the wind in the trees and the hushed cascade of crickets replace the rush of a train and the daily human chatter but, strictly speaking this is quiet, not silence.<sup>91</sup>

Within a performance environment, the auditory field consists of the intentional and the unintentional. With the abatement of intentional sounds, comes the increasing evidence of the unintentional; as the music ceases, one can feel the dense presence of one's surroundings. The listener can only judge sound from what she is aware of within an auditory field, the visible and the invisible. Outside the venue life goes on, people converse and traffic passes by. Only sometimes, we are unable to hear the invisible, so we can assume it does not exist — it is silent. Therefore, it is plausible to think that there is a horizon of silence that surrounds a present or 'aurally visible' auditory field, which can fluctuate in size depending on what is happening within.<sup>92</sup> When experiencing quiet or sparse sounds, one can become very aware of this horizon, as its perimeter shrinks with the decrease in dynamic. Dense or louder sounds push this horizon back, and can shift our focus straight to the visual objects we can see producing these sounds. For me, therefore, silence, or the absence of intention, within an auditory field, has not only become a means to provide space to intentional sound, but also acts as one side of the threshold between audibility and inaudibility — sound which is either cognitional or imperceivable.

The 'limen' is a term from psychology for a point at which the 'human ear is able to recognise changes in sound intensity.'<sup>93</sup> With the use of both extreme dynamics, predominantly within the quiet region, and ceasing intentional sound, silence within my compositions is used to invite the perceiver to question the relationship between hearing and listening. The question posed here is, if one listens hard enough to an extremely soft

---

<sup>90</sup> Jean-Luc Nancy, *Listening*, ed. David Wills, trans. Charlotte Mandell, Annotated edn (New York: Fordham University Press, 2007), 14.

<sup>91</sup> Ihde, *Listening and Voice: Phenomenologies of Sound*, 81.

<sup>92</sup> *Ibid.*, 53.

<sup>93</sup> Juergen Tonndorf, F. A. Brogan and David D. Washburn, 'Auditory Difference Limen of Intensity in Normal Hearing Subjects' *AMA Arch Otolaryngol* 62/3 (1955): 292–305 (292).

real sound i.e. an intentional external sound within the perceptive field of the listener, can the enveloping silence gradually become part of it, causing the listener to remain hearing an echo long after it has ceased? This exploration of the limen can affect the perception of and also, extend in one's mind the intentional presented sounds (in correlation with reiteration and the memory), as it pivots one's perception around the 'edge of audibility, playing on either side of it and teasing apart the sensory activity of hearing, and the cognitive act of listening.'<sup>94</sup> The ceasing of intentional sound also allows time for memory to materialise, which can relate to and merge with the threshold of perception, as, during this period of silence, parallels can occur between presented sounds, the listener's environment, and the inner voice.

The electronic music of Bernhard Günter has played with this extreme using almost inaudible sounds, causing the attentive listener to perpetually question whether sound is present or absent, when it enters or exits, and the location of those thresholds. His tape piece, *Un Peu de Neige Salie* (1993), consists of incredibly quiet hums, rumbles and clicks interspersed with long passages of recorded silence. He says of these silences:

Very often they are intended to function as a kind of projection surface for the listener's recollection of what he has heard so far, and his extrapolations as to what he will hear as the pieces goes on, or a quiet time for him to calm and focus his concentration.<sup>95</sup>

This philosophy also concurs with that of Luigi Nono as the fragmented material of his late works is always shrouded in silence inviting the listener to concentrate her focus on different elements of sound while providing these with additional room to sit — to live, breathe and evolve. Pieces such as *La Lontananza Nostalgica Utopica Futura* (1988) for violin and electronics, and *A Pierre, Dell'Azurro Silenzio, Inquietum* (1985) for contrabass flute, contrabass clarinet and live electronics, are built from juxtaposed fragments which stem from and recede into the surrounding blocks of silence, leaving an echo of the disintegrating material within the mind of the perceiver. The thought process behind this is where the use of silence within my compositions stems from — a greater area of space for sound to exist and for listeners to perceive.

In my *Two Cello Pieces* (2014) and *Reheal* (2014), silence is implemented as a thread to join together fragments of sound allowing the listener the time and space reflect on what

---

<sup>94</sup> Gottschalk, *Experimental Music Since 1970*, 23.

<sup>95</sup> Bernhard Günter interview with HALANA Magazine, USA (<http://trenteoiseaux.net/interviews>, 6 June 2017).

she has just heard, and prepare for what she will hear next. Many of these silences are preceded by extremely quiet, fragile sounds which are sustained for lengthy durations. The performer decides how long silences can last for in between each fragment, which can enable a certain amount of space for intentional sound to breathe as well as time for, not only the listener's contemplation, but also her own as she can use remnants of sounds gone by in order to prepare for the proceeding explorations. The unstable nature of the sound fragments naturally benefits from the space which silence provides. For example, the opening fragments of *Aberrate* contain a harmonic pitch at a very high register (fig. 1.4.1). Already this sound is incredibly unstable due to the nature of its register but, furthermore, the addition of bow position, pressure and dynamic extremities have a major influence on its quality, adding both shape and noise elements to the timbre. Therefore, the more space or time given to a sound like this will naturally result in increased fluctuations of its timbral components. Due to the surrounding silence and freedom of time, sounds can be perceived as both transformations between, and mutations of, the different acoustical properties available. The sparsity of construction here, allows the sound itself space in which to rest, balancing between the threshold of audibility and inaudibility; traversing to and from this silent dimension of the auditory horizon. The trailing edge of reverberations and the retention of echoes traverse this threshold, leaving a trail of sound memory enveloped by silence, in which perceivers can contemplate the liminal qualities of both the passed intentional and the remaining unintentional. Extremely quiet dynamics, long sustains and pauses all complement the concept of silence within these compositions and, in turn, lend themselves to the complete focus upon the fragile and unstable nature of the intentional sounds.

The image displays two systems of musical notation for the opening fragments of *Aberrate*. Each system consists of a treble clef staff and a bass clef staff. The first system features a treble staff with a high register note marked with a circled 'i' and a slur above it, and a bass staff with a note marked with a circled 'i' and the instruction '(let ring always)' below it. The dynamic marking 'sfpp' is centered below the bass staff. The second system is labeled 'ORD.' above the treble staff. It shows a treble staff with a high register note marked with a circled 'ii' and a slur above it, and a bass staff with a note marked with a circled 'iii' and a slur above it. Dynamic markings '< sf >' and 'pp' are placed below the treble staff, and '< mf >' is placed below the bass staff.

Fig. 1.4.1: Opening fragments of *Aberrate* displaying the high unstable partial's freedom to evolve.

The other element of ceasing sound is the effect it has upon the listener's status within the performance environment. As mentioned previously, the quieter the auditory horizon is, the easier it becomes for one to feel closer to the silent dimension, and the unintentional sounds within this dimension. As a result, one is increasingly aware of the intentional sounds left within the auditory field, whose echoes and vibrations can gradually, after more and more concentrated focus, become part of the listener's environment long after their conclusion. Even more so than sounding, silence has the capability of highlighting the subjectivity of the listener as, when there is no intentional sound emitting from the performance area, listening becomes the only remaining musical activity. Silence, or extreme quietness, allows the listener to become music's embodied subject as she is provided with a choice or, in other words, granted permission to listen (or not) to whatever she wishes to find. For example in the American composer David Dunn's *Purposeful Listening in Complex States of Time* (1997-98), a much greater responsibility is given to the listener as she herself becomes the composer within the surrounding environment. In the score, Dunn instructs the listener to 'shift their perceptual focus through a wide variety of listening states that include a shifting of aural awareness towards the surrounding soundscape and their own bodies' in differing outdoor environments with 'low level ambient sound'.<sup>96</sup> By composing listening, Dunn provides the listener with a kind of autonomy usually reserved for the performer. Tim Rutherford-Johnson explains:

The shift in emphasis, from object to subject, from external artwork to embodied experience, echoes both the shift undertaken in the new musicology, in which what the work is like as an experience for the listener becomes more important than how it relates to an 'objective' in history [...]<sup>97</sup>

As a result of unintentional sound, the listener's role becomes heightened in the musical community as there is a diminishment within the subject/object divide. For me, the intention of making the instabilities within sound formation as accessible as possible can benefit hugely from this increased listening status. Therefore, along with the provision of space (both physically and cognitively), silence within my compositions is used to encourage the intensification of awareness towards both the environmental surroundings and the perception of what is happening within.

---

<sup>96</sup> David Dunn, *Purposeful Listening In Complex States of Time*, (1997-98).

<sup>97</sup> Rutherford-Johnson, *Music After the Fall*, 70.

The construction of compositions for me has become about providing unstable sound with as much space as possible. As discussed, this is done primarily through limitation, reiteration and silence. The question here is: do these methods divulge the essence of sound formation? Needless to say, this is reliant on how much one is willing to hear yet, it can be argued that displaying unstable sound in this way presents a greater opportunity for a listener to experience the many differing components and interrelationships within its formation. The balance and unity between formation and perception, and the influence one has upon the other — physical attributes affecting our cognition and, in turn, our intensity of perception drawing out further attributes — has, therefore, become the basis of my aesthetic in sonic studies. The extension of sound elements, this ‘protension’ that Husserl speaks of, and a practice composers such as Saunders and Feldman are known so well for, leads to the creation of something very large from the juxtaposition of smaller entities and can be said to complement the idea of letting the sound evolve in a more ‘natural’ way. The term ‘natural evolution’ prompts one to think that sound has its own tendency and can develop of its own accord. This is not necessarily the case, as intentional sound is always somewhat governed by its creator; an instrument cannot be physically or externally heard without a force behind it. However, there is an opinion that supports placing sound within this environment, and says it will have an effect on both its formation and perception. The repetition of limited unstable timbres and the treatment of sound in this way will naturally bring about mutations of similar entities through fluctuations, unstable phenomena and the constant movement in the sounds themselves. Thus, it can be said that unstable sounds have a greater chance of spontaneity or volatility under this form of treatment; they are granted permission to evolve. The reduction of material, sparsity of construction and use of the unintentional (silence), then leads to a globally static and immersive aural plane in which the listener can illude herself through different forms of perception — concentrative focus, memory, inner voice, imagination, improvised listening practices — that the sounds are, in fact, evolving of their own accord. The physical unstable formation, the method in which sound is urged to be produced, and the freedom surrounding this practice will elevate the idea of sound being itself: unforced, raw and untamed. By all means, sound having its own will forever rests in the ears of the perceiver; however, this method of construction allows for a greater chance of a voluntary occurrence.



## **Chapter 2 - Collaboration and the Performer**

As the first chapter dealt primarily with the listener, this section will discuss the position of the performers within the creation of my compositions, and how their individual input in dealing with the presented unstable sound palettes has become essential in further exploring the possibilities in sonic evolution. The focus will concentrate on the collaborative relationship with the composer, improvisatory relations between individual performers, their liberation from certain standardised practices and, in effect, the collaborative bond formed between performers and their selected sounds. This chapter will also look at the role of the score, and the many ways in which conventional notation abandonment can be implemented to achieve varying levels of improvisation individual to each composer's desire. Performer liberation generally correlates with the break away from standard notation, as the two lend themselves to each other. These two aspects of musical performance — improvisation and graphic notation — which are implemented throughout my compositions, naturally form a collaborative, egalitarian musical community, aiding in, like those discussed in the previous chapter, the creation of space for the boundless evolutions of sounds possible within the limited unstable timbral palettes.

### **2.1 Creator - Composer or Performer?**

The concept of a musical work can be thought of as a rather ambiguous entity primarily due to its practice of creation. Is a composition complete after the composer is finished with the score or, is there still more to be done beyond her grasp? If the composer is not performing, who controls and, in turn, decides whether or not a production is a true representation of the work? The composer creates the notated article; however, its fate rests within the performer's hands. One could argue that it is the composer's decision if an instantiation is worthy of being labelled a representation of the work; however, they could make this decision at multiple times, in multiple places, after perceiving multiple versions of the work. The polar opposite, although still in direct correlation, could see the performers having the final say, as they can also decide numerous times when a work is complete, at numerous concerts, after numerous interpretations.

This argument may stem from a philosophical viewing of musical works as having an ideal quality, that is to say, they are essentially spiritual entities that have an ideal, rather

than real, existence within our cultural world and, in this context, are ‘created (rather than discovered) by human activity.’<sup>98</sup> In discussing this idea, Bruce Ellis Benson uses Edmund Husserl’s schema which presents the theory that ideal objects such as plays, novels and musical works, in contrast with the real, all have a timeless existence as they are ‘everywhere and nowhere’ and can ‘appear simultaneously in many spatiotemporal positions, and yet be numerically identical as the same.’<sup>99</sup> This concurs with Charles Sanders Peirce’s type-token distinction, with ideal objects being types and the reproduction of these objects their tokens, which arises from the differentiation between certain performances or instantiations of a work, and the notion of the work as an ideal entity itself.<sup>100</sup> A performance of a piece obviously consists of the real and physical attributes of producing sound; however, what Husserl suggests is that this is merely a physical embodiment of the ideal entity.

Therefore, with this in mind, we may again ask the question: when is a piece finished? Does the increase in uniformity and consistency of every performance draw it closer to the ideal entity and, if so does this make it more ‘complete,’ leading one to believe it finished? For the performer who is working within a stringent model (i.e. a musician who’s role it is to yield to the composer’s strict instructions in rendering the supplied notation as precisely as possible), there are standard assumptions within their production of a work, namely, those boundaries designed by the composer to both define the work and to limit the activity of the performer. The legacy of ‘classical music’ appears to be balanced upon the preservation of what the composer has created and, as a result we, as listeners, have grown to expect performances to be part of this conservational chain. Tim Rutherford-Johnson states:

In the nineteenth century and deep into the twentieth, a score of Western art music was assumed to be a unified, perfectible object. Although interpretations of a single score might differ slightly from performance to performance, it was held that each different interpretation was an attempt to achieve the “correct” or “most faithful” rendering of the composer’s intentions.<sup>101</sup>

---

<sup>98</sup> Bruce Ellis Benson, *Improvisation of Musical Dialogue: A Phenomenology of Music*, (New York: Cambridge University Press, 2009), 6.

<sup>99</sup> Edmund Husserl, *Experience and Judgement: Investigations in a Genealogy of Logic*, ed. Ludwig Landgrebe, trans. James S. Churchill and Karl Ameriks (Evanston, IL: Northwest University Press, 1973), 260–1 (260). This is also quoted in: Benson, *Improvisation of Musical Dialogue: A Phenomenology of Music*, 7.

<sup>100</sup> *Types and Tokens* (<https://plato.stanford.edu/entries/types-tokens/>, 12 July 2017).

<sup>101</sup> Rutherford-Johnson, *Music After the Fall*, 82.

Although this statement is slightly exaggerated, it still points towards musical works being considered as self-contained. This process has thus become the model for what we think is involved within creating music; composers create and performers reproduce until, over time, the standard practices and requirements for a piece are agreed upon by the musical community. However, it is within the conception stage that a composer can decide upon the degree of compliance required. Although they still reign as ‘demiurge,’ having brought something into being which did not exist beforehand, the fate of the work can still rest solely within the performer’s hands, regardless of how strict the score’s instructions are.<sup>102</sup> Every compositional approach differs with each individual, yet it can be assumed that the obvious goal is inevitably a result as close as possible to the composer’s preconception, forcing them to present a medium which will guide a performer to produce this in the most effective and efficient manner; ‘the ideal performance is one that perfectly realises the composer’s intentions.’<sup>103</sup> The level of stringency within the composer’s intentions is what defines a performer’s role during the production process.

Performers of scores usually assume two main obligations which are: to render the work (1) accurately and (2) creatively, imaginatively and interestingly. Immediately, just from comparing these obligations, it is obvious that conflicts can easily arise between the two antithetical areas. Tensions between fixity and performance variety can complicate the relation between works and performances — notated entities and their instances. The success of a work’s instantiation rests upon two conflicting areas, correlating with the above, these being: faithful exemplification and musicality. The conventional criterion for the exemplification of a work is rigorous loyalty to the score, the prime virtue being notation-perfect execution.<sup>104</sup> Yet, at times musicality can call for violations of exemplification in order to improve aesthetic potentiality (this is clearly evident in the meticulous scribbles within the performer’s parts, as they are altering the exemplification in order to aid with musicality). For example, a composer may ignore certain instrumental idiosyncrasies whilst writing a passage in strict accordance with a certain theoretical practice, or they may let their familiarity with one instrument shroud their judgement of another; string players could possibly have to comply with pianistic notations and vice versa. Therefore, the height of musicality does require some departure from uniformity, as players seek a method to produce the intended sound in a manner they feel both reflects best upon them, displaying

---

<sup>102</sup> Jerrold Levinson, ‘What a Musical Work Is,’ *Music, Art and Metaphysics*, (New York: Oxford University Press, 1990), 63–88 (67).

<sup>103</sup> Benson, *Improvisation of Musical Dialogue: A Phenomenology of Music*, 10.

<sup>104</sup> Stan Godlovitch, *Musical Performance: A Philosophical Study*, (London: Routledge, 1998), 84.

the capabilities of their skill, individuality and imagination, and the overall aesthetic of the composer. Stan Godlovitch asks:

How is variety under fixity possible? which, in turn, prompts the question: What is the nature of a work's fixity? Whatever the answers, notated works must allow highly varied instances to meet the expectations of the performance. Notated works which tolerate a single type of instance would not be works-for-performance as we know them, but would instead satisfy certain composers who have turned to electronic instantiation precisely to avoid the variety typical of instantiation by so called 'interpreters.'<sup>105</sup>

Thus, to possibly reach a successful instantiation of a work — one that displays the premeditated compositional effort whilst simultaneously fulfilling 'performance expectations' by embodying a live unpredictable energy situated in the present — a yielding between true exemplification, or accuracy, and creative variety needs to be implemented. If one leans too far toward either pole, the essence of bringing a notated work into a live setting could be lost.<sup>106</sup>

As a result, the performer, in essence, becomes the story-teller, and successful story-telling usually demands leniency regarding the prototype or frame; in this case, the notated score. The activities of story-telling run parallel to that of musical performance in many respects — particularly, with regard to varying instances; time and again the same tale or joke has been recounted in different semblances, habitually influenced by one's surroundings. Therefore, the areas in which variation becomes successful are mainly situated within: (1) the communicative element in performing, (2) its acceptance and appreciation by the performer and (3) the level of skill employed in its accomplishment. Once the dominance of fixity in a musical work is re-assessed, one has a chance of finding a balance between strict fidelity and musical innovation. The manner of story-telling relieves type and token (or instance) of any tension that could be found in between, by giving prominence to a higher degree of creative variety — making this deliberate variation a necessity. For example, in my composition *Hiraeth*, although notation is conventionally fixed, much creative variety is presented to the performers as a result of the destined sound world. The bassoon's material, consisting of timbral trill, breath and glissandi, is incredibly malleable and open to various amounts of interpretation by the performer. The same can be said of the strings, as their mono-gestural material of glissandi trills, with constantly

---

<sup>105</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 85.

<sup>106</sup> Consequently, a successful representation of a work can have multiple forms, regardless of how strict the instructions of the score are, with the 'most successful' being a matter of subjectivity.

moving bow position, allows for micro-variations within such as fluctuations in speed, timbre and pitch. In this way, allowing variety into the notation and, as a result the production, the strict activity-laden concept of performance can become neutralised by the primacy of determining and presenting the overall nature of the work, through the performer's eyes, as a whole.<sup>107</sup>

Scored works differ remarkably in their detail, some being vastly more restrictive than others, depending on the composer and their surrounding influential environment. For example, if we look at Brian Ferneyhough's piece *Time and Motion Study 2* (1973-76), for cello and electronics, it displays many straining demands on the performer, with fixed notation being taken to extraordinarily complex extremities (fig. 2.1.1). According to Ferneyhough, the reasoning behind such complex composition and notation was to create something between the score's indications and the numerous possible outcomes that may result from the printed page.<sup>108</sup> He describes, in the preliminary remarks of the piece, that:

The very complexity and nature of the instrumental/electronic layout will almost certainly induce associations with extra-musical events which, whilst not entirely unwelcome, are not in any way to be boosted onto a level of importance equal to that represented by the purely musical substance.<sup>109</sup>

Fig. 2.1.1: Complex notation in Brian Ferneyhough's *Time and Motion Study 2*: page 13.<sup>110</sup>

<sup>107</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 96.

<sup>108</sup> Brian Ferneyhough, *Collected Writings*, James Boros and Richard Toop (eds.), (Harwood Academic Publishers, 1995), 108.

<sup>109</sup> Brian Ferneyhough, *Time and Motion Study 2*, (Edition Peters, 1977).

<sup>110</sup> Ibid.

This highly determined notational complexity has been taken to further extremities by others, who attempt to battle this notion of score underdetermination, by supplying directions which treat the instrument not as a combination of actions towards a single end (i.e., the sounding of one note), but as a polyphony of moving body parts (finger, hands, mouth, tongue, etc.) composed separately from one another. An extreme example of this is the American composer Aaron Cassidy's, *A Painter of Figures in Rooms* (2012), for vocal ensemble, in which notation is provided for vocal folds, glottis, mouth and tongue. Here, Cassidy supplies a physical landscape of the body, rather than a sounding one, in a form of tablature that forces players into strict performance situations through 'layers of procedural, interpretive and translational distortion' (fig. 2.1.2).<sup>111</sup>

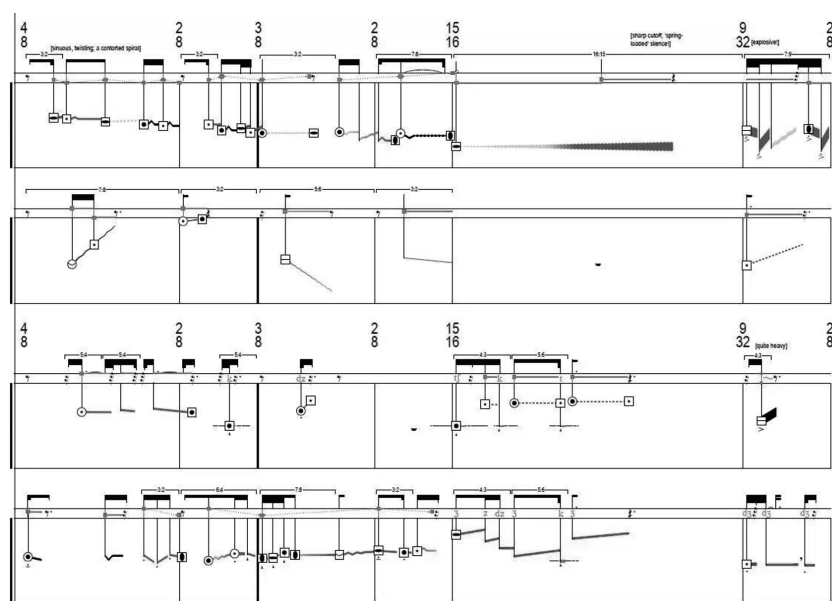


Fig. 2.1.2: Strict tablature 'decoupling' the instrument and body in Aaron Cassidy's *A Painter of Figures in Rooms*: bars 38-43.<sup>112</sup>

In both of these instances, the method chosen to provide creation to the performer is one of extreme precision and complexity, within the field of exact notation. Elements of liberation and changeability are initiated, forcing a protest of sorts within the music, by further curtailing the box inside which the performers have been placed. One could argue that this spontaneity or interpretive creativity could be achieved by simpler means, with regard to notation (or lack thereof) and instructions, posing a question of complex notation's necessity. It certainly was necessary for Ferneyhough at that point in time, as this is what he deemed

<sup>111</sup> Rutherford-Johnson, *Music After the Fall*, 108.

<sup>112</sup> *A Painter of Figures in Rooms*, (<http://aaroncassidy.com/product/a-painter-of-figures-in-rooms/>, 3 September, 2017).

suitable to achieve certain fluctuations, brought about by the slight interpretative means it took the performer to solve the complicated gestures. Cassidy is also trying to push performers with notation, asking them to reconsider entirely how they use their vocal apparatuses, drawing them further from the comfortable knowledge and capabilities of their own bodies.

Using precision is something both Ferneyhough and Cassidy apply to bring about creative spontaneity, with the musician being advised to let the complexity of the notation shift them towards certain ambiguities within the performance. I, too, aim to achieve a creative spontaneity within performance; however, in an effort to attain such extempore occurrences, the lineage of my compositions exhibits a progression away from precise notation. This has been implemented to encourage a more collaborative and interactive relationship between composer, performer and the score. Additionally, this brings about further opportunities for another genus of participants within the musical community, namely those who may not be labeled as professional musicians. In this performance environment, one can call upon both conventionally trained musicians and players from less formal educational backgrounds, to collaborate and explore the possibilities available when implementing a freer notational practice. This approach is a result of the attempt to have the selected material within my pieces explored in as many interpretative ways as possible; allowing both the professional and the novice to use their histories, experiences and memories in a more open and creative approach to performance.

Freer musicianship addresses the tension found between the universality of independent music expression, and the barriers around music production certain musical 'guilds' have created.<sup>113</sup> Here, questions can be asked of most standardised practices associated with these guilds such as: the need to call upon conventionally trained musicians and not players unconstrained from formal teachings; the possibilities available when replacing conventional notation with a more intuitive, universal and less specialist language; the level of stricture a score imposes upon a performer and how leniency can induce an environment devoid of standards of correctness.

The American composer Earle Brown proceeds in the direction of this route, handing over elements of creation by using freer notation accompanied by explanatory notes. His *String Quartet* (1965), uses a fixed overall form with areas of flexibility left within certain areas of the inner structure. In some cases, related pitch duration and rhythm are indicated by graphics, with instrumental techniques given, while other sections use purely

---

<sup>113</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 76–77.

graphic notation to include ‘the basic rhythm and contours of the work into the score in the most spontaneous manner (fig. 2.1.3).’<sup>114</sup>

The image shows a musical score for four staves, likely representing different string instruments. The notation is highly graphic and includes various performance instructions and dynamic markings. The first staff (top) is marked with 'TASTO', 'PIZZ.', 'Gliss.', 'PIZZ.', 'NAT.', 'PONT.', 'PONT.', '(NO CUE)', 'PONT.', 'BATT.', 'PONT.', and 'NAT.'. Dynamic markings include *p*, *mp*, *mf*, *f*, *ff*, *fff*, *p*-*f*, *mf*, and *f*. The second staff is marked with 'PONT. Gliss.', '(INART.) NAT.', 'PIZZ.', 'NAT.', '(INART.) PONT.', and 'BATT.'. Dynamic markings include *mp*, *mf*, *ff*, *p*, *mp*, *fff*, *p*, *mf*, *pp*, *f*, and *p*. The third staff is marked with '(INART.) PONT.', 'BATT.', 'TASTO', and 'MICRO. CHANGES OF PITCH AND TIMBRE'. Dynamic markings include *mp*, *p*, *f*, *p*, *mp*, *ff*, and *pp*. The fourth staff (bottom) is marked with 'PONT.', 'PONT.', 'NAT.', and 'TRATTO'. Dynamic markings include *mp*, *pp*, *mp*, *pp*, *pp*, *fff*, and *pp*. A vertical label on the left side of the score reads 'small, transient, inarticulate sounds'. The score is enclosed in a large bracket on the right side.

Fig. 2.1.3: Free notation in Earle Brown’s *String Quartet*: page 4.<sup>115</sup>

Here, he explains this technique as a way of ‘getting the time of composing closer to the time of performance.’<sup>116</sup> Consequently, this becomes a means for embodying the composition within the performance; bringing the entity away from an ideal quality and placing it firmly within its instantiations. The logic behind this is that music is, ultimately, a performance art and without the performance there is only the notated score. A piece of art with numerous simultaneous parts cannot plausibly be an object of inner sounding. One may be able to hear all the workings of a Beethoven Symphony score; however, this is usually aided by memories of performance. This is heightened even more, for example, if the work is conceived for an instrument or an intricate and unfamiliar timbre combination, the sound of which one has no experience of and, as a result, cannot form any such idea prior to hearing. Additionally, performance repeatedly risks the possibility of failure. It is only through performances that one can discover problems and, in turn, correct them. For these reasons, readings of scores cannot substitute for hearing an instantiating sequence of sounds as a way of acquainting oneself with a work. With this form of liberation, Brown is

<sup>114</sup> Earle Brown, *String Quartet*, (Universal Edition, 1965).

<sup>115</sup> Ibid.

<sup>116</sup> Ibid.



elevating the importance of playing over the notated score, bringing composition and performance closer together within the process of creation and production. He is gradually ridding the creative environment of the barrier between composer, score and performer — transporting the moments of conception immediately to the present.

This barrier does not exist in art forms that lack representation through other means: a painter applies directly to a canvas and a novelist touches pen to paper. The question, therefore is: would certain compositional and performative aspects benefit from increasing this barrier's transparency — bringing composition into the playing and vice versa — and if so, how does one go about implementing this?<sup>117</sup> The extreme would be to make all music universally accessible by eliminating the specialised demands of traditional musicianship. In order to engage untrained participants more immediately, an accessible means of communicating musical information would be required. This would naturally call for simplification in the instructions i.e. graphics or text, and/or simplification in the sound production i.e. proposing sound entities that may be achievable by a novice such as humming or banging. These practices can very quickly lead to an anarchistic society, in which anyone can do just by wanting to; the standards of admission and rejection no longer exist. However, what makes this musically conventional is the intention in establishment, whether it be a concert, a rehearsal or simply an organised gathering of open participants (with the presence of a composer and their intentions, or some form of instructions, strengthening this even further). In the case where there is no composer authority present, it is the deliberation behind these participant's actions that argues a reason for rendering it acceptable as a musical exercise. An ideal example of this is Cornelius Cardew's text piece, *The Tiger's Mind* (1967), which deliberately seeks musical virginity, as it demands 'no musical education and no visual education; all it requires is a willingness to understand English and the desire to play in the widest sense of the word.'<sup>118</sup> Music such as this, gives birth to performances that only rely upon the willingness to participate. Performance is, therefore, transformed into:

An amorphous phenomenon of willing engagement which requires no orthodox credentials. Skilled execution is not banished from the new music, but it is demoted

---

<sup>117</sup> Aspects here include rehearsing, workshopping (experimentation of ideas), audience engagement, performance and acceptance of universality of musical expression.

<sup>118</sup> Michael Nyman, *Experimental Music: Cage and Beyond*, 2nd edn (Cambridge University Press, 1999), 119.

to being a needlessly formal way of approaching what others engage in with equal thoroughness, less formally.<sup>119</sup>

My piece, *Loam* (2016), embodies this notion, as it consists of interpreting symbols in a primal, non-virtuosic way requiring no music reading ability or previous education. All it requires is the willingness to engage with the sound material presented as well as the other agents involved. In this way, the piece can become a composition of the acting agent's personalities, unbiased or uninfluenced by past training, aiding in a novice approach of exploring the possible sound journeys. Evidently, the trajectory of my compositions is towards this direction of liberationist practices, encouraging performer to become co-creator. The main reasoning behind this is, in correlation with what Brown says, to maintain the performative aspect at the time of composition through to each and every production of the work. Due to my adapted aesthetic of examining unstable sound in a limited and reiterative environment, the handing over of certain choices to the performer becomes obvious as, with freedom of interpretation, comes explorations, mutations, and relative sound entities imperceptible at the time of conception due to the unknown renditions of other agents. Naturally, as a result of the limitation, the sonic area in which these entities are sited is generally known. What is not, however, is the form in which they will present themselves. This is something that comes about whilst using performance as a form of composition, and is why the role of the performer becomes ever important during the creation; the composer establishes and the performer creates.

It can begin with something quite small, for example, my *String Quartet No. 1* is comprised of juxtaposed fragments of which the performer can choose the rhythmic, timbral, textural and durational properties. The sounds chosen all come from hands-on experimentation with the instruments, which I felt would benefit the most from a malleably temporal environment. In other words, sounds that, when stripped of rhythmic confinements and durational boundaries, have the properties to evolve into an alternate being. The process then becomes: how to hand this over to the performer in a way true to these original experiments, preserving the improvisatory nature of creation. The most straightforward answer is to provide freedom. For example, here the performers are given a choice of what to play and how to play it. They can select which pitches to sound and are able to play each with three different bowing techniques: phasing (constantly moving bow position), speed (very fast or very slow) and pressure (light or heavy). The performers can choose any page to start with (A-N) and can read forward or backward alphabetically,

---

<sup>119</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 121.

stopping once all pages have been played. As a result, the formation of this piece becomes a circle created through woven textures, with no concrete start or end point as sounds can blend back and forth like a colour wheel with shades melding between each primary.

In *Baruopa*, this is taken a step further, with the composition being devoid of any certain structural path. The players are given a greater responsibility in creation, choosing any route they desire, with their fragments either blending from one to the next or being divided through silence. In the score, it is noted that each sound can last between 5-10 seconds, however, this is just a guideline to give the performers something to latch on to. Performers will not be counting seconds in their heads, and they shouldn't be expected to; however, giving the players a jumping-off point provides them with a certain amount of assurance which, in turn, can lead to even greater fearless exploration. Cornelius Cardew ensures this importance in his text, *Virtues that a Musician Can Develop*, when he states:

You should not be concerned with yourself beyond arranging a mode of life that makes it possible to remain on the line, balanced. Then you can work, look out beyond yourself. Firm foundations make it possible to leave the ground.<sup>120</sup>

Consequentially, this should provoke performers to delve deeper into the possibilities presented by the composer, to gain a wider creative palette. Ambiguity can be implemented, both in terms of outer framework, correlating with aleatoric or chance methods, and the sound material of the inner structure. The question posed, of performance practice benefiting from this, is certainly subjective; however, in an environment where the study of sonic material and its evolution is paramount, its contributions are undeniable. It can rid the performer of external knowledge associated with conventional practice, in which the abiding musician has the sound presented to her in mind, before she makes it. Here, for the performer, the sound is unknown, leaving only the process of doing, and with this level of ignorance all that is left is to create and explore: to embody the sound.<sup>121</sup>

With unstable sound, there is always the fear of demise due to its volatile state; the fear of unpredictability. Liberation can support this property of sound as, with the acceptance of the unknown, comes the acceptance of music's transience. Cardew continues:

---

<sup>120</sup> Cornelius Cardew, *Towards the Ethic of Improvisation*, (Edition Peters, 1971).

<sup>121</sup> This point will be referred to in more detail in the subchapter on Improvisation.

The desire always to be right is an ignoble taskmaster, as is the desire for immortality. The performance of any vital action brings us closer to death; if it didn't it would lack vitality. Life is a force to be used and if necessary used up.<sup>122</sup>

For this reason it can be said that freeing the performer aids in freeing the sound. This is mainly due to the fact that with liberation can come an acceptance of the mortality exhibited by unstable sound; the ideal object gradually dissipates, leaving only the real. Thus, within this more liberated method of production, the 'type' becomes extinct leaving only tokens to represent a work. The ideal object is no longer 'protected from the caprices of the real world,' as it can only exist through physical space and time.<sup>123</sup>

With this in mind, it becomes a case of: how much from the outside will the composer allow into the composition?<sup>124</sup> As my portfolio of pieces progresses, the attempt at bringing the act of creation and performance closer together heightens, having the composition process extend beyond myself and towards my collaborators. This, in turn, leads to indeterminacy, which can be said to contain two quite different concepts: aleatoric and improvisation. The two certainly have a crossover, due to their indeterminate foundation; however, they both come from quite contrasting philosophies. Aleatory refers to a compositional method whereby chance elements, beyond the reach of the performers, are permitted to affect the resulting music.<sup>125</sup> These chance methods used by Cage were only an answer to structuring sound events. He wanted 'to make improvisation a discipline': to remove certain choices from the composer and leave it to probability.<sup>126</sup> In retrospect, chance methods also 'prevent' certain choices to the performer with regard to sound material produced, only allowing the determination of its course; the composer is still very much in charge. Improvisation correspondingly favours the unexpected, yet this unpredictability is now in the hands of the musicians.<sup>127</sup> So, it is exclusively when improvisation is introduced that sound elements, as well as their structuring, become malleable, with specificities uncertain to both composer and performer. This is what I

---

<sup>122</sup> Cardew, *Towards the Ethic of Improvisation*.

<sup>123</sup> Benson, *Improvisation of Musical Dialogue: A Phenomenology of Music*, 7.

<sup>124</sup> The outside here refers to anything not within the grasp of the composer i.e. performer interpretation, performance environment, external influences, etc.

<sup>125</sup> Jason Robinson, 'The Networked Body,' *Negotiated Moments: Improvisation, Sound and Subjectivity*: 91–112 (92).

<sup>126</sup> Stanley Kauffmann and John Cage, 'The Changing Audience for the Changing Arts,' *The Arts: Planning for Change: Proceedings of the Twelfth National Conference*, (New York: Associated Council of the Arts), 23–52 (46).

<sup>127</sup> Robinson, 'The Networked Body,' *Negotiated Moments*, 92.

intend to accomplish from freeing certain musical practices: to achieve the malleable formation and unpredictable nature of unstable sound, by bringing the spontaneity of performance into the composition and, in turn, bringing the unpredictability of ideation into the performance. It, therefore, becomes a necessity to unite these two practices (composition and performance), and it is within this realm of improvisation that they have a greater chance of becoming one whole creative and collaborative unity.

## 2.2 Improvisation and Collaboration - Compositional Performance

The activities of composing and performing are, essentially, improvisatory in nature, varying in amount and taking different forms with each activity.<sup>128</sup> Whilst improvisation is usually thought of as promoting the pinnacle of spontaneous creativity, this creativity is usually constrained by two aspects: the musical (or stylistic) and, as a result, the performative (or physiological).<sup>129</sup> The musical constraint usually comes in the shape of an underlying formal scheme or model, as well as certain instrumentation steeped in musical tradition, which is used to produce such material. It is within this constraint that a common ground for communication is formed between composer, performer and audience. The American psychologist and improviser, Jeff Pressing, labels this as a ‘referent’ and describes its role as ‘providing material for variation, so the performer can allocate less processing capacity (attention) to selection and creation of materials.’<sup>130</sup> Within my compositions this is done through the limitation of material which, in turn, spawns a controlled improvisatory environment. As discussed previously, this also has the capability of affecting the processing capacity of the audience as they can plant their feet upon the foundation from which the improvisation will grow. The other tool which Pressing speaks of is the ‘knowledge base’ which ‘encodes the history of compositional choice and predilections defining an individual’s personal style.’<sup>131</sup> This knowledge usually takes the form of social and historical influence upon those producing the sound, and leads to individual interpretations and explorations within the practice of improvisation — subconscious memories of past

---

<sup>128</sup> Benson, *Improvisation of Musical Dialogue: A Phenomenology of Music*, 2.

<sup>129</sup> Aaron Berkowitz, *The Improvising Mind: Cognition and Creativity*, (New York: Oxford University Press, 2010), 2.

<sup>130</sup> Berkowitz, *The Improvising Mind: Cognition and Creativity*, 5.

<sup>131</sup> *Ibid.*, 6.

experiences. Subsequently, it is the amalgamation of referent and knowledge that gives improvisation some form of stability, even if it is a frail evanescent structure, that allows for greater explorations to commence.

To improvise is, naturally, to collaborate. Collaboration, being quite a broad word covering many actions in many fields, is easiest described within a creative environment as: the allowance of innovation to unfold from consistent conversing and side-by-side work.<sup>132</sup> This may not be immediately reachable between participants; however, through time and practice, the creative bond can become more formidable. For example, the American aviator and engineer, Wilbur Wright, explains the collaborative connection between himself and his brother:

From the time we were little children my brother Orville and myself lived together, played together, worked together and, in fact, thought together. We usually owned all of our own toys in common, talked over our own thoughts and aspirations so that nearly everything that was done in our lives has been a result of conversations, suggestions and discussions between us.<sup>133</sup>

Within the history of creation, we are sometimes drawn to the image of the sole creator: the lone genius whose enigmatic moment of intuition changes her creative field. There is an argument that suggests this is just a myth and, instead, is group effort that generates breakthrough innovation. Many innovations once believed to be individual genius may have emerged from invisible collaborations, that is, ones unseen and undocumented; Freud's creation of psychoanalysis was aided by ideas that emerged from a vast network of colleagues; Einstein's contributions to modern physics were firmly fixed within an international collaboration among many laboratories and many teams.<sup>134</sup> The individual genius of said creators should never be tarnished; however, in understanding how creativity relies on a network of participants, it is necessary to accept that the contributions within their fields emerged from many years of interactions, trial and error, and false starts — not in a single burst of insight.

Creativity usually consists of the ideation stage, where the non-conscious brain divergently emits unfamiliar actions, and the evaluation stage, in which the conscious brain chooses which of these is coherent within the creative domain.<sup>135</sup> Within composition this

---

<sup>132</sup> Keith Sawyer, *Group Genius: The Creative Power of Collaboration*, (New York: Basic Books, 2007), 3.

<sup>133</sup> *Ibid.*, 4.

<sup>134</sup> Sawyer, *Group Genius: The Creative Power of Collaboration*, 10.

<sup>135</sup> David Borgo, *Sync or Swarm: Improvising Music in a Complex Age*, (London: Bloomsbury, 2005), 2–3.

usually translates to one finding the materials for a piece — a pitch group, rhythmic cell, timbre combination, gesture, etc. — after which one begins forms of investigation, treated through elaboration and documentation, finally resulting in some form of composition. Where these materials originate can seem entirely arbitrary as they stem from within the individual's perception. Therefore, this method of working proceeds from the assumption that creativity is primarily an individual psychological process, with one composer controlling all artistic aspects.<sup>136</sup> However, there are many 'knowledge-based' forces at play here within the creative musical domain: past external influence, memories, social environment, political and historical situation — forces that shape an individual's subconscious which, subsequently, influence one's ideation. It can then be argued, that there is already collaboration at play here; an inner collaboration, with a profusion of subconscious thoughts influencing these apparent unfamiliar actions. For example, in my *String Quartet No. 1*, each player is given a choice of what to play, how to play it, and how long to play it for. The question here is what, from their past cognition, influences this choice process? Is it solely the fact that they have been instructed towards this quasi-liberation or, are there deeper forces at play when it comes to physically and cognitively producing, sustaining and exploring the sound?<sup>137</sup> Furthermore, when other agents are added to the creative environment these forces multiply, as the individuals now become influenced by physical external forces, ones that are consciously visible. The violinist could choose to sound a frequency or timbre most evident to them from within the array of sonorous cello multiphonics or, could visibly witness the viola proceeding in a similar fashion and retreat to new directions. Here is usually where the process of a united collaboration materialises, which exists between all agents within the creative domain as a multiplicity of variants in a multiplicity of places: between one's thoughts and one's actions, other's influences and one's reactions — all creative agents and the resulting sound.

The music of Éliane Radigue is a prime example of a creative collaborative approach which in turn leads to a reliance on both composer and performer developing and rehearsing selected sounds, refining them over time and sculpting appropriate techniques into their clearest and purest forms of exploration. Her piece, *Naldjorlak* (2004-09), is a composition in three parts, each created through this intense collaborative process. The first of these was with cellist Charles Curtis, of which he recalls:

---

<sup>136</sup> Ibid., 1.

<sup>137</sup> This idea of internal collaboration or historical influence will be discussed later in the chapter.

Our work was detailed and exacting. We discussed at length the ordering of the techniques and sound-states, and the ways in which the characteristic instabilities of a sound-state would shape its own gradual transformation. I practiced extremely quiet transitions and ways of connecting the sections through fingerings and string adjacencies. We discovered a very logical sequence that follows the geography of the cello, seemingly working down to the root of its sound. Éliane would take breaks to brood and agonise over the progress of the piece, while I waited before continuing to search.<sup>138</sup>

Radigue's focus rests upon limited sound and its diffusion; in this case, the wolf tone of a cello. To her, a sound's primary source is only a very small part of its phenomenal reality, with concentration resting upon the micro-particles such as overtones, combinatory tones, resonances — the secondary phenomena. Because of this, the working method she and her collaborators have developed, over time, supports the situation of sound in 'the collaboration, and not in a written score.'<sup>139</sup> In correlation with this principal, the later pieces in my portfolio, such as *Baruopa* and *Loam*, are composed for a specific instrumentalist bringing about a more personal experience in an attempt to give equal ownership of the music to the performer. In *Baruopa*, a collaboration is naturally formed out of necessity, due to the ambiguity of the score. Performers are first asked to explore sounds specific to their instrument — as a process in discovery of the fecund unstable sound complexities — before combining these with sounds of others: melding into each other's sound forming hybrids of fragile and subtle textures. This collaboration, therefore, becomes a process shared by the performers themselves, with gentle crossings and communications forming between players. In this place, performers are required to maintain individual control whilst, at the same time, creating complex interactions with the other musicians. For example, in *Loam*, players are asked to find sounds within others, in an attempt to blend individual timbral palettes back and forth throughout the ensemble. This process requires alternating between internal listening — finding a resonance between themselves and their instruments — and relinquishment of individuality, in the search to become part of the sound as one, greater timbral mass.<sup>140</sup>

As a result of this collaborative creative process that puts sound studies at the forefront, there are some specific elements that, even though being musically centred to performances, are unable to be identified in the score. These elements mainly fall under

---

<sup>138</sup> Éliane Radigue *Naldjorlak* (<http://www.shiian.com/shiian3.php>, 2 August, 2017).

<sup>139</sup> Gottschalk, *Experimental Music*, 214.

<sup>140</sup> Hope and Robinson, 'OCCAM HEX II: A Collaborative Composition,' 25.



two categories: structural acoustic content and musical directives.<sup>141</sup> It can be said that the scored work only determines, to a certain extent, what counts as a sufficient instance and, as a result, can underdetermine its performances. With this underdetermination, a collaborative process naturally occurs between all parties involved: composer to performer, performer to performer, and performer to score. Only by implementing these collaborative means, does the chance of a notation becoming a truer instance of a work, improve. With regard to the structural content of a notated work, since the crucial components are ordered sounds, it can be considered that a notated score's primary function is to represent these abstract acoustic structures. In a structural content account, underdetermination rests upon the score's failing to supply a complete acoustic musical depiction of the sonic arsenal available within a performance. Being incredibly familiar with a score is insufficient for knowing everything that a musical performance can provide.<sup>142</sup> For example, in my piece, *Terricrepto*, certain notations demand collaboration of all participants (with each other and the score): the bow position clef of the strings, the syllabic pronunciation of the flute sounds, the battuto rhythms of cello and piano, and the fragile content of the clarinet multiphonics; or in *Reheal*, where the gesture of uneven glissando trills, with change in bow position and finger pressure, comes to fruition through experimentation. Each of these practices are clearly depicted in the score but only through implementation, improvisation and collaboration will agents find sounds within the moment, that feel necessary and beneficial to a successful instantiation of the work.

The other element of underdetermination centres around the practice of musical directives and the specific ambiguities that surround them. The purpose for notating music is to supply the performer with a set of commands that act as a directive or, in some cases interpretive, set. The negative effect of this is that the work falls short of directing the player in all relevant respects, for example, directive gaps such as expression markings, bowing/breathing techniques, trills and appoggiaturas, as well as other movements taken for granted, such as hand position, eye location and openness of the ear. If we look again at Ferneyhough's highly determined score, the excess of notational detail introduces unfaithfulness, in that multiple contradictory layers of information lead to a 'constant negotiation between performer and score that does not permit a casual deferral to "the composer's intentions."' <sup>143</sup> The negativity of this is highly subjective, as some players may

---

<sup>141</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 86.

<sup>142</sup> The issue of eye versus ear will be examined in more detail in the following subchapter.

<sup>143</sup> Rutherford-Johnson, *Music After the Fall*, 85.

find comfort in the presentation of every fine detail of sound production, whereas, others may cross out the notations provided in order to find the technique which naturally suits them best. The cellist in *Reheal* is not expected to accurately produce every notational detail as this completely defeats the purpose of how and why the notation is presented in such a manner. Due to the volatility of the sounds and ambiguity of the simultaneous techniques used (bow pressure/speed, finger pressure/speed, vibrato width, etc.), the performer is urged to experiment with the notation and fill in her own directive gaps. Depending on the scrutiny of the performer, each interpretation of identical notation could be a result of the striving to produce uniformity or, oppositely, be the acceptance of invariable non-existence and the relishing of the unknown (fig. 2.2.1). It can be argued that stripping a performer of any individual interpretation goes against performance ethics; however, if everything one associates with the method of playing is described, does this not physically embody the spirit of the composer to the greatest extent? The composer's dominance is unquestionably asserted. If this is seen as the antithesis of an expressive or free nature (something which is the embodiment of creative musical performance), the opposite must call for directive incompleteness which, in the case of my method of working, offers an open invitation of voluntary collaboration, with the player being entrusted to complete certain sounds within the work. Here, instructive underdetermination is 'complemented by' and, ironically, consequently 'demands player self-determination.'<sup>144</sup>

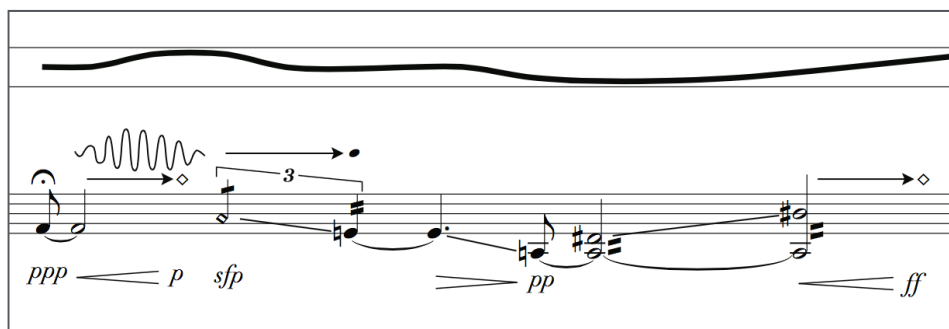


Fig 2.2.1: Volatile sounds and a multiplicity of ambiguous techniques in *Reheal* urge the performer to experiment and fill in the gaps.

Thus, viewing a work as a set of directives, enables promotion of the performance above the actual work within a musical hierarchy. Commands to make sounds do not contain the richness of real sounds created; a rebuffed directive is fairly hollow. A stress

<sup>144</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 88.

upon directives encourages the individual treatment of a work by having it exist only through its instances. Due to the score underdetermining its instance, nothing incontrovertible in the notation alone can determine the credibility of a given instance. Though one does learn some fundamentals of the work through the score, this knowledge is only skeletal as, for the performer, to really know a work is to participate in the progress of making it sound — to collaborate. One becomes aware of and can even determine the essence of a work only through producing some of its instances.<sup>145</sup> This is where the importance of collaboration within the improvisatory community, and within my practice of composition, rests.

Collaboration, for me, stems from the presenting of sounds, in which with I have experimented, to performers, within a controlled improvised setting.<sup>146</sup> Although coinciding with Radigue's method of exploring limited sounds in an improvisatory manner, I choose to also be the instrumentalist during the early stages of creation. As mentioned previously, the reasoning behind this is to be both familiar with the possibilities of the sound world, and to transport the phenomenology of a selected sound palette from the initial stages of conception, through to the present form of performance. Thus ensues a controlled improvisation, due to the limitation of material, which presents numerous relative sound qualities, timbres and textures that I know are achievable. It then becomes the performers' goal to search for these possibilities with my duty being, as a composer, to make sure they are presented with the most efficient environment in which to do so. Derek Bailey, in his writings on improvisation, discusses this responsibility given to the performer:

The unique experience for a composer in the use of improvisation must be the relinquishing of control over at least some of the music and, even more critically for the composer, passing over that control not to 'chance' but to other musicians.<sup>147</sup>

As a composer I create the domain. However, the choices given to performers allow them to rule it. For example, in my *Three Graphic Pieces* (2015), each composition is built from having the players explore a specific combination of timbres. In *Meridian*, for any number of clarinets and electronics, performers are given an array of fingerings (which can be chosen at random), categorised into four types of sound: stable multiphonics, unstable

---

<sup>145</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 89.

<sup>146</sup> The element of control is primarily limitation of material, reasons for which were given in Chapter 1.

<sup>147</sup> Derek Bailey, *Improvisation: Its Nature and Practice in Music*, (New York: DaCapo Press, 1993), 70.

multiphonics, colour/timbral trills and fluttered tones. By selecting these fingerings, a sonically controlled environment is established, containing subtle differences in frequencies and unstable fluctuations evident within the narrow frequency band, leading to an assortment of rhythms derived from the ‘spectrum pulse’.<sup>148</sup> For the performers there is no start or end point, with the path being interpreted differently by each individual player. The compositional process that led to the forming of this work was one of reiterative improvisation and deep listening, recording and juxtaposing the numerous results: fragmented dynamics or fluctuations in noisy timbre, breaks in sound, the unpredictable accidental relationships. Handing this possible sound world over to performers then allows them to create their own journey, within themselves and with the others around them. Therefore, the performance becomes a heightened form of the compositional process extending the ingredients, taken from the composer’s hands into something unknown, newly harvested in the present, influenced by numerous bodies: the performers, the interpreters, the audience: a collective creative musical community. Within this community, all members have some input into a work’s creation, as its creation exists both in the pre-devised state as well as the performative.<sup>149</sup>

Here, a point needs to be addressed about the role of the audience within this musical community. The re-imagining of relationship between audience and performer is something that has been in question for many years. Meta undercurrents have forever infiltrated the compositions of those who tend to question the audience’s role, in both the creation and experience; an early example being the text in Stockhausen’s *Momente* (1962-69), consisting of audience reactions heard at performances of his earlier works. The origin of this urge to reinvent the audience’s role could stem from the concert hall setting and its direct segregation. It is hard to reimagine music as a part of life — an inclusive community — within this context so, therefore, composers feel something must be done to amend this barrier, especially in our present society where, through technology and the Internet, the relationship between artist and their audience is becoming ever more direct. Naturally, taking the audience out of a standard setting and placing them in an immersive environment, either combining them with performers or having a more mobile encounter, is the obvious solution. However, this is not always feasible. Therefore, how does one approach this within the standard milieu of a recital or concert?

---

<sup>148</sup> Rădulescu, ‘*Sound Plasma*’.

<sup>149</sup> The social and political aspects of this community or ‘network’ will be elaborated upon in final chapter.

This is all on the dependence that an audience is required for a performance. What if it is suggested that only a player and listener is needed for a true performance of a work? The word listener prompts one to think of an audience, however this can be in reference to just one individual; the composer, perhaps, witnessing a rehearsal or, furthermore, the performers themselves listening to one another. What depicts a performance is its intention for an outer party. Having said that, its successfulness also depends upon the attentiveness of those the performance is intended for; a performer playing music at a dinner party is instructed not to intrude upon conversation, as their music should be heard but not listened to. This instruction, that kills all pretensions of a performance, can be shattered by the applauding of one individual at the dinner party, who has been aesthetically aroused and enraptured by a certain number. An identical sound sequence may count as a performance for them, but not for others, so long as they differ appropriately in their experiences. Therefore, it can be argued that a key factor in governing a performance is how attentive or concentrated the listeners are. This is quite subjective, as there are many deciding factors when it comes to engaging a listener: does the performance suit their taste, has the performer failed to capture and sustain the expectations of the concert, are there more distractive elements within the performance environment that steal the focus of the listener? What is more certain, however, is the idea that to progress within the field of questioning relationships between performer and audience, one must treat the audience not as a separate entity, but as an opposite force or pole, with the two relying greatly upon each other: the emission of coercive currents and their balance in unity. An eye-view of the ready and abled listener ensures a meaning and purpose to the decisions a player makes. In performance, the player's sound creations take on the form they do, in part, because of an attentive listener's capability to share experiences of musical subtleties; for 'no subtleties would be worth the effort, if there were no listeners subtle enough to hear them'.<sup>150</sup>

Therefore, as important as collaboration is, the central key to a collaborative community's success is reliant on participants, both performers and listeners, who are capable and willing. Referring back to the performance section of this chapter with regard to level of skill required, naturally, within some of my compositions this is necessary. However, due to the focus on unconventional techniques in order to gain unstable and fragile timbres, the drift away from virtuosic or even classically trained musicians is ever more present. Unfortunately, perfection can give birth to fear of 'letting go'. Due to this fear, a problem that can often occur with improvisation is the settling in a safe place, one of

---

<sup>150</sup> Godlovitch, *Musical Performance: A Philosophical Study*, 45.

familiarity, where the performer is sure of ‘successful’ results. The instinctive choice can then become one for tried material. This can also occur within a group setting when an individual bases her own playing on what others do, or simply follows the group as an overriding strategy leading to inflexible circular results: one faulty cog can decide a wheel’s fate.<sup>151</sup> This fear most likely stems from the idea that performance practice within a classical music or ‘concert hall’ setting, throughout its history, appears to have evolved to promote the idea that music or sound is, of its nature, fixed and is rarely malleable, changeable. This is mainly due to the customary strict instructions of the score, merged with both the classical musician’s high level of skill in all aspects of instrumental playing and, in correlation, the high expectation of the listening audience. Here, music is thought of as being precious and the performers can ‘embody a threat to its existence.’<sup>152</sup> In this authoritative setting, the composition never belongs to the performers; they are usually allowed to handle it but only under strict supervision. David Borgo explains:

With traditional musical practices that are organised in a predominantly hierarchical manner, personality differences can often be managed in deference to the group leader, the authority of the musical score, or the professionalism of “getting the job done.” Free improvisation ensembles tend to aim for a more egalitarian organisation that makes them particularly susceptible to the full spectrum of both musical and so-called “extra-musical” influences.<sup>153</sup>

This may be why many musicians begin from an accuracy point of view, trying to recreate what is actually on the score as precisely as possible in order to appease whoever is ‘in charge’, rather than a sounding point of view which would involve a more guided quasi-improvisatory approach.<sup>154</sup>

Therefore, within my improvised compositions, there is always a necessity to draw performers out from a comfortable state ensuring the movement of sounds, whilst at the same time assuring agents of their place within this egalitarian community. From experience with freer compositional practices, namely through performances of my improvisatory pieces, an effective way of achieving this is providing clear instructions, explaining the amount of freedom a performer has within the sound world of the piece, after which conversation solidifies any insecurities or doubts. In this way, the controlled improvisatory

---

<sup>151</sup> Borgo, *Sync or Swarm: Improvising Music in a Complex Age*, 8.

<sup>152</sup> Bailey, *Improvisation: Its Nature and Practice in Music*, 66.

<sup>153</sup> Borgo, *Sync or Swarm: Improvising Music in a Complex Age*, 14.

<sup>154</sup> The extremity of this obviously relies upon the type of notation presented to the performer.

method of composition does also rely on composer's instructions; however, here the reasoning behind these is not to display an authority but is, in fact, the antithesis of this: to ensure the performer of their higher rank within the creative domain. The reliance upon conversing is a necessity within most musical practices — composers explain the ethos behind a piece, their notations, and how they would like performers to approach the work; conductors ask certain practices of performers, whilst making sure the composer is satisfied with the work's sounding. Yet, with improvisation, conversing appears to be the most effective way of communicating individual and collective thoughts between all active participants, allowing everyone to have equal input into the creation. Practicing in this way, what then is obtained, are (due to the controlled improvisatory setting) multiple alternately formed versions of an entity, that was pre-envisioned by the composer: the performer has officially gained status as co-creator.

Just like most practices, there are varying degrees of improvisation that can be used in numerous ways to achieve a wide variety of compositional and performative results. As generalised as that statement sounds, it is entirely because of the artistic nature of musical creation. Within the participant musical community, the level and type of improvisatory practices used are usually the decision of the composer, with the role of his collaborators, who are (in most cases) the performers, left to his discretion. No matter what the purpose of creative improvisation is, whether it be individual/group composition/performance, what is clearly consistent throughout all of its forms are: an aura of selflessness, an acceptance of the unknown, the gravity of listening (awareness of one's surroundings), a preparedness for no matter what eventuality and, most importantly, the absence of hierarchy. If we look at one of the earliest forms of improvisation in Indian music, even though it displays certain guidelines — the *raga* framework, the basic intervals of *shruta* and *svara*, and the rhythmic cycle of the *tala* — it is clear that the above factors have always been the bedrock of its practice. All laws and principles here are of a spiritual nature, correlating with and almost inseparable from Hindu and Muslim teachings and, although there is a large body of literature concerning the music, there is an almost complete absence of systemised, musical theory.<sup>155</sup> Thus, compositional responsibility is placed upon those who perform, as they are left with enormous freedom in the treatment of material; the structure of the *raga* is in constant flux, only achieving its final state in the moment of performance. Here, the performer is used as a vessel for the ever-evolving formation of the *raga*, infusing their

---

<sup>155</sup> Bailey, *Improvisation: Its Nature and Practice in Music*, 1.

cultural context within its growth. The sitar and tabla player, Viram Jasani, speaks of the raga's movement over time:

If you take a raga today and look at it in terms of its history you may find that it has changed considerably. But it is not changed by one performer but by a succession of performers. So the changes are imperceptible over any short period of time. They become part of the raga. I think a raga is [...] a product of product of peoples' changing attitudes and tolerances.<sup>156</sup>

Improvisational composition here is influenced by one's historical situation and, although the ideation stage is aided by a higher spiritual order, the evaluation stage is purely governed by the influence of one's social, political and cultural memories: a psychological collaboration of sorts. Collaboration, in this context, can be seen not just as the reliance on external physical forces, other agents providing their individuality, but also psychological influences on the composer during the ideation stage; what, from their social history caused them to perform certain actions? The formation of every individual's thought process is, somewhat, governed by the external forces of their everyday encounters, therefore, individuality can be thought of as the reaction to these past experiences, historical memories or influences. This, in turn, leads to the 'gradual release of cognitive control and an increasing willingness to trust the body to respond appropriately.'<sup>157</sup> For example, Pauline Oliveros recounts her method of improvising and notating whilst composing *Variations for Sextet* (1960):

I listened for what I wanted to hear next. If I got stuck, then I improvised at the piano until I got what I wanted. That is, my improvising body knew how the piece should go, whereas my cognitive side could be stuck and not know what to write next. I was often frustrated, though, because I heard in inner listening what I wanted to notate, but I had to acquire the writing skills gradually. I was not nearly fast enough to notate what I was hearing.<sup>158</sup>

A certain amount of individuality may be plausible for an improvisational creative process, that is, bringing something into being; however, one must take these influences into account, regardless of the level of subconsciousness involved. The inner listening that Oliveros refers to must come from past outer experiences that are stored in the subconscious, before being

---

<sup>156</sup> Bailey, *Improvisation: Its Nature and Practice in Music*, 10.

<sup>157</sup> Pauline Oliveros, 'Improvising Composition,' *Negotiated Moments: Improvisation, Sound and Subjectivity*, 75–90 (75).

<sup>158</sup> Oliveros, 'Improvising Composition,' *Negotiated Moments*, 78.



translated to the physicality of doing. Trusting the body to respond seems the most effective way to greater communication between the non-cognitive nature of the human being and the cognitive appreciation of improvising composition. Furthermore, once others become involved in the process of production, the acceptance of their individual histories, influences and memories is an inevitability.

This poses the question of what the interpretations of other agents can bring to the domain of musical production, and the importance of a composition's reliance upon this. Within my compositional practice, the specific concentration upon the act of extorting performer's memories and cultural influences, and how they can influence the interpretation or exploration of a sound, has become ever present. Each individual has her own view on what is needed, both cognitively and physically, to produce certain sounds. To perform, especially to improvise, involves, to a certain extent, bringing oneself under the influence of the past in order to transport it to the present. This is mainly done through performing memories — both our own and those of others. A human being embodies the personal and cultural memories that, in turn, mould and instruct her physical body. The physicality of our bodies and their practices are thus partially formed by these memories so, therefore, to improvise is to call upon the history of resources available as a means to ascend outside the confines of our biological structure; to bring about something deeply personal only individual to us.<sup>159</sup> This can be found in all levels of performance, even within the most rigorously predetermined performance of a strictly notated score. Of course, it is more evident within freer practices; however, even the most subtle forms of improvisation — any micro-musical details that depend upon performative context, such as an expressive vibrato or temporal impulse — can be spawned from personal and cultural memories. In other words, the repository of experience, stored in each individual body, can be divulged in the sonic results of improvisatory music-making practices, and where it comes from is only known on the inside — similar to that of a black box.<sup>160</sup> What extends this notion even further is how the performing body chooses to deal with these memories; two performing bodies with similar shared experiences may not communicate them identically. One could embrace past experiences, whilst others could reject or repress what they have been given from their ancestors; however, both are valid responses.

Despite most musical styles being steeped in tradition, they are equally as reliant on individual expression, bringing something individual or personal into performance from

---

<sup>159</sup> Mandy-Suzanne Wong and Nina Sun Eidsheim, 'Corregidora,' *Negotiated Moments: Improvisation, Sound and Subjectivity*, 217–231 (217).

<sup>160</sup> Wong and Eidsheim, 'Corregidora,' *Negotiated Moments*, 217.

outside the fixity of tradition. An ideal example being, not just Indian music, but also that of Blues and Gospel, both of which are plentiful in personal and cultural memories presented by improvised elements — ornaments and cadenzas in Gospel and individual solos in Blues. These two genres also share an emphasis on the narrative, which give the memories a historical context; in this case it is a more obvious one, relating to the struggles of African diaspora.<sup>161</sup> Obviously, the voice is an extremely effective way of translating memories, as this is the form of communication we are most familiar with. The American composer and soprano, Diamanda Galás, uses extremities of her voice — foregrounding its physicality whilst highlighting the flaws, breakages and imperfections — in order to portray suffering in her work. For example, *Plague Mass* (1990), is used as a powerful statement on the ongoing tragedy of AIDS, of which her brother had died a few years previous, consisting of Galás' voice pushed to straining limits, an 'uncompromising howl of accusation' almost unbroken for the full ninety-five-minute duration.<sup>162</sup> Singers, rappers, poets, actors can all connect body, sound and history to expand narratives, choosing how they are affected by inner and outer forces and, as a result, how they decide to express embodied memories. Inner forces are built from self cogitation, whereas, outer tend to be more involuntary, taking the form of many shapes; a gospel singer embodies the past to convey suffering, enabling her to make powerful, unique sounds; a rapper conforms to established pronunciations caused by their contemporary surroundings; an instrumentalist may unconsciously conjure sounds driven by her heritage; the sounds that appeared in Pauline Oliveros' head were a result of her social and cultural upbringing. She explains her method of solo performance:

My nonverbal body makes the music by drawing instantaneously on my wealth of experience. I trust the accuracy of my body in this enterprise. I am bypassing "thinking" my way in the improvisation. I am counting on and trusting my body to manifest the music purely and freely.<sup>163</sup>

The extent to which one can present one's memories or someone else's, is flexible. As a result, tension between the 'here' and the 'beyond' becomes apparent within the

---

<sup>161</sup> Ibid., 226. For further reading on Afrodiaspora in gospel music see: John Burdick, 'The Singing Voice and Racial Politics on the Brazilian Evangelical Music Scene,' *Latin America Music Review* 30/1 (Summer 2009): 22–25.

<sup>162</sup> Rutherford-Johnson, *Music After the Fall*, 63.

<sup>163</sup> Oliveros, 'Improvising Composition,' *Negotiated Moments*, 83.

improvising body, as it acts as both a present agent and a transmitter of ‘absent or faraway other.’<sup>164</sup> This tension is what makes improvisation of an individual so compelling.

As mentioned previously, this is further multiplied when agents are increased, as there is additional influences incorporated into the dynamic, both inner and outer. Within this community of improvisors, it is then quite common for a ‘group mind’ to develop during performance. In the moment-to-moment dynamics of improvised performance, it also becomes difficult to define ‘individual contributions and intentions from those cultivated by this “group mind.”’<sup>165</sup> The ambiguity between one’s thoughts and one’s actions, and one’s actions and the actions of the others surrounding them, becomes the bedrock of this ‘collective mind,’ posing the question: did you do that because of me, or did I do that because of what you did?<sup>166</sup> In an improvised setting, what is then usually required is a sense of trust or empathy among all participants, in order to reach an egoless state, in which the sound takes control over action — the aura of selflessness and abolishment of hierarchy. This is where a level of creation can be reached, which contradicts the notion of creativeness being an individual psychological process. The ideation and evaluation stage of creativity can now occur in a more complex, rather than linear, fashion and may even become externalised due to the process of a group dynamic. The internal workings of an improvising ensemble, especially larger groups, can be slow to respond to change and are, for the most part, beyond the control of any one individual. Therefore, when a performance is deemed ‘successful’ by all participants, it is usually a rather arduous task in attempting to understand the precise dynamics which caused this: the collective dynamics of improvisation will always transcend the full awareness of each individual. For these reasons, collective improvisers sometimes choose to adopt certain schemes or devices in order to offer some additional degrees of control over the situation. This is where the practice of controlled improvisation, a practice which I choose to embrace, is situated.

Looking at my piece, *Loam*, in more detail, what is evident is a level of control with regard to structuring whilst, at the same time, providing a great amount of freedom concerning instrumental timbres, techniques, durations and dynamics. The formation of this piece rests upon three main elements found within improvisation: listening, pausing and responding. It provokes performers to find sounds within their instruments, in response to those of the surrounding others. Here, listening inclusively to everything that can be

---

<sup>164</sup> Wong and Eidsheim, ‘Corregidora,’ *Negotiated Moments*, 230.

<sup>165</sup> Borgo, *Sync or Swarm: Improvising Music in a Complex Age*, 2.

<sup>166</sup> David Borgo, ‘Openness from Closure,’ *Negotiated Moments: Improvisation, Sound and Subjectivity*, 113–130 (113).

perceived in a moment, a global attention, is a way to hold the space for improvisation or the preparedness to respond, a focused or individual attention. The act of being aware of surrounding sounds becomes a meditational process of balancing both types of attention, in order to find the readiness needed to sound. For example, from a piano resonance one could hear numerous sound entities. It is the responsibility of other agents to find a readiness within themselves in order to respond (both in receiving sound as well as making it) — whether it be latching on to a resonant harmonic and beginning the search for its complimentary or, hearing a beating pulse and spontaneously locating a rhythmic counterpart. The primary factor for the formation of this piece is the willingness to be open and ready to react within the present moment. Any prior commitment could have an effect on an improvisatory embodiment — the non cognitive, subconscious — such as a delay in response time or lack of spontaneity.<sup>167</sup> Another reason for this method of improvisation is to present something to an ensemble, or group of performers familiar with each other through past experiences, that will lead them away from their own sense of identity (which may have been established over time). This identity can form a boundary within an ensemble developed, not from personal choice or affinity between individuals, but from genial trust built through these past experiences. Thus ensues a balancing act between maintaining a certain amount of this identity and the ability to adapt this identity to the changing dynamics of the environment.

Keith Sawyer expands upon Mihaly Csikszentmihalyi's notion of individual 'flow,' a state of heightened consciousness in which action and awareness become phenomenologically fused, to include the process of group performance. This increases when the performers begin to feel autonomy, competence and relatedness as a unified whole, leading to a sense of control. However, this control can result in a paradox, for each participant must feel in control while simultaneously remaining flexible, listening openly yet closely, and always be accepting in yielding to the surrounding flow of the group. Managing this paradox happens when:

Many tensions are in perfect balance: the tension between convention and novelty, between structure and improvisation, between the critical, analytical mind and the freewheeling, outside-the-box mind, between listening to the rest of the group and speaking out with your own individual voice.<sup>168</sup>

---

<sup>167</sup> This is something, however, that can be practiced through doing.

<sup>168</sup> Keith Sawyer, 'Group Flow and Group Genius,' *The NAMTA Journal* 40/3 (Summer 2015), 29-52 (45).

The call for openness to extemporise material in my composition, *Stupa*, can bring about this ‘group flow’ ethic between all participants. Timbrally, texturally and dynamically this composition urges the players to judge what is happening around them, letting the surrounding sound world affect their choices. Here, the performers are asked to attempt to find a balance between individual mind, adding their independent voice to the situation in a hope to affect others, and listening mind, the choice in whether to respond to external forces. With the aid of certain instructions in the score, choices of frequency and path are available to the performers. However, how great each point of the sound compass is applied to each frequency and within each path is completely up to the performers’ interpretation, resulting in an entirely different execution of similar material by separate individuals, which will, in turn, affect other performers’ interpretations.<sup>169</sup> For example, no strict notational markings are given so it is of the players decision to how loud or soft sounds are, and how long they stay or move with a specific sound, which can trigger multiple dynamic, sonorous responses, within the ensemble. Similar ethics can be found with regard to techniques implemented; one could search for a certain sound in order to complement a sonic entity within their perceptive range, whilst, at the same time, another could do the opposite in an attempt to find contrast. Each individual can contribute their histories to their interpretation and judgement of what they feel will result in an overall successful dynamic. Consequently, a leaderless organisation is formed; leaderless in a performance aspect, that is, as the composer may still have inherited that role in proposing the sonic material in which to explore (even then this is hardly a leadership that reigns over all like, for example, that of a conductor). Cause and effect does still exist although, now, without chain of command. The secret behind this lies within the intercommunication of group’s members. The ability to self-organise is achieved in non-authoritative, flexible and yet powerful ways ‘through direct and indirect interactions among autonomous agents and between agents and their environment.’<sup>170</sup>

So why are improvisation, collaboration and performance so important in the creation of my work? For me, they have become a necessity to translate the freedom of the first ideation improvisation into every successive performance. To transport the spontaneous ‘now’ of improvisation to the future and beyond, to have it be eternally in the present, never putting a box around certain elements, and allowing improvisation to

---

<sup>169</sup> See Chapter 1, pg. 31.

<sup>170</sup> Borgo, *Sync or Swarm: Improvising Music in a Complex Age*, 6.

permeate through the proceeding stages of creation, using its primary stage as a blueprint for every aspect of the composition: the sound materials, the sonic relationships, the interagency possibilities but, most importantly, the performative aspects.<sup>171</sup> My method of composing has also gradually led to the attempt of unifying composer, performer, and listener, ridding all participating agents of the barrier that can easily form between individuals. In my compositions I see the performer having as much creative input as myself. I am not, however, diminishing the importance of the composer as it is still entirely my choice as to what seeds get planted and, ensuring that they are continuously tended to (by notational instructions and conversational collaboration). Therefore, two types of creativity can be said to be apparent here: one of demiurge, and one of evolution. I choose certain sound qualities to be explored in specific ways that can yield vast amounts of variations on relative results. The materials are provided for the performer; in *Circles, Lines and Squares* and *Meridian*, the selection of woodwind fingerings and the different ways to blow can be likened to different shades and brushes available to a painter. My picture has been painted, and now I wish to see how others craft with the same materials: multiple shades with multiple brushes. This method of further extending results by bringing other agents and their histories into the exploration (or creation) process, is purely to uncover results unknown to me. Due to the independent cognitional process of every individual, it seems an incredibly beneficial method of achieving multiple evolutions, examinations and interpretations of the limited unstable timbre palettes presented. Although having different roles in the production of a work, both processes of composition and performance are no longer confined within stringent boundaries — the reciprocal exchange between the composer’s supply of strict instructions, and the performer’s attempt to reach the most faithful rendering of the composer’s intentions; they are now one continuous activity, as with every successive performance, creativity is forever passed around all agents of production. The importance for me here is that this keeps the examination and perception of sound, by both performer and listener, in the present, drawing it away from any past fixity or connective relationships and, thus, giving a greater chance to the formation and recognition of, in Oliveros’ terms, secondary phenomena: ones that need more time and space to fully reveal themselves. Cardew discusses this feature of performance practice, and its affect on a composition’s viability, in the guidelines to his composition *Treatise* (1967):

---

<sup>171</sup> Performative aspects here refer to the instructions given to the performer within the work as a whole; the notation, the glossary of symbols, the guidelines in which to follow (performance notes), and the reliance on verbal communication.

Written compositions are fired off into the future; even if never performed, the writing remains as a point of reference. Improvisation is in the present, its effect may live on in the souls of the participants, both active and passive (i.e. audience), but in its concrete form it is gone forever from the moment that it occurs, nor did it have any previous existence before the moment that it occurred, so neither is there any historical reference available.<sup>172</sup>

Historical reference here does not refer to the creator's memories, but to the present form of what they create; its spontaneity making it devoid of concrete formation. This lack of historical reference becomes extremely important for composer, performer and listener within both a creative and performance setting. For me, as a composer, it allows the spontaneity of compositional improvisation to carry through to the performance, with the performer judging the sounds they are creating separate from any historical reference — past or future — allowing them and, as a result, their production to exist in the 'now'.<sup>173</sup> Due to the absence of past versions, the listener is aided in the concentration upon the sound itself in the present moment. That is not to say, past connectivities of the visual or aural will not occur as, mentioned previously, these are a natural reaction in exposure to new environments. The main achievement here is that one can witness something develop from infancy into an entity that has never identically occurred before. Therefore, all agents are given a chance to participate in this musical dialogue. Stravinsky has claimed that within musical composition, composers invite the listener to be an associate in 'the game initiated by the creator' and that their relationship is 'nothing less, nothing more than a partnership'.<sup>174</sup> However, here, in this improvised collaborative environment, the composer and performer are also an invited participant; everyone is equally a partner within the musical event, which is now:

Defined neither by the composer nor by the performer nor by the listener. It is a game that has a long history, a performance practice that has been preserved and handed down over the years. That game belongs to all of its participants, and none of them can claim priority. For the game — the very performance tradition of music making itself — is a gift that none of them own and no one player can control. It belongs to all of them and none of them.<sup>175</sup>

---

<sup>172</sup> Cornelius Cardew, *Treatise Handbook*, (Edition Peters, 1971).

<sup>173</sup> Here, conscious historical reference is not to be confused with the subconscious historical memory.

<sup>174</sup> Igor Stravinsky, *Poetics of Music in the Form of Six Lessons*, (Harvard University Press, 1970), 137.

<sup>175</sup> Benson, *Improvisation of Musical Dialogue: A Phenomenology of Music*, 191.

In our modern world, a place where society is becoming ever homogenous through globalisation, technology and rapid connectivity, the embracing of this network, of distributing responsibility and empowerment equally between participants, has become a necessity. In this habitat, composer, performer and audience are brought closer together and what now transpires is the removal of any hierarchy within the creative/performative domain, focusing more attention on: the historical and social factors that shape and expound creativity, its role in collaborative and learning situations, and the surprising and emergent properties of collective creativity that can become apparent in the moment of improvisation or, to rephrase, ‘compositional performance’.<sup>176</sup>

### 2.3 The Visual in Performing - Eye versus Ear

The notion of work-concept, or a musical work, being an ideal entity is intimately related to the visualisation of music or, in simpler terms, the score. The main reason behind this is quite straightforward as notation allows the music to exist independently of its composer. It also allows intentions to be compared, altered and refined within the course of notating the sound, with the composer being able to traverse the piece, differentiating past events with future ones.<sup>177</sup> Furthermore, conventionally notated practices, being music that is manifest as a fixed score, have become standardised practices for their ability to both coordinate musicians for performance and allow the analytical contemplation of sounds outside the temporal flow; one can obtain a basic idea or experience of the piece just from reading the score. This concept of score representing a work, is taken to the extreme by Schoenberg, when he states: ‘Music need not be performed any more than books need to be read aloud, for its logic is perfectly represented on the printed page.’<sup>178</sup> This point is firmly of the opinion that music is an art of the eye; however, from the contrasting view that music is an art of the ear, this statement can become antiquated. Here, a score can be seen to represent only potential music and that true representation lies within the sonic experience. Especially, with more liberated practices such as improvisation and creative collaboration, the idea of the score representing a work can become more and more equivocal. As

---

<sup>176</sup> Mihaly Csikszentmihalyi, *Creativity: the Psychology of Discovery and Invention*, (New York: HarperCollins Publishers, 1996), 110.

<sup>177</sup> Simon Shaw-Miller, *Eye hEar the Visual in Music*, (Burlington, VT: Routledge, 2013), 50.

<sup>178</sup> Dika Newlin, *Schoenberg Remembered: Diaries and Recollections (1938-76)*, (New York: Pendragon Press, 1980), 164.



considered previously, working in an interpretive and collaborative manner can lead to a score underdetermining its instances, with certain performative aspects being only translatable through conversing, listening and doing.

In an attempt to balance these contrasting views, it could be argued that both are necessary as one influences the other. The body ‘does not oppose sight to hearing, rather it fuses sight to ear, just as the score fuses sound to the eye.’<sup>179</sup> Simon Shaw-Miller describes this attempt to find a middle ground:

It is not necessary to construct an opposition between score and performance; it is not necessary to imagine the score contains the ‘work’ any more essentially than the performance, because in ontological terms the work is not *in* the score but in the score *in performance*. The score needs to be made first visible, and then audible, but the music exists in both.<sup>180</sup>

Here I concur, as music can be represented through both seeing and hearing; after all, sound is vibration, something that is represented visually and aurally through waves and their forms.<sup>181</sup> It, therefore, becomes a choice of the creators as to what means they find most effective in order to physically present a work. Do they attempt at using only one representation, either an incredibly detailed score or no score at all, or accept the recognition of underdetermination and use it to their advantage, influencing performers to interpret symbols in various ways — to ‘fill in the gaps,’ so to speak?

The main advantage of traditional music notation, like that of traditional speech notation, is that it enables people to say or, in this context, perform things that are beyond their own understanding; a child can read complex philosophy aloud or, if gifted, play Rachmaninoff preludes. With this analogy, therefore, it is clearly evident that one can understand a notation without understanding everything that the notation is able to notate. To abandon notation is, therefore, a sacrifice; it deprives one of any system of formal guidelines leading us into uncharted regions.<sup>182</sup> On the other hand, this formality of traditional notation can be seen as a disadvantage, with tensions growing between fixity and creativity. From the second half of the twentieth century onwards, many special-purpose notation-systems have been devised, containing blurred areas that aid in liberating the

---

<sup>179</sup> Michel Serres, *The Five Senses: A Philosophy of Mingled Bodies*, trans. Margaret Sankey and Pete Cowley (London: Bloomsbury Academic, 2009), 225.

<sup>180</sup> Shaw-Miller, *Eye hEar the Visual in Music*, 51.

<sup>181</sup> The importance of the visual in the perception of sound has been discussed in chapter 1.

<sup>182</sup> Cardew, *Towards the Ethic of Improvisation*.

performer demanding a more improvised interpretation. Here is where the embracing of more ambiguous notations comes into effect.

The visual in music can be used for numerous purposes: as communication from one agent to another, as a means to coordinate agents, to efficiently represent musical ideas but also, to evoke reactions from a performer. This can be done primarily by two visual stimuli: text and graphics/symbols. Text in musical notation is fundamentally used for communicative purposes, such as instructions on what and what not to do.<sup>183</sup> We have seen this being implemented both for inner voice — Drummond’s *STOP* asks the performer to, ‘Think of a sound in your past that has affected you like no other’ before imagining an equivalent sound, ‘To be experienced in your future,’ — and outer voice — Cardew’s *The Tiger’s Mind* urges a more physical embodiment of the text.<sup>184</sup> With pure text pieces it could be suggested that there is no need for the physicality of a score, as instructions can be orally communicated. The only need for the use of writing is to present the composer’s instructions during his absence. Text pieces, therefore, can still exist without the written entity. That being said, composers like Drummond may want the text read instead of heard, as one’s inner voice is very different from another’s outer voice. On the other hand, the composer may choose to use the aurality of speech to influence one’s thoughts, perceptions and intentions. For example, the Dutch composer, Jaap Blonk, attempts to find new ways of expressing and translating text into sound. In his sound poem, *Sound* (1990), the text is about sonorities found in the voice as well as breathing, listening and hearing. Here, he finds numerous methods of representing the text, and invites the listener to emulate the process (fig. 2.3.1).

Are you listening?  
 You’re listening.  
 You’re breathing in. You are holding your breath.  
 Your ears are whirring. You hear the whirring in your ears. It is a timeless whoosh.

You’re breathing out. You hear yourself breathing out.  
 After that it’s quiet. You hear nothing. A pin could drop.  
 You are listening.

Fig. 2.3.1: Extract from Jaap Blonk’s sound poem *Sound* (1990).<sup>185</sup>

<sup>183</sup> The other main use of text being forms of libretti.

<sup>184</sup> Bill Drummond, *Stop* (<http://www.the17.org/scores/326>, 15 August, 2017).

<sup>185</sup> Jaap Blonk, *Sound* (<http://www.jaapblonk.com/Texts/sound.html>, 16 August, 2017).

Graphics, however, hold much more ambiguity, as they are not a spoken language. Indeed, conventional musical notation is an understandable form of communication and one any musician should be familiar with, but it is when this conventionality is gradually abandoned that things become more uncertain. As a musician reads musical scores, she encounters numerous variations of the symbols and their syntax, depending on the style of music. Regardless of notational style, the score's function is essentially the same: to provide a map for musicians with which to navigate their way through a work, with an audience alongside. The performers of Cardew's *Treatise* describe:

In its purest sense, a score provides glimpses of the overarching structure of a work and information on our location en route; it signals meeting points and exposes symmetries/asymmetries; it gives us the destination, as well as velocities, depths and heights; it constitutes a stele of sorts, with an ornate system of symbols and directions according to epoch and style.<sup>186</sup>

Nevertheless, what does become malleable to the composer is how the object (the score) presents itself and, as a result, allows the musician artistic freedoms in emotive values, technical execution, pitches, dynamics, durations and even instrumentation: the finer details within the music. Composers are able to form their own language, an independent method of communication that enables one to sound one's individual voice within a schema that portrays and, in turn, yields one's compositional desires most sufficiently. From its birth, graphic notation's purpose was a quite straightforward one of presenting ideas that conventionality could not: freer pitch, durational and rhythmic choices, extended techniques driven by the focus on timbre or noise, and the ascent of interpretive creativity and improvisatory practices over fixity. If a work does not promote these performative aspects, the need for graphic notation may become hollow. For example, the purpose of Morton Feldman's graph music was not one of surrendering control, but more so, a method of dealing with certain rules of fixity. He explains:

The rules of the game were clear enough, but how to jump the hurdles were not. I learned it was a lie, that old dictum, "Rules are made to be broken." They were, in fact, obstacles to be jumped — that our musical history and the realities of note pushing into shapes and forms was a treacherous steeplechase.<sup>187</sup>

---

<sup>186</sup> Alex South and Richard Craig, 'Sketches Towards a Performance of Cornelius Cardew's *Treatise*,' *The Drouth: Graphic* 41/1 (Winter 2012), 42–50 (42).

<sup>187</sup> Morton Feldman, *To Have Known Stefan Wolpe*, (<http://www.cnvill.net/mforton.htm>, 31 July, 2018).

In other words, he wanted to find a way around the process of ‘note pushing’; to give sound a more spacious environment by presenting fewer parameters (time but not pitch, for example), with the intention of, in concert with the performer’s realisation, reconciling opposites.<sup>188</sup> This graphic notation was, however, short lived, due his apathy towards performer interpretation; he wanted to provide the sound and not the performer with freedom. He managed to find, and perfect, this area of freedom within a precise conventional notation, therefore, the need for graphics became unnecessary; as John Cage remarked in this connection: ‘Feldman’s conventionally notated music is himself playing his graph music.’<sup>189</sup>

Therefore, it seems one has to be entirely committed to, and willing to accept, the spontaneity of results produced with notation abandonment. With graphics, it appears to be at its most effective when thought of as the representation of ideas (entities with an equivocal aura), rather than specific details. Through the performers these ideas are expressed, with the composer leaving their interpretation free, in confidence that the seeds for these ideas have been accurately and concisely presented in the score. In this way, the purpose of a visual becomes a means in which the composer can impose her ideas upon the thoughts of the performer. If the composer has a concept for a sound or timbre, they can implement graphics as a form of representation — an expression of the area where the sound is situated, in which the performer can roam around freely. It then becomes the responsibility of the performer as to how she chooses to interpret these ideas. Does she allow her historical memories of conventional notation seep into the graphic rendering or, does she use this as a rebellion against conformist practices? Cardew explains:

The danger in this kind of work is that many readers of the score will simply relate the musical memories they have already acquired to the notation in front of them, and the result will be merely a gulash made up of the various musical backgrounds of the people involved. For such players there will be no intelligible incentive to music or extend themselves beyond the limitations of their education and experience.<sup>190</sup>

If one is presented with an ascending line or a black rectangle does one immediately think of a glissando or a sustained sound whose density matches that of the graphic? This is entirely a case of how performers use their experience in deciphering certain symbols; a balance

---

<sup>188</sup> Shaw-Miller, *Eye hEar the Visual in Music*, 61.

<sup>189</sup> *Ibid.*, 63.

<sup>190</sup> Cardew, *Towards the Ethic of Improvisation*.

between bringing some past familiarities into the unfamiliar, and accepting the spontaneity of their subconscious to deal with the uncharted environment.

For me this balance has become the main purpose of implementing freer notational forms. I see it as a way of influencing the performer in ways conventional notation is unable to. In the same way external forces of surrounding performers affect the individual, the visual can be used as a means for composer to coax certain responses from each agent using the performer's eye as well as ear. The origination of this is found in my composition, *Reheal*, which uses a mixture of conventional notation (including instructions for pitch, rhythm and dynamics), with a blend of liberated notation (certain conventional aspects removed) and fully graphic notation. These stages of liberation are used to urge the performer to take what they have learned, from playing the precise material, and apply that way of thinking to the freer material. The graphics consist of lines of differing thickness, either ascending, descending or continuously straight. These can be interpreted in many different ways with line thickness possibly referring to volume, pressure, density or noise, and line inclination either conveying pitch register or bow position (for string instruments). Some fragments contain both graphic and conventional notation with one going either to or from the other, prompting the performer to move from or towards interpretation (fig. 2.3.2). The American composer, Mark Applebaum, has used notations in a similar way, liberating the performer by asking her to continue what she is playing through graphic notation. In his piece, *56 1/2 feet* (2002), for chamber orchestra, Applebaum notates a box with graphics that proceeds a conventionally notated stave (fig. 2.3.3), in which the performer can interpret however she pleases. It is completely undefined and marked with a duration of 5 seconds. Therefore the performer can read it left to right, up or down or as 'one instantaneous blast of some sort that occurs some time during that five second span'.<sup>191</sup>

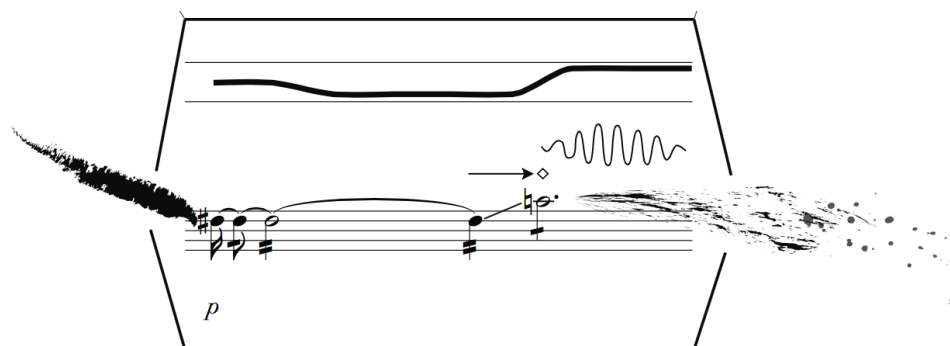


Fig 2.3.2: Moving between graphic and conventional notation in *Reheal*.

<sup>191</sup> Robert Arnold, 'There's No Sound In My Head: Mark Applebaum's Metaphysics of Notation' (<https://www.youtube.com/watch?v=sxsssRAB8bc>, 2 October 2014).

The image displays a musical score for Horn and Trumpet. On the left, three staves of musical notation are shown, with a 3/8 time signature below them. The notation includes notes, rests, and dynamic markings like 'p'. To the right, a square box labeled 'BRASS:' contains abstract graphic notation, including a large curved line, several dots, and a crescent moon. Below this box is a horizontal line with a square box containing '5'' and a line ending in a 2/16 time signature. Underneath this line is the instruction: 'CONDUCT DOWN BEAT AND PICK UP TO MEASURE 38 ONLY.'

Fig. 2.3.3: Continuing a sound through graphic notation in Mark Applebaum's *56 1/2 feet*: Horn and Trumpet, bars 36-37.

Asking the performer to interpret something, using a thought process learnt from past musical directions, spawns something very natural from within both the physical body and cognitive mind, letting the same sound be explored in different ways each time it is stated, and allowing the freedom of expression from the interpreter to shine through. Furthermore, when the sound holds natural instabilities, the numerous varieties of natural phenomena within should also come to the forefront, through the vessel of performative spontaneity and improvisation within a timbrally controlled environment.

Therefore, the origins of graphic notation within my compositions stem from the role of the score acting as a stimulus or catalyst, as well as a guide, to improvisation. The use of aesthetic objects, such as visual art, can provide inspiration — aiding performers in exploring different techniques, searching for sounds within their instruments, and rethinking about their approach to playing. Visual art has always influenced thought, and the graphics I use are precisely for this reason, with texture, density and shape each contributing to the sculpting of sounds. For example Éliane Radigue uses images as the genesis for her *OCCAM* pieces (2011-12), proposing a visual and sensory score for each which, in turn, evokes different reactions from collaborators; some are less motivated by the images, preferring to leave them behind as soon as possible, while others like to use their memories as a guide toward playing with another energy, somehow far beyond the 'notes'.<sup>192</sup> This evocation is quite evident in my piece, *Meridian*, where lines differing in

<sup>192</sup> Cat Hope and Carol Robinson, 'OCCAM HEX II: A Collaborative Composition,' *TEMPO* 71/282 (October 2017), 18–28 (22).

various qualities such as opacity, density and structure depict the nature of clarinet sound of which the performer must search for (fig. 2.3.4). Directions are given as to which type of graphic represents which type of sound (stable/unstable multiphonic, trills, etc.), with suggestions for duration and fingerings. The reason for these written instructions is purely for informative purposes, providing the performer with as much knowledge as necessary for them to begin their exploration. Here, accuracy is not desired, as it is the hunt for sonic representation, the journey through unstable sound, and the cognitive effect upon the performer — these are of the utmost importance.

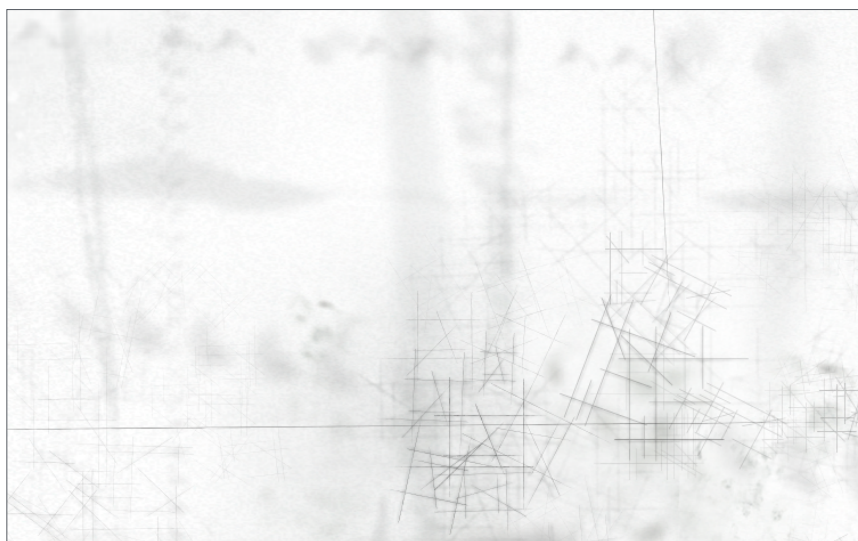


Fig. 2.3.4: Graphics influencing the performer's sound in *Meridian*.

Along with the limitation of material, the score implements an element of control within improvisations. Even though it is liberated from certain fixities, its authority still translates the will of the composer, by governing, to a certain extent, the music created. Therefore, within the collaborative process, musicians have the chance to familiarise themselves with the sonic world of the score, testing out the range of aural possibilities which can enable their guidance, by the resulting sound, just as much as the score. Cardew writes:

We are *searching* for sounds and for responses that attach to them, rather than thinking them up, preparing them and producing them. The search is conducted in the medium of sound and the musician himself is at the heart of the experiment. If the alchemy is successful, what results is not the transformation of lead into gold, but something much more mysterious, that is, the generation of a musical organism: a

living polymorphous entity which absorbs our individual wills and transcends our individual powers.<sup>193</sup>

Due to the allocation of their concentration within performances, individual agents may be unaware of their contributions to the resulting total sound. Such contributions, which are brought about by the evolving, dynamic sonic environment, are not only regulated by the visual aesthetic object of the score and the set of instructions provided, but also by the rules of engagement between agents; the physical and cognitive musical schemata of this newly formed musical organism. With each work, the visual aspect aids with the individual performance practices and their influence on the sonic formation of this organism: its senses, its ability to shift, its gestures and thoughts — all are developed in order to allow its existence in the independent sound world of each work.

Thus, the placing of a visual aesthetic object in front of each musician is not only a means to apply certain rules within the performance practice, allowing the growth in allocation of attentive thought to each sound within a timbral palette, but also to build a foundation as to how individual performers engage with each other: the provocation of group flow. This can come about in various ways, depending on the amount of time performers have with the score before the initial performance. For example, in the premier performance of my piece, *Baruopa*, through the open visibility of the score, the ensemble chose to loosely pre-devise the structure, by using the timbres and textures provided as a means of provoking each other towards a dynamic arc. In my *String Quartet No. 1*, the visual quality of certain lines and shapes can, at times, urge performers to attempt the replication or embodiment of one another's sounding material, causing a cumulative knock-on effect, as both will influence and react to each other's doings. Furthermore, at times, visual graphics may be the only way that one agent within a musical community sees fit to present a sonic image from within their creative thought. The Irish performer and composer, Sam Kavanagh, and his Dublin based Lalala Choir, invite members with little to no musical training to compose works for each other, using individually devised notations in order to represent their compositional ideas. From this method, stems musical objects and organisms that shift and grow from processes of improvisation and collaboration. Like that of Cardew's text pieces or Oliveros' *Sonic Meditations*, the use of the visual becomes a way of abolishing the hierarchal aura surrounding the musical score and permits the formation of an egalitarian musical community where improvisation, collaboration and group flow thrive.

---

<sup>193</sup> South and Craig, 'Sketches Towards a Performance of Cornelius Cardew's *Treatise*,' *The Drouth: Graphic*, 49.



However, if one wants to rid barriers within this community, one may ask is it necessary to have any score at all? If conversing and collaborating within an improvisatory setting are so effective, why is there a need for any written instructions or documentation – especially since a score is lesser without its sounding instances? The ideas of work-concept or absolute music are intimately related to the visualisation in music and if we want to think of composition not as a transcription of an idea, but more as a dialogue between imagined sound and its visual representation (a discourse between sonic and visual), does this make the importance of a score ever more redundant with time?<sup>194</sup> With a collective musical community, is it not enough to allow free improvisation and collaboration to happen without the hierarchy of one composer and her instructions? Derek Bailey explains:

There is an unmistakable suspicion that the acquisition of reading skills in some way has a blunting effect on improvising skills, an acceptance that these are very often two things which do not go together. So, of course, in musics where there isn't an 'accurate' notation system, that possible problem, or distraction, disappears.<sup>195</sup>

Yet, as true as this statement may be, it is also certain that the absence of a music reading/writing tradition puts the existence of the composer in jeopardy; that is, in the traditional sense of the individual creator. Composers of improvisatory material, however, rely less upon this tradition as they accept their role as part of the musical community, and not supreme leader; their existence is not affected by the abandonment of standardised compositional and musical practices. The sounds that I consistently choose to explore are ones that would appear incongruous with conventional notation; they can be named and described much more easily; some may be notated as references but, due to the extreme subtlety of their treatment within the sonic environment and, as a result, what is actually happening in the music, their precise notation becomes antithetical to the resulting sound. What is being generated briefly by a single sound would take numerous lines to explain (like that of Ferneyhough or Cassidy), forcing the performer to concentrate on following instructions rather than being receptive to the qualities of the interacting sounds.

Therefore, for me, the visual aspect in my compositions promotes my role as a composer within this egalitarian society, not as a figurehead but, as an organiser and an influencer. I strive to keep a constant evolution within my music and, in order to maintain this, a balance needs to be achieved between: the graphic's influence on the player, the

---

<sup>194</sup> Shaw-Miller, *Eye hEar the Visual in Music*, 50.

<sup>195</sup> Bailey, *Improvisation: Its Nature and Practice in Music*, 10.

internal growth of the sound, and the external influence and interactivity connecting individual sounds into duos, trios or one single mass. What is paramount in graphic notation is: communicating to the performers how to become one with a certain technique, to almost master it yet, at the same time, forever remaining open to its evolution.

### Chapter 3 - Reverberations

The remaining question is how do these methods of dealing with sound affect its situation in the musical world today? Of course, this point certainly rests upon what, in fact, does the present musical world consist of? Searching for fragments between different composers in the present age may be incautious, as the world we live in today is one of globalisation and digitisation where disparateness has become increasingly scarce. Therefore, in searching for some individuality, it may be best to think of this disparate element within composition today as a way in which the past is utilised, or processed, to become part of the present musical discourse. Tim Rutherford-Johnson calls this:

A musical concept that presents not only the Z of a completed piece but also the X and Y of source that came before it. This is not only a legacy of earlier twentieth-century movements but also a function of, response to, reflection on, and even celebration of the wider social and political forces of our time.<sup>196</sup>

This ‘afterness’ can manifest in various forms: some being influenced by developments in technologies, others by larger external authorities such as social, economic and political forces. As our world is becoming more homogenous and interconnected, it must be accepted that continuities will be found within responses across all art forms, influenced by both the historical past, and the immediate present. My compositional output can be viewed as both a response to what has musically come before, with the aim of freeing certain elements of music in promoting unstable sound studies, and what is socially happening in recent times — the connectivity between participants in the improvisatory musical community and how these networks facilitate reciprocal interactions, providing an efficient method of sharing knowledge outside of traditional structures.<sup>197</sup> Individuality must be relished *within* these responses; in the infinite ways different composers can choose to react to their common surrounding influences.

---

<sup>196</sup> Rutherford-Johnson, *Music After the Fall*, 263.

<sup>197</sup> Borgo, *Sync or Swarm: Improvising Music in a Complex Age*, 22.

Therefore, in seeking more clarity, I must delve further into my practice and ask the question of: what are the aesthetic consequences that come about from displaying sound in a more limited yet, freer manner and, are there restrictions in relying upon others for the finalisation of a composition? My aim from the very beginning was the attempt at displaying qualities of sound in a manner that seemed most natural or ‘honest’ to a primal unstable state, allowing imperfections to shine through, with no direct attempt at taming certain volatilities; letting the sound be itself. However, this provision of space to sound, in multiple musical aspects (reduced aural plane, improvisational performance practice, notation abandonment, etc.), although providing freedom and breaking free of structure to a certain extent, naturally brings composition into repetitive territories and, from these, emanates a form of perceptive stasis within an aural encounter — the continuation or extension of sound, rather than its ‘development’. In correlation with composers such as Morton Feldman, Rebecca Saunders, Laurence Crane, and members of the Wandelweiser group, it can be argued that this music is globally flat or static due to its repetitive nature. Nonetheless, due to the reduction of certain elements, the focus or subjectivity of their (and my) compositions is able shift between dealings with the material, and the actual material itself. One must be able to see (and hear) past the repetition and understand the reasoning behind why the sound is being presented in such a manner. For me, it is to bring all participating agents into an immersive state of creation and perception, where numerous types of intensified improvisational practices (in both performance and listening) are obtainable, in order to experience the multiple forms and relationships states that the material can undergo.

Alternatively, this could be interpreted as a safe or unchallenged aural experience, leading to a generalised type of listening. This, unfortunately, may be because of the negative long-held attitudes surrounding the term ‘static,’ frequently linking it with feelings of boredom or monotony. As a result, with my compositions, I prefer to describe the sound world as lacking in significant change, with regard to obvious musical elements and forms such as pitch, rhythm, periodicity and climax. This is not to say that the music is subject to change, as the variations within form an antithesis which is now more minute or gradual, and less immediately apparent. The exploration of unstable sound is the building block, which can be said to have no dynamism pointing beyond itself and therefore no conflicting other. It would then seem as though the sound world is based upon the total neutrality of its material. However, it appears to be quite the opposite, as this unstable, volatile material, and its ‘neutrality,’ is determined by many forces that, in their own disposition, have the ability to spark internal incongruous behaviour. Furthermore, outer dynamisms of human

interaction with these sound types are also hugely influential in the generation of antithetic undercurrents. Therefore, the nature of the sounds themselves, along with the freedom of interpretation and improvisation, should be adequate in debauching this neutrality to some extent.

Having said that, does one need some form of contradiction in order to deem a musical experience successful? Is this not just a tradition that carries constituents of old music in itself? Seeing as tradition is the locus of non-neutral material, how does one proceed in writing music that is ‘properly modern’? This is especially difficult today, since composers broke with tonal music over a century ago and have since experimented with myriad methods in the search for extending and evolving the past. The debate appears to be in how to recapture the dynamism of material without obviously recuperating structures from this older music, which would cause the ‘new’ music to appear immediately unoriginal. In his *Musique Informelle*, Theodor Adorno provides an abstract outline of this, as he seeks a way out from the bourgeois antinomies of subjectivism or mechanism — that is, either unmediated liberty, which lucidly reproduces unfronted constraints, or pure necessity, which, at a higher level, can become completely unnecessary and arbitrary.<sup>198</sup> On the one hand, the subject could remain external to the work, in its autocratic pre-compositional complexity, and when the work commences the subject ends; on the other hand, the subject is totally relinquished in favour of the pure, aleatoric materiality of the work. Finding a medium between these extremes seems the most logical solution as, what Adorno is arguing for is a genesis of a compositional subject that is not external to the work, and a concept of the work that is not external to the subject; to re-appropriate non-neutral material — that is, to form local level structures that have their own dynamism, not determined by the larger logic imposed upon them: a motive that points beyond itself, an antecedent requiring a consequent, a tension requiring a resolution.

For this reason, should we not look within the inner formations of the material itself, rather than expecting conspicuous discrepancies that we have become so accustomed to within musical discourse? Such practices can reveal that it is within the material where a form of unity between ‘automated’ and ‘capricious’ can occur, and the focus upon those which enjoy a primal state, already imbued with a certain internal differentiation or relational complexity, may provide us with this compromise. Brian Ferneyhough

---

<sup>198</sup> T.W. Adorno, ‘Vers in *Musique Informelle*,’ in *Quasi una Fantasia: Essays on Modern Music*, trans. R. Livingstone (London:Verso, 1992), 269-322, 319.

summarises such material in a presentation given on Adorno in Goldsmiths College, London, 1998:

Such elements are in a position to enter into a dialogue with the composing consciousness, assigning values and articulating criteria of relevance themselves amenable to being treated as material for further manipulation. Far from being one-dimensional ‘thematic/motivic’ givens, such elements are able to move up and down a scale conjoining the extremes of apperceivable material quiddity and abstracted structural vehicle. In so doing, they mediate — in Adorno’s sense, dialectically — both local and global architectures of meaning.<sup>199</sup>

In his *String Quartet No. 2* (1980), Ferneyhough attempts an intersection between the two extremes laid out by Adorno with his use of salient materials (reliant on their physiognomic features), and the morphology within both their delineated global departure and internal configuration and self consistency. These physiognomic features are designed in such a way, as Ferneyhough describes:

With a view to being what one might term vectorially active, in the sense that their degree of definition is such that it is possible to imagine them, reduced to abstract parametric quanta, projected onto future states of the discourse where, in combination with other such strata, they recombine to bring forth qualitatively new and distinct constellations which nevertheless are, to some degree, consequences — or, at least, partially homologous mutations — of their various points of departure.<sup>200</sup>

His reliance on the material itself is his justification for the re-synthesising of thematic or serialistic procedures as, since the qualities are not generated by abstract streams of data but are instead well established in their original context, the composer is now unconstrained from any *a priori*, as it is his interpretive creation, within this material, that the generation of the piece now depends upon. In this way, he deems it possible to still produce an abundance of serial or parametric procedures, whilst avoiding the ‘disadvantages of motivic principles too closely allied with iterable concrete contouring’.<sup>201</sup>

To put it in simpler terms, according to Ferneyhough, with the implementation of processes that can come as ‘accretive continua,’ he has deduced a way of infiltrating automatic serial tendencies with a form of subjectivity, regarded as suitably balanced or, in other words, not

---

<sup>199</sup> Brian Ferneyhough, *Adorno Presentation* (<http://www.entretemps.asso.fr/Adorno/Informel/Ferneyhough.htm>, 3 October, 2017).

<sup>200</sup> *Ibid.*

<sup>201</sup> Ferneyhough, *Adorno Presentation*.

arbitrarily or spiritually extruded but with a precisely judged and clearly cognitional variety of freedom.

Yet, once more a contradictory argument could be made against this aesthetic, as its ambiguity refuses to take a clear stance within an opposing musical discourse; it still remains reliant upon both anachronistic vectorial movement and the necessity in contrasting with non-neutral material. Is there a departure from this model that is not forever clutched within its history? In correlation with composers like Crane and Feldman, my attempt at removing this historical rhetoric has been driven by the contextual emancipation of material and as a result, treating such as sound objects with assurance upon the strength of the elemental nature and ‘protean fecundity’ of reiterated improvisation of unstable sound.<sup>202</sup> The monolithic sound worlds produced as a result of detaching their formation from the systematically generated, emotionally precomposed, or picture painting aesthetic, is not something infinitely groundbreaking, nor is it the only way in distancing a musical creation from a comparable past; however, what can be assured is a much greater opportunity at focusing on raw sound materials, placing trust in their inner dynamisms and incongruous attributes. If Ferneyhough has placed his trust in salient material and the ‘qualitatively new and distinct’ variations it can bring about, then an equal trust must also be placed in the assurance that there are alternate ways, other than precomposed methods, of accessing these. Ferneyhough has chosen to begin on one extreme of Adorno’s scale, injecting serial methods with a precisely crafted form of freedom, whereas, I choose to start on the other side, in bringing complete aleatory or arbitrary tendencies into a semi-controlled and limited environment; each rely on the importance of selected material, the local level structuring of its inner dynamisms, and its multi-dimensional properties when manipulated both internally and externally (juxtaposed with similar entities). The principal question, however, still is one of uniformity. Can this method, due to the reliance upon a small amount of material and the creation of larger forms by reiterative and extensive means, be labelled as uniform?<sup>203</sup> To a certain extent yes; however, this is a consequence that must be accepted in order to explore the higher entities at play within this uniformity; to see how far the material itself — its internal quiddities and the morphology within — can evolve.

---

<sup>202</sup> Ferneyhough, *Adorno Presentation*.

<sup>203</sup> This method of composing also encapsulates many varying styles with fruitful examples including the work of Scelsi, Feldman, Saunders, Rădulescu, Crane, Pärt and Reich.

Naturally, this result depends upon how immediately apparent uniformity is within an aural experience; are we able to predict where the music is going, what is coming next or how events will unfold? Does a certain amount of confidence in predictability inflict upon a listening experience or, can we observe this in a more positive light — as an aid in focusing on other perspectives of perception? The route of simplification, reiteration and the focus on inner workings of material, may naturally bring about a primary perception of a global uniformity. However, temporally this stasis can become a mirage, as it rests solely upon the listener and how she considers her surrounding aural experience. If we think of an aural plane as having levels, the most upper of these or the ‘surface level’ is what one usually first perceives when listening. By creating a web of reiterative activity at this surface level, the overall effect becomes a continuously flat sound world, suggesting to the listener that she has not actually been moved anywhere in time or space, and has only been reconsidering the same static surface for a prescribed duration. Yet, after a while, this alleged stationary surface level can begin to draw attention to what lies beneath; in the case of my compositions this would be the ‘secondary’ phenomena within the unstable timbral palettes, and the resulting relationships formed through their juxtaposition. Alvin Lucier describes his experience of James Tenney’s *KOAN* for String Quartet (1984), in which the entire piece progresses upward through micro intervals in a continuous rhythmic manner:

I could hear the small things that were happening in the music. Once you accepted the fact that it wasn’t going to change, and there was no story, no climax, you began to hear the acoustical phenomena.<sup>204</sup>

The juxtaposition and blending of similar frequencies, timbres and textures, slowly submerge images of the foreground, background and depth in a ‘single complex surface.’<sup>205</sup> Subsequently, this upper level becomes a pane of glass, which draws the particles up from beneath, like vapour on a windshield, creating a comprehensive object of focus, of perceptive illusions that are both questioned and doubted: a global static entity with micro moveable parts.<sup>206</sup> For example, in my composition, *Stupa*, formed by repetitive glissando between the five prescribed pitches juxtaposed with the reiterative limited material of the solo violin, or in my *Two Cello Pieces*, where fragility and instability are consistently partnered with slabs of silence in which the retention of echoes flourish, the upper surface level appears

---

<sup>204</sup> Alvin Lucier, *Music 109: Notes on Experimental Music* (Wesleyan University Press, 2014), 194.

<sup>205</sup> Gottschalk, *Experimental Music Since 1970*, 136.

<sup>206</sup> *Ibid.*, 136.

static at first. However, the longer one is exposed to this sound world, the easier it is to succumb to the finer details found both in the microscopic view of the upper level and underneath the surface itself. One forgets the interdependence of pitch or rhythm and concentrates on sonic relationships — the constantly moving textures and timbres of each individual sound source, and the connections they can form with each other within this reiterative, immersive environment.

Where repetition can suggest stasis on a global level, it can also present a paradoxical view of temporality within music. Mobility can be shrouded within the intrinsically static frame of the overall compositional picture. If one looks at a waterfall for a time, then after, immediately looks at the adjacent stationary rocks, these appear to be moving upwards slightly; the mobility of this monolithic water mass is revealed. On a microlevel, interlocking and gradually evolving repeated figures seem, ironically, to put time into motion inside this static frame. Viewing the aural plane now, from the bottom upwards, these repetitive moving lines saturate the aural surface to a point that their ‘intrinsic temporal motion becomes subsumed into an aural stasis.’<sup>207</sup> Such examples are quite evident in my pieces *Terricrepe*, *Hiraeth* and *Reheal*, where the reiterating of smaller entities permeate through to the surface level, giving the illusion of a static mass. In *Terricrepe*, these take the shape of repeated micro intervals of subtly changing timbres that consistently glide up and down the range of the narrow frequency band for the duration of the piece. In *Hiraeth*, the strings continue in the same manner throughout, providing a backbone for the duration of the piece, slowly evolving from one sonority, before searching for the next, creating a blurred stasis on the surface level but with a flurry of constant movement underneath. *Reheal* could be considered the least ‘globally flat’ of these, as its repetitive fragments contain a higher level of sporadic movement. However, due to the limited timbral and pitch content of the cello, mingled with the echoing of its material by the surrounding instruments, a temporally static environment is created. The individual levels of the aural plane are also more evident as material has the possibility to break away and split into multiple particles, as well as condense back down into one fused organism. Here, reiteration can create temporal movement, while at the same time suspending it. That being said, how time passes depends on the way one perceives the aural plane. All it takes to alter the temporality of an auditory experience is the inversion of the listener’s perspective.

---

<sup>207</sup> Gottschalk, *Experimental Music Since 1970*, 138.



This is further influenced by the consistent softness apparent within the sonic environments I choose to create and explore.<sup>208</sup> This overwhelmingly reduced dynamic range may support uniformity; however, it has become increasingly important in both the perception of unstable sound (by both performer and audience) and, in turn, the forming of bonds between players — their's and each other's sounding instruments, and the audience. A lower dynamic naturally impacts the intensity of our concentration as the paucity of these fragile sounds requires a matching from all participants that is, at times, quite challenging to undertake. In correlation with controlled improvisation, with performers it necessitates the relinquishing of individuality; they are to be part of the sound as one timbral element in a greater mass. From the audience's perspective it can have a similar effect, drawing them into deciphering the sound — the ephemerality of in-between phenomena yearning for an intimate relationship, the use of memory, the slowing down of time in concentration. This prompts the question do we hear more efficiently when sounds are very quiet? Does a softer dynamic prompt other perceptions of sound and the awareness of the resonating space in which it is formed? Much like reiteration, it may be more productive to say that its most rewarding quality is that it can support the opportunity for deeper forms of perception and concentration to occur; a natural breeding ground for vibration, resonance, ghost tones and shadow notes — a place where unstable sound and the resulting phenomena thrive.

The reliance upon the inner workings of the material itself is, again, heightened by its presentation to performers in a collaborative, improvisatory and visually influential manner. This is, primarily, a causation of the unlimited ways in which unstable sound can be treated. Therefore, it becomes a necessity to take advantage of a score's underdetermination, and develop a method in which 'filling in the gaps' is promoted as a means to aid in both musical creation and experience.<sup>209</sup> This trust and reliance in a performer and their histories allows an equality to occur, where the unified goal of researching, exploring, and recording the possibilities within selected sonic material reigns supreme. I, therefore, think of my compositions, especially the latter, as experiments or research in specific sound worlds and, I feel, having the individual (and combinatory) input of numerous agents — their histories, memories, influences and influential behaviour, inner and outer thought, ability of individual and group flow, audience reaction, balance of visual and sonic relationships — provides a greater chance of witnessing more and more

---

<sup>208</sup> That is not to say loud dynamics are not encouraged or not available to performers. These are, however, used sparingly to either amplify volatility or reset listening attention.

<sup>209</sup> Benson, *The Improvisation of Musical Dialogue: A Phenomenology of Music*, 84.

formations that these sounds and their timbres can take. Improvisation in performance encourages improvisation in listening, as the intersubjective and dialogical practices displayed between sounding participants are carried through to the listening participants. Only through this openness in connectivity, can listeners access these deeper forms of perception. Here, we can draw from the partial connections between certain classes of sound and listening, and their reliance upon one another to reveal complexities within an intimate relationship. With improvisation of specific sounds or certain practices of unpredictability in a certain environment, like that of a soundwalk or a limited improvisation, the reliance upon external forces is heightened; performers drawing upon the influence of their histories, other performers, and audience attentiveness; the resulting listening and attentive practices of participants influencing each other; the unstable complexities of sound perception relying upon this openness in listening. This lack of sovereignty, or promotion of partial connectivity, issues a possibility for improvisation, in listening and attention to the moment, that spurs potential for fresh and imaginative ways of gaining knowledge about the sound environment in which agents are both creating and experiencing.<sup>210</sup> Here, reiteration, neutrality and uniformity can be forgotten, as attention is directed to a higher place; an eternal reciprocal exchange between all participants.

This is where my contribution has led me to within the field of composition: in the importance of the connective relationship between the three participating agents of the musical community — finding a balance between each monologue. My compositions are hugely reliant on this collaborative practice, not just in creation and formation but also, in perception. This can also be seen as a succession of impartial translations from one medium to another, highlighting the importance of equality among participants. Bruce Ellis Benson describes:

From its very origin to its final end, the existence of a piece of music depends on a kind of improvisatory translation: the effect of tradition on the composer...the transformation of dots and squiggles into an acoustical existence, and the hearing that takes those moments of sound and blends them together to form a coherent whole. Of all these sorts of translations, none is more important than the others. *All* are necessary for making music.<sup>211</sup>

---

<sup>210</sup> McCartney, 'How Am I to Listen to You?' *Negotiated Moments*, 53.

<sup>211</sup> Benson, *The Improvisation of Musical Dialogue: A Phenomenology of Music*, 179.

Humility, therefore, must be an appropriate stance of all participants in relinquishing to the importance of allocating sound phenomena: the ‘ideal’ composer, performer, or listener is one who is really ready to encounter an other who, ‘breaks into my ego-centeredness and gives me something to understand.’<sup>212</sup> The German philosopher Hans-George Gadamer’s metaphor of a ‘fusion of horizons’ (or perspectives), when describing successful communications between agents — the composer, the score, the performer, and the listener — may be applicable here. For example, the horizon of a composition becomes connected to both performer and listener, so that there is some form of mutuality; a connection. However, if each horizon is viewed as being constantly in motion, the goal must be a blend or a melding between each individual voice that, at the same time, does not lose individuality or otherness; one that does not simply erase particular identity. In correlation with an improviser being aware of both her inner workings and those that surround and influence, the objective here is to both be aware of the threat to individuality and to be creative in allowing each party to have a genuine voice.<sup>213</sup> Therefore, maybe it is best to mitigate this thought process in the belief that one’s horizon is never truly one’s own; they are, musically and generally, part of a culture, a society and politics that is frequently out of one’s control. Each horizon is forever a shared horizon and so, is repeatedly affected by otherness.

With this in mind, the fundamental result in structure of improvisation and extended notation or graphics in my compositions can best be described as a series of exchanges. Although being liberated to a certain extent, a form will always evolve through these natural human reactions and exchanges: the pause and anticipation for when to begin sounding, the moment that feels right for a minor shift to occur. Due to the unstable, delicate yet volatile sounds, and their free reiteration, being the essence behind all of these social practices, the concept of a ‘highpoint’ becomes complicated, as there are no explosive dynamisms littered throughout, only gradual (occasionally to the point of imperceptibility) evolutions; ‘a precarious fragility pervades the interdependence of all participating agents within the musical community.’<sup>214</sup> As a result, the ambiguous relationship between composer, performer and listener, and the interdependence between each, can now be assured, as the question of one being more important than the other becomes irrelevant. All practices now rely equally upon one another in a co-creative environment. The

---

<sup>212</sup> Ibid., 167.

<sup>213</sup> Ibid., 169.

<sup>214</sup> Hope and Robinson, ‘*OCCAM HEX II: A Collaborative Composition*,’ 26.

transportation of the ideation, the moments of conception, the spontaneity and excitement; each allow the audience to become part of the musical process. The redefinition of the listener in modern times has aided in this unified musical practice, with composers striving to make listening more of a creative practice, rather than a receptive one. In this place, there are no secrets between composer, performer and listener, as all are on the same journey, each perceiving (in the case of my compositions) the malleability of sound, both physically and cognitively, within the limited sonic environment. To me, this seems a positive way forward for a musical community, as the links to past historical practices, conformities and guilds become more faded as each performance — the music, the sounds explored, the purpose of creation — is situated in the present moment: it is of that place and that time.

Within the area where my work is situated, there is a consistent dialogue between every element in musical creation and performance — a push and a pull, a constant balance — that needs to be exposed, nurtured, and exploited. In formation and perception, it is the complex timbres requiring and therefore initiating specific types of improvised listening; they rely on connections with others in order to gain objectivity. In performance, it is the unity of all agents in improvisation and collaboration; the balance of inner and outer, past influential histories and memories, visualities of the score and their effects. Each of these social practices is a result of the assurance in a limited unstable sound palette's inner differentiation and relational complexities, and how these can be transported from internal to external when juxtaposed with others of a similar nature. This is where the basis of my argument for constructing music in this manner stands. With my methods of presenting unstable sound, the aim is one of creating a sonic world with organic qualities, both living and breathing, that feels like it is already in existence; it has existed forever, and the importance of its being rests upon each individual's experience. This uniting of composer, performer and listener is a necessity when attempting to treat unstable sound in a way where it can be formed and perceived to its greatest potential. As a result, my compositional aesthetic has become one that pursues the embodiment of sound's unstable nature, both through individual intensified listening methods, and social collaborative improvisatory practices, resulting in a music with mobile parts that shift and grow into individual organisms with each performance, elevating the importance of studying the enigmatic marvels encased within the sound itself.

## Bibliography

*Aaron Cassidy: A Painter of Figures in Rooms*, (<http://aaroncassidy.com/product/a-painter-of-figures-in-rooms/>, 3 September, 2017).

*An Analysis Of Morton Feldman's 'Piano and String Quartet'* (<http://www.cnvill.net/mfsani2.htm>, 15 May 2016).

'Acoustical Terminology,' *ANSI (American National Standards Institute) ANSI S1, 1-1994 (R1999)*.

Adorno, T.W., 'Vers une Musique Informelle,' in *Quasi una Fantasia: Essays on Modern Music*, R. Livingstone (trans.), (London: Verso, 1992), 269–322.

Arnold, Robert, *There's No Sound In My Head: Mark Applebaum's Metaphysics of Notation* (<https://www.youtube.com/watch?v=sxsssRAB8bc>, 17 December 2015).

Ashby, Arved, 'Schoenberg, Boulez, and Twelve-Tone Composition as "Ideal Type,"' *Journal of the American Musicological Society* 54/3 (Autumn, 2001): 585–625.

Bailey, Derek, *Improvisation: Its Nature and Practice in Music*, (New York: DaCapo Press, 1993).

Berkowitz, Aaron, *The Improvising Mind: Cognition and Creativity in the Musical Moment*, (New York: Oxford University Press, 2010).

*Bernhard Günter interview with HALANA Magazine, USA* (<http://trenteoiseaux.net/interviews>, 6 June 2017).

Blonk, Jaap, *Sound* (<http://www.jaapblonk.com/Texts/sound.html>, 16 August, 2017).

Borgo, David, *Sync or Swarm: Improvising Music in a Complex Age*, (London: Bloomsbury, 2005).

Browne, Earl, *String Quartet*, (Universal Edition, 1965).

Cage, John, *Notations*, (New York: Something Else Press, 1969).

———, *Silence*, (New Hampshire: Wesleyan University Press, 1973).

Cardew, Cornelius, *Treatise Handbook*, (Edition Peters, 1971).

Cobussen, Marcel, Vincent Meelberg, and Barry Truax (eds.), *The Routledge Companion to Sounding Art*, (Abingdon, Oxon: Routledge, 2016).

Cook, Elizabeth, *The Stupa: Sacred Symbol of Enlightenment*, (Dharma Publishing, 1977).

Cook, Norman D. and Takefumi Hayashi, 'The Psychoacoustics of Harmony Perception,' *American Scientist* 96/4 (July 2008), (311-319), 318–319.

Csikszentmihalyi, Mihaly, *Creativity: the Psychology of Discovery and Invention*, (New York: HarperCollins Publishers, 1996).

Douglas-Barrett, G., *After Sound*, (London: Bloomsbury, 2016).

Drummond, Bill, *Stop* (<http://www.the17.org/scores/326>, 15 August, 2017).

Dunn, David, *Purposeful Listening In Complex States of Time*, (1997-98).

Edwards, Peter Ivan, 'Object, Space, and Fragility in Luigi Nono's "Das Atmende Klarsein,"' *Perspectives of New Music* 46/1 (Winter 2008): 225-243.

Feldman, Morton, *Give My Regards to Eighth Street: Collected Writings of Morton Feldman*, B. H. Friedman (ed.), (Exact Change, 2000).

———, 'Crippled Symmetry,' *Anthropology and Aesthetics*, 2/1 (Autumn, 1981): 91–103.

———, *Coptic Light*, Study Score (Universal Edition 21 340, 1986).

———, *Piano and String Quartet*, Performance Score (Universal Edition 17 972, 1985).

———, *To Have Known Stefan Wolpe*, (<http://www.cnvill.net/mforton.htm>, 31 July, 2018).

Ferneyhough, Brian, *Collected Writings*, James Boros and Richard Toop (eds.), (Harwood Academic Publishers, 1995).

———, *Time and Motion Study 2*, (Edition Peters, 1977).

———, *Adorno Presentation*

(<http://www.entretemps.asso.fr/Adorno/Informel/Ferneyhough.htm>, 3 October, 2017).

Gasseling, Vincent and Michael Nieuwenhuizen (eds.), 'Morton Feldman and Iannis Xenakis In conversation,' Friday, July 4, 1986. De Kloveniersdoelen, Middelburg, The Netherlands. Transcription available: *Res Anthropology and Aesthetics*, vol. 15 (Spring 1988), 177–181.

Gilmore, Bob, 'Wild Ocean: An Interview with Horatiu Radulescu,' *Contemporary Music Review*, 22/1-2 (2003): 105-122.

Griffiths, Paul, *Modern Music and After*, 3rd edn (Oxford: Oxford University Press, 2001).

Grisey, Gérard, 'Tempus ex Machina: A Composer's Reflections on Musical Time,' *Contemporary Music Review* 2/1 (1987): 239–275.

———, *Partiels pour 18 Musicians*, (Ricordi, 1975).

Godlovitch, Stan, *Musical Performance*, (London: Routledge, 1998).

Gorodecki, Michael, 'Strands in 20th-Century Italian Music: 1. Luigi Nono: A History of Belief,' *The Musical Times* 133/1787 (January 1992): 10–17.

Gottschalk, Jenny, *Experimental Music Since 1970*, (London: Bloomsbury, 2016).

Harley, Maria, 'From Point to Sphere: Spatial Organisation of Sound in Contemporary Music (after 1950),' *Canadian University Music Review* 13/1 (1993): 134–135.

Heaton, Roger, 'Horațiu Rădulescu, "Sound Plasma,"' *Contact* 26/1 (2014): 23–24.

Hope, Cat, and Carol Robinson, 'OCCAM HEX II: A Collaborative Composition,' *TEMPO* 71/282 (October 2017): 18–28.

Husserl, Edmund, *Experience and Judgement: Investigations in a Genealogy of Logic*, Ludwig Landgrebe (ed.), James S. Churchill and Karl Ameriks (trans.), (Evanston, Ill.: Northwest University Press, 1973).

Iddon, Martin, *New Music at Darmstadt: Nono, Stockhausen, Cage and Boulez*, (Cambridge: Cambridge University Press, 2013).

Ihde, Don, *Listening and Voice: Phenomenologies of Sound*, 2nd edn (SUNY Press, 2012).

*Interview with Rebecca Saunders* (<http://www.james-saunders.com/interview-with-rebecca-saunders/>, 10 January 2014).

Kamoche, Ken N., Miguel Pina e Cuncha and João Vieira de Cunha (eds.), *Organizational Improvisation*, (Routledge Publishing, 2002).

Kauffmann, Stanley and John Cage, 'The Changing Audience for the Changing Arts,' *The Arts: Planning for Change: Proceedings of the Twelfth National Conference*, (New York: Associated Council of the Arts), 23–52.

Lachenmann, Helmut, *Gran Torso*, (Breitkopf & Härtel, 1972).

———, 'Touched by Nono,' *Contemporary Music Review* 18/1 (1999): 17–30.

Levinson, Jerrold, 'What a Musical Work Is,' *Music, Art and Metaphysics* (New York: Oxford University Press, 1990): 63–88.

Ligeti, György, *Lontano*, (Schott, 1967).

Loy, Gareth, *Musimathics: The Mathematical Foundations of Music Volume 1*, (Massachusetts: The MIT Press, 2006).

Lucier, Alvin, *Music 109: Notes on Experimental Music* (Wesleyan University Press, 2014).

*Mark Applebaum: The Mad Scientist of Music*. Published on 3 August 2012. Video clip. ([www.youtube.com/watch?v=46w99bZ3W\\_M](http://www.youtube.com/watch?v=46w99bZ3W_M), 25 June 2014).

*Mandalas and Stupas*

([http://www.himalayanart.org/pages/Visual\\_Dharma/mandalas.html](http://www.himalayanart.org/pages/Visual_Dharma/mandalas.html), 30 November 2015).

*Morton Feldman in Middleburg Words on Music: Lectures and Conversations Volume 1*, Raoul Mörchen (ed.) (Köln: MusikTexte, 2008).

Murail, Tristan, 'Scelsi, De-composer,' *Contemporary Music Review* 24/2 (June 2005): 173–180.



Murphy, Timothy S., 'The Negation of a Fixed Form: Luigi Nono and the Italian Counter-culture 1964-1979,' *Cultural Studies Review* 11/2 (September 2005): 95–109.

Nancy, Jean-Luc, *Listening*, David Wills (ed.), Charlotte Mandell (trans.), Annotated edn (New York: Fordham University Press, 2007).

Neuhaus, Max, *Notes on Place and Moment* (<http://www.max-neuhaus.info/soundworks/vectors/place/notes>, 26 May 2017).

———, *Three to One* (<http://www.max-neuhaus.info/images/ThreeToOne.gif>, 26 May 2017).

Newlin, Dika, *Schoenberg Remembered: Diaries and Recollections (1938-76)*, (New York: Pendragon Press, 1980).

Nicholls, David, 'Getting Rid of the Glue: The Music of the New York School,' *Journal of American Studies* 27/3 (December 1993): 335–353.

Nielinger-Vakil, Carola, "'The Song Unsung': Luigi Nono's 'Il Canto Sospeso,'" *Journal of the Royal Musical Association* 131/1 (2006): 83–150.

———, *Luigi Nono: A Composer in Context*, (Cambridge: Cambridge University Press, 2016).

Nono, Luigi, *Das Atmende Klarsein*, (Universal Music Publishing: Ricordi, 1983).

———, *A Carlo Scarpa Architetto ai suoi Infiniti Possibili* (Universal Music Publishing: Ricordi, 1985).

———, *"Hay Que Caminar" Soñando*, (Universal Music Publishing: Ricordi, 1989).

Nyman, Michael, *Experimental Music: Cage and Beyond*, 2nd edn (Cambridge University Press, 1999).

Potter, Keith, *Four Musical Minimalists*, (New York: Cambridge University Press, 2000).

Radigue, Éliane, *Naldjorlak* (<http://www.shiian.com/shiian3.php>, 2 August, 2017).

Rădulescu, Horațiu, *Sound Plasma – Music of the Future Sign*, (Munich: Edition Modern, 1975).

Reich, Steve, 'Music as a Gradual Process,' in *Writings on Music 1965-2000*, (New York: Oxford University Press, 2002).

Reish, Gregory N., 'Una Nota Sola: Giacinto Scelsi and the Genesis of Music on a Single Note,' *Journal of Musicological Research* 25/1 (2006): 149–189.

Roads, Curtis, *Microsound*, (Massachusetts: The MIT Press, 2001).

Rose, François, 'Introduction to the Pitch Organization of French Spectral Music,' *Perspectives of New Music* 34/2 (Summer 1996), 6–39.

Rossing, Thomas D., *Science of Percussion Instruments*, (World Scientific, 2000).

Rutherford-Johnson, Tim, *Music After the Fall*, (Oakland: University of California Press, 2017).

Santini, Andrea, 'Multiplicity, Fragmentation, Simultaneity: Sound-Space as a Conveyor of Meaning, and Theatrical Roots in Luigi Nono's Early Spatial Practice,' *Journal of the Royal Musical Association* 137/1 (May 2012): 71–106.

Sauer, Theresa, *Notations 21*, (Mark Batty Publisher, 2009).

Saunders, Rebecca, *Ire*, (Edition Peters Group, 2012).

———, *Quartet*, (Edition Peters Group, 1998).

Sawyer, Keith, 'Group Flow and Group Genius,' *The NAMTA Journal* 40/3 (Summer 2015): 29-52.

———, *Group Genius: The Creative Power of Collaboration*, (New York: Basic Books, 2007).

Scelsi, Giacinto, *Konx Om Pax*, (Editions Salabert, 1986).

———, *Okanagon*, (Editions Salabert, 1968).

———, *String Quartet No. 4*, (Editions Salabert, 1964).

Schaeffer, Pierre, *Traité des Objets Musicaux*, (Paris: Seuil, 1966).

Schafer, R. Murray, *A Sound Education: 100 Exercises in Listening and Sound-Making*, (Ontario: Arcana Editions, 1992).

- Sciannameo, Franco and Alessandra Carlotta Pellegrini (eds.), *Music as Dream: Essay's on Giacinto Scelsi*, (Scarecrow Press Inc., 2013).
- Searby, Michael D., *Ligeti's Stylistic Crisis: Transformation in His Musical Style, 1974-1985*, (Rowman and Littlefield, 2010).
- Serres, Michel, *The Five Senses: A Philosophy of Mingled Bodies*, Margaret Sankey and Pete Cowley (trans.) (London: Bloomsbury Academic, 2009).
- Siddall, Gillian, and Ellen Waterman, *Negotiated Moments: Improvisation, Sound, and Subjectivity*, (Durham: Duke University Press Books, 2016).
- Shaw-Miller, Simon, *Eye hEar the Visual in Music*, (Burlington, VT: Routledge, 2013).
- South, Alex, and Richard Craig, 'Sketches Towards a Performance of Cornelius Cardew's *Treatise*,' *The Drouth: Graphic* 41/1 (Winter 2012): 42–50.
- Spiegel, Laurie, *The Expanding Universe Booklet* (<http://www.bussigel.com/technosonics/wordpress/wp-content/uploads/2016/07/Laurie-Spiegel-The-Expanding-Universe-UW09booklet.pdf>, 25 May 2017).
- Sterne, Jonathan (ed.), *The Sound Studies Reader*, (New York: Routledge, 2012).
- Stockhausen–Sound's in Space* (<http://stockhausenspace.blogspot.ie/2015/08/stockhausen-on-electronic-music-wdr.html>, 25 May 2016).
- Stockhausen, Karlheinz, *Gruppen*, (Universal Edition, 1963).
- , 'How Time Passes,' *Die Reihe* 3/1 (1957): 10–40.
- Stravinsky, Igor, *Poetics of Music in the Form of Six Lessons*, (Harvard University Press, 1970).
- Szendy, Peter, and Jean-Luc Nancy, *Listen: A History of Our Ears*, Charlotte Mandell (trans.) (New York: Fordham University Press, 2008).
- Tonndorf, Juergen, F. A. Brogan and David D. Washburn, 'Auditory Difference Limen of Intensity in Normal Hearing Subjects' *AMA Arch Otolaryngol* 62/3 (1955): 292–305.

Trainor, Laurel J. and Becky M. Heinmiller, 'The Development of Evaluative Responses to Music: Infants Prefer to Listen to Consonance Over Dissonance,' *Infant Behavior and Development* 21/1 (May 1998), (77–88).

*Types and Tokens* (<https://plato.stanford.edu/entries/types-tokens/>, 12 July 2017).

*Vertical Thoughts* ([http://www.petermaybury.com/files\\_img/Vertical\\_thoughts.pdf](http://www.petermaybury.com/files_img/Vertical_thoughts.pdf), 19 October 2015).

Warnaby, John, "'Only Travelling Itself': Reflections on Luigi Nono (1924-1990)," *Tempo, New Series* 176/1 (March 1991): 2–5.

*Wild Ocean* (<http://www.horatiuradulescu.com/interview.html>, 26 April 2016).

Wilson, Andy (ed.), *Cosmic Orgasm: The Music of Iancu Dumitrescu*, (Unkant Publishers, 2013).

Xenakis, Iannis, *Formalized Music: Thought and Mathematics in Music*, 2nd edn (Pendragon Press, 1992).

———, *Musique Architecture*, (Tournai: Casterman, 1971).

———, *Nomos Alpha*, (Boosey and Hawkes Music Publishers Ltd., 1966).