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**Shaping Time in Music: Explorations in Localised Temporalities:
A Portfolio of Compositions with Accompanying Commentaries**

Submitted for the degree of Doctor of Philosophy by Composition

Daryn Dawson-Jones

Durham University

2019

Abstract

This commentary stands as the companion to my portfolio of compositions. To provide clarity to the reader, I have sectioned this commentary into two distinct parts. The first part stands as a theoretical framework and the underlying foundation for my music. This framework covers issues pertaining to the fields of philosophy, psychology and composition. The second part consists of commentaries for the individual pieces, responding to the issues discussed in the framework.

Chapters 1-3 will cover the philosophical underpinnings of my portfolio including an investigation of temporal ontologies and the perception of music. This includes exploration of the definitions of objective and subjective time and how Bergsonian principles of space and duration can influence the structure of musical composition. I will also pose some fundamental questions as to our experience of time, and whether time as we know it, actually exists at all, in order to introduce the temporal framework underpinning my own ideas on music. Additionally, I will present the way we comprehend musical structure, in a global context.

In Chapters 4 and 5, I will explore the structures for experiential time and *local listening*, and how this relates to the forms for which my music will adhere/take inspiration from. This will involve looking at compositional discourse, techniques and insights into experiential form. I conclude my theoretical framework by summarising the underlying structures that underpin my compositional aesthetic. Moreover, I give a brief insight into my own stylistic approaches to music that fall outside of the temporal ideology as part of the portfolio.

The second part of my commentary brings together the concepts and techniques outlined in the theoretical framework and applies them against my own work. Any accompanying documentation needed has been provided in the appendices of this portfolio and has been clearly labelled in both the document and the contents.

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Over the course of my doctorate studies I have received guidance, counsel and encouragement from some of the most talented, inspirational people I know. I would like to take this opportunity to express my gratitude to them.

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i. List of Compositions

1 - <i>Piano/Quartet(S)</i> (2018) - Piano Quartet	<u>Duration:</u> 10'
2 - <i>Echoes</i> (2018) - Clarinet, Violin, Viola, Cello and Piano	<u>Duration:</u> 10'
3 - <i>On the Shore at Midnight</i> (2018) - Clarinet, Viola and Piano	<u>Duration:</u> 10'
4 - <i>Come to me, Unyielding</i> (2017/19) - 8 Part Vocal Group	<u>Duration:</u> 10'
5 - <i>Thelxiepeia</i> (2017/19) - Male Trombonist and Plunger	<u>Duration:</u> 12'
6 - <i>Silk and Velvet</i> (2018) - Viola and Flute	<u>Duration:</u> 10'
7 - <i>Ouroboros</i> (2019) - String Quartet	<u>Duration:</u> 9'
8 - <i>Cælitum</i> (2019) - Orchestral	<u>Duration:</u> 19'
<hr/>	
Total Portfolio	<u>Duration 90'</u>

ii - Contents of Accompanying CD's

This portfolio is accompanied by 2 CD's. It contains the recordings of pieces that were included in university workshops and the midi renders of the work I was unable to have performed. As *Cælitum* explores timbre using various extended instrumental techniques, it would not be accurately reflected in a midi render. As a result, it has not been included. CD 2 contains PDFs of all the scores.

Note: Recordings provided alongside the portfolio may not be representative of the final score; rather they chronicle the material as it was conceived at the time of the workshops.

CD 1- Workshop Recordings

- 1 - *Piano/Quartet(S)* - The Ives Ensemble - February 2017
- 2 - *Echoes* - The Ives Ensemble - February 2018
- 3 - *On the Shore, as Midnight* - Ensemble 7Bridges - June 2017
- 4 - *Thelxiepeia* - Ensemble 7Bridges - July 2016
- 5 - *Silk and Velvet* - Ensemble 7Bridges - June 2018
- 6 - *Come to me, Unyielding.* - [midi render]
- 7 - *Ouroboros* - [midi render]

CD 2 - Scores and PhD Commentary

- 1 - *Piano/Quartet(S)*
- 2 - *Echoes*
- 3 - *On the Shore, at Midnight*
- 4 - *Come at me, Unyielding*
- 5 - *Thelxiepeia*
- 6 - *Silk and Velvet*
- 7 - *Ouroboros*
- 8 - *Cælitum*

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Part I - Theoretical Framework

Chapter 1. - Introduction

My doctoral compositional project engages with an issue that has been considered of both technical and aesthetic importance during the development of Twentieth Century music: the quest to find new ways of treating musical time that break with traditional linearity. I propose to explore the creative possibilities afforded by a process of *local listening* - a term of my own definition - that has been inspired by the writings of Jonathan Kramer, Susanne Langer and Richard Glover, and rooted in the philosophy of Henri Bergson and F.B. Jevons. *Local listening* applies to music that subverts linear temporality and traditional modalities of teleological progression, development, and movement. In order to introduce the temporal framework underpinning my ideas, I will address certain fundamental questions about our experience of time; even whether time as we know it actually exists at all.

My research seeks to make a contribution to compositional praxis by exploring how the experience of *local listening* shapes a listener's perception of music's temporal unfolding. I aim to show that a moment-to-moment passage affected by *local listening* creates an existential continuum of the present moment. This will be arrived at through the circumvention of formulary measures of succession in the development of musical forms. In essence, the structure and musical material aims to simultaneously avoid the recollection of previous material and prevent prediction of where it will unfold to. My project will also pursue the potential for applying *local listening* habits to new modes of formal organisation within my own compositional work. I will draw upon key 20th century theories on the aesthetic and technical aspects of subjective temporality, as well as building upon approaches developed by composers over the past century.

The theoretical framework for my portfolio will introduce concepts from the disciplines of philosophy, psychology and music composition. This includes a brief introduction to the larger study of time philosophy, before reflecting on its implications to the world of music.¹ The second section will extend the philosophical concepts to the field of psychology and highlight relevant

¹ This is not an exhaustive study of the entire field but rather a summary of topics relevant to my own work.

empirical testing that shows some support to the positions I have taken. The third section will engage with the relevant theoretical and compositional perspectives that has lead to the creation of musical material for my portfolio. As such, the information within this section of my commentary is designed to follow a logical and coherent thread from theoretical inception to practical application.

1.1 - Background

As far back as I can remember, I have felt a powerful affinity with what I now know to be music that engages with vertical aspects of time perception. When I began to compose, and discovered the music of the 20th Century — when traditional models of form and temporality were stretched, and broken — I developed an enthusiasm for adopting approaches to musical organisation where a listener's tendency towards global directionality was prolonged or subverted. My interest was piqued after encountering difficulties listening to Stravinsky's *Symphony of Wind Instruments* (1947) where the harmonic material never seemed to fully resolve and was continually developed across varying instrumental textures with rhythmic irregularity, leaving my desire for resolution caught in a suspended state. Throughout the course of my Masters degree, I started incorporating components of this process into my own music; using ambiguous harmonic progressions, emphasising this with use of orchestral variation and experimenting with asymmetrical phrases to disrupt metre.

As my work evolved, I took less care to adhere strictly to traditional metric structures and melodic concerns; instead I explored and experimented more with duration, large-scale repetition, discontinuity, perceptions of form and how they relate to the teleology of music. Naturally, I found myself gravitating towards the writings and works of Morton Feldman and Karlheinz Stockhausen; in which the experience of time passing plays a large role in the creation of material and structure. This became an important foundation in my own compositions; yet while I clearly acknowledged the impact of Stockhausen's *Moment form* as an organisational model, I maintained the desire to explore different structural models.

It must be noted that all my musical observations, be it about my own work or that of other composers, comes from my subjective experience of temporality. That is not to say that relevant empirical data cannot provide some basis for a broader conversation about human cognition and grouping mechanisms; however there are no definitive conclusions on this topic, only indicative ones. As such, it is from my own experience that I, like others, must shape my understanding of, and theoretical approach to, music.

Chapter 2. - The 'Experiential' Philosophy of Time

2.1. - A Formalisation of Temporal Ontologies - 'Objective' vs. 'Subjective' time

Given the diverse nature of terminology within space and time philosophy, I feel that it is necessary to formalise and define the terms that I will be using throughout this commentary. It should be acknowledged that, while these descriptions of time are all found within philosophical literature, they are often given different names and titles. Therefore, I will use this introductory section to outline with clarity, the definitions that have been adopted.

'Objective time' refers to a quantifiable series of time as pure sequence; as the Merriam-Webster Online Dictionary puts it, "an objectively determinable order in which durations are measured and an absolute present is indifferent" (Merriam-Webster Online, 2019). Thus, it could be said that objective time consists of regular recurrent time events that are generally proportionate; a 'ticking' clock, for example. It also explains time as a one-dimensional continuum, which is a necessarily useful term, given that its primary function is used for analysing and modelling temporal events. Therefore, objective time can be said to be the system of measurement used by scientists in order to understand the image of time in the universe. The strength of this quantifiable system, however, comes at a price. The cost being that objective time often overlooks or circumvents any experience or engagement with temporality; especially that which is difficult to formalise or measure with a scientific theory. Consequently, philosophers have attempted to clarify in greater detail the facets of a 'psychological' or 'experiential time'².

Experiential time is considered to be the subjective experience of temporal properties of events and processes, based upon memory³. It is altogether different from the colloquial usage of the term 'perception of time' as we cannot 'perceive' time as such, rather we can experience changes of events *within it*. This is the position of M.M. Schuster, who states "(time) has a subjective rather

² Not to be confused with biological time, which refers to internal cyclical processes such as circadian rhythms. See Arthur Winfree (2001, vii)

³ See *The Confessions of St. Augustine* (2007, 196), and Matthew's *Temporal Cognition: Connecting Subjective Time to Perception, Attention and Memory* (2016, 883)

than objective reality...the experience of passage arises from the interaction of subject and object (Schuster 1986, 698)". Consequently, such an interaction, as Arstila and Lloyd point out, is based upon an "intricate and nuanced *temporal field*", an experience which identifies the features of temporal order: duration, time of occurrence, context among simultaneous events, and events before and after (Arstila and Lloyd 2014, x). Thus, subjective time is a product of our own consciousness, giving us the ability to track and anticipate the complex processes and changes within an otherwise dynamic physical world (ibid., xi).

2.2 - On Timelessness

Before describing the philosophical underpinnings of the pieces in this portfolio, it is important to define the concept of 'timelessness', as this is highly relevant to my compositional approach. This will involve a brief exploration of temporal philosophy, a broad field of study dating back as far as St. Augustine (Augustine 1991, XI/xiii/15). Perhaps most relevant to my own work, are the ideas of F.B. Jevons, in his work *Timelessness* (1905/6). Despite its age, this text defines the concept with clarity and concision; I have used Jevons' ideas as a foundation for the development of further concepts in my own work.

A key concept in Jevons' work is that of a *specious present*; an image of time discussed by philosophers and psychologists such as E. Robert Kelly and William James⁴. The term *specious present* describes a perceptible time-frame that is said to "intervene" with both the past and the future (Jevons 1905/6, 206). This time-frame, according to its advocates, presents an image of time which sees the future being perceived in simultaneity with the past (ibid., 207). Consequently, in making temporal judgements about the position they hold in time, an individual will retrospectively "[discriminate] parts⁵ in relation to each other"(ibid., 207).

⁴ See Kelly's *The Alternative: A Study in Psychology* (1882), and James's *Principles of Psychology I* (1890)

⁵ 'Parts' here referring to a singular a priori unit of space time, broken into sections through the means of attention (Jevons 1905/6, 207)

Assessing this concept, Jevons concludes that the *specious present* cannot exist in reality because of the following observation: if an individual can conceive of past, present and future simultaneously, they cannot exist “successively” (ibid., 207). It can be inferred from his objection that the claim being made engages in *contradictio in adjecto*; a self-contradictory logical fallacy. Moreover, he stresses that the *specious present* is evidence of the past, rather than the present; it infers the existence of the past as a presupposition. As the concept relies on the notion of the “recent-past”, it “assumes the very position that wants proving” (ibid., 212).

Jevons’ view of time is shared by Henri Bergson, who in his seminal work *Time and Free Will: An Essay on the Immediate Data of Consciousness* (1910) presented his concept of *pure duration*. Bergson states that two points of space may be able to co-exist, however two points in time cannot (Bergson 1910, 87). He argues that individuals will often misrepresent or project the idea of space onto time⁶ (ibid., 84-5). *Pure duration* is the perception of time-flow assumed by the succession of conscious states, when we abstain from separating a present state from the preceding one (Bergson 1910, 105). It is a “succession without distinction”⁷ (ibid., 101). To summarise Bergson's position in my own words: constructs of past, present, and future happen only when one projects spatial points either retrospectively into the past or directionally towards the future. This involves an individual removing themselves from the ongoing flow of time. Thus time, as implied by Bergson, is relative⁸; an observation dependent on the position of its viewer.

2.3 - Towards a Musical *Specious Present*

The ideas broached in the previous section are relevant to this portfolio as both Jevons’ and Bergson’s concepts can be applied to music. Fundamentally, they raise interesting questions as to the existence of time itself; a notion that has influenced my own work. However, while he may have rejected the idea, Jevon’s descriptions of a *specious present* are suggestive of underlying

⁶ This is similar to Jevons claim that people often “inject space” (ibid., 220) into succession; his critique being that “past, present and future may be compared to points in a line; but they must first be there in order to be compared” (Jevons 1905/6, 221).

⁷ 'Distinction' here meaning the separation into spatial units (Bergson 1910, 101)

⁸ Bergson is characterised as a relativist by Keith Ansell-Pearson (Ansell-Pearson 2018, 418)

judgement-based mechanisms of music cognition (see **3.1.1**). Moreover, Bergson's concept of "succession without distinction" (Bergson 1910, 101) raises, perhaps unintentionally, an interesting prospect. Could an expressive medium, such as music, act as a replacement for the spatial framework that Bergson describes (see **2.2**), but present time as succession with distinction? If true, this would support Jevons' claims that time, if compared to points on a line, must be present before one can make comparisons about past, present and future.

Further to the above, I believe it's important to demonstrate what I mean by a *spatial framework*; a concept I hold to be fundamental to the teleology of music. A *spatial framework* has no physical attributes; it might be best described as a 'temporal surface' in which music can present *event-vectors* to a listener.

Event vectors in music are, by my own definition, anchor points in time; one might think of these in the same way as a brush stroke on a canvas. However, instead of occupying a physical location within defined boundaries, they manifest to a listener as experiential temporal markers connected to an unfolding duration. Listeners might intuit these vectors, at moments of structural saliency, as awareness of past, present, and future, using memory and expectation to distinguish previous and future events. This premise is supported by musicologist Robert P. Morgan's notion that "a musical composition not only defines its own space, but does so moving through this space in its own unique manner. Musical space is thus inseparable from musical time, just as musical time is inseparable from musical space" (Morgan 1980, 529). There are also similarities with my own perspective of time with those of philosopher Susanne Langer's, as outlined in the following quotation:

"...(music) is something radically different from the time in which our public and practical life proceeds...Such passage is measurable only in terms of sensibilities, tensions and emotions; and it has not merely a different measure but an altogether different structure from practical or scientific time." (Langer 1953, 109)

Langer refers to a form of *virtual* time - an illusionary time that the music itself dictates; one based upon the apprehension and perception of formal structure by a single means: listening (ibid., 109). She explains that music extends our perception of time and helps a listener "monopolize it —

organize, fill, and shape it, all alone” (ibid., 110). It produces an impression of time defined by the movement of forms which appear to offer meaning, even when sound is itself transitory. She concludes, “[music] makes time audible, and its form and continuity sensible” (ibid., 110). While one might argue that Langer’s ideas extend beyond music, what she describes is reliant upon succession and duration; temporally static art would struggle to replicate a similarly immersive response. However, art forms such as theatre — even literature — might hold the potential to manifest in similar ways.

Based on the concepts introduced above, one could argue that the anticipation of musical events, reflected in the experience of time passing — the perception of distance between *event-vectors* — can be directly linked to expectation in the surface-level of music. The surface-level to which I refer, is described by Emilios Cambouropoulos as “a minimal discrete representation of the musical sound continuum” (Cambouropoulos 2010, 132); in essence the surface-level is the “now” - as such, it directly correlates to Jevons’ description of a *specious present*.

It is my belief that listeners anchor themselves to this continuum and model future events based upon expectation; as Jackendoff states, “certain aspects of affect, for instance, come from very local sources of the musical surface” (Jackendoff 1991, 226). This musical *affect* — a term coined by Leonard Meyer to define emotional responses to music⁹ — is generated not just by listening to a piece’s surface, but as Jackendoff says “in the activity of deriving in real time all the details of abstract musical structure” (ibid., 226). Thus, a listener finds enjoyment in deduction; by perceiving the direction in musical structure by evaluating surface-level activity.

Consequently, it is important to identify the mechanisms involved in the perception of musical structure. This is because, in order to create music that manipulates or circumvents time, we first need to understand how musical time is perceived in a linear direction. This is because I argue that ‘timelessness’ in music will not come in creating new structural schemata, but by diminishing linearity and succession in pre-existing models.

⁹ For definitions of *affect*, see Laszlo (1968:131)

Chapter 3 - Expectation and Perception in Music

3.1 - Surface-Level Processing

When talking about the processing and perception of music, it is common to use language-based analogies; as Jackendoff suggests, “[music] parallels the perception of language; it involves the unconscious construction of abstract musical structures, of which the events of the musical surface are the only audible parts” (Jackendoff 1991, 199). I raise this comparison because I tend towards a reductionist model of music perception; all listeners, whether knowingly or not, engage with the syntax and grammar of music to determine its formal construct.

In my own work, I have found that the clearest way to define the features of surface-level perception is to express them through the following four areas: grouping structure, metre, harmony and *continuity and succession*. A *grouping structure* refers to the parsing of the surface-level and its subsequent expansion to the macro-level. *Metre perception* refers to a framework of implied strong and weak accents. *Harmonic perception* refers to the importance of harmony in directing a listener towards their inferred *event-vectors*. *Continuity and succession* refer to the way by which sections are organised, and how this relates to the internal linear coherence.

3.1.1 - Perception of *Grouping Structures*

The perception of *grouping structure* is the assessment of formal succession, by reflecting surface-level material against progressively larger structures in the music. The concept is explored in depth in Patricia Howland’s article *Formal Structures in Post-Tonal Music*, which has been of great influence to my own work. My reason for choosing Howland’s work was her comparative assessment of— and development upon— existing literature in this field, including the ideas of James Tenney and Christopher Hasty.

As she describes, meaningful formal structure is projected when attention is shifted towards “secondary parameters” (Howland 2015, 71). These parameters include temporal density (speed

of attack), spatial density (number of sounding voices), dynamics, register and timbre (ibid., 71). Changes in state or magnitude of these parameters can lead to more explicable formal structures. Smaller units called “segments” combine to form phrase-like units she refers to as *integrated parametric structures* (IPS), which can combine to create larger structures (ibid., 71). With regards to segmentation, Howland adapts Hasty's position that a parametric change in value produces a discontinuity and the moments where change occurs becomes the outline of the grouping boundaries. (ibid., 74).

A sequence of temporal musical elements can be interconnected by consistency of parametric values or by a uniform process; e.g. becoming louder or changing registers (ibid., 75). The parameter's similarity and magnitude changes behave as a grouping mechanism. Consequently, while the *relative* terms of parameters are defined as high, middle, or low; for *comparative* terms this could be expressed as louder, faster, and so on. A listener will be able to recognise the difference in segments based on these parameters. Following Howland's rationale; if a hypothetical passage in a low register with a high temporal density, is held against a (preceding) passage in a high register, with low temporal density, this lays the foundations for a grouping structure (ibid., 75).

In order to achieve cohesion in segmentation, Howland argues that a form of "structural closure" is necessary to ensure that— for phrases that last longer —the coherence is not put in “jeopardy” (ibid., 73). Closure can emerge from three “articulations” in post-tonal music. Firstly, by a perceptible return to the “opening” parametric conditions; tension/release and symmetrical structures in post-tonal music can achieve this. Secondly, from salient events resultant from increasing or decreasing processes. Finally, by converting an ending to the start of a new phrase (ibid., 74). In short, *segmentation* is the grouping of units between boundary-lines, according to differences in secondary parameters caused by discontinuity on the surface-level.

3.1.2 - Musical *Entrainment* and *Metre Perception*

When discussing one's ability to perceive metre, it is important to note the biological process known as *entrainment*. *Entrainment*, as defined by Michael Thaut, is a "a universal phenomenon that can be observed in physical...and biological systems ... when one system's motion or signal frequency entrains the frequency of another system" (Thaut 2015, 253). In music, this describes a listener synchronising to different rhythmical levels, from surface-level metre to the larger pulse of a piece.

The mechanism for this process is still unclear; however, Justin London postulates that listeners may "synchronise attentional energies" to the rhythms that they are presented with (London 2012, 25). As a result, he suggests that we tend to latch onto temporal invariants of metre — a notion defined as similar events that occur at regular intervals— as we listen (ibid., 25). This view is shared by Lerdahl and Jackendoff, who propose that our ingrained metric sense allows us to transform a signal from "perceptual input" to "metrical accent", by taking musical cues and extrapolating a regular pattern (Lerdahl and Jackendoff 1996, 13). Therefore one could suggest that *entraining* to metrical regularity, contributes towards *metrical attending*¹⁰; the experience of the rhythmic structure.

It would be amiss to ignore the contributions towards *metrical attending* by noted cognitive psychologist Mari Riess Jones, who has published extensively on time perception in music. Jones believes that attending to a regular pulse can often lead to assessments of structure and goal-orientation within musical form. On this, she states: "music... (has) potential for expressing degrees of meaningfulness¹¹. This is because nontemporal markings [structural time hierarchies and harmonic markers] can reveal different kinds and levels of temporal coherence through the dynamic play of multiple underlying time hierarchies" (Jones & Boltz 1989, 467). Elaborating further, she suggests that highly coherent events lead to *future-oriented* attending, as they offer high temporal predictability leading to the use of higher order time patterns to generate

¹⁰ A term coined by Justin London (London 2012, 25)

¹¹ It is deduced from the text that "meaningfulness" here, refers to a structural pragmatism or purpose.

expectation on musical closure (ibid., 467). Coherence, she seems to imply, comes from regularity or “fairly constant properties” (ibid., 467). When metre provides clarity to these non-temporal markings, time estimates can be inferred from the confirmation or violation of expected end times, referred to as, ‘in-the-moment’ expectancies (ibid., 467).

Further to the above, Lerdahl and Jackendoff suggest that a listener’s cognitive task is to match the presented *phenomenal* accents¹², against patterns of metrical accentuation (Lerdahl and Jackendoff 1981, 486). When the patterns diverge, the result is syncopation, ambiguity or rhythmic complexity (ibid., 486). Thus, in presenting linearity and continuity within a piece, metre provides the means for such measurement. Its function, it can be argued, is to divide the musical flow into equal time spans; this is what makes linear metrical structures *periodic* (ibid., 487). However, this does not mean that a periodic metre will always imply or support goal orientation/directionality, rather it highlights a connection between regularity and structural parsing as a result of metre and expectation.

Consequently, it can be suggested that regularity is intertwined with expectation; the listener’s attention can maintain focused for longer during situations with regular intervals. As Jones states, “synchrony is less constraining in [static arrays] than in dynamic ones because elements endure over time, affording a flexibility in the timing of one’s attention focus to a location” (Jones et al 2002, 313). One could argue that this offers the listener the necessary stability to be allow for the visualisation of potential global direction and the modelling of future *event-vectors*.

3.1.3 - Harmonic Perception

There is a prerequisite expectation, by introducing this brief section, that the listener will have learned the principles of tonal organisation implicitly though exposure from a young age. Although tonal harmony is seldom employed—in a traditional context—within my music, it is essential that I understand the underlying schema with respect to expectation.

¹² Which are events on the musical surface that give emphasis or stress to that particular motion in musical flow (Lerdahl and Jackendoff 1981, 485).

Many fields from musicology to psychology identify expectation as one of the main experiential elements of harmony. For the *Implication-Realization Model* (I-R), Narmour suggests that a musical structure will be perceived by recognising the 'characteristic implications' of musical parameters (Narmour 1977, 122). He proposes that the parameters of music, such as melody, harmony and dynamics can be 'open' or 'closed'. 'Open' parameters mean that implications are still unfulfilled whereas 'closed' parameters have had their implications realised (ibid., 124). In his own words, there are "nonclosural aspect(s) representing ongoing processes in time, and the closural aspect(s), events in time" (ibid., 124).

Harmonic expectation is, according to Fred Lerdahl (co-author of *A Generative Theory of Tonal Harmony*), rooted in historical tradition. Based on works by amongst others Koch, Rameau, and Fux, he has highlighted a range of hierarchical precepts. Moreover, using Schenker as a foundation, he created a comprehensive system for representing event hierarchies, from minor details to global connections. (Lerdahl 2015, 85). Lerdahl's concept of *pitch-event hierarchies* observes a sequence of pitch events (pitches or chords) and their ability to "project long-range dependencies to preceding or succeeding non-adjacent events" (ibid., 84) This is supported by Jones who argues that expectancies consist of a set of vectors guiding attention towards future pitch-time regions (Jones 1976, 348).

One of the possible explanations for this is that, and is supported by music psychologist Poulin-Charronnat, voice leading and harmony may tap into different cognitive processes. Poulin-Charronnat suggests that voice leading may relate to stream segregation; the perceptual organisation of musical sounds (Poulin-Charronnat 2005, 617). Thus, the processing of auditory information begins at an earlier point in the music; harmonic function processing does not begin until later (ibid., 617). One could argue that this lays the foundation for voice-leading and harmonic growth in diatonic music; the production of tension and release due to harmonic instability between chords. The perception, and by extension the appreciation, of harmony, could therefore be argued to be directly linked to the cognition of tendencies in harmonic movement, directing the listener towards places of rest. In terms of functional harmony, this could mean a cadence; in non-tonal music, it will more likely be a moment of surface-level salience.

3.1.4 - Continuity and Succession in Music

To continue with the argument outlined in this chapter it is important to develop an understanding the characteristics of continuity in music, and their contribution towards the perceived implication of succession in musical form. To this end, we will begin by looking at the work of theorist Christopher Hasty, as outlined in *On the Problem of Continuity and Succession in Twentieth-Century Music* (1986). Hasty proposes that for a piece of music to be considered continuous, it will likely have a "unification of events"; not simply an absence of internal articulation (Hasty 1986, 59). For events to be unified, they usually have "connections" that give rise to "melody, phrase, rhythmic pattern or the prolongation of a tone through diminutions" (ibid., 59). His assessment comes from the observation that continuity can also be governed by complexity: disruptions to certain parameters— such as abrupt changes in volume or register— do not necessarily equate to discontinuity when reflected against the macro-structure¹³. Therefore, variations in complexity can still project continuity, if the sum of the parts is subject to a perceived unification.

More to the above, unified elements are important to continuity as they play supportive role in succession. This is clearly emphasised by James Tenney who states:

"The relativity of continuity and discontinuity might best be illustrated by an analogy with... vision. It often happens that one's first impressions of a modern painting do not correspond with one's later impressions... At first one may see an apparently random distribution of colors, shapes or lines [etc.]... At some point in the process of studying the painting the seemingly random elements are subjectively integrated making perceptible the configurations that are essential to one's understanding of the work (Tenney 1988, 17).

This analogy with painting, while seemingly irrelevant, given that it is not a temporal art form, is actually pertinent to musical form. In assessing the spatial aspects of a painting, Tenney suggests that the observer will look at the position of objects on the canvas and subjectively integrate them to understand the form. By extension, in assessing the temporal aspects of music¹⁴, a listener may be similarly required to subjectively integrate divisible parts of its structure. If continuity helps provide clarity to structural parsing and succession, then our perception of time is contingent upon it.

¹³ The example he gives is of a continuous glissando versus scale steps. The former has no internal articulation, the latter does, but both appear continuous to a listener.

¹⁴ As suggested in 2.3, temporality in music— as I see it— is a spatial assessment.

From the above, it could be argued that when strongly linked formal nodes are perceptually joined, a path is created — through subjective integration — which influences our understanding of directionality, through continuity. A possible explanation for this may be that when a path affirms tendencies — or confirms our expectations — an image of the past is actualised and our position within the present is rendered observational. This position allows us to link formal gestures with a common vector or contour, and relate constituent entities with one another. The relationship between these entities is how we paint our image of continuity. Therefore, when Hasty suggests that "if we allow continuity to encompass distinct elements or parts then we must conceive discontinuity as the absence of connection—a genuine hiatus in the relationship of consecutive events" (Hasty 1986, 59), he introduces the concept of *succession*.

Succession in music, it could be argued, refers to consecutive parts moving along a linear line. Hasty explains this as "the basis of temporal order" (ibid., 59). It is indicative of directionality as it presupposes a sequence caused by the spatial ordering of parts following each another. The latter is the feature of *continuity* in succession. When goal-orientation and expectation are diminished within a musical sequence of events, this leads to what Lippman refers to as an "illogic of consecution" where the absence of structural interrelationships leads to assessments of "no progress" and "incoherence" (Lippman 1984, 132). This refers to *discontinuity* in succession; a notion further explored in Stockhausen' seminal work *Structure and Experiential Time*.

Stockhausen identifies one's experience of time passing as the time it takes to "grasp alterations" in the music. Alterations are here being defined as a process of change in any musical parameter. *Experiential Time* is dependent on both the measured tempo — determining the speed of the shortest time-interval in the music — and on the speed of the succession of different musical processes. In his conclusion, *experiential time* can pass very slowly where there is a low rate of succession, even if the music is fast-moving. Conversely, time can pass quickly when there is high rate of succession even if the music is slow-paced. (Stockhausen 1958, 64-5). It follows that if discontinuity is known to circumvent succession, it could also affect experiential temporality.

3.2 - Global Listening

From the information collected in the previous chapter, I present what I ascribe to be the *Global Listening* mode. This is a habit of listening that can be thought of as approaching music ‘horizontally’; it is anticipatory and expectational. It reflects the spatial separation of music into successive blocks or sections, which our minds use as the foundation for predictive modelling procedures. As Justin London claims, “perception is not only for deriving representations of reality; perception also serves to guide our behaviour and this includes perceptual behaviour (tracking a moving stimulus...)” (London 2012, 5).

Global Listening suggests that a listener may model multiple projections of future resolution, based on musical grammar and pre-existing hierarchical structures. These musical inferences are primarily constructed as a result of biological processes of entrainment and structural intuition; however they also rely upon the use of learned musical grammar and syntax for harmonic induction and surface level inference. This process is to be considered dynamic, in the sense that it occurs simultaneously with performance and allows for multiplicitous expectational outcomes.

Given that in **3.1.1** and **3.1.2** hierarchies are introduced with respect to grouping structures and metre, it is advantageous to quickly reflect the importance between perception of music hierarchy and how humans engage with external hierarchies outside of music. As Yako comments, "(one can) take up any random part in a system, and clarify its position within the system (Yako 1997, 47). In other words, hierarchy is important in music as it allows a listener to identify their position as part of the ongoing musical performance. This creates opportunities for *event-vectors* to engage *global listening*.

Chapter 4 - Towards a 'Timeless' Music

4.1 - Introduction

In Chapters 2 and 3, I explored the listener's perception of *global* musical components. This relates to music that is linear, directional, and derived from expectations. However, as suggested in section 2.3, to perceive music as 'timeless', it must follow contrary characteristics. As such, the succeeding exploration of musical timelessness is based on the concept of what I call *local listening*.

4.2 - Local Listening

Local Listening differs to *Global Listening*, in that it may lead to the restriction of directional perception in music. This manner of listening describes music that explores structural processes to diminish linearity by drawing the listener's attention away from *global* judgement (using anticipation and expectation) in favour of the local; being engaged with the unfolding immediate present. In this mode, the listener may be able to recall events from the recent past, but should be less able to access more distant past events. Moreover, they would have little expectation of any future outcome¹⁵. As such, *Local Listening* might be said to resonate with the Bergsonian sense of time; one of pure duration, with diminished perceptions of succession. As the experience of time passing is a subjective one, the experience of local listening is likely to be different person to person. Consequently, it would be wrong to suggest the works in this portfolio represent a universally applicable approach to temporality. It would be more accurate to state that the compositional praxis in this portfolio aims to invoke multiple images or experiences of time, as listeners explore *Local Listening* on their own terms. To this end, we must attempt to circumvent the previously mentioned features of formulary musical succession associated with the *Global Listening*, in favour of the *Local*.

¹⁵ It could be argued that it doesn't mean that a listener cannot or will not attempt to model future outcomes, rather that it would become apparent that it will not be fruitful to do so.

4.3 - Vertical Time

A discussion on musical temporality would be incomplete without addressing Jonathan Kramer's seminal works *New Temporalities in Music* (1981) and *The Time of Music: New Meanings, New Temporalities, New Listening Strategies* (1988). One of Kramer's concepts in particular, that of *Vertical Time*, is highly pertinent to this commentary. This term is applied to music that contains moments of "self-containment by means of process or stasis, comprising the essence of the entire piece" (Kramer 1988, 549). To Kramer, musical phrase segmentation will usually imply progression, goal direction, movement and contrasting rates of motion (ibid., 549). These are all the characteristic traits of *Global Listening*. Non-linear, *Vertical Music* is described as "a single present stretched out into an enormous duration, a potentially infinite 'now' that nonetheless feels like an instant" (ibid., 549).

Based on Kramer's definition, it could be argued that *Vertical Music* has three primary foundations: 1) it will not dictate or highlight the conclusion of segments/sections, 2) it will avoid any emphasis on beginning/introduction, as well as internal expectations with regards to the end of the piece - in short, it 'starts' and it 'stops', and 3) it will avoid the manipulation of tension and release that would guide the music to end-points that might act as climaxes (Kramer 1981, 549). Kramer argues that *Vertical Time* occurs because the essence of the music falls between "sound-world boundaries" during performance of a work (ibid., 550). These boundaries are often imposed and defined early in the work. He suggests that any violation of the temporal boundaries placed upon the work would imply structural importance - as such linearity would return and emancipate the music of its verticality (ibid., 550). At the start of any work, a listener will always form predictive models aimed at making sense of the next steps of the piece. As the work unfolds, implications accumulate, yet the minimal degree of logical consequence (expectation) is left unsatisfied due to the music avoiding "changes in structural import" (ibid., 550). Thus, *Vertical Time* begins, following our disengagement with expectation; we listen in a more localised fashion, as implication, expectation, anticipation, linearity, and global function fade into the cognitive background.

As can be surmised from the above, a clear parallel can be drawn between *Vertical Time* and *Local Time*. However, there are certain notable differences between Kramer's and my own approach. Kramer argues that a violation of temporal boundaries would lead back to cognitive linearity. However, I believe that this may depend on the purpose and context of the violation in question. If the interruption is employed to delay or avoid a move towards linearity, it might instead serve a functional purpose within *local listening*. I am also sceptical to the idea that for a piece to exhibit *Vertical* functions, it must emancipate itself from beginning or end; after all, one will still develop expectation through initial musical material. Furthermore, I do not believe that the *Vertical Time* model— whether as mass repetition or a literal extension of the present moment— is the only potential schemata for *Localised Listening*. Certainly, some of the most cited works of 'stasis' or 'temporally ambiguous' music— such as Debussy's *Jeux*— do not exist within the boundaries of an 'extended present', as defined by Kramer. It could be argued that these works circumvent linearity through repetition but they also achieve this by other means. On *Jeux*, Jann Pasler asserts it's a musical form in "constant flux"; material shaped by characteristic self-contained elements juxtaposed across a larger form (Pasler 1982, 61). In her own words "similarity or continuity with immediately surrounding sections is secondary to the surprise of metamorphosis" (ibid., 63). Thus, the present need not only be extended with continuity; it could be argued discontinuity in succession is possible even if the material is similar.

4.4 - Metre within *Local* Structures

Manipulating metrical frameworks is important to my 'minimalist' as well as 'discontinuous' works. Such frameworks do not only imply regularity — they can also be used to emphasise irregularity. If all beat-based rhythmical emphasis is removed, the listener might conceivably perceive the rhythm and pulse as ethereal—in the immaterial, intangible sense— permeating and often obscuring the motion and movement. A similar effect is often employed by Webern (though through a different method); especially in his miniatures, where it results from the imbalance and irregularity of instrumental entries see **Fig. 1**. This is particularly effective at slow tempo, where rhythmically disjointed entries draw a listener's attention to uneven intervals between parts. The

high degree of perceived discontinuity; the listener will find it increasingly difficult to parse the separate rhythmic structures. Over the duration of the piece, the continuity of this process will draw the listeners attention to the surface-level movement, as they attempt to cognitively clarify/resolve the metric dissonance. This, in turn, engages *local listening* as the attention to directionality is disrupted as the listener preoccupies themselves clarifying the immediate input data. The focus on the surface elicits a vertical response by listening to the moment-to-moment passing of events.

4.5 - Final Remarks

As argued above, *Local Listening* is a process of experiencing the unfolding of musical material in the 'present moment'. In this mode of listening, the listener will have a limited recollection of past, and anticipation of future, material. As a result, the listener is given the opportunity to engage in a subjective temporal experience associated with the appreciation of vertical material. The process is to be considered 'static'; although the listening occurs simultaneously with performance (like *Global Listening*), it does not facilitate expectational outcomes. In essence, it is the appreciation of surface level changes in music over time.

Chapter 5 - Structures for Localised Time

5.1 - Introduction

There are very few articles or books on composition that directly address the notions of temporality explored in the previous chapters. It may be that other composers have engaged with the ideas without writing about them in text, while some have ended up with a similar aesthetic as a result of different compositional practices. Nevertheless, there are a few composers that have written on this subject. In this chapter their work will act as a foundation for the design of forms and musical structures aimed at eliciting *local listening*.

It must be acknowledged, from the data presented so far, that the surface-level appears to be the common denominator in distinguishing directionality and expectation within music. As such, I argue that by using musical structures to redirect the listener towards the *specious present*, and removing future *event-vectors*, this will obscure the perception of temporality. This is because the listener consistently assesses—though not always consciously aware— the local, surface information to predict future events. When these expectations are continually unrealised, they will continue searching for directional patterns by constantly engaging with all aspects—including the smaller details— of the surface-level. This reflects the aspects of vertical listening.

As a result, I have presented three structural models for how my compositional process engages the *local listening* perception. These are the *structure-as-isomorphism*, *structure-as-external process* and *structure-as-instinct* models.

5.2 - Structure-as-Isomorphism Model

When researching temporality in music, it would be amiss to ignore relevant practices in Minimalism. This is, after all, as Michael Nyman points out, is the "art form of limited material" (Nyman 1968, 518–19). Two compositional techniques are particularly relevant to the *structure-as-isomorphism* model: *sustention*, or the use of sustained tones, and what I refer to as

prolonged cellular repetition (PCR): the use of exact/near-exact repeated material in the form of cells/motives over an extended time scale with low succession. As both techniques are used in this portfolio, it is important to understand the fundamental differences between them as they relate to *local listening*.

5.2.1 - Structure-as-Isomorphism: *Sustention*

Sustention involves sustaining a note over extended durations. This can include two scenarios: 1) where a single pitch is sustained for an extended time, by a single instrument, and 2) where the pitch is dovetailed across multiple instruments for the same period. Following the gestalt principle *factor of similarity*, our ears would tend to perceive both scenarios in a similar manner¹⁶. James Tenney addresses this in *Meta-Hodos and Meta Meta-Hodos*: "a collection of sound elements (or clangs), those which are similar (with respect to values in some parametre) will tend to form clangs (or sequences), while relative dissimilarity will produce segregation" (Tenney 1988, 32). Thus, it could be argued that *sustentation* is a presentation of the singular, as a form, as opposed to the multiple; the interconnection of parts in succession.

Further to the above, sustained music tends to diminish the effect of regular motion that is often experienced in conventional musical structures; as Kramer points out "[the] experience is static despite the constant motion in the music" (Kramer 1988, 57). Motion can also include the formation of cognitive units, as Tenney states, "the very process of unit-formation implies relative separation from other units" (Tenney 1988, 31-32). It can be argued that perception of motion from these units—whether motifs or pulse induced from metre— requires a separation in the mind; something that becomes increasingly difficult to achieve when pitches are sustained over a protracted period. Moreover, while sustained acoustic music is likely to contain natural forms of pulsation—due to breathing, bow changes, or acoustic beating— it will generally have a low degree of salience due to the aforementioned *factor of similarity*. As Richard Glover argues, "homogeneity overrides contrast, [and tends] towards being perceived as a whole" (Glover 2010, 13).

¹⁶ See Koffka (Koffka 1935, 325)

5.2.2 - Structure-as-Isomorphism: *Prolonged Cellular Repetition*

Prolonged cellular repetition (PCR) has many similar features as sustained music, except it relies upon motifs or cells — and in some cases, whole passages — that are extensively repeated, experientially *ad infinitum* to the listener. The properties *PCR* share with *sustention*, include the possibility to implement process techniques such as pitch transformations and what Glover refers to as *iteration*: movement successively approaching a desired result¹⁷ (ibid., 33).

Structurally, *PCR* can also be seen as a singular ‘whole’ after an extended duration. This is supported by Lippman, who claims that when repeated sections become longer, succession will emerge “less readily” (Lippman 1984, 32). Any perceptions of high-degree structural hierarchy derived from music will turn into perception of low-level structure if succession is removed. Consequently, any inference of form at the start of a piece would likely reduce to something more singular or sparse over time. Additionally, It is important to note that *local listening* habits become more fragile under *PCR* due to the delicate nature of propulsion/motion in respect to expectation. As Lippman points out: “musical propulsion, which in general is superimposed on continuity or succession, is more elusive and more various in its quality... A simple increase in loudness imposed on any continuous sonority will produce an impetus and an expectation” (ibid., 32). Therefore, for *local listening* to take place, any changes to successive material must be handled in a way that does not draw attention from the surface level, or directionality will form. Once directionality is reinstated, a *localised* environment would move to a *global*.

James Tenney might describe works that employ *sustention* or *prolonged cellular repetition* as having a morphological relationship between *clangs* that were *isomorphic* in character.

Isomorphism expresses relationships as being “identical (or nearly, i.e. effectively identical) in form — with respect to one or more parameters” (Tenney 1986, 71). When these relationships are applied to larger scale structures, they might tend towards what Glover refers to as a “singular hierarchical upper level [temporal gestalt]” (Glover 2010, 15), in which a listener circumvents

¹⁷ It should be noted that the word ‘sustained’, in the context of approaching a desired result, refers to a continuous pitch — sustained over a duration — as opposed to a singular pitch. Whilst not obviously relevant, it is important to make the distinction when referencing *iteration*.

cognitive faculties, to delineate the separate lower-level temporal gestalts. As such, it could be argued that slow rate of succession leads the listener to acknowledge a lack of substantial change in material. As a result, they reflect upon other facets of a changing surface texture; this movement from perceiving macro succession to surface-level succession, is what embodies *local listening*. The surface level becomes the 'now', the *specious present* — the *local*.

5.3 - *Obstructive Discontinuity*

As *obstructive discontinuity* can be used for both the *structure-as-external process* and *structure-as-instinct* models, I will present it here in its entirety and then reference the specific elements pertaining to the structural models in **5.5** and **5.6**.

Discontinuity in music, as Scott Donald Barton states, is "often produced when contrasting entities are juxtaposed... [creating] breaks in specific musical parameters" (Barton 2012, 25). To note contrasting entities in music we engage with identifying dissimilarity between parts, then make difference judgements. In so doing, we draw boundary lines, which Barton argues "[demarcates] two distinct entities, which we can then compare to determine the entities relative likeness" (ibid., 62). When reflecting the hierarchy present in the music, as described in **3.3.1**, it could be suggested, that the comparison of intensity of dissimilarity between each hierarchical level influences our perceptions of discontinuity.

Moreover, one could rank the degree of discontinuity from low to high. A traditional melody line that contains rests would be considered a low degree example, as the function of rests is to interrupt continuity on the surface-level. However, I argue that when music in continuity uses transformational sequences and processes, aimed at expectational *event-vectors*, the inclusion of interruption creates a higher degree discontinuity perception. By employing discontinuity this way, the composer could encourage listeners to produce *event-vectors* before misdirecting them elsewhere. The term *obstructive discontinuity* is applied to what I consider to be intense degrees of discontinuity, presented in what might be considered an antagonistic manner.

I have established two methods for obstructing continuity: 1) as mentioned in the previous paragraph, directional teleology can be systematically introduced then subverted or prevented from reaching its conclusion. Thus, the listener is thrown into a sense of ‘stasis’, wherein their expectations are not (even never) met, known as *interrupted teleology*. 2) *self-containment*, a method involving the creation of self-contained music, in which the grouping boundaries are separated not by the traditional usage of harmonic/melodic patterns, but by contrasts of competing salient ‘secondary parameters’¹⁸. This method is supported by Barton’s assertion that “parameters combine to form higher-level parameters and perceptual segmentation boundaries. The latter is particularly important... as notions of discontinuity are often produced by segmentation boundaries” (Barton 2012, 142).

Consequently, the more the parameters change, the more intense the segmentation boundary. This style of praxis bares resemblance to Stockhausen’s concept of *Moment-Form*¹⁹. On this he writes:

‘Every present moment counts, as well as no moment at all; a given moment is not merely regarded as the consequence of the previous one and the prelude to the coming one, but as something individual, independent and centred in itself, capable of existing on its own. An instant does not need to be just a particle of measured duration. This concentration on the present moment— on every present moment— can make a vertical cut, as it were, across horizontal time perception, extending out to a timelessness I call eternity. This is not an eternity that begins at the end of time, but an eternity that is present in every moment. I am speaking about musical forms in which apparently no less is being undertaken than the explosion—yes—even more, the overcoming of the concept of duration’ (Stockhausen 1972, 120-21).

The importance of self-containment is important to *localised listening*; it draws the listener’s attention to changes in the surface level, by exploring relationships between disparate materials. For a *moment* to exist on its own, it should—by definition— have attributes that separate it from the music that precedes/succeeds it. Although *localised* music differs from *moment-form* — it must not be void of beginning or ends— there are techniques that are relevant to both; in particular, the implementation of mobile forms either during the writing process, or in performance. Kramer alludes to this when he states that the ordering of music in moment-form is

¹⁸ As outlined by Howland in **3.1.1**

¹⁹ When referencing moment-form, it is worth noting the role of Cage’s work with indeterminacy and chance procedures that inspired Stockhausen’s views on anti-teleological music (Cage 1961, 35-40)

both “arbitrary” as well as an “extreme requirement” (Kramer 1978, 181). Mobile forms are designed in such a way that there are several possible orders of succession; however, if successful, the listener's expectations will not be met, regardless of the order. This rings true for mobile forms that are open in performance; even if a listener were familiar with the material, the surprise element will still be in place.

5.4 - *Structure-as-External Process Model*

Structure-as-External Process utilises different serial procedures in order to generate material or frameworks that disrupt the surface-level, preventing *event-vectors* being formed. For the compositions that employ this process, serial procedures are typically used in two ways. Firstly, to create a rhythmic framework that will disturb the regularity of metre, and secondly; to decide the ordering of instruments in the music. Consequently, the function of using serial techniques is to disrupt an aspect of attention or expectation; depending on how they are employed in the music determines the creation of structures using *interrupted teleology* and *parametric saliency*—the two techniques of *obstructive discontinuity*— as outlined in 5.3.

5.5 - *Structure-as-Instinct Model*

Structure-as-instinct, is a model that allows for more instinctive decisions to be made during the writing process. The addition of this freedom requires more deliberation and explanation.

Consider the following by Schoenberg:

“ A composer does not, of course, add bit by bit, as a child does in building with wooden blocks. He conceives an entire composition as a spontaneous vision. Then he proceeds, like Michelangelo who chiseled his *Moses* out of the marble without sketches, complete in every detail, thus *forming* his material”.(Schoenberg 1967,1-2)

One might say that this is a highly romanticised outline of the compositional process; certainly, in my own experience, musical structures seldom emerge fully formed. It may of course be that Schoenberg was being intentionally idealistic for the benefit of students aspiring to develop their

craft; however, perhaps unintentionally, it also suggests an approach to composition that allows a composer to live on the surface-level of a piece. An approach whereby the composer can compose moment-to-moment, in order to distinguish points in which expectation is created, thereby allowing them to attempt to prevent it.

5.6 - A Word on Timbre

For the works in this portfolio that approach a minimalist aesthetic, I have chosen to create music where the surface-level is multi-faceted; purposefully using low-succession instrumental techniques and timbres for the listener to immerse themselves in sound combinations that draw their subjective attention. This is because *sustention* and/or *prolonged cellular repetition* cannot gain traction as compositional procedures for *local listening* without variance in the surface-level material. Thus, a growing component of my work is exploration of different timbral colours using two separate techniques. Firstly, by presenting the same pitch using varying extended techniques of instruments; one could argue this produces differing degrees of acoustic “brightness”. Secondly, by presenting the same pitch using different orchestral/ensemble instrument combinations (see *Cælitum*). When different permutations occur in close succession, I refer to it as a *static metamorphosis*; the material remains the same, but the colour changes. In a sense this can be described as a form of equilibrium between change and no change.

The above is important as a feature of the *local listening* becomes listening to the intricate changes of music vertically, described in **5.1**. As such, a *static metamorphosis* can allow the listener to pick up on nuanced changes to the surface-level material. A broad timbral palette facilitates the focus on perceptually lower-degree temporal gestalts, something which resonates with Tenney’s concept of *isomorphism*. In short, the listener should be able to experience any clashes/complements in the colour of a musical surface, without cognitively accessing the hierarchy that comes with harmonic movement.

5.7 - Final Remarks

To conclude, in this portfolio, I have utilised three different types of musical structure underpinned by two compositional techniques for engaging *local listening* (see **Table 1**). These have been outlined here to illustrate the ways by which I attempt to avert directionality within my own compositional practice. Naturally, there are certain characteristics that straddle the boundaries between the models, however any coalescence will largely be aesthetic rather than functional. In any case, **Table 1**, expresses how each compositional technique aligns with its intended musical structure.

Obstructive Discontinuity (OD)	Prolonged Cellular Repetition (PCR)
Structure-as-External Process	Structure-as-Variation
Structure-as-Instinct	

Table 1 - Diagram of the structures based on compositional techniques

It is important to note that this list is not exhaustive of the possible structures that would elicit the types of aesthetic that I might seek to compose. Rather, it is a categorisation of the predominant approaches I have taken within this portfolio.

Part II

6. - Introduction

During the course of my studies, my compositional work has both changed and improved with the development and refinement of my writing process. Therefore, I would like to begin the second part of this commentary with a brief overview of aesthetics and style, and how this relates to the individual pieces.

6.1 - A Word on Style

During the compositional process, I always attempt to strike a balance between those aspects of my music that are instinctively designed and those that employ serialism. I do not believe that these seemingly disparate approaches to structure are mutually exclusive— that they cannot exist together. Rather, my use of serial procedures is functional; it is used to develop musical structures that avoid the *global* traits of directionality: linearity and succession. In deciding between a rigid application of serial procedures or allowing myself freedom to “bend the rules”, I tend towards the latter. This is because I do not write serialist music for the sake of the process; rather serialism is employed as a device, when I am unable to generate a specific type of material using instinct alone. This aligns with Feldman’s argument for his use of a twelve-tone row in *Violin and Orchestra* (1979):

“I wrote a ‘row for the moment.’...that I use only for three measures of the piece. And then the piece goes on, and about ten pages later, I felt that what I wanted was to have a little frame, and inside the frame I wanted some beautiful symmetry. Symmetry isn't my bag, but I needed some beautiful symmetry at that moment (Gagne and Caras 1982, 172).

Feldman’s desire for symmetry led to the use of a twelve-tone row, not because he wanted to write twelve-tone music, but that he felt it was necessary for his piece at a particular moment. This sentiment resonates with my own use of serialism.

At this point I think it is important to draw a distinction between the terms ‘intuition’ and ‘instinct’, as both are important tenets of my compositional approach. According to Cambridge Online Dictionary, To ‘intuit’ is to know something “based on your feelings, rather than facts” (Cambridge Online Dictionary, 2019). “Instinct” on the other hand, refers to “actions stemming from innate or biological behaviour” (ibid.). I believe that the latter term is a more appropriate description of my own engagement in the writing process than the former. This is because I consciously assemble material based on my understanding of prior conventions in music. This does not mean that I compose with the intention of adhering to/adapting traditional forms or techniques explicitly, but rather it is an acknowledgement that my music does not come from a lack of ‘facts’. I would argue that due to ‘innate’ sensibilities, I will favour particular formal designs and compositional techniques, that I have learned from my years of studying music.

Furthermore, the concept of *local listening*, as outlined in Chapter 4, does not refer to one particular aesthetic style; I have experimented with materials ranging from the more minimalist, through varying degrees of discontinuity. Rather than limiting the opportunities to develop my own personal idioms, the stylistic diversity in this portfolio has allowed me to explore the philosophical and psychological concepts underpinning them with a broad musical palate.

It is worth briefly mentioning that all of the works in this portfolio have a certain programmatic element; that is, my pieces do reflect some kind of external imagery. Not all of this imagery is of a physical event or place; some works reflect non-physical attributes, including emotional states and the descriptive properties of objects. In Part II of this commentary, I will outline these seeds of inspiration that have given shape to the pieces. These should not be taken to reflect the listening habits or aesthetics I am looking to engage with (as outlined in Part I). However, I present them to give context, and to underline certain inter-connections that may fall between the conceptual foundations and the resultant work.

6.3 - Random Number Generator

For several works in my portfolio, I employed a random number generator to produce an input for the ordering of my musical material. Specifically, I used a mobile phone application titled *The Random Number Generator* (2019). While most developers of applications do not make the code and algorithm used to produce ‘random’ numbers public, I will nonetheless attempt to provide some clarity on this issue, largely gleaned from the limited information provided by the developer. I do not believe that I am at a loss for not having the algorithm. I reason this two-fold; firstly, it did not generate the material directly; it only provided the ordering of numbers that were then further developed against my own process methods. Secondly, I would argue that it is more important that I relay the way in which the application was used procedurally—what it does— as opposed to how it works.

Random number generators can either be one of two forms; Pseudo Random Number Generators (PRNG) or True Random Number Generators (TRNG). The generator that I have used is a PRNG, meaning that it uses computing algorithms that can generate lengthy sequences of apparently random outcomes that are, in reality, entirely determined by a smaller original value, known as the seed or key²⁰. *The Random Number Generator*, according to the developer, uses *arc4random*, the library function first available on BSD platforms. The tool has been configured to randomly produce numbers that fall within a specified range. The numbers in the range cannot repeat, and every number in the range must appear before resetting. The way that I have applied the tool has been consistent in all of the pieces for which it has been used. However, the output of the generator has been utilised differently in each piece.

My decision to opt for PRNG over TRNG was purely down to the more widespread availability of PRNG. Moreover, I did not feel that the latter would make any notable difference to the compositional structures to which it was applied.

²⁰ For an article on the difference between generator types, see Mads Haahr (2019).

7 - Piano/Quartet(S) (2017/2018)

7.1 - Context

Piano/Quartet(S) was originally written for the Ives Ensemble as part of a workshop at Durham University in early 2017. The piece was subsequently revised in mid-2018, to improve the clarity of notation and to rectify a few minor technical issues.

The piece was written at a time when I was becoming more acquainted with the writings and music of Morton Feldman. In particular, his ideas pertaining to projecting “sounds into time, free from a compositional rhetoric that had no place [there]” (Feldman 2000, 35). It should be noted that whilst Feldman’s philosophy contributes to the idea behind this piece, I have not directly applied the same structural devices—spatial notation and memory-based composition— that he used.

In the original concept for the piece, I planned to have the music performed alongside a video of deep space, inspired by the Hubble Telescope imagery. While it is still a potential option in the future, I was satisfied with how the piece functioned in a standalone chamber setting, so finalised the piece without the inclusion of the film.

7.2 - Idea

There are two central concepts underpinning the creation of *Piano/Quartet(S)*. The first idea was rooted in the extra-musical imagery outlined above, envisioning a sound-world to reflect the mystery and majesty of deep space. This played an important role in the harmonic choices and implementation of spatial form (as outlined in **7.3**). I wanted the listener to experience moments of intense immersion with the material, where the music is perceived as unpredictable, yet nevertheless directional. While this may sound like a paradox, it rings true with Ryan Howard's description of Feldman’s earlier music as being the “simultaneous evocation and negation of a sense of traditional narrative linearity” (Howard 2014, 2). For *Piano/Quartet(S)*, I devised a

structure that implies continuation, whilst the succession of chordal presentation should remain unpredictable.

The second concept came from exploration in the writing process itself. This was a reflection of the analysis Phillip Glass applied to his own piece *Music in Twelve Parts* (1971-74), combined with observations made in Jann Pasler's seminal work *Narrative and Narrativity in Music*. Glass wrote:

"The music is placed outside the usual time-scale substituting a non-narrative and extended time-sense in its place...When it becomes apparent that nothing "happens"... the gradual accretion of musical material can and does serve as the basis of listeners attention, then he can perhaps discover another mode of listening" (Glass 1983, 79)

Pasler claimed that "non-narratives are works that may use elements of narrative but without allowing them to function as they would in a narrative" (Pasler 1989, 244-248). Following this rationale, I reflected on the potential narrative elements associated with functions from the Western musical tradition, and how these could be ascribed to my own work whilst retaining the concept of non-narrativity.

7.3 - Structure and Form

Piano/Quartet(S) has been designed in a way that reflects the *structure-as-isomorphism* model outlined in Section 5.2. The structure repeats a four-chord pattern over a extended duration, employing the use of *prolonged cellular repetition* techniques (see 5.2.2). Rather than approaching this as a smaller motif/cell-based repetition, my aim was that the listener should conceive of each harmonic cycle (consisting of four separate chords) as a single perceptible 'unit'. It must be said, however, that in the workshop performance of the work, I experienced something different. In my own subjective experience, during moments of intense immersion, I would experience some individual chords as a self-contained units, due to the at times radical changes in pitch, register and timbre. Nevertheless, I would argue that this does not undermine the effect of the work as an exploration of musical time, as varying strengths of immersion are entirely possible at the *local listening* level.

Further to the above, the piece is aleatoric in the sense that it employs indeterminacy at the point of performance. Each player is given their own version of the score, to interpret with a high degree of autonomy. With respect to coordination, the only link between performers is the knowledge of who will lead the next cycle. I did not want the performers to attempt to balance dynamic levels or synchronise techniques that affect instrumental colour²¹ in rehearsal, so I made the decision to omit these from the performance directions.

The piece is set to a quiet dynamic level for two practical reasons; firstly, the techniques used, such as string harmonics will be almost inaudible over the piano at higher volumes. Secondly, the blending of sound between the strings and piano at low volume produces textures that befit the intended atmospheric character of the work. With regards to the direction to include occasional instances of a louder dynamic, the reason was to create ‘momentary’ breaks in the surface-level. The desired effect is to create a sense of anti-climax, where the listener feels as if directionality is being restored, only for the music to return to its previous state.

In terms of harmony, quartal and quintal voicing of the chords were used. The choice to employ a relatively conventional harmony—albeit not strictly diatonic— was a purely subjective decision aimed at reflecting the extra-musical imagery. The ‘hollow’ sound of the intervallic relationships between stacked fourths and fifths represents the openness of space. As well as sounding ‘hollow’ I also consider these intervals to represent what I see as the ‘mysterious’ nature of space. While entirely subjective, this nonetheless represents my personal experience with certain harmonic configurations and the ‘characters’ they imply²². From a technical perspective, this choice of harmony aims to avoid the directionality typical of voice-leading in tertian harmony. When extending these harmonic cells over several octaves, occasional thirds will inevitably surface; however, this was not a major concern, as the four chords were not closely related, harmonically speaking, meaning that voice-leading in a traditional sense is avoided.

²¹ By “synchronising techniques that affect instrumental colour”, I refer to wanting the players avoiding using a similar vibrato, or use of bow position for *sul tasto*/*ponticello*.

²² It could be argued that this sentiment was shared by composers such as Scriabin, through his use of the *Mystic Chord* stacked in fourths, used in *Piano Sonata No.6, Op. 62* under the character indication ‘mystérieux’.

The harmony in *Piano/Quartet(S)* is expressed in terms of mixed and pure voicing. Where an interval is stacked in 4ths or 5ths directly above the pitch below it, I define this as a “pure” voicing. If it is a mixture of two intervals, one being the interval of a 4th, it is a mixed voicing (as illustrated by **Fig. 2**). My reason for having the different voicing of chords was for two reasons. Firstly, to avoid a succession of parallel intervals; the movement of the bass of each chord being a second apart may suggest directionality which reflects *interrupted teleology* (5.3) more than *prolonged cellular repetition* (5.2.2). Secondly, to have variation between the chords providing interest as each chord changes.

The choice of pitch was reflected against the available notes of the string instruments, with respect to natural harmonics. I was aware during the early conception of this piece that I would need to choose chords that can be played as natural harmonics in addition to upholding to the quartal and quintal voicings and the interrelationships that I planned to use.

The distance between the four chords was designed to incorporate different configurations of the 2nd. Thus, from C-D-E^b to F[#] it ascends step-wise from a M2 - m2 - A2. If I were to develop this idea further at a later date, I would consider including a 5th chord with a diminished 2nd interval, and allow the viola to lead it. The reason for not doing so here was to maintain the symmetry of 2 ‘pure’ and 2 ‘mixed’ harmonies, preventing a clear sense of larger directionality or ‘release’ in the experienced structure of the work.

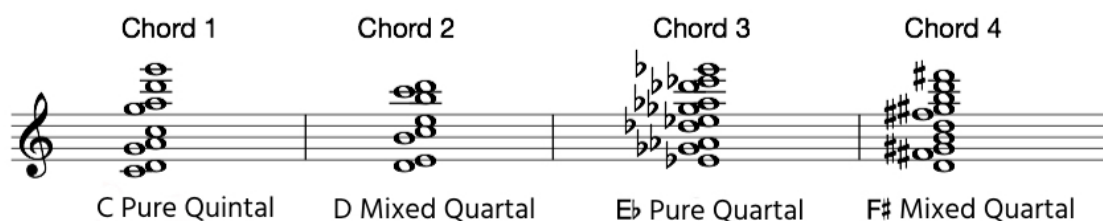


Fig. 2 - Quartal and Quintal voicings of chords in *Piano/Quartet(S)*

The ideas underpinning the harmonic and orchestration-based considerations of this work are directly resultant of my compositional praxis in the area of a *static metamorphosis*, as described in (5.6). This model led me to include a great degree of freedom in the string parts; these performers can perform pitches at multiple octaves and use a variety of bowing techniques for each chord. The desired musical effect is of a ever-shifting surface with a multifaceted array of colours.

7.4 - Final Remarks

The inclusion of the autonomous aspects of performance of *Piano/Quartet(S)* could be argued to support a small degree of narrative, adhering to the previous description of ‘non-narrative’ that Pasler put forward (see page 46). This would be down to the prolonged re-ordering of a four-chord unit with no perceived resolution, or implication of high-degree structural succession. Moreover, I believe that the measure of performative freedom I have employed, will allow for a subtle degree of linear cohesion, without resulting in directionality. This might result from the alternating role of ‘leader’, which will include the physical properties of cueing each cycle. This will involve eye contact and gestural instruction; whilst subtle, these play a necessary role in performance narrative.

Phillip Glass’ quotation on page 46 suggests that the concept of non-narrative aligns with *local listening*; an absence in temporal judgement might lead to the discovery of other modes of listening (see 4.2). This aligns with my aforementioned idea of a *specious present* (see 2.3), in which the continuous presentation of the surface-level of music subverts linearity and expectation due to diminishing the ability to produce *event-vectors*. This is because a listener will find difficulty in modelling future events.

8 - *Echoes* (2018)

8.1 - Context

Echoes was first performed by the Ives Ensemble in February of 2018. The piece was revised in 2019, though only with regards to the surface material; the structure of the work remained the same. The recording submitted is not of the final version of the work; however, the sound-world remains largely the same. Having previously worked with the ensemble, this piece was written specifically with the performers in mind.

8.2 - Idea

The concept for this piece initially came from a tour of Durham Cathedral. Upon walking the Nave, I noticed that any sound that I made travelled upwards towards the ceiling. The individual sounds, though independent from one another, produced a 'ripple' effect as they traversed each other, reverberating off the walls and ceiling. The abstraction of these Cathedral echoes became the basis for the piece; parts coming together and moving away in expansion and contraction.

The greatest musical influence of this work is James Tenney's concept that a listener's attention is drawn towards elements that have a high value on the 'parametric scale'; where multiple parameters produce an increase in the subjective intensity of sensation (Tenner 1988, 36). This intensity of sensation is caused by the contrast of multiple temporal sections; independence and unity moving in and out of sequence with one another.

8.3 - Structure and Form

The structural design of *Echoes* employs the *structure-as-external process* model, and engages with the technique of *obstructive discontinuity* (both outlined in 5.3). It is worth noting that there are also elements of *structure-as-isomorphism* involved, in the use repeated cells for the A and B sections. The rationale behind this combination of structural devices is that I was interested in

exploring whether aspects of different structural models might function concurrently. *Echoes* was the final result of this experimental process.

The score consists of three sections, A, B and C, cued by individualised audio tracks. The performers can either synchronise the tracks together physically, with mp3 players, or by running a multi-track device that can be triggered offstage. My preference is for the latter, but due to technical and spatial restrictions the former may be necessary. The click track allows one instrument to align with another in the ensemble, during measured sections, forming a series of transient duets throughout the piece²³. Performers move between the A and B sections, following the instructions in the audio track, before progressing to C, which sees the ensemble playing together in rhythmically unity.

When developing and organising material for each section, I have taken care to ensure that the salience of the duets can be identified by the audience. This means that material in both the A and B sections was designed to have both ‘partially-related’ and ‘significantly-related’ material. By ‘partially-related’, I refer to material that is absorbed into the larger formal structure; instruments contribute towards building an ambience of changing colours/timbres, with no single player taking attentional precedence. This is because cells are designed to diminish the clarity of interrelationships between the instruments; there is some connection between material, but it offers little directionality or functional purpose in a formal sense. ‘Significantly-related’ material, on the other hand, describes material with more distinctly identifiable interrelationships, where the formation of grouping boundaries is suggested, through the use of melodic and rhythmic contours.

The material in the A section is written to be non-functional. This means that the material is void of correlation to any larger directionality. To achieve this, cells were composed to produce unpitched material or self-serving sounds that contribute little to the wider ensemble. The tempo of this material is left up to the performer’s discretion.

²³ The term ‘duet’ does have traditional associations, though here it is simply used to refer to 2 instruments playing connected material.

The material of the B section is written to be cohesive, and to form notable relationships between the instruments that are performing the duets. The material has been composed with an element of fragmentation in mind; however it does introduce some melodic phrasing, as opposed to the A section that largely avoids this. This material is measured and is controlled by the tempo of the click track. For each B section event in the piece the tempo changes, with the aim of avoiding any overarching sense of expectancy from the listener.

The material of the C section ends the piece, with the entire ensemble playing simultaneously at the same rhythm and tempo; it transitions from autonomy to a unified synchronisation of parts. This material aligns with the material that has been presented in the piano part throughout the course of the piece, but is not intended to imply closure in the common-practice sense. The aim is that the music is so fragmented that it serves as both closure and continuation material. This change in character may restore some directionality to the piece, though as stated in **3.2**, it was not my intention to remove endings altogether, but rather to remove their meaning.

The piano in *Echoes* occupies a different role to that of the other parts. It exists outside of the world of Sections A and B. It is more functional than decorative; it is employed to remove the expectation of metric regularity and beat induction (see **3.1.2**). Additionally, it is given an antiphonal element, to be present and ‘felt’, though to stay in the background until it takes a central role at the end of the piece. Aesthetically, I wanted it to sound non-instinctive, almost mechanical; maintaining a formal coherence and consistency across the successive sections. The piano also acts as one of three layers of polytempo in the piece and, functionally speaking, contributes towards the unfolding of the form. The intention is that after listening to the piano for an extended period of time, the audience will, much like in *structure-as-isomorphism*, be moved towards introspection.

To generate the material for the piano part, I converted a portion of Alfred Tennyson’s poem *All Things will Die* (**Appendix 1**) into binary code, using an online binary code generator. This code was then mapped into quaver note attacks and rests, with bar-lines pragmatically drawn in to

mark the first beat of the bar (**Fig. 3**). My intention with this was to emancipate the piece from any perceptible rhythmical regularity of attack.

The harmony was generated using an ordered pitch-set - the whole-tone scale - and using the same binary code; each pitch of the note set would either stay on the same pitch, or move to the next note in the sequence, depending on whether they read 1 (move) or 0 (stay). Once the end of the pitch set was reached, it repeated (see **Fig.4**). The reason for using the whole tone scale was instinctive; I did not want strictly diatonic patterns, but I also did not want a 12-tone pitch set.

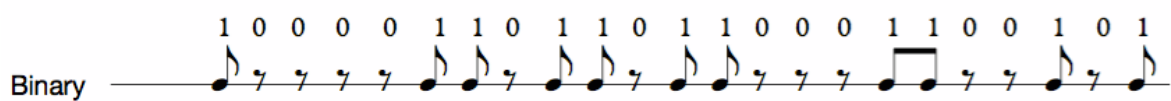


Fig 3. - Opening text of Tennyson converted to binary code (not including barlines)

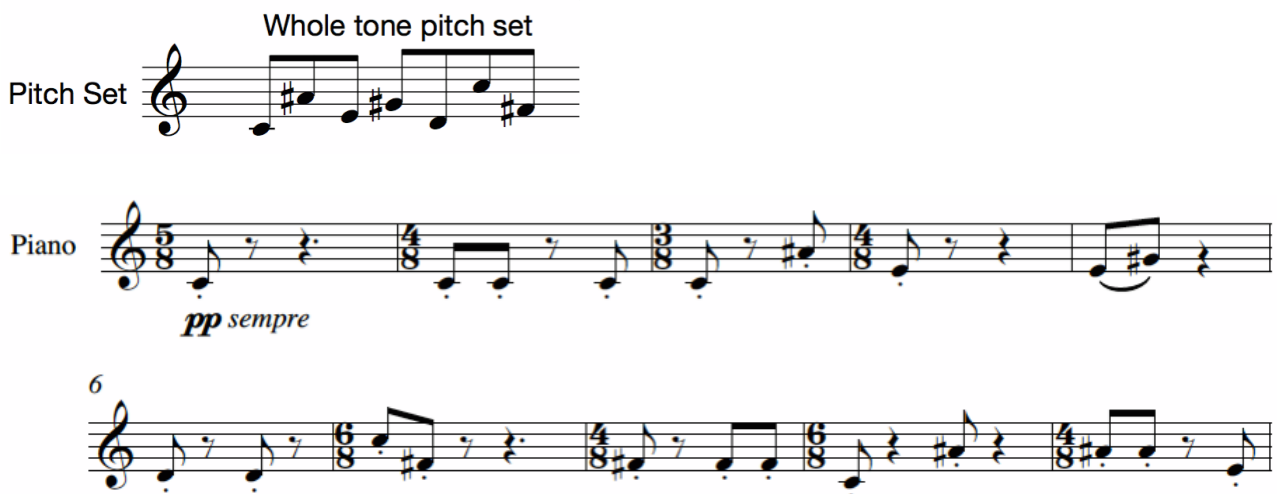


Fig. 4 - Whole tone scale pitch set and the movement as dictated by same binary code

8.4 - Organisation of Macro Structure

Echoes is approximately 8' in length and contains 5 duets, each lasting approximately 20 seconds. The metronome marking changes between each cycle of the B section, adding an element of variation to this. Tempo is usually the same between the performers in duets; however

at 3'26" the material is presented at 2 different tempi (Q=60, Q=69) in the viola and cello, adding a rhythmical phase to the material, as a variation on preceding events.

A choice was made to include more sectional changes between the clarinet and the cello, largely for aesthetic reasons. The clarinet's material for the A section differs from that of the string instruments in that it is based on multiphonics; as such, the contrast to the melodic B section material should be more evident in this part. **Table 2** outlines the breakdown of the section changes in each part (as directed by the audio track), as well as the metronome markings. The metronome marking for Section A material is marked as N/A, as the tempo is free, whereas the Section B material is marked as 'Q=' for crotchet (quarter note).

Clarinet	Metronome Marking (Q=Quarter note)
A Section- 0'00"	N/A
B Section- 2'04"	Q=56
A Section- 2'26"	N/A
B Section- 4'24"	Q=84
A Section- 4'44"	N/A
B Section- 6'44"	Q=66
A Section- 7'06"	N/A
C Section- 7'35"	Q (dot)=76
Violin	Metronome Marking (Q=Quarter note)
A Section- 1'24"	N/A
B Section – 5'44"	Q=96
A Section- 6'04"	N/A
B Section- 6'44"	Q=66
A Section- 7'07"	N/A
C Section- 7'35"	Q (dot)=76
Viola	Metronome Marking (Q=Quarter note)
A Section – 0'44"	N/A
B Section – 2'04"	Q=56
A Section – 2'26"	N/A
B Section – 3'26"	Q=60
A Section – 3'46"	N/A
C Section – 7'35"	Q (dot)=76
Cello	Metronome Marking (Q=Quarter note)
A Section – 1'04"	N/A
B Section – 3'26"	Q=69
A Section – 3'44"	N/A
B Section – 4'24"	Q=84
A Section- 4'44"	N/A
B Section- 5'44"	Q=96
A Section- 6'04"	N/A
C Section- 7'35"	Q (dot)=76
Piano	Metronome Marking (Q=Quarter note)
No Sections	Q (dot)=76

Table 2- Section Changes in *Echoes*, including metronome markings.

Duets	Time
Clarinet/ Viola	2'04"
Viola/Cello	3'26"
Clarinet/ Cello	4'24"
Violin/Cello	5'44"
Clarinet/Violin	6'44"

Table 3- Duet timings in *Echoes*

Fig. 5 gives a graphic representation of the full 8 minutes of the piece, illustrating the structure of the duets and continuation passages between the instruments. Each instrument is represented as a line; the piano sits below the timeline, merging with the others for the final passage of the work.

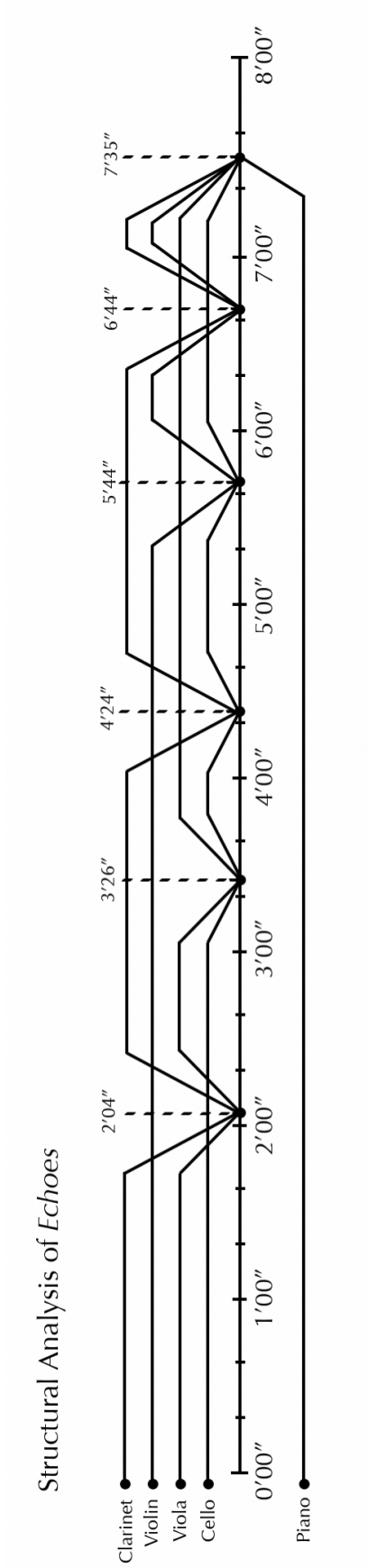


Fig. 5 - Structural depiction of *Echoes*.

8.5 - Final Remarks

Echoes is an experiment in immersive temporality, employing multiple layers of polytempi as part of a larger structural schemata. The aim of the piece was to produce a temporal framework that would subvert the listener's expectations by shifting between layers of instrumental autonomy and collective performance.

At the start of this chapter, I cited the influence of Tenney in creating a structure that has elements of high value on the 'parametric scale' and using parameters to produce an increase in the subjective intensity of sensation. This is achieved in *Echoes* by having material relatively equal with respect to hierarchical prominence— no material is more prominent in one instrument over another— but has complexity in terms of the superimposed tempi in the A section alongside the function of the piano. Even with this complexity, the material is still hierarchically equal due to players having music of similar salience. Thus, during moments of alteration, the focal 'resolve' should be drawn towards the duet material. When these expectations are not met, due to the irregularity of the alterations and tempi, the listener should begin to listen 'vertically', engaging the mode of *local listening*. As Tenney suggests, "if the music is highly complex, with many and variegated elements contained within the limits of each musical idea, such a listener will be in the position of the viewer described above whose attention is fixed on the details, being thereby unable to see the larger configurations of the picture" (Tenney 1988, 19-20). When listening to the piece in performance, I believe this aim was at least partly achieved, as there was clear movement through the different tempos expressed by each section.

9 - *On the Shore, at Midnight* (2018)

9.1 - Context

This piece was first workshopped, then performed as part of DurhamKlang in June 2017 by Ensemble7Bridges Emma Richards, Dov Goldberg and John Snijders. The notation and material has subsequently been revised as to improve the clarity of performance and improve material.

9.2 - Idea

On the Shore, at Midnight is one of two programmatic pieces in this portfolio that depicts physical imagery, the other being *Silk and Velvet*. The work focuses on the abstract notions of the scenic, evocative, and melancholic. As the title suggests, the piece was first conceived of on a beach (South Shields), a little before midnight. As such, the material reflects sounds in nature—such as the waves crashing against the shore and marine wildlife — as well as my frame of mind as I stood alone, peering into a vast void. Both of these aspects were important to the generation of material and structure for the piece; the balance between the two is reflected in the handling of the material.

As well as the abstract notions underpinning the work, *On the Shore, at Midnight* is the result of an exploration into new avenues for defining the temporal framework to map out musical material. The aim of this process was to discover a framework that was void of metrical regularity, yet could nonetheless be used as a system of reference for performers. The choice of the natural decay rate of the piano's sustain pedal seemed a natural choice for the work; one might argue that the piano's decay embodies a regularity of sorts, however, 'attentional energies' cannot be synchronised to it (see **3.1.2**). The decay rate is dependent on dynamic attack, which will to some degree vary from performance to performance. In essence, the pedal functions as the framework for the work's temporal structure; the material is mapped onto points in space — as the sound decays — the players judge when to execute their material based on the graphic representation in

the score. This allows for autonomy and flexibility, but also to allow the music room to ‘breathe’ naturally, rather than be fixed to a set of strictly regulated metrical cues.

9.3 - Form and Structure

On the Shore, at Midnight employs the *structure-as-instinct* model as part of its design and explores *obstructive discontinuity*. The latter is employed to elicit varying degrees of antagonism in the disruption of the musical surface-level. This disruption appears in two forms: firstly, the piano clusters that interrupt the material in the clarinet and viola; secondly, the irregular release of the sustain pedal. The combination of these two factors is aimed at manipulating the audience’s perception of upcoming events. The piece is a single movement work; not just in the formal sense, but also in terms of the macro-structure.

The material in the piece is notated as gestures/cells in what might appear to be free time. However, whereas the cells attached to the sustain staff with red lines are in free tempo - allowing for flexibility in performance - black lines indicate the music performed with in tempo, defined by the spacing of the page. Any passages where two or more instruments enter together, are joined with a black line. Balancing the material was a challenging task due to the competing dynamic parameters of the work; the cluster chords at the low range of the piano having to blend in close succession to string harmonics and clarinet multiphonics. However this was overcome by taking care to place the viola and clarinet material at a far enough distance from the initial attack of the piano. This involved predicting when the sustain pedal would have decayed enough for the material to be heard.

The cellular material in the piano is new for each entry, with the exception of the clusters, and their rhythmical identity also varies. However, the harmonic basis for the material is the same, allowing for a certain degree of sonic consistency throughout the piece. I employed relatively traditional material in the work for two different reasons. Firstly, the piece addresses an emotional state of emptiness; the use of tonal material harks back to the traditional practice of attempting to portray

emotions in music. Secondly, one of the influences for the piece was Henry Cowell's *Tides of Manaunaun* (1917) for solo piano, which primarily uses melody alongside chord clusters.

The material in the viola and clarinet is mainly intended as texture-based surface colour. Some of the cells do reflect the harmony of the piano, however the material was chosen due to the delicate and unstable sounds of the multiphonics and harmonics; where the harmony in the piano is reflected, it is done on a fragile - one might say wavy - surface.

The process for mapping the material onto the piano decay was largely instinctive. The piano part was composed first, from which I made structural decisions with regards to the decay rate, reflected on each minute-long page and mapped according to estimated duration. Once the piano material had been ordered and the decay staff was notated in the score, the viola and clarinet parts were spaced in such a way that the more delicate sounds could be heard in the overall texture.

9.4 - Additional notes

The notation of the piece was inspired by two specific works: Stockhausen's *Momente* (1969) and Toru Takemitsu's *Rain Spell* (1982) (see **Appendix 2**). The notational models of these pieces lent clarity and context to my work and, in the case of the latter, the use of vertical lines to synchronise parts.

It is worth noting that different pianos have different acoustic properties depending on their model and size. It is acknowledged that some decays will last longer than others, but this should not affect the desired sound in performance. If the piano has a shorter decay, the pianist will have to compensate by playing more loudly in order to more accurately represent the notation.

9.5 - Final Remarks

On the Shore, at Midnight does, like the other pieces in this portfolio, require a certain degree of autonomy in performance. The metric ambiguity of the work aims to displace the listener perceptually from the spatial framework of the music (as explored in **3.1.2**). This should decrease one's ability to place *event-vectors*, as outlined in **2.3**. The rationale behind this is that the 'anchor point' of the *specious present* is predicated upon regularity and clarity of succession. The novel temporal framework of *On the Shore, at Midnight*, based on the decay of the piano, should overcome this through the (non-anticipated) unpredictability in the instrumental entries.

10 - *Come to Me, Unyielding* (2017/2019)

10.1 - Introduction

The idea for this piece came from experimenting with varying forms of metric dissonance, in the period following the completion of *Echoes*. The latter piece uses different temporal strata for each of its sections and I wanted to explore a variant of this model that presented the same musical idea across different time streams.

10.2 - Idea

This concept behind the piece germinated from reading Margaret Thomas's overview of Conlon Nancarrow's approach to tempo proportions in *Nancarrow's 'Temporal Dissonance': Issues of Tempo Proportions, Metric Synchrony, and Rhythmic Strategies* (2000). Thomas suggested that a "listener must expand and fragment their attention in order to track both voices separately"²⁴ (Thomas 2000, 139). However, a number of researchers in the field of psychology have noted that human beings can have difficulties distinguishing or perceiving polymetre and polyrhythms (Vuust et al: 2006; Keller & Burnham, 2005). Imaging results in the work of Vuust et al, support the claim that the appearance of multiple tempi activates parts of the brain that deal with language processing²⁵. Consequently, while it is difficult to understand empirically how polymetre is perceived, it can be argued that a listener will attempt to parse multiple temporal streams into their constituent parts. In language processing, the meaning of a sentence is usually only comprehended after the subject has gained an understanding of the context and the position of the individual words that comprise it.²⁶ Following this rationale, in attempting to comprehend multiple time streams, a listener might engage in a similar cognitive process. This would align with the Gestalt principle of finding order in chaos.

²⁴ "both voices" here referring to 2 tempo streams being used simultaneously in Nancarrow's work.

²⁵ As identified in Poudrier and Bruno H. Repp (Poudrier and Repp 2013, 372).

²⁶ For a summary discussion on lexical and syntactic rules of grammar see Joshi (1991, 1242-1243)

Following the concepts outlined above, *Come to Me, Unyielding* explores the idea of exposing the listener to complex compound time streams, and parsing these during performance. I recognised that they will be unable to do this immediately; the aim was that this perceptive feature develop throughout the piece, as the material is reiterated eight times in slightly different guises. The aim is not for the listener to decode the work into its constituent temporal parts, but rather to hear the material multiple times and to be drawn to the moments in which the collision of material at different tempi is more apparent to them. This is based on the concept of *static metamorphosis* (explored in 5.6). The focus on the tension produced by the desynchronised musical material should draw listener's attention to the surface-level, allowing them a more complex temporal experience; each permutation of the chorale will be reflected against the initial unified tempo.

10.3 - Form and Structure

Come to Me, Unyielding utilises the *structure-as-isomorphism* model, alongside *prolonged cellular repetition* (PCR). The underlying structure comprises the repetition of the same section of material nine times, the first of which is at a unified tempo. For the following sections, eight separate tempo markings were used, ranging from $\text{♩} = 60$ to $\text{♩} = 84$. The range of tempi was chosen for structural considerations; if there were larger distances between the fastest and slowest tempo, the perceived harmony would disintegrate, rather than achieve the intended 'blurring'; if there were too much variance in tempo, this would risk the parts not appearing to belong to the same underlying material. This is why I indicate that the piece be rehearsed multiple times at a unified tempo and that a performance begins with this; to create a common approach to dynamics and phrasing, reinforcing the idea the the piece is a manipulation of a single musical idea being repeatedly bent 'out of time'.

A matrix for the tempo selection in *Come to Me, Unyielding* is outlined in **Fig. 6**. Note that the tempo of $Q=60$ is dovetailed across the parts starting in the second bass and moving up to the first soprano in the final permutation. The reason for doing this was two-fold. Firstly, it produces a symmetry; the piece begins with the slowest tempo in the bass, and concludes with the slowest tempo in the soprano. Secondly, due to the spacial positioning of the singers — whether stood in

a straight line or surrounding the audience in a circle — one of the temporal units will move linearly from one singer to the next throughout. This could be argued to lend the piece a degree of internal consistency; one of the tempos will move on in the same direction, after each permutation of the material. However, this is unlikely to affect the experience of complexity at the surface-level, as multiple time streams are likely to obstruct any potential coherency in the perceived tempo. Thus, this element of temporal clarity is likely to only ever be ‘felt’, as opposed to directly acknowledged; nevertheless, while it may not be perceived, the effect may lend some consistency to the experiential frame of the work.

S1	8	3	6	5	4	7	2	1	1. ♩ = 60
S2	7	4	5	6	3	8	1	2	2. ♩ = 63
A1	6	5	4	7	2	1	8	3	3. ♩ = 66
A2	5	6	3	8	1	2	7	4	4. ♩ = 69
T1	4	7	2	1	8	3	6	5	5. ♩ = 72
T2	3	8	1	2	7	4	5	6	6. ♩ = 76
B1	2	1	8	3	6	5	4	7	7. ♩ = 80
B2	1	2	7	4	5	6	3	8	8. ♩ = 84

Fig.6- Matrix for metronome markings in *Come to Me, Unyielding*.

There is a clear degree of self-containment in *Come to Me, Unyielding* due to the way the material has been shaped. There are defined rests between each section (these are included in the audio track) and the dynamic shape frames the music in clear contours. Each section is symmetrical with respect to the rise and fall of volume, and the use of a cadence outlines the end. This would present, what Howland describes as, *structural closure* (as outlined in 3.1.1), where symmetry in the music— emphasised by dynamics and harmonic resolution— combine to form phrase-like units (IPS). One can see how once these phrase-like units are repeated, following durations of silence, they become self-contained. One might support this by referring to the *Gestalt* grouping principles of similarity and closure.

With respect to form, my aim was for a process of *static metamorphosis* (introduced in 5.6) to be elicited as a result of the attempt at parsing the separate temporal streams. The tension produced by the desynchronised material should mean that a listener will focus on the surface-level, allowing for a disengagement from teleological temporal experiences. The reason for this is twofold; firstly, each permutation of the chorale will be reflected against the listener's memory of the initial unified tempo. Secondly, it will be difficult for the listener to segment material because —as explained in 3.1.1— the parametric and magnitude changes needed to define the grouping boundaries will be diminished due to the layered tempo.

10.4 - Final Remarks

Come to Me, Unyielding employs *prolonged cellular repetition* in the form of a repeated chorale presented at multiple concurrent tempi. The listener should perceive the piece as having a low degree of succession, despite splitting the vocal group into individual temporal streams. This is because the piece has been composed in such a way that the voices will appear to be part of the same continuum. Moreover, the music has an internal consistency, resultant from the spatially stepwise movement of the base tempo across the group. Each permutation of material is designed to suggest self-containment; this is achieved through dynamic contour and cadential closure, alongside the physical spacing of the performers.

The compositional method outlined above should result in a piece where the listener will be drawn to the material on the surface-level, while attempting to engage with multiple temporal strata in each permutation. This should lead to the subjective parsing of vocal parts; the listener should be attracted to temporal 'collisions' at specific moments throughout each section. Thus, the listening experience of the piece will move from the *global* to the *local*.

11 - *Thelxiepeia* (2016/2019)

11.1 - Context

Thelxiepeia was written for a workshop with Juna Winston in July of 2016, and performed as part of Durham Klang 2016. The piece was revised in 2019; new material was added and small alterations were made to the notation. The piece was also changed to include a mobile form. The submitted recording is of the original version of the piece, therefore new material will not be included.

11.2 - Idea

Thelxiepeia is scored for solo male trombonist and plunger. The name 'Thelxiepeia' belongs to one of the Sirens from Ancient Greek mythology. Sirens were notorious for luring sailors to their death with their songs. This piece forms part of a three work cycle entitled *Siren Series* for solo brass instruments; the other pieces in the series are attributed to the two remaining Sirens.

The musical material in *Thelxiepeia* was not a result of temporal research as such; rather it came from my research into the idiosyncratic techniques of the instrument. The sung multiphonics that I employ throughout were initially inspired by Luciano Berio's *Sequenza V* (1966). The piece is written specifically for a male trombonist due to the vocal range which is situated at a bass/baritone register; transposing the vocal material up an octave would unfortunately render the material significantly less effective. The piece employing a plunger was for purely sonic reasons; the ability to control the dynamic projection of the instrument allows for more surface colour and detail. Moreover, a third element of timbral detail can be found in the change of vowel sounds, projected on to the framework outlined by the pitch and plunger. The addition of vowels could be argued to function as a natural counterpart to the plunger. By this, I mean that while the plunger will 'artificially' suppress the dynamic projection of the stream of sound, the vowel sounds — resultant from changes in formant shape — will add variable depth and resonance to the pitch, whilst at the same time also affecting airflow and projection.

Conceptually, I wanted the piece to revolve around continuously developing timbre (an approach in **5.6**); the framework for this was to use successive continuity and measures of self-containment (as described in **4.1** and **5.4**). Given the scope of extended techniques that could be combined with singing, I aimed at producing a wide variety of colours. I therefore began by writing a series of cells with no predetermined order, without focusing on an overall macro-structure for the work. As a result of the compositional process, it dawned on me that the cells of material were in a sense self-contained, and that the succession of parts was secondary to the exploration of instrument colour.

11.3 - Form and Structure

Thelxiepeia conforms to the *structure-as-isomorphism* model (see **5.2**), though it includes certain elements of instinctive design. However, this does not mean that it follows the *structure-as-instinct* model, as it was not conceived as a moment-to-moment form (see **5.5**).

As mentioned in **11.2**, I composed the material without deciding upon the order of the cells. I did, however, register the need for a definitive beginning and end to the work; the material in the centre of the work does not rely upon succession. In the initial version of the piece, I chose to order the parts throughout and present it as a through composed work. However, upon further deliberation — following the performance — I concluded that the work was not reliant on this ordering of cells; in fact I thought it might benefit from a degree of variation between performances. In this way even a familiarised listener would not be able to predict the internal framework throughout. Consequently, it was reconfigured as a mobile form, where the player independently chooses the order of the central material (everything apart from the first two, and the last page).

The piece revolves around the alternation of two pitches; at the start of the work the singular G^b to A^b , then expanding to include a wider palate of fifths and octaves. The end of each cell is

different, depending on technique applied. The focus on the interval of a 5th was arrived at from listening to the *organum* style of medieval singing. It occurred to me that the lack of tonal directionality characterised by the perfect fifth, as opposed to intervals such as thirds and sixths, diminished the ability of listeners to model *event-vectors* as a result of pitch-movement.

With regards to form, I employed varying durations of rest after each cell in order to prevent the listener from perceiving any form of regularity in the interval between them. On the topic of a listener's estimation of time, Firmino et al state: "events ending at the "right time" would confirm expectations and would elicit quasi-precise estimations ("zero-contrast"). A sequence of events ending later than expected would seem longer and would elicit overestimations ("positive-contrast")" (Firmino et al 2009, 205). Following this rationale, by varying the lengths of rest and asking the performer to play each cell for as long as they are able to — in-so-doing adding a further element of variation due to the different air-requirements of each cell — I aimed to elicit both under- and over-estimations of duration.

11.4 - A Note on Notation

The notation in *Thelxiepeia* is a combination of traditional and novel models. The pitch material and rests at the end of each cell are notated on conventional 5 line staves. The vowel sounds — whilst presented in a conventional manner — are given their own staff, for the purpose of clarity. I chose to position of the plunger (with relation to the bell of the trombone) on a third staff. Although the layering of this number of multiple staves may at first glance look somewhat complex, it has allowed for more precise technical directions, whilst also giving locational markers through which the performer can coordinate the changes in pitch and vowel sound. The three technical dimensions of the work (plunger, vowels, and pitch) are of relatively equal importance, and the notational model does illustrate this quite clearly, while presenting them in a such a way that they can be clearly mapped.

11.5 - Final Remarks

Thelxiepeia employs the *structure-as-isomorphism* mode in mobile form, giving the player a degree of autonomy in the succession of material. It focuses on the exploration of timbre, resultant from a selection of extended techniques on the trombone; the piece is defined by the use of sung multiphonics, plunger manipulation, and changes in formant shape. The pitch-material, which moves between two primary pitches and selection of perfect fifths, creates a musical framework that is perceived to have a low degree of succession. Therefore, the changing colours of the surface-level should allow a listener to experience the material from a *local listening* mode.

12 - *Silk and Velvet* (2018/2019)

12.1 - Context

Silk and Velvet was written for Ensemble 7Bridges (Richard Craig and Emma Richards) and performed as part of the *SoundLab KLANG* series in Durham, in June 2018. The piece was revised in 2019; the notation was refined and an element of gestural bowing was added. The submitted recording is of the original version of the piece and as such it is worth noting that there are certain differences between this and the final score. Having worked with both performers previously, the piece was written specifically with them in mind.

12.2 - Idea

The title for *Silk and Velvet* is reflected in the music itself, giving the piece a certain programmatic image (see 6.2); it describes a contrast in timbre, reflecting these different types of fabric. This information is not directly relayed to the player or audience (other than through the title itself); it simply reflects by subjective images of sound. Silk portrays a soft, fluid material, whereas velvet has a coarser and rougher surface. The initial idea underpinning the work was to structurally blend these ‘materials’ together.

At the time of composition, I was particularly interested in the timbral quality that can be achieved through the use of extended techniques, with respect to varying degrees of sonic clarity (or the lack thereof). A technique that results in a clear presentation of the pitch or sound will be described as having timbral clarity. When referring to techniques that have lack of clarity, I mean that they are unstable in terms of projection and in maintaining the stream of sound; these are techniques that a player will need to adjust during performance in order to regulate and retain control. This notion of clarity is reflected in the musical material; material that flows with timbral clarity reflects silk, while varying degrees of instability are used to create the ‘roughness’ of velvet. With regards to the latter, the instability in the bass flute is largely derived from the use of

multiphonics, timbral trills, and air sounds, while ricochet bowing, different bow placements, and natural harmonic tremolo are used in the viola.

12.3 - Structure and Form

Silk and Velvet adheres to the *structure-as-instinct* model. This is because a large portion of the musical material has been instinctively designed with consideration to “vertical” aspects of time (see 4.3). The piece also employs *obstructive discontinuity*, though a process of *parametric saliency* (see 5.3). This was achieved through the use of asymmetrical phrase lengths in combination with fragmentary cells of material anti-climactic gestures.

The structure of the piece focuses on a variation of textural colour, using recurrent gestures and cells, without the implication of continuity and succession. Consequently, the material does not modulate through keys; it has a low degree of development and is not defined by changes in character, metre, or rhythm. As part of the compositional process, each cell of material was ranked in order from the most, to the least salient. These were then ordered in such a way that the least salient material was shaped to prolong the distance between musical ideas of higher saliency. As such, many moments within the work are asymmetrical; in the unfolding of the material a number of cells/phrases were purposefully cut short, to align with the aim of an overarching irregularity to the piece. For example, bars 1-3 and 11-13 are similar in their design but 11-13 loses a quaver value (being 2 bars of 5/8, instead of 5/8 and 6/8) and the duration of the pause is shorter.

Further to the above, the succession of material in *Silk and Velvet* was composed according to Narmour’s notion of ‘open’ and ‘closed’ character implications, with regards to musical parameters. Most of the phrases and cells are ‘open’ insofar as they raise a desire for resolution. This notion of resolution is dealt with, and subverted, in three different ways. Firstly a resolution is arrived at before our expectation would suggest it should be (e.g. bar 21 is shorter than 1-3 and 11-13). Secondly, the music is not resolved in a definitive way (e.g. bars 27-38 decay in activity, compared with the increased activity of preceding phrases). Finally, the material is enveloped in

distinct non-resolution (e.g. bars 68-77, where material is introduced that fits the aesthetic of the piece, but has no preparation or resolution within its unfolding). All three of these solutions affect the way by which the listener's expectations are realised, and how they predict the direction of the piece through *event-vectors*.

Irregularity and discontinuity are important features in diminishing the effect of succession in *Silk and Velvet*. This is expressed in two features of the work; firstly, the difficulty in following the metrical structure, and secondly, from the variety in the length of phrases, and asymmetry. Both of these structural devices deter the listener from making accurate hierarchical judgements. As a result, I would argue that this piece may present a counterpoint to Yako's argument, expressed in **3.2**: by not being able to clarify the position of material within a system, the clarity of the larger whole is lost. Thus, the experience of directionality is diminished. The material will still hold interest in terms of its sonic aesthetic but it will have less contextual impact on the large-scale structure of the work.

12.4 - A Note on Notation

The notation utilises a traditional 5-line staff for most of piece, however like *On the Shore* it employs a gestural approach to the dampened sections in the viola part. The emancipation of rhythm in this material allowed me to draw a choreographed shape for the bow, indicating different intensities of pressure, based on the density of the line. This method is similar to models devised by Helmut Lachenmann and others; however, the idea to employ the density of line to indicate pressure was derived from Eric Skytterholm Egan's work *Fragments | of Shapes | Hewn | in White | Silence* (2015).

12.5 - Final Remarks

Silk and Velvet employs the largest amount of instinctively composed material in my portfolio. I specifically crafted the piece with consideration for the 'verticality' of the music. This involved ensuring that the unfolding of the work from moment to moment was irregular, with the degree of

contrast ranging from low to high. Furthermore, there is a purposeful lack of development in the piece, in terms of modulation or character change. As a result, the material moves between moments of varying intensity on the musical surface. While there is no 'tonal centre' to the work, the notion that the piece continually develops from a singular point was pertinent to my formal approach. The combination of these factors is intended to suppress a listener's expectations and to prevent future *event-vectors* from forming.

13.1 – Idea

Ouroboros was conceived as a result of experimenting with different types of harmony. In particular, I was interested in harmonic frameworks that would circumvent the resolution points that are common features in traditional tonal practice. The *Ouroboros*, like the Siren *Thelxiepeia*, is a creature in Greek mythology; the image of a serpent eating its own tail has often been used to depict the concept of infinity (∞).²⁷ This sentiment is reflected in the piece; I wanted the harmony to consistently consume itself, making it sound like each phrase ends where it began.

13.2 – Harmony

Ouroboros is scored for string quartet and follows the *structure-as-external process* model, employing *obstructive discontinuity*. In order to fully experience the intended effect of the work, the listener must be familiar with the syntax and grammar of traditional tonal music; this knowledge will shape anticipation and expectation. One of the suggested mechanisms for employing *obstructive discontinuity* in music is *interrupted teleology* (see 5.3); the introduction of directionality, followed by purposeful disruption or prolongation, never allowing the material to reach its resolution/conclusion. *Ouroboros* engages with this concept by manipulating traditional models of harmonic continuity and succession— associated with the common practice era— changing the harmonic framework in order to weaken internal stability.

In the common practice era, composers would create harmonic frameworks by exploiting the interrelationships and tensions produced by harmonic movement; an example being the use of dominant and sub-dominant function. This would elicit an expectation of direction due to sequences and patterns (see 3.1.3). **Fig. 7** presents this as a diagram that maps the common harmonic progressions. The purpose of harmonic charts such as this, is to underline the relative

²⁷ For a discussion on the Ouroboros connection to infinity, see Anthony van der Sluijs (2009, 18)

stability and instability of tertian harmony, and highlight the onset of tensions that would invariably indicate movement back to the tonic.

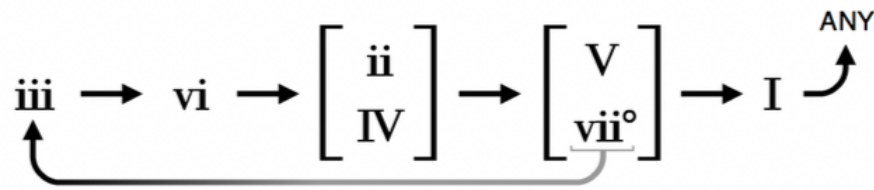


Fig. 7 - Illustrating the movement between chords in a major key.
Diagram courtesy of MusicTheory.net (MusicTheory.Net, 2019)

As part of my exploration of harmony, I used the diagram above (**Fig. 7**) to map chordal movement, using secundal triads instead of tertian triads. The resultant sound could be experienced as directional— following the same *event-vectors* that a knowledge of musical syntax would infer—however, removal of the tertian third meant that the sense of diatonic movement was suppressed. The resulting effect is a constant state of flux, providing pseudo-directionality from a familiar, traditional bass movement, but without any strong cadential function²⁸. This provoked a sense of irritation, due to the lack of expected/desired resolution. This reminded me of an observation made by Christian Wolff²⁹:

“notable qualities of this music...are monotony and the irritation that accompanies it. The music has a static character. It goes in no particular direction... it is not a question of getting anywhere, of making progress... As for the quality of irritation,...its source is, of course, precisely in monotony, not in any forms of aggression or emphasis. It is the immobility of motion. And it alone, perhaps, is truly moving” (Cage 1961, 54)

Fig. 8 shows the secundal triads underpinning the work, in the dorian mode, and gives the first 8 harmonic cycles of the piece³⁰. The key on the upper side of the diagram describes the intervallic relationships of secundal triads. For example, a secundal “major” triad must comprise a major

²⁸ It can suggested that this is a similar harmonic device like used in Charles Ives *Central Park in the Dark* (1906)

²⁹ Quoted in Cage’s lectures on Silence (Cage 1961, 54)

³⁰ It is worth noting that the harmonic progression chart provided has been given in all upper case Roman numerals due to the qualities of each triad being different to what it would be classified within tertian harmony. The purpose was more to highlight that the progressions have been constructed using the **Fig. 8** diagram from the traditional idiom.

second with a minor second above; each triad, like in tertian harmony, has a major, minor, augmented and diminished classification.

Secundal Dorian

M/M = + M2
M/m = M m2
m/M = m root
m/m = o

Harmonic Progression for first 8 sections

[I-VI-II-V-I] [I-VI-IV-VII-III-VI-II-V-I] [I-VII-V-I] [I-III-IV-IV-V-VII-III-VI-II-V-I] [I-IV-V-I][I-II-V-I] [I-III-VI-IV-V-I]

Fig. 8 - The relationships of chords of the secundal dorian scale and how they are applied to the first 8 cycles of *Ouroboros*.

13.3 – Structure and Form

The rhythm of the piece was devised from a serial matrix containing 6 different rhythmical values. Each sequence of the matrix was assigned a number from 1-24, after which a random number generator determined the sequence. The number generator was configured to not repeat a number until all 24 were used; this process was repeated for the assigned length of the piece.

	V1	V2	V3	V4	V5	V6	
1							R1
2							R2
3							R3
4							R4
5							R5
6							R6
	VR1	VR2	VR3	VR4	VR5	VR6	

V - Vertical
R - Retrograde
VR- Vertical Retrograde

Fig. 9 - Matrix illustrating the retrograde, vertical and vertical retrograde variations. Each row was assigned a number between 1-24 and then input into a PRNG to determine rhythm.

Once the rhythm had been determined, a proto-structure for the piece was designed; instinct was applied to decide the rhythmic values of the rests and notes (see **Fig.10**). After this, a four-part chorale based on the previously determined secundal chord progressions was composed.



Fig. 10- Mapping of rhythm (not harmony) for the piece.

The final compositional stage entailed mapping the parts of the chorale to the string quartet, ensuring that at least two instruments began together, and creating a bar structure to support the entries. Following this, the material was shaped into phrase-like patterns and indications for bowing and dynamics were determined. Passing-notes were included to shape the music with the purpose of alluding a traditional string quartet idiom; this was done carefully as too many passing notes might lead to an unwanted suggestion of tertian harmony.

With respect to form, the serialist approach to rhythm was intended to emancipate the music of a regular metre. This increases the perception of discontinuity within the large-scale hierarchy of the piece because it diminishes the expectation of particular rhythmic patterns and metrical beat induction. Moreover, the irregular entries allow for a contrapuntal ambiguity across parts. Inspired by Debussy's *Jeux*, the dynamics often ascend and descend quickly as a way to disrupt the linear succession, preventing any form for climax. This, alongside the ambiguity with regards to harmonic closure, embodies the concept of *interrupted teleology* (see 5.3); it implies goal-direction but cuts the material short before reaching its expected conclusion.

13.4 – Final Remarks

Ouroboros employs formal and structural techniques to avoid measures of formulary succession. Secundal harmony has been used as a replacement for tertian harmony, resulting in a consistent ‘failure’ to resolve during harmonic progression and at traditionally defined cadential moments. Irregularity in metre leads to reduced beat induction; consequently the listener may be unable to accurately predict the instrumental entries. The combination of these techniques means that neither the harmony nor the rhythm express clear expectational and directional vectors; therefore the listener’s attention could be drawn to the musical surface, affecting their sense of time.

14 – *Cælitum* (2019)

14.1 – Idea

Cælitum, concluded in the spring of 2019, is the most recent of the pieces included in this portfolio. As such, it embodies the most direct reflection the compositional methods and aesthetic outlined in **Part I** of this commentary. The work is the culmination of extended research into the concept of *sustention* (introduced in **5.2**). The word *Cælitum* comes from the latin for "celestial, heavenly" (World of Dictionary, 2019) and the piece is designed to emulate the shimmering surface often attributed to descriptions of divine form³¹. As such, my approach to *sustention* aligns with Richard Glover's:

“The manner in which this 'subject matter' is perceived is less concerned with ... 'quarendo' (to obtain, to get) which is familiar to more traditional compositional syntax, but with 'audiendo invenietis' (to discover on hearing). The singular formal gestalt does not lead or entertain the perceiver through various contrasting levels of engagement; the perceiver is given the opportunity to discover these naturally-occurring variations within the surface layer of the sound, and engage with their transformative qualities”. (Glover 2010, 18-19)

Consequently, my aim for this piece was to create the *static metamorphosis* of a shifting timbral surface (as described in **5.6**) combined with durations of silence. In *Cælitum*, this is presented through use of a held pitch, transformed through different parametric changes, such as variable dynamic shifts and the employment of various timbral techniques (air sound, bow placement, varying levels of vibrato).

The decision to employ large blocks of player inactivity — some lasting up to 45” — rather than breaking these down into smaller units, is rooted in a perspective on silence borrowed from Edward Cone. My intention was to ‘frame’ each section in the piece, in a fashion explored by Cone in *Musical Form and Musical Performance* (1968):

³¹ “...two men in clothes that gleamed like lightning stood beside them”- Luke (24:4)

‘The frame of a picture...marks the limits not only of the picture, but also of the real work around the picture...First, it separates the subject chosen for treatment from its own imagined surroundings...; second, it protects the work from the encroachment of its external environment...’ (Cone 1968, 14-15)

Cone’s words formed an important feature of *Cælitum* — I wanted inactivity to have as much prominence in the music as the played material. This shaped the decision to draw attention to moments of inactivity by featuring the ticking of a clock, emphasising a static sound world I was attempting to create. Additionally, the clock is there to retain a sense of formal cohesion and to invoke a measure for time processing not presented by the rest of the material. I do not believe this detracts from the effect of the inactivity, insofar as the instrumental inactivity still ‘frames’ the music around it.

14.2 - Form and Structure

The framework of *Cælitum* adheres to *structure-as-external process*, while also reflecting the *structure-as-isomorphism* model (see 5.2.1 and 5.4 respectively); it employs the practice of *sustention*. In simple terms, the piece is broken down into 32 sections, consisting of varying degrees of *active material* and *inactive immaterial* (silence). By these terms, I refer to sections of sustained pitch (*active*) contrasted against sections with no musical material (*inactive*); the tape is introduced periodically throughout the piece.

To determine the macro-structure of the work, I used a serial process based on triangular numbers; these are derived from points mapped to equilateral triangles of gradually ascending size (see **fig. 11**).

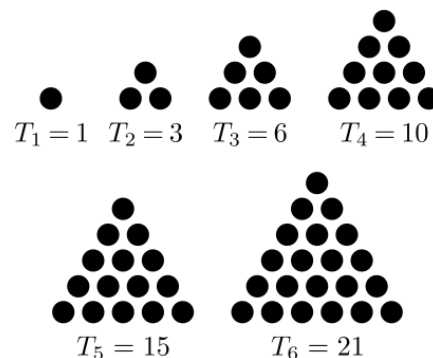


Fig. 11 - How triangular numbers are formed

As there were 20 minutes left in the musical scope of my portfolio, I decided that I would like to compose a process-based piece, which would be as close to this timeframe as possible. I approached the macro-structure by applying a sequence of *triangular numbers* to seconds; each number represent the duration of a section. From 16 consecutive triangular numbers, the total duration was 816 seconds, or approximately 13.6 minutes. The total duration of 19 minutes was arrived at by duplicating the second to ninth *triangular numbers*, allowing for 16 sections of *inactive material* without these becoming so long that they would risk destabilising the piece. Removing the “1” from the series gave me 328 seconds (see **Table 4**), resulting in a total duration of 1144 second, or just over 19 minutes

3	6	10	15	21	28	36	45
3	6	10	15	21	28	36	45
Total = 328 seconds							

Table 4 - Table for the *inactive* sections of *Cælitum*.

With regards to the ordering of the *active* and *inactive immaterial*, I wanted these decisions to follow a clearly determined, non-instinctive process. I knew that I would be making instinctive decisions with regards to the timbral changes on the surface-level, so wanted an external source to predetermine the succession of events, limiting the scope of instinctive decision-making to the outer layer of musical structure. To this end, I employed a random number-generator for the task. The source consisted of 16 sections of *active* and 16 of *inactive material*, so I set the range from 1-16, ran the process twice, and interweaved the result, shown in **Table 5**, below.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
45"	21"	1'18"	15"	15"	10"	21"	3"	1'06"	45"	1'31"	6"	3"	36"	6	28"
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
2'16"	10"	1'45"	36"	10"	45"	28"	3"	2'00"	21"	1"	15"	55"	6"	36"	28"

Table 5 - Table for the structural ordering in *Cælitum*. **Bold** font refers to *active* material, regular font refers to *inactive* material.

After the structural of the piece was determined, I further subdivided the time lengths for *active* sections by using the *infinite series* of natural numbers to determine the note durations. The *infinite series* is related to the triangular number series in that it is the n th sum part of the former (MathWorld, 2019), making it a suitable process for the subdivision of notes and rests. As such, each *active* section's duration can be divided by the sum of the *infinite series* ($1+2+3+4\ldots ad\ infinitum$).

As an example, the first section of the work, the 45 second duration can be divided into 9 parts:

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = 45 \text{ seconds.}$$

The *active* sections can therefore be assigned further subdivisions, giving the durations of each held note (in each part) and rest. To reorder these subdivisions, I used a random number generator with the range of $[1 - n]$, where n is the base *triangular number* of the section. **Table 6** illustrates this more clearly.

Flute	4	3	9	5	1	8	7	6	2
Clarinet	3	5	7	2	9	6	4	1	8
Perc. 1	7	9	8	3	6	5	1	2	4
Perc. 2	7	3	9	2	6	5	1	4	8
Violin 1	3	8	1	9	2	9	4	7	5
Violin 2	9	3	7	6	2	1	5	8	4
Violin 3	7	8	9	4	6	3	1	5	2
Violin 4	9	2	3	5	4	1	7	8	6
Viola 1	8	4	3	1	5	2	9	6	7
Viola 2	2	5	9	4	8	1	6	3	7
Cello 1	8	3	6	1	5	9	2	7	4
Cello 2	2	1	9	4	8	6	5	7	3
D-b	2	3	4	1	6	8	5	9	7
Each line adds up total duration =									45"

Table 6 - Section 1 (45") broken down into subsection for *active* (bold) and *inactive* (reg).

At this stage in the compositional process, the lengths of each section and their subsections had all been determined. The final stage involved the shaping of the surface-level material. I felt it was important to do this instinctively, to be able to tailoring the appropriate degree of timbral change to the allocated time-frames. My concern was that using process-based methods to distinguish the pitch and timbre would lead to undesirable results in terms of the orchestral balance. To ensure as good a result as possible, I created a colour-chart to monitor the vertical alignment of instruments and timbre; this also allowed me to ensure that no orchestral combination was used more than once across the duration of the work. This model is illustrated in **Fig. 13**, which gives an overview of the first section of the piece³².

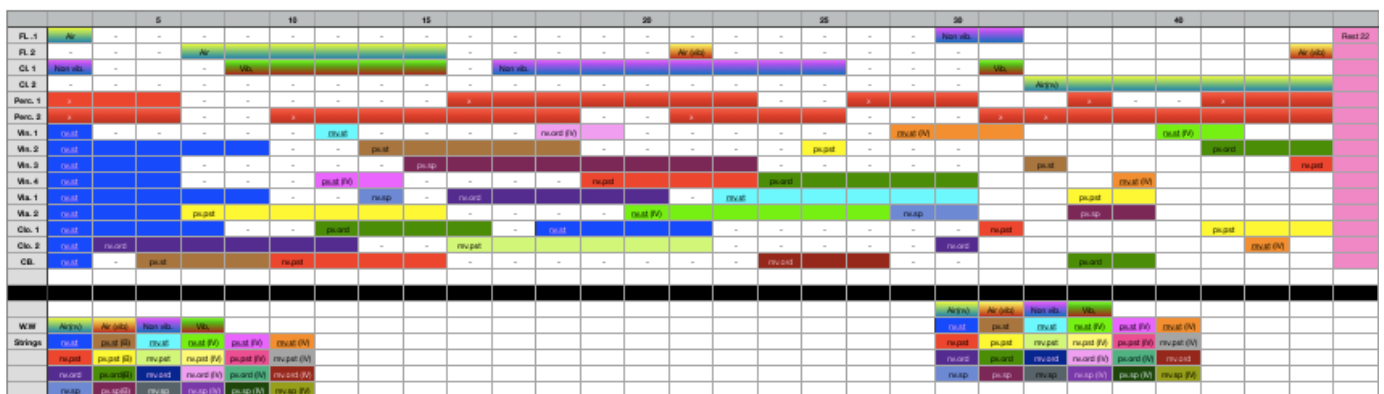


Fig. 12- Colour chart for the first section of *Caelitum*

The pitch material for *Caelitum* comprises a sustained ‘A’ for the majority of the work, with momentary moments of alteration. These alterations were devised based on the sectional duration of the sustained pitch. Moreover, the dynamic levels were instinctively determined; the reason for allowing myself this level of control was again, to a degree, be able to regulate the orchestral balance. For example, certain string techniques are notoriously difficult to balance in terms of brightness and projection within larger ensemble and orchestral textures (such as *sul tasto* and *sul ponticello*) . A relatively delicate approach to orchestration was therefore embraced.

³² For a larger version see **Appendix 3**

Furthermore, the quiet dynamic and relatively weak projection of these string techniques allowed me to experiment with fading in and out different orchestral effects³³.

With regards to form, there is evidence that a listener will retrospectively judge periods of silence as lasting longer than equal durations of sound. In a literature review on the experience of silence, Margulis points to a listener's overestimation of duration when they are waiting for something to happen (Margulis 2007, 488). Moreover, she presents Jones and Boltz' (1989) framework for understanding how structure affects modes of attending (sensing experiences) for time estimation. According to the study, "if the end of an event comes later than expected, the event will seem long and its duration will be overestimated. As a result, the presence of longer blocks of silence should infer a longer time perceived by the listener" (ibid., 488). This notion is experientially exploited in *Cælitum* through the difference in the duration of, and at times extended use of, silence.

14.3 - A Note on Notation

The score for *Cælitum* does not include barlines; as such the temporal pacing of the piece does not imply metre. Instead, the material is presented through extended lines for pitches and block durations for silences. Whilst not a direct reference, my model does take a degree of inspiration Penderecki's *Threnody to the Victims of Hiroshima* (1960), due to the use of sustained lines and the removal of barlines.

14.4 - Final Remarks

Experientially, *Cælitum* should have a low degree of succession; any perceived complexity takes place on the surface-level rather than the macro-structure of the work. The overall structure of the

³³ For example, on page 18 of the score (between 8'15"- 8'35") upon entry of the instruments, the flute, glock., vln.2 vla.1 and clo.1 sustain a pitch of similar projective quality. Vln. 3 and 4, vla.2 and clo. 2 crescendo while the timp. w/superball, vln.1 and 2 and double bass diminuendo. The overall dynamic level will be consistent but there should be timbral variety from the rise and fall of dynamics from instrument groupings.

piece was designed through formal processes but the musical surface was 'shaped' instinctively, to retain a sense of orchestral consistency and verticality.

By following *sustention* methods, the music embodies the concept of *static metamorphosis*, in which variation of colour coupled with limited structural movement, will allow the listener to remain in their own *specious present*.

15 - Summary and Conclusion

In the introduction to my theoretical framework (page 11), I mentioned that I have pursued notion of *localised* temporality in my music for a number of years; in fact, this was relevant to my MA portfolio, completed 2015. As such, the compositions in this portfolio are part of a long-term exploration of the topic. However, the ideas underpinning my compositional methods and models have only become fully formed in the past few years. As such, it is evident that my most recent pieces adhere more closely to the theory than the earlier works included in this portfolio.

My theoretical framework, in **Part I** of this commentary, is structured in a way that reflects my own ideas surrounding *localised* forms of listening. While I do not believe that time exists — in an objective sense — I do believe that the concept of a *specious present*, as outlined by F.B. Jevons (Jevons 1905/6, 206), carries a strong resonance with presentations of musical structure. This is supported by Howland and Tenney who describe spatial aspects of music by suggesting that listeners engage in segmentation in order to group materials in succession (Howland 2015, 71) (Tenney 1988, 32). This segmentation is explicitly linked to Bergson's observation that, when presenting ideas about time, individuals will attempt to separate present states from the preceding ones (Bergson 1910, 105). In fact, one could argue that if a listener can simultaneously perceive the moment-to-moment passing of the surface-level, while predicting future events (through expectation), then music holds the same attributes as the *specious present*.

Consequently, to create a music that is localised — and to present perceptions of “timelessness” — the composer must reduce the features in music that allow a listener to model *event-vectors*³⁴. Therefore, Chapters 4 and 5 explore the different structures that I would argue diminish a listener's ability to predict future events, by (re)directing their attention to the surface-level. This could be described as a shift from horizontal listening to vertical listening, lending verisimilitude to Kramer's ideas on time in music (see 4.3).

It is clear from **Part II** of this commentary that some of my pieces share a number of common elements. One might note, for example, that *Piano/Quartet(S)*, *Cælitum*, *Thelxiepeia* and

³⁴ These features are outlined as the characteristics of *global listening* (explored in 3.2).

Ouroboros all share the theme of extended repetition with explicit focus on timbral change.

Echoes and *Come to Me, Unyielding* both engage with temporal dissonance and the layering of temporal strata, while *On the Shore at Midnight* and *Silk and Velvet* present *instinctive* structures using asymmetrical metre and material. Moreover, every one of these works have in common an engagement with the surface-level and rely upon a suppression of teleological directionality.

To conclude, I would like to say that my research into the temporal musical experience has made me feel acutely aware of how we as human beings listen to, and engage with our sensory input — with respect to expectation and direction — and how this may play into the creation of music. Whether I pursue this topic further in the future is uncertain at this point in time; however, the techniques that I have learned and implemented over the past four years will doubtlessly play an integral role in my compositional work going forward. This is because — at a fundamental level — my writing process now seems attuned to engage with the core principle of music, explored throughout its history: how to manipulate tension and release.

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Appendix 1

Alfred Tennyson (1809-1892)

All Things Will Die (1830)

Clearly the blue river chimes in its flowing
 Under my eye;
 Warmly and broadly the south winds are blowing
 Over the sky.
 One after another the white clouds are fleeting;
 Every heart this May morning in joyance is beating
 Full merrily;
 Yet all things must die.
 The stream will cease to flow;
 The wind will cease to blow;
 The clouds will cease to fleet;
 The heart will cease to beat;
 For all things must die.

All things must die.
 Spring will come never more.
 Oh! vanity!
 Death waits at the door.
 See! our friends are all forsaking
 The wine and the merrymaking.
 We are called we must go.
 Laid low, very low,
 In the dark we must lie.
 The merry glees are still;
 The voice of the bird
 Shall no more be heard,
 Nor the wind on the hill.
 Oh! misery!
 Hark! death is calling
 While I speak to ye,
 The jaw is falling,
 The red cheek paling,
 The strong limbs failing;
 Ice with the warm blood mixing;
 The eyeballs fixing.
 Nine times goes the passing bell:
 Ye merry souls, farewell.
 The old earth
 Had a birth,
 As all men know,
 Long ago.
 And the old earth must die.
 So let the warm winds range,
 And the blue wave beat the shore;
 For even and morn
 Ye will never see
 Through eternity.
 All things were born.
 Ye will come never more,
 For all things must die.

Example of Text Conversation to Binary Code

Text

Clearly the blue river chimes in its flowing

Under my eye;
Warmly and broadly the south winds are blowing

Over the sky.
One after another the white clouds are fleeting;
Every heart this May morning in joyance is beating

Full merrily;
Yet all things must die.
The stream will cease to flow;
The wind will cease to blow

....

Binary Code of Text Above

```

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01101001 01110110 01100101 01110010 00100000 01100011 01101000 01101001 01101101
01100101 01110011 00100000 01101001 01101110 00100000 01101001 01110100 01110011
00100000 01100110 01101100 01101111 01110111 01101001 01101110 01100111 00001010
00001010 01010101 01101110 01100100 01100101 01110010 00100000 01101101 01111001
00100000 01100101 01111001 01100101 00111011 00001010 01010111 01100001 01110010
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01100001 01100110 01110100 01100101 01110010 00100000 01100001 01101110 01101111
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