

Exploring Organic Decay through Sound

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Abstract

This portfolio consists of eight compositions, scores and recordings, and a commentary. The commentary provides some context for how a consideration of organic decay in our world has shaped my music both technically and aesthetically. It discusses how seeking to capture different aspects of organic decay has changed my approach to form, notation, the creative process and live performance over the duration of this research. This is mainly explored through reflections on individual works, ordered chronologically in terms of their completion to more effectively communicate the rationale behind these changes. However, in reality these works form a web with overlapping creative time frames and revisions in response to one another.

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1. Context

Rationale

There are three reasons why I wanted to explore organic decay through sound. Firstly, music which investigates the notion of decay can encourage us to scrutinise our transitory human condition more deeply. I find the following description of Bill Viola's work particularly apt here: 'The real investigation is of life and being itself; the medium is just the tool in this investigation.'¹ My works document my own reflections on transience, but also serve as reminders to its listeners that we too will die. This is explored metaphorically by examining various forms of decay in our world, rather than engaging directly with human mortality as a poetic concept.

Sound as a medium lends itself well to this exploration because it is transient. The Wandelweiser composer Eva-Maria Houben once stated that 'listening becomes the awareness of fading sound. Fading sound is the link between life and art; between perception in daily life and perception while performing, while composing.'² This relationship is reinforced by her observation that 'by listening I am aware: nothing remains, everything is lost – something always is given to me so that I may lose [sic] it. Composition thinks about ways of losing [sic] sound.'³ Thus Houben suggests that sound's transience can remind us that everything in life is ephemeral.

Secondly, this research is pertinent in developing an aesthetic of quiet music that investigates both poetic and technical notions of decay. This is crucial as there currently appears to be more dialogue surrounding decay in the visual arts than in contemporary classical music. Only as recently as 2017 did Nomi Epstein write:

Despite many works being described as fragile, such as those by Morton Feldman, Luigi Nono and Salvatore Sciarrino, there has been surprisingly little writing relating specific musical elements to fragility, or asserting and defining musical or sonic fragility as legitimate terms.⁴

1 Raymond Bellour and Bill Viola, 'An Interview with Bill Viola', *October* 34 (1985), 101

2 Houben, Eva-Maria, 'Presence – Silence – Disappearance', Lecture at i and e festival (Dublin, 2010). Viewed online: http://www.wandelweiser.de/eva-maria-houben/texts-e.html#Houben_Presence, accessed 2/11/2018

3 Ibid.

4 Nomi Epstein, 'Musical Fragility: A Phenomenological Examination', *Tempo* 71 (2017), 40. <https://doi.org/10.1017/S0040298217000432>

Her article, 'Musical Fragility: A Phenomenological Examination', sought to address this by categorising different types of musical fragility in the works of various composers. My work seeks to build on this by providing an in-depth investigation into how my music explores organic decay.

Thirdly, existing music on impermanence seems to be often characterised by an ebbing away of life, realised through drones, stillness, silences, and emptiness. In the same article, Epstein states:

One can imagine that, with many works demonstrating multidimensional fragility, a semblance of life (in the music) may be hardly detectable. Sonic energy may seem almost strenuously expressed.⁵

While my music contains these elements, I am primarily trying to create surface energy and richness in my work, so that the materials not only falter but also have some activity and momentum, both in the sounds themselves and in the flow of materials.

Research questions

- 1) How might processes of decay be applied to sonic materials to deepen a work's poetic investigation of organic decay?
- 2) How might the methods of visual artists inform and extend the use of decaying processes in contemporary classical music?

I will now provide a frame of reference for my work. The following references were chosen because together they allow sounds to parallel decaying objects in our world. I will first outline aspects of organic decay, and draw on traditional Japanese aesthetics to identify physical qualities of decaying objects. To translate these qualities into sound, I will explain how sound can be perceived as a physical object, and how timbre can reflect the material qualities of decay. I will then consider how the transformation of sounds over time can mirror the process of organic decay. This is followed by a brief explanation of why my sounds parallel objects, and how the creative process is shaped by aspects of decay.

⁵ Epstein, 'Musical Fragility: A Phenomenological Examination', 50

Organic decay

I have investigated various types of organic decay in our world as poetic content for my music. I have explored processes of decay which occur naturally over time, because they are more unpredictable and difficult to control. They are also sometimes unnoticed and taken for granted, and show us that decay is inevitable and widely occurring, whether we notice it or not.

I am also interested in how each type of decay uniquely changes the properties of the object. I have concentrated on decay that enriches the properties of the material rather than merely fragmenting it, such as rust. Richness, unpredictability emerging from a lack of control, and refreshed perception are aspects which I aim for in my work.

My work involves finding musical parallels of organic decay, so that my sonic objects⁶ decay in a similar way through musical processes. By reflecting the natural decay of our world, my work is characteristic of what Jennie Gottschalk calls 'nonfictional music'⁷ – 'music that is about the time and place in which it occurs'.⁸

Traditional Japanese aesthetics

I was drawn to traditional Japanese aesthetics for two reasons. Firstly, decay is highlighted, rather than hidden. This is reflected in the practice of *kintsugi*, where broken pottery is mended with a gold paste that draws more attention to its fractures. This contrasts with other cultures, in which the notion of decay is often avoided and concealed.

Secondly, traditional Japanese aesthetics offer established ways of exploring decay in art that is an alternative to Western strategies. This is particularly true of wabi-sabi, the aesthetics of impermanence. The following aspects of wabi-sabi are important in my own aesthetics (adapted from Leonard Koren's table and writing in *Wabi-Sabi: for Artists, Designers, Poets & Philosophers*⁹):

6 Here referring broadly to a sound or collection of sounds within a work.

7 Jennie Gottschalk, *Experimental Music Since 1970* (Bloomsbury, 2016), Kindle Edition, Loc 250

8 *Ibid.*, Loc 256

9 Leonard Koren, *Wabi-Sabi: for Artists, Designers, Poets & Philosophers* (Imperfect Publishing, 1994/2008), adapted from 26-29.

Modernism	Wabi-sabi
Mass-produced/ modular	One-of-a-kind/ variable
Geometric organization of form (sharp, precise, definite shapes and edges)	Organic organization of form (soft, vague shapes and edges)
Manmade materials	Natural materials
Ostensibly slick	Ostensibly crude
Needs to be well-maintained	Accommodates to degradation and attrition
Purity makes its expression richer	Corrosion and contamination make its expression richer
Cool	Warm
Seamless, polished, smooth	Earthy, imperfect, variegated

Figure 1: Characteristics of wabi-sabi

Wabi-sabi differs from earlier Western traditions of exploring decay, such as memento mori and vanitas art, in that here, decay is expressed through the rich materiality of the object itself, rather than merely symbolised by skulls and candles. Even Romanticism's interest in ruins was centred more on fragmentation rather than decay which dynamically altered the material's properties.

These wabi-sabi aesthetics resonate with my own artistic sensibilities because they are rooted in the natural world, and are therefore ideal for work exploring organic decay. I will expand on how these qualities directly shape my materials in later chapters.

While the material qualities of wabi-sabi have hugely influenced my work, I have not taken on the underlying Zen Buddhist philosophy. As Koren notes, wabi-sabi does not simply explore material qualities but 'provides an integrated approach to the ultimate nature of existence (metaphysics), sacred knowledge (spirituality), emotional well-being (state of mind), behavior (morality), and the look and feel of things (materiality).'¹⁰ I merely draw from wabi-sabi aesthetics as a method of allowing my materials to reflect organic objects in our world.

Sound as physical object

Since I aim for my work to reflect organic decay, it is important that my sonic materials are perceived as objects, like the physical objects we encounter in

¹⁰ Koren, *Wabi-Sabi: for Artists, Designers, Poets & Philosophers*, 41

everyday life. Stephen Snook has commented on how repetition can create stasis within music:

Escher's interlocking and gradually evolving repeated figures seem ironically to put time into motion within the intrinsically static frame of the picture, while Clementi mirrors and reverses this process by so saturating the aural surface of his works with repetitive moving lines that their intrinsic temporal motion becomes subsumed into an aural stasis, producing a diffuse sonic 'image' within an indeterminate 'frame.'¹¹

While I aim for transparency and a minimal amount of material in contrast to Clementi's saturated textures, it is clear that through repetition, a sound or collection of sounds can establish itself as a single, static entity, like an object.

This sonic object then transforms over the entire duration of the piece, to reflect a physical object undergoing a process of organic decay. The decay is global rather than local, affecting the work in its entirety since it is the main focus. Since transformation is, as composer Edmund Finnis described, 'a very specific kind of variation technique'¹², different versions of the same material are presented, as though the same object is undergoing various stages of decay. My work is therefore a window of time in which the listener can 'view' and scrutinise an object in space, rather than traverse through a changing landscape.

Most of my works have a central metaphor for the way a sonic object transforms. This is to help listeners ground the music, which is naturally abstract, in a more concrete, everyday experience of organic decay. Underlying this is an aesthetic of transparency, a desire to reveal connections between the sounds and decay. According to the instructional technologist Paul Harmon, metaphors can highlight and conceal certain aspects of the material, and set an emotional tone for the listener¹³:

When we choose an image to begin a slide show [...] we are automatically directing the reader's attention to some aspects of the subject rather than to others. Moreover, since most basic metaphors also imply an attitude, we are, in effect, suggesting the feelings that our reader should summon as he or she begins to learn about a new subject.¹⁴

11 Gottschalk, *Experimental Music Since 1970*, Loc 3986. Quote originally from Stephen Snook, "Aldo Clementi: Works with Guitar," <https://www.dramonline.org/albums/aldo-clementi-works-with-guitar/notes>

12 Edmund Finnis, *Illuminating Distortion: Using Distortive Methods as Generative Agents in the Compositional Process* (PhD diss., Guildhall School of Music & Drama, 2013), 33-34

13 Paul Harmon, 'Review of *Metaphors We Live By* by George Lakoff and Mark Johnson', *Journal of Instructional Development* 6 (1983), 37. <http://www.jstor.org/stable/30220738>

14 Ibid.

This is important because metaphors can prevent the listener from focusing on ideas that were not intended by the composer. By informing the listener's experience of the work, metaphors can enable listeners to have a fresh perception of decay in the world.

Tactility: timbre as surface

With the importance of metaphor in my work, it may seem like the sound itself is less valuable than what it is alluding to. However, the opposite is true. I explore references to organic decay by delving deeper into the materiality of sound itself, thereby keeping sound as central.

For sounds to seem tactile, like objects, there needs to be an equivalent of a textural surface. In my work this surface is characterised primarily by timbre. I wrote earlier of investigating processes of organic decay which alter and enrich the properties of the material. I have explored this musically by working with what I consider to be high entropy material¹⁵, that is, sounds which are timbrally rich and unstable. Their instability reflects the unpredictable, and varied, results of organic decay. Rather than creating richness through complex combinations of pitches and rhythms, the richness lies in the timbre, which arises simply from the physical nature of the instrument. Richness is found rather than constructed. (In describing his own aesthetics, the composer Paul Newland has connected found richness in music with Bizen pottery, which exposes the natural, unpredictable results of the glazes.¹⁶) This approach to material is informed by the value of earthiness in the wabi-sabi aesthetic:

Earthy. Things wabi-sabi can appear coarse and unrefined. They are usually made from materials not far removed from their original condition within, or upon, the earth and are rich in raw texture and rough tactile sensation. Their craftsmanship may be impossible to discern.¹⁷

The equivalent of this earthy richness in timbre is often found in extended techniques. Their likeness to organic material is reflected in their tendency to be discovered, rather than crafted, through the instrument's physical properties. Extended techniques reinforce the notion of minimal craftsmanship, because they often come with their own found pitches and requirements for duration and dynamics, as well as a lack of control. They also make the sound source more ambiguous, which enables the sound to be its own object rather than being

¹⁵ This term was suggested by Stephen Cornford.

¹⁶ Paul Newland, Guildhall School of Music & Drama 'Open Session' seminar, 7/6/2017

¹⁷ Koren, *Wabi-Sabi: for Artists, Designers, Poets & Philosophers*, 68

defined by its source. I have simplified other musical parameters and used extended techniques within transparent textures to allow their rich timbre to be the focus. Timbre is central – pitch, rhythm, dynamics, tuning and harmony all serve to enhance timbral richness.

Kaija Saariaho's *Sept Papillons* (2000) for solo violoncello is a beautiful example of timbral richness and activity in the context of impermanence. She explores vulnerable sounds which are prone to change by transitioning rapidly between harmonics and non-harmonics¹⁸, and placing the bow very near the bridge.¹⁹ The cellist Anssi Karttunen has commented on the lack of control that Saariaho often invites in her music in general:

I realized quite quickly that it was not a question of destroying beauty which could, indeed, be the first conclusion because our entire education as instrumentalists focuses on teaching us to control qualities of beauty in the sound to the very extreme. Now there is a composer who insists that you begin to break down this control, [which produces] the beautiful sound. And suddenly, we find new values of beauty in this deformed [broken] sound.²⁰

Like earthy materials, sounds resulting from a lack of control and rawness have a distinct beauty that is different from sounds which are refined and crafted.

However, my practice is closer to composers who explore natural musical phenomena in a more radically austere way. Éliane Radigue's wolf tone piece *Naldjorlak I* (2004-2009) for solo violoncello, and John Lely's *The Harmonics of Real Strings* (2006/13) are examples of works which are very exposed, focused and grounded in rich timbre, while also sharing the notion of minimal craftsmanship. In *Naldjorlak I*, Radigue investigates the wolf tone, a note that is naturally 'jagged or excessively-resonant'²¹ from being the same as the natural resonating frequency of the instrument. While the lack of control over this raw sound has led to its perception as 'a blemish on an instrument's sound'²², Radigue magnifies this complex timbre by tuning all the parts of the cello to the wolf tone, including the strings, tailpiece and endpin. This emphasis on investigating the natural richness of the instrument rather than the imposed craft of the composer, is reflected in her collaborator Charles Curtis's statement:

Tuning to the wolf tone inverts the conventional function of tuning, which is to link an individual instrument to a social norm – concert pitch, what in

18 Saariaho, *Sept Papillons* (2000), Papillon V, bb.1-2. Chester Music (CH 62150)

19 Ibid., Papillon III, bb. 2-3.

20 Anssi Karttunen in Pirkko Moisala, *Kaija Saariaho* (Urbana and Chicago, 2009), 81

21 Charles Curtis, quoted in www.shiian.com/shiian3.php, accessed on 31/10/18

22 Charles Curtis in *ibid.*

German is called kammerton. Instead, the cello is tuned to a value found within itself. From an outwardly directed act, tuning is turned inward, seeking an audible structure of interiority.²³

Lely's work, written for any solo bowed string instrument, features harmonics which naturally appear and disappear as a very slow, harmonic glissando is played on one string. The work exposes not just the natural harmonics but also very complex sounds inherent in the instrument, such as multiphonics and grainy sounds which arise from playing between the nodes. However, these timbral complexities are found through such simple and practical means, which are rooted in the physicality of the instrument rather than the intervention of the composer. This exposure of the naturally occurring richness of the instrument through minimal craftsmanship has led to Lely being described as exploring the cusp between art and science. John Eyles writes:

Despite its experimental nature, the whole thing never sounds remotely like a Physics experiment but makes fascinating and enthralling music which handsomely repays repeated listening – a near-perfect marriage of science and art.²⁴

By exposing rather than constructing richness, listeners can scrutinise the natural phenomena of our world in a fresh way, in the very materials of the work.

Change

Organic decay in our world often occurs very gradually over long periods of time. In watching a flower wilt, for instance, the changes are small and subtle in the moment, but over time, its transformation is quite pronounced. Time is linear, with the flower having a clear past and present. But the process takes a long time to unfold and may appear very static.

Similarly, my sonic objects ultimately decay in a linear trajectory, but also seem static due to the high amount of repetition and the subtlety of the transformations. In most works, their specific poetic metaphor has influenced why and how the sonic object transforms. I enjoy the sense of ambiguity as to how much time has really passed, and aim to make my pieces feel much shorter than they really are. This approach to time is described by the composer Michael Pisaro as

²³ Charles Curtis, quoted in www.shiijin.com/shiijin3.php, accessed on 31/10/18

²⁴ John Eyles, 'John Lely: The Harmonics of Real Strings', *all about jazz* (January 2015): www.allaboutjazz.com/the-harmonics-of-real-strings-by-john-eyles.php, accessed 4/11/18

...time which is felt only in moments of transition, where duration is only figured in retrospect: this is the time we know, as opposed to the time which is told.²⁵

By letting my pieces unfold naturally in near stasis, without emphasising a musically imposed time, I aim to reinforce the notion that the listener is 'viewing' an object decay in our world.

Beauty and decay

Organic decay can sometimes be aesthetically very beautiful, but underlying it is also a sense that things are not as they should be. Both aspects must be present, in order to rightly acknowledge the seriousness of mortality, and the aesthetic beauty that decay sometimes has. Koren captures this tension well in his description of wabi-sabi as producing a 'sad-beautiful feeling'²⁶.

Without acknowledging the gravity of decay, there is a risk of 'beautifying destruction'²⁷, which can lead to an insensitivity in exploring decay. The war photographer Graham Sutherland (1903-80) considered this during The Blitz, when he was eager to photograph ruins from air raids until he saw the human cost in East London.²⁸ He wrote that the City of London buildings 'were offices and people weren't in them at night. But in the East End one did think of the hurt to people and there was every evidence of it.'²⁹ There is clearly no beauty in such destruction.

I mentioned earlier that a reason for exploring organic decay through sound was to encourage us to scrutinise the human condition more deeply. The works in this portfolio do not explore human mortality directly, but at one remove, by drawing parallels with inanimate objects and other organisms which decay. Sounds are likened to decaying physical objects or organisms in our world, which we then connect with ourselves through our shared transience.

25 Gottschalk, *Experimental Music Since 1970*, Loc 3923. Quote originally taken from Michael Pisaro, "Time's Underground", http://www.wandelweiser.de/michael-pisaro/texts.html#Times_Underground

26 Koren, *Wabi-Sabi: for Artists, Designers, Poets & Philosophers*, 57

27 Sara Wasson in a film shown in 'Perspectives of Destruction', Museum of London. The film's citation read 'the risks of beautifying destruction'.

28 Ibid., and other citations in Museum of London, 'Perspectives of Destruction' (2017)

29 Citation in Museum of London, 'Perspectives of Destruction'

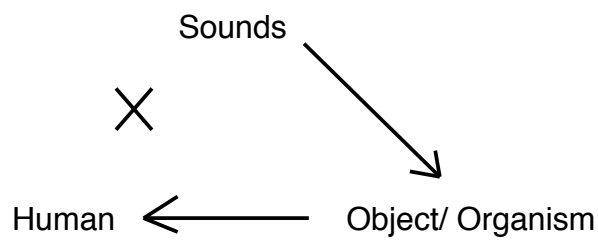


Figure 2: Parallels between sounds, object/ organism and listener

I have not explored human mortality directly for two reasons. Firstly, if I am searching for beautiful sounds, the work is more likely to beautify death in its direct exploration of human mortality. Secondly, this relationship is associated with a more traditional view of music which is based on emotive expression and verbal dialogue. Instead, by reflecting objects, there is more freedom to explore sounds that I find beautiful, but when lost, naturally evoke a sense of sadness and poignancy.

Collaboration

Collaboration is at the heart of my compositional practice. Every piece in this portfolio is the result of a close collaboration with instrumentalists, from the start to the end of the creative process. Some works also involved visual artists and dancers. This was necessary for two reasons. Firstly, in pursuing timbral richness that is found rather than crafted, it was crucial to work with musicians who intimately knew the physical properties of their instrument. The emphasis on discovering sounds together rather than merely testing sounds I had already composed, resulted in sessions that were open and flexible, but still directed. Input from collaborators often led to intriguing and unfamiliar material, which I incorporated into the work. Therefore the collaborative process itself was shaped by a deliberate lack of compositional control. Secondly, the sounds that result from extended techniques are often dependent on, and specific to, individual players. Collaborators were necessary to test that these extended techniques were reliable across various players.

2. Works

***Reordering the Unconsumed* (for two violoncellos and video)**

Reordering the Unconsumed was written for *We Astronomers*, a site-specific project that was showcased as part of *Curious Festival* in 2016. *We Astronomers* was curated by the MAP/ making group³⁰, and fostered collaboration between musicians and visual artists from the Guildhall School and Central Saint Martins. *Reordering the Unconsumed* was created in collaboration with Geoffa Fells and violoncellists Christopher Brown and Natasha Zielazinski, with help from Lawrence Jay Pearson, Sophie Clements and Paolo Catalano who enabled Geoffa's visual material to be presented as a video.³¹

The work exists as a live performance, with two violoncellos tracing the trajectory of expansion and contraction inherent in decomposition, while video footage of mould is projected onto two screens behind them.



Figure 3: Natasha Zielazinski and Christopher Brown playing *Reordering the Unconsumed* in the Rose Lipman building (photo: Tom Medwell)

³⁰ The MAP/ making group consists of Sophie Clements, Nell Catchpole, Detta Danford, Natasha Zielazinski and Jo Wills.

³¹ Alice Bibette (visual artist) and Robert Hesp (dancer) were also collaborators in the early stages of the project. Geoffa Fells joined the project a little later. This project involved weekly sessions with tutors Nell Catchpole, Sophie Clements, Natasha Zielazinski, Detta Danford and Jo Wills, whose valuable feedback and ideas greatly influenced the outcome of the work.

Our starting point were the words 'expansion' and 'contraction', which we selected from the brief we were given. We arrived at mould through a long and unexpected route – rather than thinking immediately about the expanding and contracting motion of decaying matter, we originally thought of contraction as a means of compression, burial and fossilisation. It was in this context that Geoffa began collecting dust from around London using sticky tape. She saw dust as a layer which buried us, and wanted to lift it from the surfaces we see everyday – our clothes, home, and the underground stations and tubes. It was through this experiment that we eventually moved away from fossilisation and centred on mortality and our return to dust.³²

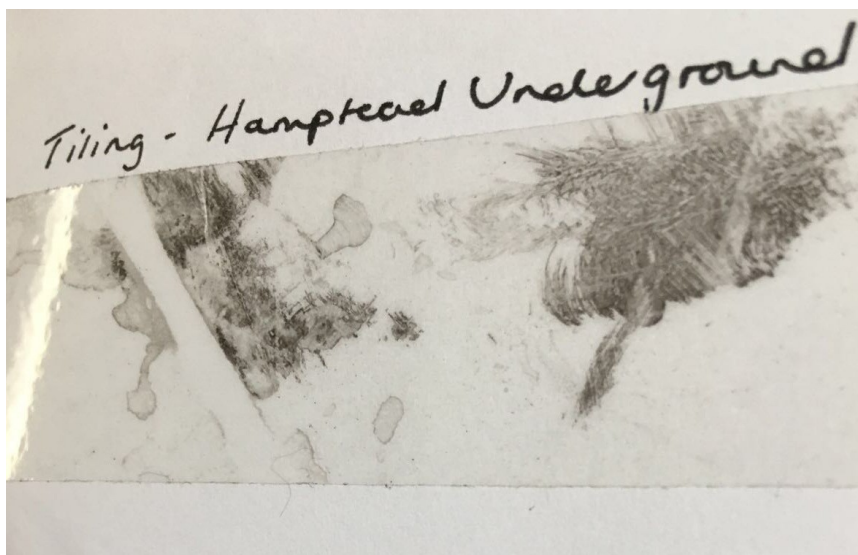
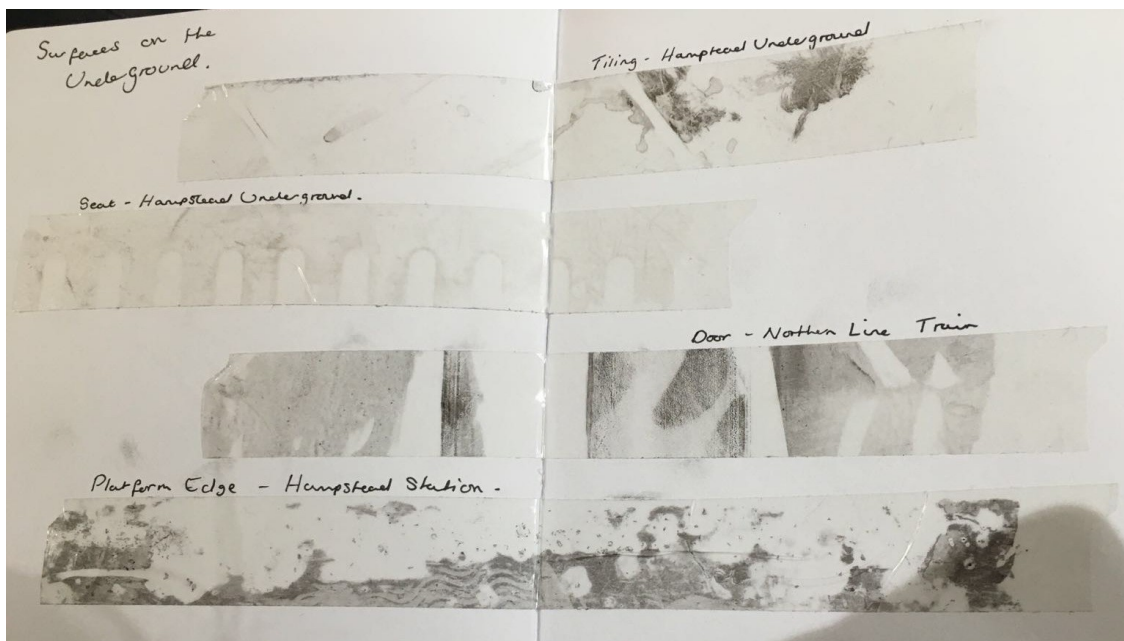


Figure 4: Dust collected from around London using sticky tape

³² This change of context was suggested by Sophie Clements.

What was striking about Geoffa's early tape experiments was her desire to discover what was naturally occurring around us by capturing and revealing it in an unfamiliar way. We are invited to look at what is often hidden and unwanted in our everyday lives. By documenting traces from our world and framing them like slides under a microscope, she encourages us to scrutinise mortality more closely, not as an abstract, distant concept but intimately, with the labels bringing it much closer to home.

Geoffa then captured mouldy material from food she had left to rot. This was significant as it revealed not dead dust but organic matter which grew as part of the decaying process. The following was mould from residual tea in a mug:



Figure 5: Mould from residual tea

Developing this further, here a grid, reminiscent of a lattice, was created by superimposing layers of acetate with gaps in between, on which the sticky tape adhered. There was a rich tension between growth and decay – mouldy matter seemed like fragments of plant life, with the rotting blueberries almost looking like pressed flowers.



Figure 6: Mouldy matter (and bits of white paint) on acetate

These acetate sheets were then photographed individually on a light box and compiled into a video.³³

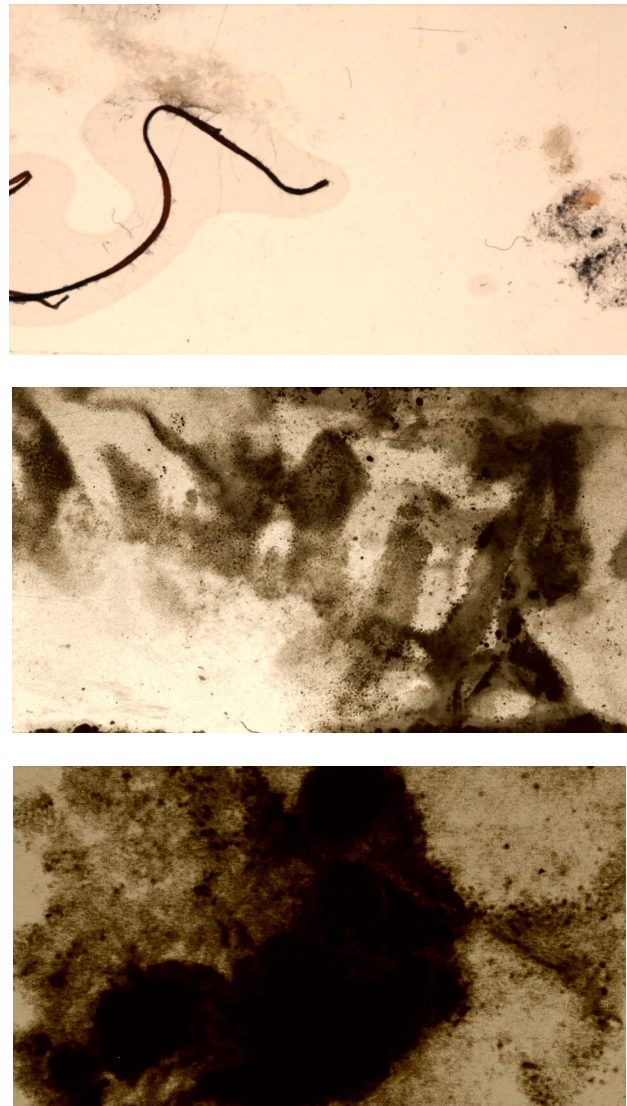


Figure 7: Stills from final video

The notion of scrutinising the mould from Geoffa's early tape experiments was preserved in the final outcome through the deliberately unsteady angles which move in and out of focus.

The music conveys the gradual process of decay. This was intended as a contrast to the video, which initially revealed snapshots of material at a fixed stage of decay. However, as the creative process developed, the video evolved to show an unfolding chronology of decay through subtle adjustments of colour. The music and video now closely parallel one another, but each progresses

³³ This part of the process was carried out by Paolo Catalano, Sophie Clements and Lawrence Jay Pearson.

freely without any formal ways of synchronisation.

As well as Geoffa's experiments, the music was influenced by Sam Taylor-Johnson's film *Still Life*.³⁴ Taylor-Johnson's time-lapse of a rotting bowl of fruits helped me to form a rough list of the various stages of decay, which evolved to become the different sections of the piece:

Section	Characteristics
Start	Ordered, earthy, organic, alive but slightly stale
A	Growing mouldy, increasingly fluffy, undefined and hazy
B	Expanded, fully mouldy, utterly fluffy, undefined and hazy
C	Shrinking, collapsing, becoming dense liquid
D	Dense, dark, liquid, disordered

Figure 8: Form of *Reordering the Unconsumed*

Decay is portrayed through the rhythmic structure, timbre and pitch of the material. All three parameters work closely together to convey decay holistically.

Sonic aspect	Aspect of decay
Rhythm	motion (expanding, shrinking, liquid), and entropy (order → disorder)
Pitch	loosening of physical tension (collapsing)
Timbre	material quality (stale → fluffy → dark, dense)

Figure 9: Parallels with organic decay in *Reordering the Unconsumed*³⁵

Rhythm as motion and entropy

Brian Cox's explanation of entropy in 'Destiny', the first episode in the television series *Wonders of the Universe*, informed the rhythmic structure of my work. To describe how increased entropy means increased disorder, he suggested we view objects as having many constituent parts, like grains in a pile of sand.³⁶ In his explanation, a sandcastle has low entropy because there are few ways of rearranging the sand grains without altering the sandcastle's ordered structure.³⁷ In contrast, a disordered pile of sand has high entropy because

³⁴ The work can be viewed on www.samtaylorjohnson.com/moving-image/art/still-life-2001, accessed 2/11/18

³⁵ Tables showing parallels were informed by Arnie Cox's cross-domain mappings in Arnie Cox, *Music and Embodied Cognition: Listening, Moving, Feeling, and Thinking* (Indiana University Press: Bloomington and Indianapolis, 2016), 68

³⁶ Brian Cox in 'Destiny', *Wonders of the Universe* (BBC, 2011)

³⁷ Cox in *ibid.*

there are numerous ways of rearranging the grains while maintaining its structure.³⁸

Cox's explanation of entropy was helpful in three ways. Firstly, it reinforced the transition from order to disorder in the work's form. Secondly, the notion of rearranging constituent parts led me to build the piece from a gamut of rhythmic values which are constantly reordered.



Figure 10: Rhythmic gamut as an object with constituent parts
(bb. 1-2 of Rhythmic Skeleton, from which both violoncellos get their rhythm)

Thirdly, knowing that high entropy means more ways to rearrange the constituent parts while maintaining its structure³⁹, led me to create the material in section C. Here the rhythmic profile becomes more self-similar, transforming into a constant stream of quavers.

The following table shows how the work's rhythmic structure reflects the motion and entropy of decay. (Please also refer to the rhythmic skeletons in the appendix.)

Section	Entropy	Motion	Rhythm
Start	Low (Order)		Clearly defined, distinct phrases
A		Growing	Phrases expand as small cells repeat within each phrase
B		Expanded	Subdivision of the beat lengthens from semiquavers to triplet quavers Slower tempo
C		Shrinking	Longer values gradually omitted, so that the material becomes more self-similar (only quavers) 12/8 – flowing quality
D	High (Disorder)	Liquid	Constant tremolo (Cello 1) and sustained sound (Cello 2) – fluctuating, liquid state

Figure 11: Rhythmic structure reflecting motion and entropy of decay

³⁸ Brian Cox in 'Destiny', *Wonders of the Universe*

³⁹ Cox in *ibid.*

Pitch as a loosening of physical tension

The loosening of physical tension (or collapse) of decay is conveyed through the instruments' glissandi and the increasingly lowered tuning⁴⁰ of the second cello. Its fourth string is tuned a quarter-tone flat, and its third string, three quarter-tones flat.

Section	Pitch
Opening	-
A (specifically bb. 20-22)	Both cellos play the B flat natural harmonic on the fourth string, a quarter-tone apart Descending glissandi
B	Natural harmonics are heard occasionally as both cellos glissando on their third strings, tuned three quarter-tones apart
C (towards the end)	Cello 2 further detunes the fourth string
D	Cello 2 fluctuates tuning, with no string tension

Figure 12: Parallels between pitch and collapse

Natasha Zielazinski suggested detuning the fourth string in section D to link the chaos of decay with the player's inability to create order out of their instrument when there is no string tension.

Timbre as material quality

The material qualities of decaying matter are conveyed through the timbral transition from the pure, high harmonics, to the hazy and muted half pressure glissandi, to the dark and dense low register. The two violoncellos form a composite object – they do not influence one another, but metaphorically decay as one.

This work raised three further avenues of research.

Lack of control

The flexibility of the work allows the piece to change subtly with each performance. This mirrors the unpredictability of mould and its unique ways of decaying. Not only is the music flexible (the unspecified pitches and lack of rhythmic alignment from section B), but the way the music and video align can also shift. Through this lack of control, there is an element of discovery with

⁴⁰ This idea was particularly informed by Detta Danford and Natasha Zielazinski.

each performance as to how the work will unfold.

However, while the opening was intended as a more ordered version of the sonic object, the results seemed too constructed, specific and contrasting. This is because pitches were chosen intuitively, instead of arising unpredictably and naturally as in section B. This made me realise that it is a lack of control that I want to explore in more depth. I also enjoyed how decay was reflected in the score as the material lost more definition from reduced compositional control.

In the future, I want to limit my control even further to produce more unpredictable and organic results. More specifically, I struggled to find a naturally occurring equivalent to Geoffa's video. I was searching for more than a metaphorical depiction of decay – I wanted concrete evidence of organic decay in sonic form. I wanted to discover this along with the listener through a lack of control, in the same way Geoffa's tape experiments exposed the natural phenomenon of decay, but was unable to find a solution.

Greater transparency

Although some conceptual meaning was contained in the rhythmic profile of the work, this was not very perceptible apart from very broad transitions. The rhythmic profile gave an energy and flow, rather than being a recognisable entity. As a result, some of the intricacies of its transformations, and therefore its conceptual meaning, were lost. I would like compositional decisions to be more transparent to the listener. I want to focus on investigating decay using mainly one musical parameter within a future work, to simplify and focus my work, and maximise the impact of compositional decisions. What is the minimum amount of material needed to explore decay? What is the simplest and clearest way to explore decay?

Growth within decay

Before *Reordering the Unconsumed*, I was researching the broader field of disintegration with an emphasis on how objects became incomplete through erasing, breaking, fragmenting, and fading. This aesthetic was influenced by the fragile weightlessness of visual art by Do Ho Suh, Shi Jindian and Bruno Catalano, and the understated violence of Shozo Shimamoto's *Holes* (1954).⁴¹

However, *Reordering the Unconsumed* opened up possibilities by investigating

⁴¹ Shimamoto's *Holes* can be viewed online at Tate, www.tate.org.uk/art/artworks/shimamoto-holes-t07898, accessed 3/1/19

how an object can paradoxically grow within the decay process. The object does not passively vanish, but dynamically transforms while teeming with activity. This led to an embracing of richer, more unpredictable materials. What other processes allow the object to paradoxically grow while decaying? Pursuing this line of enquiry resulted in a deeper interest in visual artists working with organic materials, particularly Anya Gallaccio. Her work *preserve 'beauty'* (1991/2003)⁴² for instance, consisted of panels of red flowers which gradually rotted over the duration of the exhibition.

Activity

I wish to enrich my music by exploring how speed can deepen an exploration in organic decay. How might sculptural material have a forward momentum? What is the minimum amount of material needed to generate a fast, active (yet sculptural) sonic object? How might I create complexity from simple, pared down materials?

⁴² Gallaccio's *preserve 'beauty'* can be viewed online at Tate, www.tate.org.uk/art/artworks/gallaccio-preserve-beauty-t11829, accessed 4/1/19

***Reframe* (for chamber orchestra)**

Reordering the Unconsumed was one of several pieces I wrote during my first year, all of which focused on impermanence. By the end of the year I felt that this was unsustainable. I initially tried to balance this by exploring positive functions of disintegration in our world, such as its ability to expose and conceal materials⁴³, and create new spaces. However, as my research shifted towards organic decay, these investigations gradually led to an exploration of hope within decay.

During my research, I noticed parallels in Christian eschatology. The notion of a future bodily resurrection provided a reference to hope in the face of death. In his first letter to the Corinthians, Paul writes:

But in fact Christ has been raised from the dead, the firstfruits of those who have fallen asleep. For as by a man came death, by a man has come also the resurrection of the dead. For as in Adam all die, so also in Christ shall all be made alive. But each in his own order: Christ the firstfruits, then at his coming those who belong to Christ.⁴⁴

There are two implications from this that I would like to explain in further detail. Firstly, Paul states that everything dies. Christians believe that although it was once a very good world without death, everything now dies because Adam and Eve dethroned God. Death was part of God's just response to humanity's rebellion. Secondly, Paul claims that death is defeated. Despite humanity's rebellion, God lovingly sent Jesus to pay the penalty humanity deserved. This means people can have a restored relationship with Him, and live with Him in a new, physical world untainted by death and rebellion. According to Paul, Jesus's resurrection is evidence that rebels who trust in Jesus's rescue will also be physically raised to life when Jesus returns. This is why Paul wrote triumphantly near the climax of the chapter:

O death, where is your victory?
O death, where is your sting?⁴⁵

This notion of death being defeated became significant during the creative process of *Reframe*.

43 Conversation with Geoffa Fells (Guildhall School of Music & Drama, 3/6/16) on how breaking an object can reveal hidden objects embedded within it.

44 Paul, 1 Corinthians 15:20-23, the bible. (Scripture quotations are from The ESV® Bible (The Holy Bible, English Standard Version®), copyright © 2001 by Crossway, a publishing ministry of Good News Publishers. Used by permission. All rights reserved.)

45 Paul, 1 Corinthians 15:55

Wabi-sabi and the bible?

There are two reasons why it may seem contradictory for my music to be influenced by both wabi-sabi and the bible. Firstly, the bible is an unfolding narrative, which raises connotations of programmatic and rhetorical music – music that seems opposite to static, sculptural materials. Secondly, wabi-sabi has roots in Buddhism, which is at odds with biblical beliefs.

I would like to briefly clarify their relationship to my work. The bible is used as another poetic source during the creative process. It provides abstract themes that connect with other sources, such as visual art or natural phenomena. Since my music does not seek to portray the biblical narrative, my materials are not programmatic or rhetorical. As for wabi-sabi, I only draw from its aesthetics on material qualities, rather than its Buddhist philosophy. These material qualities enable the listener to scrutinise the decay of sonic objects in a very close and focused way. These approaches allow my music to be informed by both the bible and elements of wabi-sabi.

Several months prior to composing *Reframe*, I encountered Jiang Zhi's *Love Letters* (2014)⁴⁶ in the White Rabbit Gallery in Sydney. The gallery's citation beautifully encapsulates the artist's longing for death to cease:

Jiang Zhi's wife, whose name meant Orchid, died at the age of 37. As a tribute to her and to 'all who love and are loved', he began dousing orchids and other flowers with alcohol and setting it alight. His pictures capture the normally imperceptible instant when flame and flower are both in bloom. In the real world each flower will soon be ash, but in the dream space of the photograph death can still be averted, and the flower emerge [sic] phoenix-like from the flame.⁴⁷

It is striking how Jiang Zhi expressed this content with such intimacy in his work, using simple and everyday materials. By simply changing the viewer's perception of time, he created an illusion of overcoming decay. The viewer is simultaneously confronted by the stark reality of death, and the notion that death can be avoided.

Reframe grew out of a period of reflecting on both these sources. I wanted to explore the notion of death ceasing, with the same intimacy and simplicity as *Love Letters*. I also wanted to maintain a degree of abstraction – *Reframe* does

⁴⁶ Jiang Zhi's *Love Letters* can be viewed online at Photography of China, www.photographyofchina.com/jiang-zhi-love-letters/, accessed 2/11/18

⁴⁷ White Rabbit Gallery, Sydney. © Used with permission.

not portray the narrative in Paul's letter. Rather it just expresses a longing for death to be defeated, within the context of our present mortality. *Reframe* is in two movements – *Fraying* and *Prolonged*. The first presents a sonic object that gradually decays. The second reframes this object and slows it down, so that the process of decay is frozen, and the object appears almost immortal. The second movement behaves like *Love Letters*, which simply alters our perception of the object, so that its decay is halted by the camera. (In other words, the second movement is an intervention of the first movement.)

The first movement, *Fraying* is somewhat similar to *Reordering the Unconsumed* in that a sonic object decays in a linear, goal-oriented trajectory. It explores the notion that 'all die'⁴⁸. However, here we encounter the object when it is already approaching high entropy (having learned the need for a more unified sound world from *Reordering the Unconsumed*). In *Fraying*, higher entropy is conveyed through increased timbral instability, activity and higher frequencies. The following shows how the violins, harp and bowed piano depict high entropy.

Instrument	Material reflecting high entropy
Violins	gradual transition towards playing directly on the bridge and very fast tremolos ⁴⁹
Harp	bisbigliando passages become longer
Bowed piano	repeated iterations cause strong presence of upper partials

Figure 13: Material reflecting high entropy in *Reframe*

As the work unfolds, small gaps are created in the texture through moments of temporary, white noise. These lengthen until the texture eventually thins out and frays.

In contrast to *Reordering the Unconsumed*, which embodied a very specific type of decay, the decay process in the first movement seemed arbitrary and was

⁴⁸ Paul, 1 Corinthians 15:22

⁴⁹ The violin material was informed by the third microlude (*Shimmering Quasi-Crystal*) in Alex J. Hall's string quartet *By the Pen of the Rose...* (2016). In his work, the strings gradually increase bow frequency to tremolando, and transition from molto sul ponticello to bowing vertically. However his pitch content is very different – his strings play a generally descending sequence of very high and very quiet artificial harmonics, which swell and recede in dynamics. Hall's work can be heard on: www.soundcloud.com/alexjhallmusic/by-the-pen-of-the-rose-for-string-quartet, accessed 4/1/19.

The transition towards smaller durations was also influenced by Beethoven's Piano Sonata No. 32, Op. 111, Movement 2 (1821-1822), which approaches fast surface detail within a slow harmonic rhythm.

decided rather late. This is because the work focuses on decay ceasing, rather than the decay itself. However, the notion of something fraying seemed appropriate, particularly with this definition – 'to become slightly separated, forming loose threads at the edge or end'.⁵⁰ This seemed apt as the string instruments are treated as individual threads rather than larger units, which eventually cease.

In contrast to the first movement, *Prolonged* emits a steady presence through slower bowing, longer durations and louder dynamics. The sense of the second movement as a reframing of the first is aided by the emergence of lower frequencies (usually made more perceptible when material is slowed down), which reframes the partials of the first movement as having a lower fundamental (played by the double bass). The addition of brass and lower strings, with their slowly evolving drones and incrementally shifting glissandi, enrich the sound with a stronger resonance and glow. The slower bowed piano material also enables its fundamentals to be heard more audibly than before, which provides warmth and depth. The upper strings isolate a splinter of the first movement's chronology and freeze it, thus preventing a transformation towards white noise and decay. Within these splinters, the soft edges resulting from the staggered entries and exits of individual layers (shown below), preserve an organic quality in the context of prolongation and presence.

The image shows a musical score for section G of *Reframe*, movement 2 (*Prolonged*). The score is for Violin 1, Violin 2, and Viola. It features staggered entries and exits of individual layers, with dynamics marked as *pp* and performance instructions such as "molto sul pont., very fast trem." and "poco sul pont., medium trem. (unmeasured)". Section markers G and H are present.

Figure 14: Soft edges in section G of *Reframe*, movement 2 (*Prolonged*)

⁵⁰ Cambridge Dictionary, <https://dictionary.cambridge.org/dictionary/english/fray>, accessed 2/11/18

I wanted to investigate questions that were raised from *Reordering the Unconsumed*: How might sculptural material have a forward momentum? Or, in other words, how can I create active music that still allows the listener to focus on an object? What is the least amount of material needed to create this activity? These questions were important because I wanted to explore forms of organic decay that were not characterised merely by an ebbing away of life, but also a rich surface energy and activity.

At first it seemed contradictory – how can a static object have motion? The composer Bryn Harrison articulates this confusion well:

From the point of view of Kramer's categorisation of time, this approach becomes problematic since it does not allude directly to the notion of a vertical time - in which events happen within a static time frame - or a horizontal (goal-related) time.⁵¹

However, he continues:

I propose instead, the notion of a *curved time* in which one perceives the flow of the music in the same way that one might follow the trajectory of a circle - a clear sense of motion can be apprehended but without the emphasis on a longer-term end or goal.⁵²

Harrison achieves the illusion of a static object by creating a constantly dense, saturated texture. However, this is formed using pitch cycles that provide motion. Their cyclical nature allows the music to have activity without being goal-oriented.⁵³ He has stated that, 'My intention has been to create the perception of an object that appears both static and in motion, comparable perhaps to ripples in a stream or watching a torrent of rain.'⁵⁴ Jennie Gottschalk also refers to the 'waterfall illusion' as a phenomenon in perceptual psychology to explain this paradox.⁵⁵ These metaphors were useful as they also highlight that the listener is static, while the object is both static and in motion.

The Wandelweiser composer Jürg Frey, whose aesthetic of transparency is closer to my own, also explores activity within stasis. Frey has noted that, 'I am on the precise threshold where static sonic thinking almost imperceptibly acquires direction, where static, wholly motionless sounds meet the onset of

51 Bryn Harrison, *Cyclical Structures and the Organisation of Time* (PhD diss., University of Huddersfield, 2007), 18

52 Ibid.

53 Ibid, 17

54 Bryn Harrison quoted in Gottschalk, *Experimental Music Since 1970*, Loc 4030. Originally quoted from Bryn Harrison, "The Tempo of Enclosed Spaces: A Short, Personal Reflection on the Ensemble Music of Aldo Clementi," *Contemporary Music Review* 30, nos. 3-4 (2011): 272

55 Gottschalk, *Experimental Music Since 1970*, Loc 3976

movement and directionality of the sound material⁵⁶. The listener is immersed in the present material, but there is also a subtle progression in how the material unfolds.⁵⁷ He articulates two different ways to achieve activity within stasis – either when movement over time becomes static, or when subtle changes in the static sound eventually lead the listener somewhere else⁵⁸:

as a result of a long duration in time, a path, a way, can become an expanse or a space – and conversely, where attention is turned to detail, to small changes, an expanse or space can be experienced as a path, a way.⁵⁹

Both of these approaches occur in *Reframe*. Firstly, there is motion within the object itself. Repeating active materials (violins' tremolo, harp's bisbigliando and pulsing bowed piano) allows them to be perceived as a static object. This fast articulation of a static harmonic backdrop is perhaps distantly reminiscent of American minimalists Philip Glass and Steve Reich, who similarly explored activity in stasis.⁶⁰ Furthermore, when the upper strings appear in the second movement, they still play with a fast tremolo, like an object that jitters while frozen in the same place.

Secondly, there is motion arising from the ordering of material. In *Prolonged*, momentum is created through subtle harmonic variations in the drone, and the significant entries of certain instruments. In *Fraying*, a very subtle, directional quality is produced as materials transform towards white noise.

Unlike Harrison's pitch cycles, I wanted the object's activity to be produced very simply, so that the focus is on timbre rather than pitch or rhythm. Having simple, reiterative materials, and tremolos which are unmeasured and free, allows timbral complexity to emerge.

GarageBand

During the creative process, I was frustrated by being unable to make informed decisions about my materials. I tried listening simultaneously to Sibelius playback, recordings and my own imagination as I looked at my sketches, but could not experience the composite timbre of sounds concretely enough to

56 Jürg Frey, 'And on it went' (2004), www.wandelweiser.de/juerg-frey/texts-e.html

57 Paul Newland, 'Repetition and difference, disorientating memory – directionality in the music of Bryn Harrison and Jürg Frey', Guildhall School of Music & Drama postgraduate composition seminar, 11/1/2017

58 Frey, 'And on it went'

59 Ibid.

60 Harrison, *Cyclical Structures and the Organisation of Time*, 17-18

make progress. In *Reordering the Unconsumed*, assembling and playing back material on Sibelius, and listening to timbral recordings of the violoncellos was sufficient because it only involved two musicians, who were willing to workshop the material frequently. However, with more instruments involved in *Reframe*, I became troubled by how I was working primarily with symbols, not sounds.⁶¹

Writing for chamber orchestra required a different approach that would allow me to hear the timbre of various layers simultaneously. I had used Audacity, Logic Pro and GarageBand previously as an integral part of creating live, acoustic works. Two relevant experiences include a preliminary exercise for *Reordering the Unconsumed*, in which I recorded a cellist playing a list of isolated gestures, and treated this collection of samples as my 'media bin', which held all the material I needed to create the work from. This was liberating, despite not knowing the end result, as I did not need to imagine or even invent anything beyond the small nuggets of material I had already given the cellist, but simply assemble and edit concrete material in response to my experience of it as a listener. The second experience was for *paper wings* for six voices, which I sketched directly into GarageBand by recording and layering my own voice. In both cases, assembling recorded live sounds allowed the creative process to be more fluid and driven by the actual sounds. It was as if the musicians were always there in a perpetual workshop throughout the process.

In light of this, I recorded musicians individually and layered them on GarageBand. These one-to-one workshops were not merely for recording purposes, but an opportunity to experiment and collaborate with the musicians. This approach allowed me to make informed decisions, as I spent more time listening to, rather than imagining, very specific sounds. Recording players individually rather than in groups, enabled me to explore even more sonic possibilities as I could test different combinations of materials in different contexts, without the players being present. For instance, the following shows part of a catalogue of textures I explored in creating *Reframe*.

⁶¹ As Trevor Wishart states, the conventional score prioritises pitch and duration, not timbre. Trevor Wishart, *On Sonic Art*, Simon Emmerson ed. (Amsterdam, 1996), 11



Figure 15: Part of a catalogue of textures during the creative process of *Reframe*

Working with recorded samples also allowed me to have a rough, mock-up recording of the piece before the actual workshop with the chamber orchestra, which enabled me to reflect on and respond to the overall experience of the work in advance.



Figure 16: Mock-up recording of *Reframe*, movement 2 (partially shown)

From this mock-up recording, I created the full score and parts in Sibelius. This was amended after the workshop, as working with the musicians expanded the possibilities of the work. For instance, some of the harp's material was originally an octave higher (being higher partials of the piano material), but in the workshop, Helena Ricci played this lower, which I kept because of its greater warmth and resonance. Furthermore, one of the clarinetists used a different fingering which I had not intended, but which sounded much richer. This is now the preferred fingering for Clarinet 1.

The above creative process can be summarised below:

1	Conceptual thinking
2	Loose sketch as starting point for individual player (see sketches in appendix)
3	Record explorative session with individual player
4	Extract samples from recording of individual player in GarageBand
5	Explore combinations of different samples in GarageBand
6	Assemble chosen samples into a mock-up of the piece in GarageBand
7	Transcribe score/ parts
8	Workshop with all players (recorded)
9	Revise notation and material based on live context

Figure 17: The creative process

The process was more fluid than this, with returns to earlier stages (particularly 2-4, and 8-9), but this gives a general idea of the different stages involved.

Using GarageBand has developed a stronger link between my creative process and an aesthetic of organic decay in two ways. Firstly, it reinforced the concept of sound as a physical object, because I could move my samples around in space. Time was space, not bar lines and rests, which became a barrier to experiencing my material. In organising sounds in time, I was placing objects in space. My relationship with my materials became more direct and tangible, closer to the physical materials of visual art. Furthermore, listening repeatedly to the materials in various contexts offered a phenomenological approach to composing, as it revealed different aspects of the sonic object each time.

Secondly, it has developed the notion of minimal craftsmanship. While the sounds were malleable in the studio with the musicians, I treated their

recordings like readymades or found sounds. I only edited these samples in the most basic way – cutting, copying, pasting and adjusting the volume crudely where necessary. I often transcribed the found durations and rhythms from the samples into the final score. My approach to notation has changed to become very loose starting points for players to work with (e.g. approximate durations), and at the end of the whole process, mere documentation of my research in GarageBand. This contrasts with *Reordering the Unconsumed*, where precise rhythmic notation was constructed to generate more material (fig. 10 – the rhythmic gamut). By finding rather than constructing rhythms, there is a greater lack of control in the creative process. Furthermore, repeating these fixed samples minimised the amount of variation in the material within individual layers.

***sounds which grow richer as they decay* (for two tenor trombones and prepared harp)**

After *Reframe*, I spent most of my time working on *Shifting* for baroque flute, clarinet, viola and double bass. While this piece was developing, there arose an opportunity to have a new piece performed as part of *Curious 2017* in the Barbican Exhibition Halls. I had two and a half weeks to write and rehearse the piece.

The short time frame presented a chance for the sounds alone to drive the creative process. This deliberate priority of sound over poetic concept was a reaction to spending weeks thinking conceptually for *Shifting*. There was no pressure to explore decay – if it emerged naturally from the sounds, that would be a bonus.

I wanted to investigate the trombones' harmon mute material⁶² from *Reframe* in a more exposed context. I worked closely with Samuel Barber (trombonist) and Helena Ricci (harpist) in pursuit of rich sounds that were microtonally inflected for colour. As the process unfolded, I noticed that I was most drawn towards sounds which became richer while decaying over their natural lifetime (a single breath⁶³, or a single sound that naturally fades).

Only then did a poetic concept emerge. Grant McCracken's description of patina offered a parallel to how my materials behave here:

It consists in the small signs of age that accumulate on the surface of objects . . . a gradual movement away from their original pristine condition. As they come into contact with the elements and the other objects in the world, their original surface takes on a surface of its own.⁶⁴

As the trombones' materials come into contact with one another, their combined material forms a new surface – that of beating. This natural phenomenon is

62 This technique on the harmon mute was generously shown to me by Samuel Barber when collaborating on *Reframe*.

63 The notion of a single breath being a lifetime was informed by Ian Mikyska's writing: 'Lama Surya Das proposes that every exhalation is like a small death...' The fuller context of this quote describes the Buddhist notion of the cycle between death and rebirth, but my work does not engage with this cyclical motion – instead, each iteration of my material is a different entity.

Ian Mikyska, *Towards an Aesthetics of Impermanence in the Contemporary Sonic Arts* (BMus diss., Guildhall School of Music & Drama, 2017). Mikyska's writing is originally paraphrased from Lama Surya Das, *Awakening to the Sacred* (New York: Broadway Books, 2000), 34.

64 Grant McCracken quoted in Linda Sandino, 'Here Today, Gone Tomorrow: Transient Materiality in Contemporary Cultural Artefacts', *Journal of Design History* 17 (2004), 285. Originally quoted from Grant McCracken, *Culture and Consumption: New Approaches to the Symbolic Character of Consumer Goods and Activities* (Indiana University Press, 1988), 32.

produced as one trombone very slowly slides away from a unison pitch. Similarly, as the harp's vibrating string comes into contact with the pedal mechanism or paper clip, its material acquires a new surface of rattles and buzzes. The shifting microtonal inflections are subtle, yet significant in enabling these sonic surfaces to emerge.⁶⁵

In *Here Today, Gone Tomorrow*, Linda Sandino paraphrases John Ruskin's 'In praise of rust' (1859) – 'rather than thinking of rusted iron as 'spoiled iron', rust should be seen as a 'virtue' because it represents iron as *living*, whereas 'iron pure and polished [is] dead'.⁶⁶ This is striking because it is often the opposite of what we think – what is usually a sign of decay, is here viewed as a sign of life. The sound's transformation away from its original state suggests that the material is living, as it reacts with its environment. (This attitude to decay is also reflected in Japanese tea cups, which naturally transform over time in response to the tea it contains. This change is seen as valuable and enriching, rather than a deterioration.) Like patina or rust, the sonic beating, rattles and buzzes show 'the object's *experience*'⁶⁷ and its 'naturalistic, authentic, living materiality'.⁶⁸

This notion is heightened through the reduced control over these sounds – they organically emerge of their own accord⁶⁹, due to the sound waves and physical properties of the instruments, rather than being imposed by the composer. The work differs from previous pieces in this way, because the material was not moulded to realise a poetic concept. Rather, meaning emerged from the material's properties. This reduced control led to the inclusion of 'sounds' in the title, to reflect the treatment of sound as its own living object. This contrasts with the sounds in *Reordering the Unconsumed*, which embodied another object, mould. Although I had trouble finding a natural, sonic equivalent to decayed matter in *Reordering the Unconsumed*, materials arising from a lack of control in this work are a good solution because the materials really do expose a natural phenomena of decay, in sonic form.

Sound differs from iron, as it not only changes but also disappears quickly into

65 The harp's set of pedals control the pitches of the strings. To produce a pedal buzz, a pedal must be moved after the corresponding string is plucked so that the pedal mechanism makes contact with the vibrating string.

66 Sandino, 'Here Today, Gone Tomorrow', 285. Originally paraphrased and quoted from John Ruskin, 'In praise of rust' (1859), in John Carey (ed.), *The Faber Book of Science* (Faber), 110.

67 *Ibid.*

68 *Ibid.*

69 The harp's buzzing from the paper clip and pedal mechanism, evades precision by being naturally unstable. The trombones' beating also has reduced control because of the flexible timings and slow glissando.

silence:

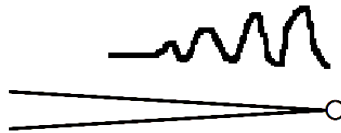


Figure 18: Schematic diagram of a sound enriching in its decay

This transience makes the emergence of new material more poignant as it suggests that there is life even during decay. The natural transience of sound is therefore integral to the piece. This emphasis on life in death, on growth in decay, reflects a continued exploration of hope since *Reframe*.

After *Reframe*, I wanted to move away from overarching, linear trajectories of decay, where one object takes an entire movement or piece to transform. This was a primary goal of *Shifting* (which I will elaborate on later), and also a consideration in this work. Unlike previous pieces, the sounds here repeatedly decay. The repetition of these transitions makes change itself the very material of the work, rather than just what happens to the material. The work provides space to listen closely to these changes (the harpist freely repeats the sound only after hearing it die away). The very few structural changes are not really events, but simply shifts in perception. The disappearance of the harp, changes in trombone patterning, and the spacious punctuation of the low harp sound all serve to provide just enough variety to help the listener stay focused, to closely scrutinise organic decay.

Like *Reframe*, the piece was composed by investigating different combinations of samples on GarageBand. A mock-up recording was created as a by-product of listening and responding to different options. However, due to the flexibility of the materials, the relative independence of the parts and the few musicians involved, it seemed most appropriate to notate this mock-up recording in the form of a list, with separate parts and no full score.

I had been wanting to explore lists as notation for several months after encountering Jürg Frey's *Fragile Balance* (2014), for ensemble with piano. The score consists of very short fragments of material, presented in four vertical columns.⁷⁰ Its vertical flow of reading was liberating, as it removed some of the expectations associated with conventional notation, such as tight control over

⁷⁰ Frey, Jürg, *Fragile Balance* (2014), Score

the parts' alignment.⁷¹ I was drawn to the score's simplicity and clarity in capturing overlapping material that would otherwise be very complex to notate. This found, rather than constructed, complexity, was enabled by the list notation. Frey's work suggested the importance of notation in mirroring minimal craftsmanship. Furthermore, lists were already an integral part of my creative process, used to capture different versions of material to help me expand and then narrow my options (see *Reframe* sketches in appendix). They were a way of scrutinising the material more closely and understanding its potential. Therefore it was striking to see this format reflected in the score itself.

I had never written a piece without a full score before, and had always wondered how composers managed to do this while producing an end result they intended. My assumption was that because there was no full score revealed, composers never used one in the creative process. However, in creating this work, I learned that I could treat the mock-up recording on GarageBand as the full aural 'score', even if it remained un-notated. This assemblage of samples on GarageBand was my global reference, from which I prepared my parts. In this way my score was a memory of the creative process, symbolising the flow of sounds I actually experienced.

The shift from notating time in bars, to minutes and seconds was freeing because there is a closer connection to the everyday – it is how people often measure time, without being filtered through the realm of music. This was important in strengthening a relationship between organic decay in the work and in the wider world.

⁷¹ Jürg Frey, Open Session Seminar (Guildhall School of Music & Drama, 21/10/16)

***remnants* (for solo violoncello)**

By now I had completed a draft of *Shifting*, but as I was dissatisfied with it for various reasons, I decided to leave it and return to it at a later stage. Meanwhile Natasha Zielazinski (the violoncellist I collaborated with on *Reordering the Unconsumed*, and co-curator of *Curious*) kindly invited me to write a new piece for her, which she would play alongside works by John Luther Adams and James Tenney.

Some of the sounds I most enjoyed from *Reordering the Unconsumed* were the multiphonics which naturally emerged during the slow glissandi with lighter finger pressure. Apart from this, my experience of multiphonics on string instruments so far was confined to fleeting appearances within existing works. This seemed to contrast with woodwind multiphonics which are often heard over longer durations as they are more common and familiar. I wanted to experience a string multiphonic for a more extended period of time, and to investigate these sounds as the only material in the piece.

However, as we worked through the detailed multiphonic fingering charts from Cello Map⁷², it became clear that even within one multiphonic there was enough material for an entire work. After hours of playing through various multiphonics in the studio and listening back, I chose this particular multiphonic because of its brightness, richness, and intriguing intervallic properties:

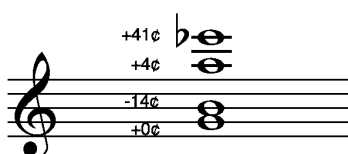


Figure 19: Multiphonic in *remnants* ⁷³

This multiphonic consists of the 4th, 5th, 9th and 13th partials of the overtone series of the G string.

A few months earlier I had visited Park Seo-Bo's exhibition in White Cube Mason's Yard, titled 'ZIGZAG: Ecriture 1983-1992'. It featured various paintings from his *Ecriture* series⁷⁴ which were produced by layering traditional Korean

⁷² Fallowfield, Ellen and Resch, Thomas, www.cellomap.com/index/the-string/multiphonics-and-other-multiple-sounds/fingeringcharts.html, accessed 4/11/18

⁷³ Transcribed from *ibid.*

⁷⁴ The exhibition included 'zigzag' works such as *Ecriture* No. 132-83 (1983), *Ecriture* No. 870907 (1987), *Ecriture* No. 920521 (1992), and *Ecriture* No. 931204 (1993). These works

paper (hanji) soaked with paint, onto the canvas. These were then pushed in diagonal lines by hand, bamboo sticks or fluted lead sticks, which forced out the pulp. Sometimes Park would paint the canvas beforehand, so that a different colour would be revealed through the pulp.⁷⁵

What I most enjoyed about this experience was the sheer transparency of the artistic process. As a viewer I felt included in Park's experiments, and was intrigued by seeing what difference a small change in the technique would create. For instance, what if

- the work was completely monochrome?
- it was a different colour altogether?
- the pulp revealed a different colour underneath?
- the pulp formed clear ridges?
- the canvas was divided within the work?
- the placement of the paper created a discernible pattern?
- there was more space between the bits of paper?

Each work seemed to exist in the very liminal changes of the technique. It was clear that although these variables were small, they produced huge differences between the works. Having a collection of distinct versions in the same space reinforced these differences by allowing the viewer to compare the works closely. This experience reminded me of Agnes Martin's work, where seemingly peripheral changes in her use of the grid, are often magnified when viewed alongside other versions (compare, for instance, the 30 screen prints which comprise *On a Clear Day* from 1973)⁷⁶.

Similarly in *remnants*, I wanted the listener to experience the impact of minute changes within the multiphonic. These would be reinforced by placing different versions of the same multiphonic, side by side. My creative process in general already involved compiling a list of different versions of material. Usually this moved from the broad to the specific as the process unfolded, starting with different types of material (material A or B), until it whittled down to the fine details (within material A, what is the difference between having an accent, and no accent?). This later stage had always been the most enjoyable, when lots of different options can arise from making minimal changes in a very small amount of material.

can be viewed online at White Cube, www.whitecube.com/artists/artist/Park_Seo_Bo, accessed 3/1/19.

75 Park's creative process is outlined on White Cube, http://whitecube.com/exhibitions/exhibition/park_seo-bo_masons_yard_2017/, accessed 4/11/18

76 All 30 screen prints comprising Agnes Martin's *On a Clear Day* (1973) can be viewed online at MoMA, <https://www.moma.org/artists/3787#works>, accessed 3/1/19

The process for this work was similar, starting with the question 'which multiphonic?' (material A or B), moving on to 'which variations of the multiphonic?' (see 'remnants – list as process' in appendix), and then to questions of their order and amount of repetition. Working with a list of the multiphonic's variations allowed me to exhaust the possibilities and find depth in the material, while also making it easier to narrow options after trying them with Natasha.⁷⁷ While this was a familiar process, it felt more systematic, in-depth and microscopic because the starting material was already a single sound on one instrument. The work asks questions such as, what if we heard

- all pitches in the multiphonic simultaneously?
- only a single partial?
- an accent?
- no accent?
- short elements?
- sustained elements?
- traces from bouncing the bow?
- traces from bouncing the bow followed by a trace of a single partial?
- traces from bouncing the bow followed by traces from almost circular bowing?

The changes are deliberately microscopic, because I was interested in creating maximum impact through the smallest of transformations.⁷⁸ Each change is intended to be clear and perceptible. I wanted to involve the listener in the process of examining different versions, rather than distancing them by veiling the creative process. In this regard, my music reacts against Feldman's use of near repetition to disorientate the listener's memory.⁷⁹ While Feldman's music is still intimate and focused, he deliberately and subtly transforms his material so that the listener forgets past iterations and cannot identify how it has transformed. This is reflected in Dora A. Hanninen's writing:

Feldman's penchant for pattern extension by near repetition poses a distinct cognitive challenge: the proliferation of near repetitions frustrates attempts to prioritise events by distinctive features, and thereby to categorise, or even remember, individual instances. The result is a superabundance of nuance that eludes conceptualization, leaves

⁷⁷ It was a very close collaboration – many options on the list were things we discovered together in the studio while Natasha experimented

⁷⁸ Jürg Frey also aims to make the smallest changes in his material have maximum significance. Jürg Frey, Open Session Seminar (Guildhall School of Music & Drama, 21/10/16)

⁷⁹ Harrison writes: 'Feldman himself has talked of 'a conscious attempt at "formalizing" a disorientation of memory' (2000, 137)'. Bryn Harrison, 'Repetitions in extended time: recursive structures and musical temporality' in Richard Glover and Bryn Harrison, *overcoming form: reflections on immersive listening* (University of Huddersfield Press, 2013), 46

listeners with little to report, analysts with little to say.⁸⁰

Instead I want the listener to perceive different versions of the multiphonic by using a form of repetition closer to loops. The composer Bernhard Lang has described the loop as 'a sort of phenomenologic microscope, a way to look at the other hidden side of an object'⁸¹. As Lang changes the speed of looping, he is 'increasing and decreasing the levels of magnification'⁸². Similarly in *remnants*, different versions of the multiphonic are looped so that the listener can scrutinise the multiphonic and discover its properties more intimately. The two approaches can be summarised by Feldman as either repeating variation, or varying repetition: '...I might repeat things that, as it's going around, is varying itself on one aspect. Or I could vary repetition.'⁸³ In *remnants*, I have repeated variations (looped different versions) so that the changes are terraced and more perceptible. In this way, the work develops a method through the list form for looking at transient natural phenomena more closely.

There is a tension in working this way, because the multiphonic is naturally unstable and can sometimes transform with each iteration. Sometimes this elusiveness enriches the work (for instance, during the longer sustains in section 2), but it can also undermine the significance of the intended changes. Without some consistency, the listener may find it hard to differentiate between what is intentional and accidental, and the form and specificity of the piece can be compromised. The higher risk and need for precision appear to be a necessary part of exploring liminal variations.

The form of the work is simply an ordering of the different versions. It was surprising that this list was not merely confined to the creative process as in previous works, or merely to the notation (as in *sounds which grow richer as they decay*), but here the list *is* the piece. The form reflects and exposes the creative process. I found it liberating to not have to fit the materials into a conceptually loaded form, because there was more flexibility within the creative process. Like *sounds which grow richer as they decay*, the form and any conceptual explorations emerged later during the creative process, resulting in a more simple and raw presentation of materials.

80 Dora A. Hanninen quoted in *ibid.*, 45-46. Originally quoted from Dora A. Hanninen, 'Feldman, Analysis, Experience', *Twentieth-Century Music* 1 (2004), 227

81 Bernhard Lang, 'Cuts'n Beats: a Lensmans View. Notes on the Movies of Martin Arnold' (Bergen, 2006), 7

82 Gottschalk, *Experimental Music Since 1970*, Loc 4076

83 *Ibid.*, Loc 4125. Originally quoted from Morton Feldman, *Give My Regards to Eighth Street: Collected Writings of Morton Feldman*, B. H. Friedman (ed.)(Cambridge, 2000), 185

remnants represents a significant shift in my approach to notation. The greater simplicity of the score arose from the list form of the work, and the desire to scrutinise different facets of the multiphonic. The inclusion of graphics more succinctly captures the sound world, resulting in a less verbose format than *sounds which grow richer as they decay*.

3. Rich, fragile, present

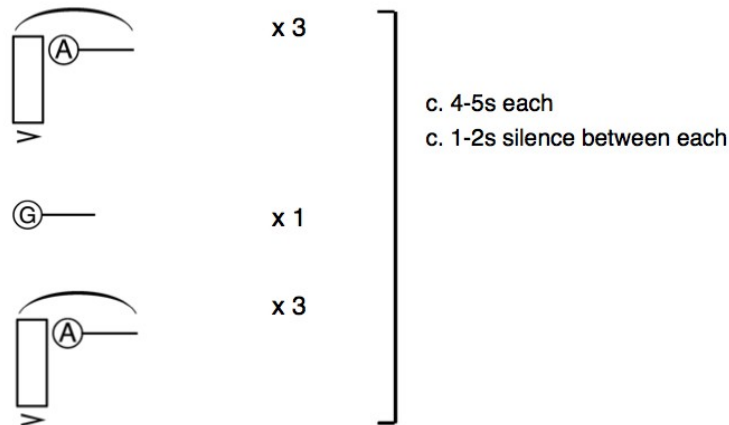


Figure 20: Extract of list notation from *remnants*

The notation's greater clarity and concision more effectively reflects found, rather than constructed, complexity. When compared to earlier scores, such as *Reordering the Unconsumed*, the reduction of compositional control is clear in the lack of generated, detailed rhythms and tempo alterations.

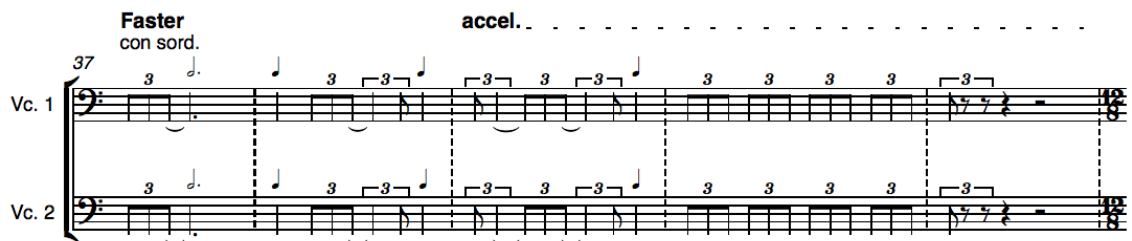


Figure 21: *Reordering the Unconsumed*, bb. 37-41 (where the violoncellos play glissandi with half finger pressure, freely out of time with one another)

This was an important step forward in minimising compositional control in notation.

The work's conceptual relationship to organic decay is hard to pin down neatly, but it is this lack of a clear, poetic concept that allowed the materials to be heard

on their own terms. As previously mentioned, the initial desire was to prolong something that is elusive. I wanted to let the multiphonic exist for a longer duration in a work – to let it be its own entity and the work itself, rather than mere fleeting appearances amongst other material. Perhaps this bears some semblance to the notion of prolongation within *Reframe*.

There is a healthy tension between the form as a list of different versions of material, where any order would do, and the seemingly poetic, overarching trajectory which emerged as a by-product of the process. As well as being a list, the overall form also outlines the emergence and dissipation of a single sonic entity. Elusive splinters grow into longer, sustained gestures which seem to emerge from a distance. The splinters become more present, but then dissolve, becoming more elusive than before. If there is any conceptual meaning, it is that the multiphonic (not reflecting another object, but rather, the very phenomenon of a string multiphonic) is the remnant. Involving intuition in the process makes the work different from the exhaustive processes of early Minimal art, such as Sol LeWitt's *Incomplete Open Cubes* (1974), which systematically catalogues all permutations of the incomplete cube, starting with three edges and ending with eleven, in the form of a photograph, drawing and sculpture.⁸⁴ Unlike LeWitt's rigid catalogue, a degree of intuition leaves some flexibility and room for conceptual meaning to emerge.

The mock-up recording helped to identify and preserve defining characteristics of the work. For instance, the work lost its forward momentum and cohesion in an earlier draft, because I incorporated more durational flexibility which affected the speed of the loop. This was addressed after more precisely timing the durations in the mock-up recording. The work has less rhythmic flexibility than *sounds which grow richer as they decay* because the repeated material is so short.

⁸⁴ Citation of Sol LeWitt's *Incomplete Open Cubes* (1974) in San Francisco Museum of Modern Art

***Shifting* (for baroque flute, clarinet, viola and double bass)**

I have always been struck by how the colours in an opal change as the stone moves against the light. There is something mysterious about the play-of-colour, the way the colours emerge, disappear, and shift. Growing up in Australia, I have spent much time enjoying the beauty of opals and their bright, vibrant colours.

This work explores the notion of change, through the transformation of various materials. Layers disappear and re-emerge, and recombine with others in new contexts. I was interested in how movement and loss are linked, and how these articulate the passing of time. (For me, the metaphor of the opal's colours has deeper resonances of the movement of individuals, resulting in loss.)

I wanted the materials to be rich and luminous like the opal's colours. I tried to capture a sense of brightness and vibrancy in high-energy materials. Writing for the baroque flute helped me to think more carefully about colour, particularly as every pitch has its own unique timbre (not being a chromatic instrument). It was necessary to investigate sounds that are already inherent to the instrument for this reason. We explored microtonalities naturally present in the instrument through cross-fingerings and misspellings (for instance, G# – B flat instead of G# – A#). In this case the unequal weighting of pitches produces a very bright and unstable sound, in which traces of higher pitches mysteriously emerge.

Shifting underwent several substantial revisions⁸⁵ due to an issue of continuity between the materials. With the poetic metaphor being the transformation of colours within an opal, there was no prescribed ordering of events which had to be mapped in the work's form. (For instance, *Reordering the Unconsumed* had clear sections which paralleled the expansion and contraction of mould.) I was drawn to the opal metaphor for this very reason, because its non-goal oriented form of decay provided an alternative to conveying the linear, gradual decay of a single object. With the form left open, I made structural decisions intuitively. However, while this approach was effective in the second movement of *Reframe* (which is similarly open-ended), it was not a good strategy with

⁸⁵ I began composing *Shifting* immediately after *Reframe*. Spanning the creative time frame of *Shifting* were *sounds which grow richer as they decay, remnants* and the initial version of *Breathing bones*.

Shifting's more extended duration. The resulting form was arbitrary and unconvincing, without a clear reason for why the materials changed. I failed to realise that the piece needed its own musical agenda for unfolding, where the poetic metaphor left it open.

But where would this musical agenda come from? My previous solutions to finding long-term continuity, apart from mapping the order of events from poetic metaphors, or intuition, were options I no longer thought appropriate for my current aesthetics. Unifying the material through a pre-conceived harmonic structure or rhythmic pattern (as in *Reordering the Unconsumed*), seemed too notationally driven and constructed, as material would be generated rather than found. What ways of controlling form would be appropriate?

After writing *remnants*, I returned to *Shifting* and revised it substantially. *remnants* had a huge impact on this work in several ways. Firstly, it forced me to find an overall continuity by clarifying how each individual instrument unfolded. I applied the list notation of *remnants* to each instrument in *Shifting*, which was originally notated conventionally (see older score in appendix). This exposed the individual trajectories more clearly, when compared to traditional notation, and enabled me to reject unnecessary material.

The image shows two systems of musical notation for Viola (Vla.) and Double Bass (Db.). The first system covers measures 21 to 25, and the second system covers measures 26 to 30. In both systems, the Viola part consists of sustained chords with a wavy line above them, indicating vibrato or a similar effect. The Double Bass part features a rhythmic pattern of eighth notes and rests. Dynamic markings are placed below the Double Bass staff: *p < mp* for measures 21, 22, and 23; *p* for measure 24; *p < mp* for measures 26, 27, and 28; and *p* for measure 29. Measure 30 is marked with a double bar line and a repeat sign.

Figure 22: Older version of *Shifting*, notated conventionally (bb. 21-30)

4. Play 6:30 – c. 11:52

The image shows two staves of musical notation for a double bass part. The first staff contains three measures of music, each starting with a dynamic marking of *p* < *mf*. This sequence is repeated four times, indicated by 'x 4'. To the right of this staff, it is noted that there is 'c. 11-12s silence between each'. The second staff begins with a dynamic marking of *p* and includes a '(bite)' marking above the first note. This staff contains a sequence of notes with slurs, repeated eight times, indicated by 'x 8'. To the right of this staff, it is noted that there is 'c. 10-12s silence between each'.

Figure 23: *Shifting*, double bass part notated as list

The list notation provided a broader musical agenda, which was to present variations of the material. The overall textures then had a more compelling flow, due to continuity in individual layers, while still being non-goal oriented on a macro level.

Secondly, *remnants* partly reinforced the use of lists within the creative process to explore more possibilities for the baroque flute's material, which was previously too unchanging. This enabled me to find new combinations of material that naturally extended the sound world in a way that was unseen at the start of the work. I wanted the listener to discover something unexpected as the piece unfolds, in the same way the opal's colours are elusive and only partially seen, with some being concealed until the stone is tilted at a certain angle. Even then, there is a sense that more colours could still be hidden, waiting to be revealed. There is a beautiful parallel in Junichirō Tanizaki's *In Praise of Shadows*, where he describes the mystery of soup concealed in darkness:

With lacquerware there is a beauty in that moment between removing the lid and lifting the bowl to the mouth where one gazes at the still, silent liquid in the dark depths of the bowl, its color hardly differing from that of the bowl itself. What lies within the darkness one cannot distinguish [...] A moment of mystery, it might almost be called, a moment of trance.⁸⁶

The baroque flute material during 8:00-10:30 was the result of this deeper exploration. There is a new intensity and focus, particularly when the texture thins to just the baroque flute and double bass.

The work shares similarities with *sounds which grow richer as they decay*, which also has multiple parts exploring independent processes simultaneously.

⁸⁶ Junichirō Tanizaki, *In Praise of Shadows* (1933), T. J. Harper and E. G. Seidensticker (tr.) (London, 2001), 25

The baroque flute and double bass have linear trajectories, while the clarinet appears once and vanishes, and the viola has an ABA structure. But unlike the earlier work, here there is more material, more layers, and longer durations of change, which make it harder to perceive each transformation as it occurs. I liked how the perceptibility of change varied; some were unnoticed, only then to be highlighted later by a suddenly sparser texture or a change in someone else's material. This seems fitting with the opal's colours, which often change in a complex and elusive way. It seems appropriate that one would require repeated looks at the same material. As Gottschalk states,

Repetition within a piece, or repeated hearings of the same piece, may reveal more or different details of the sonic surface. As these details are detected, the music is renewing itself – appearing as if it is fresh material.⁸⁷

This form of scrutinising material differs from *remnants*, which is more transparent and microscopic in its catalogue of different aspects of the material. Here the delay in perceiving entries and disappearances adds a layer of poignancy to the exploration of movement and loss.

This work raised two implications of composing on GarageBand. Firstly, it revealed the danger of becoming too attached to the mock-up recording. The viola material sounded noticeably different as a recorded sample compared to live in the room. The samples were more present and robust because different aspects of the sound were picked up by the microphone. I felt pressured to recapture this sound by asking the violist to play louder, but this created a more brittle and strained timbre. In the future, this can be avoided by workshopping the material more frequently while assembling samples, to compare the experience between playback on headphones and hearing it live. This would also help in testing the balance between instruments and its effect on timbre.

My increased attachment to the mock-up recording began with *remnants*, as the sounds were more specific and narrowly defined, due to being liminal variations. However, I want to give performers room to interpret the work, while keeping the definitive characteristics of the materials. In light of this, I have deliberately avoided listening to the mock-up recording before more recent live sessions. This resulted in a deeper appreciation for what the live performance of *Shifting* does offer – a greater sense of fragility and poignancy, and better blending between the instruments.

⁸⁷ Gottschalk, *Experimental Music Since 1970*, Loc 4184

Secondly, assembling samples on GarageBand has expanded the material's possibilities. It has allowed me to use incidental sounds resulting from the player checking or demonstrating something (the baroque flute's overblowing and the viola's accented, rhythmic material are examples of this.) I have also salvaged sounds that I had dismissed in the session. Furthermore, the process has directly influenced the sounds. The baroque flute's repeated accents from 8:00 onwards, came from the accidental clicks resulting from sudden cuts in the sample. Here GarageBand is not just a tool to scrutinise existing sounds more deeply, but a transformative force, imprinting its own inherent sounds onto the baroque flute's material. As the musician recreates these accidental sounds arising from the software, the work goes further in capturing the creative process in the end result.

The notation has developed from the earlier works, combining the time specificity of *sounds which grow richer as they decay* and the catalogued versions of *remnants*. Co-ordinating separate lists required stopwatches and more specific time frames. One of the difficulties we encountered was knowing how to rehearse the work efficiently, when there are no self-contained sections, but only overlapping trajectories. Rehearsing from a specific time was still vague, as it would fall midway through someone's list of transformations, resulting in only a rough run through. More time was spent, therefore, on refining individual layers, adjusting the balance in short bursts of textures, and playing through longer chunks of material to rehearse the entrances and exits of instruments.

***Colour Catalogue: Whites* (for flute, bass clarinet and violoncello)**

This work was created for *Unfinished*⁸⁸, a day of experimental live performances curated by Nell Catchpole and Jan Hendrickse as part of Barbican OpenFest. Artists were invited to develop work in response to The Charterhouse, a historic almshouse that was previously a monastery, mansion and school. Performances occurred simultaneously across the various spaces in the venue, creating a rich web of interventions and activity.

I chose to respond to the Cloister, which consists of recurring elements – tiles, stones and bricks. I was intrigued by the small differences within these reiterating surfaces, despite their similar materiality and shape. For instance, the floor consists of a myriad of greys, each gradient made even more perceptible through the grid structure. It was unclear whether these were inherent variations of the materials, or the result of natural decay over time, but they were fascinating all the same.



Figure 24: The Cloisters, where the work was performed at intervals throughout the day

⁸⁸ More information about the event on Barbican, <https://www.barbican.org.uk/whats-on/2018/event/unfinished>, accessed 4/11/18

This work does not have a clear metaphor for organic decay, but explores themes of organic decay such as richness, a lack of control, and scrutinising phenomena with a refreshed perception.

Richness

For several years, I had wanted to write a piece exploring gradations of white. This was due to various experiences of minimalist white paintings and from acquiring a catalogue of white paint samples. However, it was a more recent encounter with Rauschenberg's black paintings⁸⁹ which helped me to develop this idea within my current aesthetics. Their rough, complex textures⁹⁰ were a wonderful reference in finding timbres that were rich and resonant, with a charged surface activity and a rough tactility. I avoided clear, smooth sounds in order to subvert the notion of white suggesting absence and emptiness. For me, whiteness meant fullness and intensity in an exposed context – sounds that were naturally rich at a low volume; if they were too loud, they would be less beautiful.

Lack of control

The work presents eight textures, each lasting 1' 30", and framed by 20 seconds silence. Each texture is a different gradient of 'white'. The work furthers my exploration of a lack of control in three ways.

Firstly, the materials are more flexible and unrefined within each panel. My creative process usually involves forming a catalogue of various textures in GarageBand, which lasts only a few seconds each, like texture samples or tasters. These variations arise from layering sounds, and then making minute changes by slightly altering one layer, or adding or removing a layer. This method allows me to exhaust the possibilities of the material, and then eliminate these to find the material I need. But where I would have usually weaved these textures together into a larger whole (such as in *Reframe*), here I have left them in their raw, unrefined states. Through the free vertical alignment and open-ended repetition of material within panels, and increased rhythmic flexibility, the listener can experience the sounds more directly, without the composer intervening. Presenting materials in a more raw and unpredictable state brings my sounds even closer to the unrefined earthiness of organic material. The inherent unpredictability of the materials' alignment allows the listener to re-

89 Specifically, Rauschenberg's *Untitled* [glossy black four-panel painting] (c. 1951) and *Untitled* [glossy black painting] (c. 1951). These can be viewed online at Robert Rauschenberg Foundation, www.rauschenbergfoundation.org/art/series/black-painting, accessed 4/1/19

90 Strickland, Edward, *Minimalism: Origins* (Indiana University Press, 1993), 9

discover the material with each performance, as though scrutinising an object afresh, along with the composer. This allows the listening experience to be more immersive, as the listener has more freedom to navigate the work on their own.

Secondly, the grid form minimises craftsmanship by allowing each panel to have the same duration. This has two implications. Firstly, it places maximum focus on experiencing several self-contained blocks of sound, rather than the overall shape of the work. The catalogue form naturally roots the work in multiplicity, which goes even further than *remnants*. Even though the form was a by-product of assembling static blocks of material, it still coincidentally traced a single object that expanded and then faded away. But here, though the gradients are generally ordered from lighter to darker shades, that is, higher to lower registers (except the last panel), the lack of continuity between the individual blocks allows the form to more effectively expose the catalogue approach behind it. Secondly, it exposes the natural temporality of each texture. The solo violoncello material in box 6 seems to pass by more quickly than the others, for instance, because of its continuous sound.

This use of the grid form to minimise craftsmanship shares similarities with Minimal art, whose artists 'gave preference to the logic of systems over subjective expression, favoring clear geometric structures and working methods that suppress any trace of the artist's hand.'⁹¹ However, my use of the grid here is deliberately more organic, with soft, mysterious edges from staggering the musicians' entries. The visual artists Anya Gallaccio and Agnes Martin have a similarly organic approach to the grid. Gallaccio's *intensities and surfaces* (1996) consisted of a huge block of stacked ice, which melted to produce unpredictable shapes over time due to the mass of rock salt contained within it.⁹² Jennifer Mundy highlights the work's union between minimalist forms and the organic:

Its block-like form referenced the grid structures famously associated with minimalist artists such as Donald Judd and Carl Andre. But into an artistic vocabulary associated with permanence and industrial precision, Gallaccio introduced evanescence and the idea of cycles of transformation.⁹³

The delicate grids of Agnes Martin are also a parallel. Being freely hand-drawn,

⁹¹ Citation in San Francisco Museum of Modern Art

⁹² Jennifer Mundy (Tate), 'Lost Art: Anya Gallaccio' (2012), www.tate.org.uk/context-comment/articles/gallery-lost-art-anya-gallaccio, accessed 12/11/18. © Tate, London 2019.

⁹³ Ibid.

often with graphite, her 'fragile, almost dissolving lines'⁹⁴ have subtle irregularities which allow the grid to be organic.⁹⁵

Thirdly, since writing *remnants* and *Shifting*, I wanted to continue to minimise notation in order to explore a deeper lack of control. I aimed to limit the score to a page, and prioritised simplicity and practicality. The durations of individual materials are more flexible and open than in previous works. However, while I tried to incorporate a degree of timbral flexibility, it became clear after live sessions that more control was needed to produce the sounds I wanted. Therefore, I added verbal descriptions in the preliminary page, so that the score could still remain clean and unsaturated. With each live iteration of the piece, I am discovering more about the boundaries of what is effective in the work.

Refreshed perception

Often with colour catalogues, the differences between each sample are extremely minimal. I tried to preserve this subtlety between different materials in the same instrument, so that the listener would scrutinise the sound more deeply. For instance, the bass clarinetist plays the same multiphonic with slight variations (trilling with different keys, at different speeds):

Material	Speed of trill	Panel
No trill	-	1
Trill with E flat key (LH only)	Fast	2, 4
Trill with low F key	Gradual transition between slow and fast	3
Trill with first finger	Slow	8

Figure 25: Variations of bass clarinet's multiphonic in *Colour Catalogue: Whites*

The same can be said for the bass clarinet's low note in panels 5 and 7, and the other instruments. However, I wanted to make these minimal changes very perceptible, so that each panel would still be self-contained and distinct. Reinforcing the differences between panels negated the experience of one object transforming through the piece.

I really enjoyed creating this work, because the basis of the piece was the material itself, rather than an extra-musical idea. Pieces created in this way

⁹⁴ Guggenheim on Agnes Martin's *White Stone* (1964), www.guggenheim.org/artwork/2804, accessed 12/11/18

⁹⁵ Lena Fritsch (Tate), 'Agnes Martin: Close Up' (2015) www.tate.org.uk/context-comment/articles/agnes-martin-close-up, accessed 12/11/18. © Tate, London 2019.

have been the most liberating to make (*sounds which grow richer as they decay, remnants* and *Colour Catalogue: Whites*) because there was a sense that all I needed to do was find and present sounds that I liked.

***unless it dies, it remains alone* (for 11 players)**

The creative process for this work began before *Colour Catalogue: Whites* and was finished several weeks after it.

I was struck by how certain plants, such as the lodgepole pine, *Eucalyptus* and *Banksia*, require fire to germinate. Their cones or fruits are sealed with resin, which melts in the fire and allows the plants to disperse their seeds.⁹⁶ It was interesting how death can be fruitful, and even necessary for life.

This metaphor allowed me to continue exploring the hope of life within the context of organic decay.

Relationship	Metaphor	Work
life <u>instead of</u> decay	Flowers burning but not dying; something fraying but being prolonged instead	<i>Reframe</i>
life <u>within</u> decay	Patina and rust form as the object interacts with its environment ⁹⁷	<i>sounds which grow richer as they decay</i>
life <u>only because of</u> decay	Fire is necessary for some plants to germinate	<i>unless it dies, it remains alone</i>

Figure 26: Different relationships between life and decay

Like *Reframe*, this work reflects on the hope of life after decay, rather than during it. *Reframe* does this by considering a time where there is no death, while this work explores the necessity of death for the lives of others, particularly in the context of violence and suffering. (The work's title is a shortened version of an existing plant metaphor, used purely for its clarity in describing the notion of death being necessary for life: '...unless a grain of wheat falls into the earth and dies, it remains alone; but if it dies, it bears much fruit.')⁹⁸

When I started this work, I had composed the first versions of *Shifting* and *Breathing bones*, in which I was searching for forms other than the linear decay of a sonic object. I was dissatisfied with these results, and unsure how to

⁹⁶ Melissa Petruzzello (Encyclopædia Britannica), <https://www.britannica.com/list/5-amazing-adaptations-of-pyrophytic-plants>, accessed 3/1/19

⁹⁷ Sandino, 'Here Today, Gone Tomorrow', 285 (drawing from ideas by Ruskin and McCracken)

⁹⁸ John 12:24, the bible (ESV)

proceed. I did not want to portray the process (section one: death, section two: germination), or embody physical gestures (rising figures for germination) but could not see an alternative. Reflecting on *remnants* and applying its form to *Shifting* made me realise that catalogues could address my problem of form, and changed the way I approached this work.

Imran Qureshi's paintings were a useful reference because they offered a formal solution to conveying the necessity of death for life, without illustrating the death and germination process. Appearing in many of his works, such as *And How Many Rains Must Fall before the Stains Are Washed Clean* (2013) and *I want you to stay with me* (2015)⁹⁹, is what appears to be stains or splatters of blood which are simultaneously blossoming flowers. This simultaneous juxtaposition of death and life, in one integrated image, is reflected in Qureshi's comment:

Yes, these forms stem from the effects of violence...They are mingled with the color of blood, but, at the same time, this is where a dialogue with life, with new beginnings and fresh hope starts.¹⁰⁰

Qureshi's work enabled me to find an equivalent of this simultaneous juxtaposition in my work through a contrast in musical parameters. The crescendo and diminuendo signs are used metaphorically here to represent a gradual transition from an abundance to nothing, and vice versa, rather than dynamics.

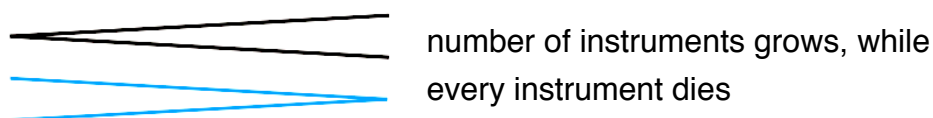


Figure 27: Musical juxtaposition in form in *unless it dies, it remains alone*

This juxtaposition is similar to *sounds which grow richer as they decay*, where a new surface emerges in the decay, except here it is the overall texture which grows, while on a micro level, the individual instruments decay.

The piece begins with a single instrument. After it dies, another two begin. Each of these die, and another two begin in each place. The piece carries on growing

⁹⁹ These can be viewed online at Nature Morte, www.naturemorte.com/artists/imranqureshi/, viewed 3/11/2018

¹⁰⁰ Imran Qureshi quoted on Metropolitan Museum of Art, <https://www.metmuseum.org/exhibitions/listings/2013/imran-qureshi>, viewed 13/02/2018

in this manner, until ten instruments play simultaneously.

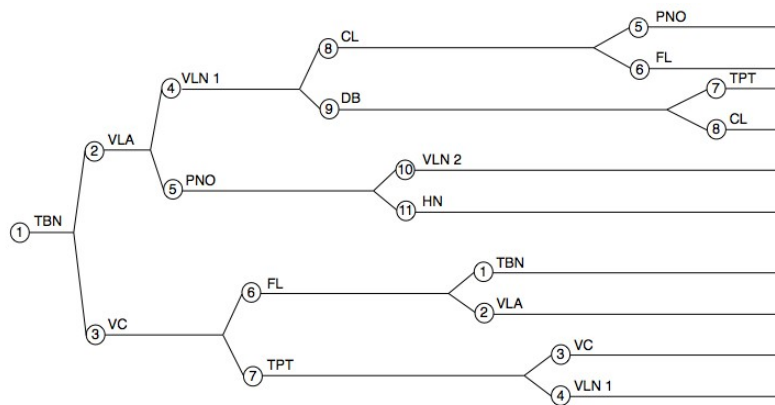


Figure 28: Form of *unless it dies, it remains alone*

While this occurs, each instrument decays in one or more of the following ways: getting slower, quieter, becoming less frequent, less resonant or timbrally present, having less attack or becoming fragmented. To show that death is necessary for life, new instruments only enter when an instrument has stopped playing. Instruments return merely for practical reasons regarding the limitations of the ensemble, rather than for any conceptual meaning.

Notions of multiplication and the gradual accumulation of instruments suggested strong associations with canonic structures. Rasmus Zwicky's *Canone doppio senza tempo* (Canon without time) from *Canons Without*, was a beautiful reference, both for its notational simplicity and conciseness, and for its growing texture comprised of lively, active materials which slow down.

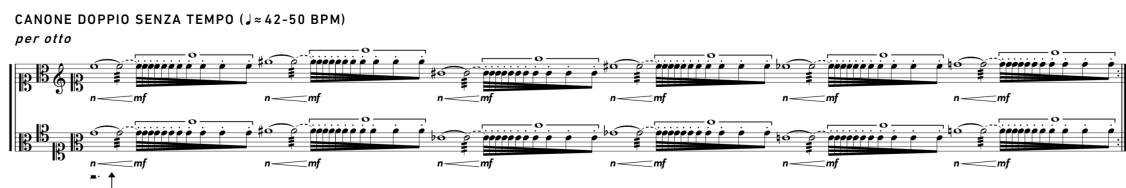


Figure 29: Rasmus Zwicky's *Canone doppio senza tempo* from *Canons Without* ¹⁰¹

I was struck by how such a minimal amount of material, and such succinct notation could generate complex, yet still flexible, materials for eight

¹⁰¹ Rasmus Zwicky, *Canone doppio senza tempo*, *Canons Without*, Score. It is included here with the kind permission of the composer. It can be heard on www.soundcloud.com/rasmuszwicky/canone-doppio-senza-tempo, accessed 4/11/18

instruments. It drove me to explore what would happen if each of my parts was notated only on a single page. The desire to have a minimal amount of material involved exploring how much variety in decaying gestures was needed to maintain the listener's interest in my work. While there are broad similarities with Zwicky's work, my piece differs in that it has a wider variety of materials and transformations, which occur over longer periods of time, and is not a canon.

I tried to maintain some continuity between parts, so that new instruments inherit aspects of the previous instrument, like seeds. This occurs particularly at the start, where the bright, charged quality of the trombone's split tone is taken on by the viola and violoncello. However, later instruments only generally inhabit the same pitch areas suggested by the initial split tone.

Furthermore, I also wanted to explore questions of temporality in more extended works, particularly how to make the piece feel short and intimate even though it is 20 minutes long. This kind of temporality is reflected in James Tenney's *Critical Band* (1988) and the works of Morton Feldman. Bryn Harrison's description of Feldman was striking for this reason:

It might be considered that what Feldman offers to the listener instead is a much closer (one might say magnified) perspective of the materials through which we are invited to focus on the subtlest aspects of change. [...] Feldman, I would argue, is not the heroic composer of works of grand proportions but a miniaturist, creating intimate works that often last several hours.¹⁰²

Despite wanting to create an intimate work, I had approached it as though it had 'grand proportions', because I allowed too many ideas to accumulate during the creative process. Integrating and focusing these was a rather complex and laborious experience. In contrast, I had approached *Colour Catalogue: Whites* as though it was a miniature, with a smaller amount of material and more clarity, because there was less time to create it. I was also initially aiming to write a 7 minute piece, rather than for 14' 45", but found that the material needed more time to unfold. In the future, I want to approach all work with the same urgency, clarity and scale as a very short piece, however long the work is, or how much time I have to write it.

This work combines elements from earlier pieces (*Reordering the Unconsumed* and *Reframe*, movement 1) and the more recent, catalogue works. Like the earlier pieces, there is one overarching trajectory for the entire work. It conveys

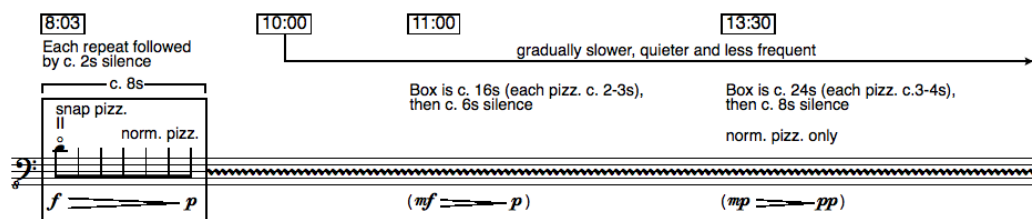
¹⁰² Harrison, 'Repetitions in extended time', 49

an unfolding, holistic process which is closely linked to the work's metaphor. However, it is also clearly influenced by *Shifting* because it is a catalogue of individual parts, undergoing separate processes. It is not one object decaying, but many, superimposed and unfolding within the overall, linear trajectory. During the creative process I was struck by Bernd and Hilla Becher's various catalogues of industrial structures, such as *Water Towers* (1972-2009), *Gas Tanks* (1965-2009), *Coal Bunkers* (1974) and *Blast Furnaces* (1969-95).¹⁰³ Different iterations of each structure were photographed and positioned together. *Winding Towers (Britain)* (1966-97) captures their decay as the British coal industry declined while the work was created.¹⁰⁴ Though its influence on my work has evolved, my piece also has multiple entities decaying simultaneously. The notation reinforces this – the work is a catalogue of decaying parts, each a page long. By inhabiting a world between linear process and catalogue (to some extent like its precursor *remnants*), the work extends *Reframe's* explorations of forward momentum within stasis.

The notated parts each reflect this positioning between linear process and catalogue by combining the list notation of *Shifting* with a horizontal transformation of the material.

1 Silence (0:00-8:03)

2 Play (8:03-15:05)



3 Silence (15:05-20:00)

Figure 30: Double bass part in *unless it dies, it remains alone*

The brevity of the notation minimises compositional control, allowing sounds to unfold flexibly, and therefore organically. This enables each performance to be noticeably different. For instance, in the last two minutes of another recording (see appendix), there are more silences within the texture which creates a more

103 These works can be viewed online at Tate, www.tate.org.uk/art/artists/bernd-becher-and-hilla-becher-718, accessed 3/11/18

104 Citation at Tate Modern, London

intriguing ending.

One difficulty I encountered was knowing how to convey conceptual thought when music is abstract. It was hard to reflect the juxtaposition between violence and hope simultaneously. In Qureshi's work, the blood and flower clearly maintain their respective identities and meanings, so that their integration instantly communicates hope in suffering. However, music requires time to unfold, being a process of growth or decay rather than a static snapshot. It is harder for individual components (instruments) to maintain their respective identities when others are heard simultaneously, because the overall effect dominates. This is because gestures such as the double bass's snap pizzicato, and the penetrating, accented sound of the flute's head joint are perceived as abstract force, rather than violence. What may seem like a violent gesture on its own can sound like exuberance within the larger texture if the overall harmony is consonant. Alternatively, what may seem hopeful (the entry of more instruments) can escalate violence if the overall harmony is tense and chaotic.

This then raised the question of how to control the overall texture. I did not want to create chords and impose them onto the texture because it sounded too constructed. The alternative was a suggestion from Paul Newland, which was to approach pitch as a contour, and to state whether each part would start slightly higher or lower than the previous gesture. The player would choose their pitch from within a given band of pitches. This was appealing, as the pitch material would grow organically and uniquely every time the piece was performed, without my control.¹⁰⁵ However, with numerous musicians, this had the potential to create a muddy, dissonant texture, which I wanted to avoid to preserve the aspect of hope in the work.

In the end, the harmony was the by-product of intuitively assembling samples in GarageBand. It mixes partials from the F harmonic series from the trombone's split tone (recorded on various instruments), and pitches which were improvised by players during collaborative sessions. The harmonic sequence was not pre-planned, but grew organically as I decided where instruments fit within the work. The harmony is simple and familiar to not attract attention, while being transparent enough to expose the transformation of individual gestures.

Hope is conveyed through consonant, modal harmony, while poignancy

¹⁰⁵ An example of this approach can be found in Paul Newland's *1-4* (2007) for amplified harpsichord.

emerges from the decay of individual layers. While the work's structure communicates both violence and hope, through the simultaneous presence of growth and decay, the listening experience actually switches between them. The work fluctuates between periods of initial energy and decay.

The work surprisingly expanded my materials within my current aesthetics. Although it began with extended techniques, there was a return to more timbrally pure and direct sounds, which are reminiscent of my earlier aesthetics of disintegration. These arose because it was necessary to simplify materials in order to maintain transparency in an accumulative texture.

***Breathing bones* (electroacoustic with video)**

This work was made in collaboration with Chan Sze-Wei, a choreographer and videographer based in Singapore. It was first shown in The Joy Offensive's multi-disciplinary event 'ocean.' as a piece for three live musicians (soprano saxophone, alto saxophone and bassoon) and video projection¹⁰⁶, but has since been substantially revised. The work now exists as a video with electroacoustic music.

In both its versions, *Breathing bones* explores the phenomenon of coral bleaching, the process in which corals lose their colour due to rising water temperatures. Corals expel algae as they become poisonous, depriving them of their colour and food. Without the algae, the coral's white skeleton becomes visible through its transparent flesh. In this bleached state the coral is vulnerable and still alive, but will die if conditions do not improve. This phenomenon is sadly occurring all over the world, including the Great Barrier Reef.¹⁰⁷ I was initially drawn to this metaphor because it is unusual for an organism to still be alive when their skeleton is visible. It provided yet another relationship between death and life that seemed achronological.

A revision was required because the initial version raised several issues (see appendix for score). Firstly, the materials were too specific. The form was dependent on perceiving very liminal variations of an alto saxophone multiphonic. While the material seemed reliable and malleable when workshoping fragments of the work, it was very difficult to produce these liminal variations in the context of the whole work. (I had also underestimated the air and stamina required for this material.) Therefore the form was prone to collapsing. Furthermore, I wanted a very specific teeth on reed sound on the soprano saxophone at the end, which was hard to recapture, despite the player listening back to their sample from the workshop. This latter issue was partly due to the deliberate avoidance of complex notation in wanting to create a flexible, simple score. This experience exposed the importance of ensuring the malleability and reliability of material early in the creative process, within the wider context of the work, and the danger of false security arising from listening repeatedly and uncritically to samples in GarageBand.

¹⁰⁶ The video was originally intended as a floor projection so that the musicians would become part of the moving image. However, due to technical practicalities for this performance the film was projected onto a curtain covering the back wall, behind the musicians.

¹⁰⁷ Pueschel, Martin (Australian Museum), Coral Bleaching, <https://australianmuseum.net.au/get-involved/amri/lirs/coral-bleaching/>, accessed on 4/1/19

Secondly, the work did not have a clear relationship to coral bleaching. In wanting to avoid portraying the bleaching process step-by-step, I had tried instead to capture the broader physicality of coral bleaching, particularly the violence, starkness and fragility, through local gestures. For instance, the teeth on reed sounds at the end were intended to convey the penetrating, yet fragile quality of bleached corals. However, the result did not satisfyingly explore coral bleaching in a clear, focused way.

Revision

I decided to recreate the work electronically as an acousmatic piece with video, to allow listeners to encounter the same specificity I had discovered in the material on GarageBand. I also wanted to make the unrealistic aspects of the work a positive asset rather than a failing. Despite this different approach, I was keen to maintain an aesthetic of organic decay in using electronic interfaces. I viewed this process as an extension of the phenomenological approach of scrutinising samples closely on GarageBand for their inherent richness.

Working on Logic Pro, I started with a small extract of a live recording of the original work. This small amount of material was originally the opening section. I then time-stretched this to around 9 times its length, and from this texture took three overlapping chunks of around 4 minutes each. Each of these chunks is a section of the work.

Instead of exploring the general violence and fragility of coral bleaching, we narrowed our focus to our ability to see the deeper, usually hidden layers of the corals as they become bleached – their white skeleton. The parallel we drew between this and our materials is as follows:

Coral body	Ambiguous body (video)	Sonic body
Layers are flesh and skeleton	Layers are human flesh and squid bone	Layers are bands of frequency

Figure 31: Parallel with coral bleaching in *Breathing bones*

The work consists of three sections, which explore a specific layer of the body. As the work unfolds, we perceive deeper layers in both the video and sounds.

Section	Video	Sound
1	Flesh	High frequencies
2	Flesh and bone	Middle frequencies
3	Bone	Low frequencies

Figure 32: Layers of the body in *Breathing bones*

At its core, each section shows the same sonic object, as the three chunks came from the same time-stretched material. However, a different band of frequency is emphasised in each, as I changed the EQ in each section to reinforce certain frequencies and weaken others.

The video was also amended and similarly underwent a reduction in the amount of material. This focused the work, and provided a clearer link to coral bleaching.

An implication of exploring minimal craftsmanship is considering where the boundary is between music that is focused and music that lacks interest. At one stage, the lack of variety in the material made the music predictable. To add richness, ambiguity and depth, I superimposed layers which had undergone various pitch (and consequently temporal) transformations, created a bigger contrast in the EQs of the different sections, and also reinforced some of these frequencies by using other filters.

Reworking the piece electronically allowed me to ensure that the listener experiences what I intended. The absence of a final score removed the risk of losing specificity. Unlike previous works, the assembled material (mock-up recording) *is* the final outcome that the listener experiences. However, despite this greater control over the transmission of the work, I still wanted to present materials in which richness was found rather than constructed. Time stretching and altering the EQ were ways of scrutinising and discovering what was already inherent in the material. I avoided any electronic synthesis of new sounds. Rather I wanted to expose and reinforce the natural unpredictabilities already within the material (for instance, the beating of the middle frequencies in the second section, or the intricate rhythms which emerged from slowing down the material). The visual content also mirrors this focus on organic materials through its scrutiny of natural textures and forms, which gives the work a sense of intimacy and vulnerability.

Despite the musicians' physical absence in the final stages, and the fact that Sze and the dancers were in Singapore, a close, human collaboration was absolutely central to the work. However, I currently do not think that the absence of live performers is a long-term solution to maintaining specificity, especially in works without a visual element, because there is something irreplaceably human about the performative element that seems key to exploring organic decay. The desire to expose the inherent richness of acoustic instruments makes it important that the listener can also see performers engaging with the irregularities and uniqueness of their own instrument. For this reason, I would prefer not to venture more fully into electronic music.

Like *Colour Catalogue: Whites*, the work now has panel-like sections which are snapshots of the material. The conceptual metaphor rests not on the qualities of individual, local sounds, but more broadly on how a fixed collection of sounds is organised. The sounds were freed from having to assume specific timbral qualities or gestures to convey the physicality of coral bleaching on a local level. By not imposing such a narrow conceptual agenda on individual sounds, I was free to explore a wider variety of possibilities for the material. The concept was used to frame the materials, rather than the materials being used to serve the concept. These two pieces thus have a different approach to *sounds which grow richer as they decay*, which, despite being framed rather than driven by conceptual meaning, had meaning located in how a local sound transformed, rather than broader sections.

The same is true for the video, which shifted from portraying violent gestures to simply focusing on the natural textures of the body. These were presented in a more understated and ambiguous way, to help the viewer scrutinise it afresh. We deliberately avoided clear synchronisations between the video and music, to reduce the sense of craftsmanship.

3. Reflections

I would now like to draw together some reflections, with reference to my research questions. The first of these was 'how might processes of decay be applied to sonic materials to deepen a work's poetic investigation of organic decay?'. Examples are varied and plentiful, including the increasingly hazy and darker timbre of the violoncellos in *Reordering the Unconsumed* to reflect mould, the loss and recombination of instruments in *Shifting* to evoke the opal's changing colours, and the emphasis on increasingly lower frequencies in *Breathing bones* to mirror the perception of deeper layers during coral bleaching. In *unless it dies, it remains alone*, the notion that death can be fruitful was reflected in the textural accumulation of instruments over time, while instruments simultaneously became slower, quieter and less present.

The question assumes that musical processes would be chosen to support a poetic concept of decay, but surprisingly, the creative process was sometimes reversed, with poetic concepts emerging from musical processes. This is true for *sounds which grow richer as they decay* and *remnants*, where poetic connections appeared later, adding poetic significance to the materials. Pieces created with this approach are characterised by a deeper lack of control. They expose phenomena of decay inherent in the material itself, rather than conveying an external reference. These works provided a method to reflect more effectively the minimal craftsmanship of organic decay, and resulted in a shift towards reflecting poetic significance in broader levels of organisation rather than in local sounds.

The second research question was 'How might the methods of visual artists inform and extend the use of decaying processes in contemporary classical music?'. Various visual artists have been significant models in exploring organic decay in my work. Sam Taylor-Johnson and Geoffa Fells's methods of revealing organic decay eventually led to an exposure of a natural enrichment within decay in sonic form in *sounds which grow richer as they decay*. Jiang Zhi's halting of decay through photography, and Imran Qureshi's blood-stained flowers provided methods of investigating decay and hope simultaneously. My unexpected venture into this area has placed my work closer to a selection of vanitas art depicting symbols of immortality¹⁰⁸ alongside reminders of transience, and the work of Anya Gallaccio, which also explores growth in

¹⁰⁸ The Editors of Encyclopædia Britannica, <https://www.britannica.com/art/vanitas-art>, accessed 14/12/18

decay. Gallaccio states:

My work obviously reflects loss, or the fragility of life, but too much focus has been placed on the death and decay. The accumulative, the building up of material and of waste; the regenerative, is important and often overlooked.¹⁰⁹

Perhaps of most significance is the work of Park Seo-Bo and Agnes Martin, who enabled me to minimise control by exploring liminal variations between versions in a catalogue. This led to a deeper scrutiny of material on their own terms, as they appeared in more raw and unrefined states. Their methods provided a solution to issues of form arising in earlier versions of *Shifting* and *Breathing bones*, and also led to a change in notation from conventional scores to lists. By minimising control in notation, there is more emphasis on finding complexity through simple and practical means.

Underlying most challenges in this research were questions regarding control. Changes to my approach to form, the creative process and notation were all driven by exploring the tension between specificity and reduced control.



Figure 33: Spectrum of control

GarageBand and Logic Pro were increasingly used in the creative process to maintain timbral specificity when composing. While my engagement with these programmes led to a more flexible approach to rhythm, pitch and notation, timbre became more specific. The liminal variations in works since *remnants* demonstrate this. Heightened timbral specificity resulted in more pressure to reflect the precision of the mock-up recording in live performance. This led to a conflict between timbral specificity and the natural unpredictability of live performance. Examples include the appearance of the highest partial of the multiphonic in *remnants*, the balance between noise and tone in the trombone's split tone in *unless it dies, it remains alone*, the viola part in *Shifting*, and the liminal variations of the alto saxophone's multiphonic in the initial version of *Breathing bones*. This conflict arose because the resulting sounds sometimes fell outside of my intentions.

Various solutions were tested. Firstly, *Breathing bones* was revised

¹⁰⁹ Anya Gallaccio quoted in Clarrie Wallis and Anya Gallaccio, 'Dust Bunnies and Coffee Stains: in conversation with Anya Gallaccio', *anya gallaccio* (Ridinghouse), 243

electronically as a work without live performance, to preserve timbral specificity. While this was effective for this particular project, it is not a long-term solution due to the reduced physicality in experiencing the work. Secondly, with regards to *remnants*, *Shifting* and *unless it dies, it remains alone*, I started distancing myself from the mock-up recording to allow myself to experience the live performance on its own terms. This helped by removing expectations, but did not address differences between the result and my original intentions.

Thirdly, I tried embracing the notion that the performers' interpretation changes with each performance. Éliane Radigue's approach to recording her acoustic works has encouraged me to patiently allow the work to ripen in the performers' hands:

[...] the first piece I did was with Kasper T. Toeplitz on electronic bass. He's played this piece about 30 times and now it's just flying; it improves every time. So we'll make another recording, to track how the piece evolves. The premiere of the new work for Rhodri Davies and his harp was also absolutely incredible. Rhodri asked if we should make a recording and I said wait a while; because it was the first time he had played in a room that wasn't his or my room in Paris. It's like with painting: in an artist's studio you see it one way, but in the gallery it's something different. So I said, let it grow.¹¹⁰

Sometimes it is difficult to distinguish between what is erroneous compositional judgement and what is possible after spending a prolonged time with the material. But Radigue's statement is a beautiful reminder of the performers' ability to further discover the material through repeated performances. This has certainly been true of works including *remnants* and *Colour Catalogue: Whites*.

However, the most useful method so far in addressing the tension between timbral specificity and the unpredictability of live performance is to change how I think about my materials. I am now beginning to accept the higher partial of the multiphonic in *remnants* when I view it as an inevitable part of raw, untreated material. Anya Gallaccio's practice has been helpful here:

With all the materials, from flowers and ice to bronze, I am interested in a degree of uncertainty and investing in a conversation with the material or my collaborators. Whilst I can anticipate what a material may do, and how it will respond, I have no expectations about how it will perform. I establish the formal parameters, the rules, and then see what happens.

[...]

110 Éliane Radigue quoted in Paul Schütze, 'Surround Sound', *Frieze* (Issue 142, 2011), <https://frieze.com/article/surround-sound>, accessed 11/10/18

Often form becomes disorder; I lose authority over the material. For example, although the pressed flowers are laid out systematically in a grid – when they decompose they leak out.¹¹¹

This has helped me to view the material's independence as a unique testament to its organicism. Its inability to be controlled is simply the material exercising its earthy properties. Although this research already began with an interest in unstable sounds, it has challenged me to begin to accept materials beyond my control and intention. Furthermore, Gallaccio's statement has also transformed my understanding of the creative process as being a collaboration not just between the composer and performer, but also with the material.

Future explorations

While accepting reduced control is important, in the future I also want to incorporate more flexibility into my materials to reduce friction between compositional intention and the unpredictability of live performance. I would like to investigate where the line is between reduced control and too little control, in order to pursue more earthy and unrefined material. I would continue exploring controlled aleatoricism, rather than creative absence from the work. Like Witold Lutosławski, I am interested in chance that 'is subordinated to the aim indicated by the composer' and that 'enriches the means of expression consciously used by the composer'.¹¹² This contrasts with John Cage, whose interest in unintention meant a 'willingness to accept any sound that may happen'¹¹³.

However, unlike Lutosławski, who did not want to be surprised by the results¹¹⁴, I aim to encounter unfamiliar material. I want the unpredictability of live performance to be a core part of the material again, so that change in the live performance is positively creative, rather than a compromise. By leaving room for the material's unpredictability, the live performance would be a collaborative act of discovery, and part of the experiment that is shared with the listener.

Flexibility could be introduced in various ways. With regards to form, I could extend the notion of the catalogue to having different versions of the work itself. By integrating some flexibility in how the work unfolds, the same piece could decay differently every time, in a way that resonates with the uniqueness and

111 Anya Gallaccio quoted in Wallis and Gallaccio, 'Dust Bunnies and Coffee Stains', *anya gallaccio*, 239

112 Witold Lutosławski, 'About the Element of Chance in Music', *Lutosławski on Music*, Zbigniew Skowron (ed., trans.) (Plymouth, 2007), 51

113 Michael Nyman, *Experimental Music: Cage and Beyond* (Cambridge, 1999), 131

114 Lutosławski, 'About the Element of Chance in Music', 51

unpredictability of organic matter.¹¹⁵ Alternatively, I could give more responsibility to the performers to catalogue their own interpretations of a given amount of material. This would allow the performers to find their own preferred interpretation by testing liminal variations of balance and articulation in rehearsal, which they then share with the listener. This makes the performers' interpretation absolutely central to the work. Another option could be exploring even more simplistic and open scores which can generate new possibilities and affect the form more directly. This would make notation more integral to the actual sounds, and have maximal impact and meaning.

To increase timbral flexibility, I could explore timbre which encompasses a wider range of desirable possibilities. This would involve using open-ended materials such as the second half of *Reordering the Unconsumed*, compared to the narrowly defined materials of *remnants*. Again, Éliane Radigue's approach is helpful here:

[...] I think of [the wolf tone] as a huge sound that is particular to each instrument. It changes every day, so first of all [Charles Curtis] finds out what is the 'wolf tone' of the day, depending on the weather. All these instruments have their own lives – this is the first thing to respect.¹¹⁶

Incorporating flexibility within the sound is to acknowledge that the physical properties of the instrument are in flux. Creating a work which can shift and change as the materials inherently transform is a way of embracing the uniqueness of each instrument. *Colour Catalogue: Whites* and *unless it dies, it remains alone* have a mixture of very specific and open-ended materials. In the future, I would like to create some pieces which focus only on open-ended materials.

Another option is to preserve the liminality of variations but to locate points of structural change within more reliable variations of the sound. These would be practical, malleable versions of the sounds that can be simply and reliably produced with precision.

Alternatively, perhaps some sounds are more beautiful when left to happen by chance. Reproducing these sounds may require controlling them less directly and instead, creating an atmosphere in which these may happen.

¹¹⁵ Applying Paul Newland's suggestion in *unless it dies, it remains alone* to future works. While working on *Reordering the Unconsumed*, Geoffa Fells also suggested introducing a greater lack of control in future explorations of mould, to reflect the mould's unpredictable response to its environment.

¹¹⁶ Éliane Radigue quoted in Schütze, 'Surround Sound', *Frieze* (Issue 142, 2011), <https://frieze.com/article/surround-sound>, accessed 11/10/18

Incorporating more timbral flexibility in these ways gives the sound space to naturally transform. This is similar to building with organic materials such as wood, where it is necessary to allow room for the wood to expand and contract in reaction to its environment¹¹⁷. In this way, the live performance can be a shared experience between the composer, performer and listener in discovering the inherent richness of instruments.

117 Baylor, Chris, 'Dealing with Expansion and Shrinkage in Woodworking Projects' (2018), www.thesprucecrafts.com/allowing-for-expansion-and-shrinking-3536449, accessed 4/1/19

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