Harmonic Centricity and Paths Towards Integrating Different Soundworlds

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Softbound submission: September 2017
Hardbound (final) submission: January 2019

This dissertation is submitted for the degree of Doctor of Philosophy
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Abstract

Many current schools of compositional thought evidence an interest in the integration and collision of different methods of harmonic organisation. Creating strategies that aid composers in incorporating many dramatically different methods of harmonic organisation in individual compositions will help lead to new, exciting music and ideas – the methods leading to the generation of such strategies are a central concern of this thesis. Composers can create pieces of music that engender dramatically different states of being and relate seemingly unrelated musical ideas – the manipulation of many methods of technical organisation will lead to the successful implementation of such shifts, the thesis also addresses this. A major difficulty in the furtherance of new music relates to how composers can make use of more unusual compositional techniques in contexts where performance practicalities could inhibit the realisation of a piece – working closely with soloists and ensembles lends a crucial insight into appropriate instrumental and vocal writing, a third important aspect of this thesis.

In conclusion, this thesis evidences that it is absolutely possible to relate seemingly distant musical ideas in individual compositions in service of an effective, practical composition. There is a tremendous, exciting wealth of powerful musical ideas to draw upon; such ideas can be found in the collision and integration of dramatically different musics.
In my compositions I seek to make the most out of the phenomenally diverse, continually expanding resources that are available to composers working today. The collision of different methods of musical organization creates fruitful ground for the creation of new music. In order for artists to express their identities in an ever-more-plural culture they must seek to harness the myriad resources available, to create musical spaces where different cultures can intertwine, and to find ways to make different musics and influences work together in the context of individual compositions. This is also a political issue: certain cultures and ways of making music are more prevalent because of the privileged position the composers of such music hold in society.1 Researching and discovering methods of implementing different soundworlds is a path towards greater representation of the marginalized, towards understanding our world more clearly, and – if for no other reason than the voices of certain communities have not been heard before – it is a route to new music that more truly reflects the world we live in.2 The marginalized groups I focus on relate to the cultures I came from or those I am currently part of – it is for this reason that I often explore themes relating to political violence, alienation, poverty, wealth inequality, and educational inequality. For me, the importance and positive impact of political engagement cannot be stressed enough.3

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Over the course of this commentary my focus will be on how one can manipulate different types of technical organization to develop pieces of music where extremely varied methods of musical organization exist concurrently – usually in relation to a harmonic centre. I will dedicate a chapter to the relevant technical elements before fully discussing my portfolio and highlighting the important aspects of each piece before presenting my conclusions.
Chapter 1: Technical Elements

In my understanding of tonality I draw on Tymoczko’s *A Geometry of Music*. He seeks to ‘provide general categories for discussing music that is neither classically tonal nor completely atonal’. For Tymoczko ‘the term [tonality] describes not just eighteenth - and nineteenth – century Western art music, but rock, folk, jazz, impressionism, minimalism, medieval and Renaissance music, and a good deal of non-Western music besides.’ He identifies five features that contribute to a sense of tonality: conjunct melodic motion, acoustic consonance, harmonic consistency, limited macroharmony, and centricity. In my work I seek to push the limits of each of these features but I find harmonic centricity to be the most significant: it is difficult to structure large-scale pieces without the clear focus that these centres provide. *A Geometry of Music* provides an analyst with a method and language to concurrently describe and discuss such different theoretical approaches to making music; this is crucial for my compositions and aesthetic goals.

I am also interested in engaging with and modifying tonal and quasi-tonal features at a deeper structural level and am particularly influenced by recent interpretations of what Peter Maxwell-Davies describes as modal tonics and dominants. Academics have argued that there are clearer, simpler ways of expressing the relationships in Maxwell-Davies’s music by using pitch-class set notation rather than thinking of it

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5 Ibid.
modally. I feel that reinterpreting what we perceive as a key or harmonic function can grant us insight into new ways of thinking about the factors that contribute to one’s sense of structural hearing. My belief that we need to be more liberal in our descriptions of tonality operates in tandem with my belief that there is no such thing as atonality – we need to listen to different musics in different ways. Much of my quasi-tonal writing relates to interval cycles.

An interval cycle is a collection of pitches generated by moving from an initial pitch-class in a single direction by a single interval until the initial pitch-class is reiterated. There are many ways to use interval cycles in music but they are often discussed in conjunction with chord substitutions. Ernő Lendvai postulates that Béla Bartók used an axis system whereby interval cycles outline a network of potential root notes upon which one may build substitute chords for tonic, subdominant, and dominant function harmonies. This idea revolved around generating 3 mutually exclusive C3 (an interval cycle moving in a single direction by a minor third) cycles beginning on the tonic, subdominant, and dominant degrees of a given key (Appendix 1). This provides us with a simple framework that can lead to a significant increase in harmonic resources. Throughout the course of my research I have found similar forms of musical logic in jazz and rock music as well as other genres of classical music – all of which strongly

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influence me (Appendix 2). Beyond basic substitutions for functional chords there are several ways of engaging with interval cycles.

Charles Ives made frequent use of interval cycles and focused primarily on two types.\(^{12}\) The first of these is the single-interval cycle. These are characterized by the cyclic repetition of a single interval. Combination cycles, the second type, are characterized by cyclic repetition of two or more intervals.\(^{13}\) In my analytical nomenclature, developed from Nicolas Jones’s analyses of Peter Maxwell-Davies’s symphonies, I use long horizontal lines to show the occurrence of interval cycles and dotted lines highlight a repeated note or an alteration.\(^{14}\)

Example 1: single-interval and combination cycles

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\(^{13}\) Ibid.

These interval cycles can be used to extend, develop, or emulate more traditionally tonal harmonies. The following example illustrates how Britten used interval cycles in his *Four Sea Interludes*. Note how he truncates his use of cycles to prevent the occurrence of chromatic pitches – interval cycles can be used in a tonal context to produce collections of pitches that can be classified as diatonic.

Example 2: Britten, *Four Sea Interludes*, Movement 1, bar 8

Thomas Adès provides particularly interesting examples of how one can develop interval cycles differently to support different musical ends. In his *Darknesse Visible* he recomposes a John Dowland lute song. The foreground modal melodic material that Adès highlights in this piece is strikingly similar to a melody he uses in *Tevot* and his Violin Concerto. Throughout both of these works, small sections of combination cycles are layered to produce harmonies that can often be interpreted as tonal, despite owing their voice-leading to a different musical logic. During my undergraduate research I described these truncations as linear intervallic patterns rather than interval cycles.\(^\text{15}\) Adès’s re-usage of these materials in subsequent works has led me to change my opinions and I would now postulate that his use of interval cycles directly emulates the type of modality used in the Dowland song. He took some of the

\(^{15}\) David J. Roche, *Consonance and Consistent Process: the Problem of Tonality in Adès’s Violin Concerto – Undergraduate Dissertation*, (Cardiff University, 2011)
melodic material from *Darknesse Visible*, transformed it into a combination cycle, and created two pieces from the ensuing raw materials.

Example 3: combination cycles in Thomas Ades’s *Darknesse Visible*, Violin Concerto, and *Tevot*

A further type of interval cycle usage that is illustrative of the manner in which I use them can be found in Adès’s Piano Quintet. He uses several interval cycles concurrently to generate harmonies that can be interpreted as tonal, again truncating them before the occurrence of a pitch that could be classified as a dissonance.
Boulezian multiplication is a specific method of producing interval cycles.\textsuperscript{16} Boulez’s usage of this technique involved taking the intervallic elements of a set-class and using them as ‘multipliers’ that impact upon a ‘multiplicand’, a pitch-class from a pitch-class set of the same set-class.\textsuperscript{17} In its most basic form this causes the cyclic repetition of a single interval from an initiating pitch-class (see example below).

\textit{Example 5: Boulezian multiplication}


Boulez is also known to have departed significantly from the processes he set up with his interval cycles; this causes huge harmonic changes, and in my music I use these in a manner akin to modulation.\(^{18}\) I fuse these gear-shift interval cycle changes with another type of interval cycle used by Thomas Adès in his composition *Traced Overhead*. In this piece Adès makes use of an interval cycle that grows by a semitone each time it is iterated; this cycle gradually produces two octatonic scales separated by a tritone (see example below).\(^{19}\)

Example 6: Adès’s gradually expanding interval cycle

\[
\begin{array}{cccccccc}
+1 & +2 & +3 & +4 & +5 & +6 & +7 \\
\text{\ding{162}} & \text{\ding{163}} & \text{\ding{164}} & \text{\ding{165}} & \text{\ding{166}} & \text{\ding{167}} & \text{\ding{168}}
\end{array}
\]

The combination of these techniques provides me with an easy method of moving between different collections of pitches in a manner that evokes a sense of key. This is something that I first implemented in my composition *Semiquaver City* (see example below, and in Appendix 3 where it is labelled with its original title, *Inertia*). The bifurcating lines provide the composer with a choice of whether to create a stable, quasi-octatonic harmony or produce something more chromatic.

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\(^{18}\) Ibid.

Example 7: bifurcating interval cycles in *Semiquaver City*

The intervallic distance from a starting note gradually expands by +1. The alternative starting notes allow me to move away from the octatonic scale this expanding interval cycle produces.

<table>
<thead>
<tr>
<th>interval class 1</th>
<th>IC2</th>
<th>IC3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 choices</td>
<td>4 choices</td>
<td>8 choices</td>
</tr>
</tbody>
</table>

Following on from *Semiquaver City* I decided to see how far I could push the idea of an interval cycle. This resulted in the composition of *Lorem Ipsum* for solo electric guitar – in this piece I made use of a 36-tone interval cycle (see below and Appendix 4) by altering the tuning of the instrument. This experimental piece became pertinent when working on my composition *Bright Paths to New Worlds* as it provided me with a basis to engage with interval cycles in a harmonic environment outside 12-tone equal temperament.

Example 8: 36-tone equal temperament combination cycle in *Lorem Ipsum*.

I am also interested in procedures relating to serialism, specifically Webern’s techniques of derivation and Berg’s highlighting of more tonal aspects of certain 12-
tone rows.\textsuperscript{20} I often serialize rhythmic elements in my music and I treat the process very liberally, usually to control the rates of musical change in my music.\textsuperscript{21}

Microtonality is another area that is important to me. Bruno Mantovani uses microtonality in a free and coloristic manner – his microtonal pitches can often be classified as extended harmonies.

Example 9: Bruno Mantovani, Jeux d’eau, bars 11-12

\begin{center}
\begin{figure}
\centering
\includegraphics[width=\textwidth]{example9.png}
\end{figure}
\end{center}

Some of my research engages with how microtonality can be implemented as part of a musical language operating in dialogue with more traditional tonalities. As such I wanted to use microtones as an expansion of extended harmonies, akin to Mantovani’s Jeux d’eau; I wanted to decorate musical gestures and quasi-tonal harmonies with microtonal pitches in a manner similar to Unsuk Chin’s Rocana and Hans Abrahamsen’s Let Me Tell You; and I wanted to make use of thundering


microtonal basslines and low harmonic writing in a manner similar to Georg Friedrich Haas’s *Hyperion*. As part of my engagement with microtonality I also wanted to engage with spectralism.

With respect to spectral harmony my research explores the practicalities of performing particular partials on different instruments. This was only possible when working with a small group of musicians over an extended period of time. Even professional ensembles often found these too hard to achieve. Aside from this I am interested in mapping certain aspects of the harmonic series on to different methods of musical organization as a way of fusing different harmonies. The following examples express how one might find harmonic links between a harmonic series and interval cycle writing.

Example 10: fusing harmonies on C

The first five pitches of a cycle of fifths starting on C will produce a C pentatonic scale, transposing this scale by interval class 5 twice in the same direction will give you two new sets – the second set will contain either a B♭ or an F#. These chromatic
pitches are also present in the Lydian Chromatic, a scale that closely approximates the harmonic series. This is just one strategy to link these very different methods of musical organization (I use this in *Bright Paths to New Worlds*). I will now provide the context for some of the rhythmic processes used in my composition.

Apropos rhythmic processes my strongest influences are Elliott Carter, Conlon Nancarrow and Thomas Adès. In much of my music I engage with the idea of multiple pulse streams. Change ringing processes also interest me due to their phenomenal complexity.\(^\text{22}\) I associate a rhythmic duration to each value in a collection of rhythms, these durations determine the rate at which these values are repeated, and this controls the rate at which pitches are reiterated. Appendix 5 gives the clearest example of this change ringing process – it is taken from the pre-compositional scheme for my composition *Lorem Ipsum*. In my submitted works, which I consider more successful, I use these processes much less strictly. I will now discuss each of my compositions in turn.

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Chapter 2: Individual Compositions

Ozartmay

Ozartmay has been revised and reworked several times. Major performances of this work were undertaken by BBC National Orchestra of Wales as part of Composition Wales: 2016 and the Cambridge Graduate Orchestra, and arrangements of Ozartmay have been performed by Lisa Nelsen (solo flute), the Gildas String Quartet, and Dr. K Sextet (flute, clarinet, violin, viola, cello, and percussion). The following table clarifies the structure of the final version of the orchestral work.

<table>
<thead>
<tr>
<th>Tables 1: structure of Ozartmay</th>
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<tbody>
<tr>
<td><strong>1-19</strong></td>
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<tr>
<td><strong>20-29(1)</strong></td>
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<td><strong>29(1.5)-54</strong></td>
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<td>191-249</td>
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<td>250-284</td>
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<tr>
<td>285-286</td>
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In *Ozartmay* I was protesting BP’s funding of the Royal Opera House’s 2016 production of Mozart’s *Don Giovanni*. In a spirit of reclamation, I treated my musical materials in a manner that I considered to be associated with the essential elements of Mozart and the Classical style. I used this alongside technical elements more associated with contemporary classical music and my research interests. BP’s reach is global and in order to musically reflect the people that their funding could potentially impact upon I required a wide range of methods of musical organization – my plurality of harmonic resources acts as a metaphor for the vast number of communities that would be impacted. The Mozartian structural elements, because they are likely to be better known and because they create certain types of

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psychological expectation, act as a unifying feature in the face of these hugely varied forms of musical organization – representing a shared musical knowledge we must preserve.

The triumphant C major brass at the end of the work (bar 249) follows a long section of turbulent, almost collapsing musical material (bars 234-248). This is a musical metaphor for the struggle to save classical music from the stranglehold of corporations. Pressure applied by the protest groups I supported did eventually effect change and caused BP’s influence over British artistic efforts to be weakened, thus showing that musicians and artists can shape our world for the better – expressing yourself publicly is important as far as political music is concerned.\textsuperscript{24} I will now outline some of the technical elements of this composition.

Example 11: \textit{Ozartmay}, bars 1-2

\textit{Ozartmay}, bars 1-2

\includegraphics[width=\textwidth]{example11.png}

In example 11 one can see a very particular type of interval cycle relationship – a tritone substitution (bar 2). In this context I am using these cycles to contribute to a

\textsuperscript{24} ‘Do the arts need oil sponsorship?’, \textit{BP-or-not-BP}, Wordpress, April 1 2012, \<https://bp-or-not-bp.org/does-the-arts-need-oil-sponsorship/> [accessed 25 September 2017]
sense of functional harmony. The initial B♭ Maj (add11) functions as a tonic, the G minor chord functions as a submediant chord (an extension of the tonic), and the B5 (♭11) functions as a dominant as its root note is a tritone away from F natural – the dominant of B♭ major. This is not the only use of interval cycles in Ozartmay, I also implement them to contribute to a sense of teleology by creating a more general intensification of dissonance.

Example 12: Ozartmay, bars 16-19

The use of concurrent interval cycles in Example 12 contributes to the intensification of dissonance – this creates the expectation of a cadential chord, the B5 (♭11). In bar 17 the harmony becomes more saturated but the quasi-tonal writing that precedes this material encourages the listener to hear the music as a kind of dominant or predominate harmony. It is also worth noting the flexibility with which the interval cycles are used. In the context of my music it is more important to use techniques to create engaging harmony outside the logic of a more typical form of tonality rather than to preserve a process - interval cycles are a route to this. They can also be used to
create more unusual, unexpected harmonic extensions. The following examples illustrate some aspects of melodic writing in *Ozartmay*.

Example 13: *Ozartmay*, bars 29-33

Example 14: *Ozartmay*, bars 39-43

Both of these examples outline combination cycles that generate pitches that can be expressed as extensions of a diatonic harmony. In the upper example I use the -1, -2, -2 combination cycle to control the sense of melodic shape and movement. This melodic shape, derived from a combination cycles, is used in the solo violin at the start of the composition and also as the fugal subject later on. The wide interval cycles starting lower in the texture create a fuller harmony with a diatonic feel; the cyclic movements were chosen to bring out features that would sound diatonic. In bars 39-43 interval cycles are used to develop a quasi-tonal ebb and flow in relation to a
harmonic centre rather than to create a feeling of departure; the rising interval cycles contribute directly to the sense of harmonic direction, dissonances can be classified as diatonic, the 3-note harmony has been maintained, and the usage of the cycles is curtailed before they produce pitches that would be considered dissonant in more strictly tonal context. The final notable usage of interval cycles in *Ozartmay* relates to a small transition section, bars 82-85. This material in annotated in Appendix 6, one can clearly see the use of concurrent interval cycles – these create a dense and saturated harmonic landscape in anticipation of the following music.

From bar 86 the music is starkly different. In order to create a contrasting section I modified the macroharmony to include more pitches, a change of harmonic centricity, and a faster rate of harmonic change above. This is shown in the modulo 12 diagram in the example below, taken from my initial sketches for the piece.\textsuperscript{25}

Example 14: *Ozartmay*, initial sketch material relating to of bar c.86
The motivic similarity of this gesture to the opening material causes the music to feel homogenous but the harmonic difference creates contrast – a sense of modulation. These relate to aspects of Mozartian style I hoped to explore; tight and clear motivic development, clear harmonic development relating to harmonic areas, and a sense of harmonic function.26

The next section of significant musical interest within this piece comes with the arrival of the fugue – starting at bar 190. My initial idea was to use a large combination cycle to derive the harmonic material for the whole passage. On beginning that endeavour I realized that in order for musical ideas to be crafted in to a fugue there has to be some kind of harmonic logic relating to modulations. My research indicated that cultural factors significantly impacted upon whether or not something was a fugue and how a fugue might be structured.27 Despite undertaking formal study and a significant amount of research regarding fugal composition, I found the most clear and abstract explanation of what a fugal structure can be was on Wikipedia. I used this as the basis of the plan of my fugue, the subject of which is shown below.

Example 14: Ozartmay, fugal subject

Using the fugal structure I started crafting different materials that I thought I would require. I created 7 chords based on some of the combination cycles I originally hoped to use – an idea I borrowed from Adès’s *In Seven Days* – and transposed these chords according to the key areas outlined in my fugal plan. The repetition of the chord progression gives a sense of key, especially when coupled with transpositions.

Example 15: *Ozartmay*, chords progression used in the fugue

Following this I created a draft score that contained the plan of the fugue. This score is included in Appendix 7 where it is fully annotated to show the full scale of the original plan of the fugue, the majority of which has been used in *Ozartmay*. Towards the end of the fugue I wanted the composition to expand in to large 12-tone harmonies and develop in to a huge cadence resolving on C major. In order to do this I abandoned my own fugal plan and drafted a graph indicating how I would taper and intensify dissonances. This graph, owing to its size, is listed in Appendix 8 and shows how I planned the usage of 4 pitch class sets from the same set class to create a gradation of harmony that leads to a large cadence.

The last major section of *Ozartmay*, bars 249 onwards, uses the harmonic series as an organizing principal. The harmonic series was a particularly suitable method of musical organization for this section as the opening three pitches are actually part of a

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set class that is a subset of the harmonic series approximated in to 12-tone equal temperament (see below).

Example 16: *Ozartmay*, using the harmonic series as an organizing principle.

*Ozartmay*, 12TET approximation of the harmonic series used in *Ozartmay*

![Harmonic Series Approximation](image)

*Ozartmay*, bars 277-281
Harmonies generated through the application of the harmonic series.
The initial motifs are transposed on to the harmonic series.

The C Mixolydian feel of this passage (created through the usage of the spectral B♭) allows a smooth transition in to the well-moulded functional tonality of the final few bars. These last few seconds are a direct quote of Mozart’s simple sonata with one considerable difference: the melodic material very quickly moves by a tritone after it reaches the final C in the melody. This is a reference to the aesthetic subject matter and a play on Stockhausen’s *Gruppen* – a piece that ends with a rather quiet, cheeky leap of a tritone in the French horn.

When workshopping this piece I found that using spectrally-influenced microtonal sonorities as a replacement for tonal harmonies created some difficulties. I suspect that the issue in the original drafts of this piece related to using microtonal pitches in one aspect of the harmony but not in the other. This created a kind of discrepancy –
half of the musicians were performing in C Mixolydian with some microtonal pitches, and half were performing in C Mixolydian in the same ranges without microtonal pitches. In order for the microtonality to be more successful I had to be more committed to one form of musical organization. I chose to use non-microtonal pitches. Appendix 9 contains some older drafts of microtonal material used in Ozartmay.

This piece was one of my earlier experiments in integrating very different methods of musical organization into a single piece and was an example where I found that microtonal harmony was perhaps not as readily implementable as I had hoped. I did, however, succeed in mixing different types of distantly related harmony showing how these different methods of musical organization can work together. The next composition I will discuss is Critical Apathy.

**Critical Apathy**

As part of the inaugural Musicfest Aberystwyth in 2016 I was asked to write a piece for the Magnard Ensemble consisting of wind quintet, piano, and two narrators (conducted by Thomas Leaky). The composition, Critical Apathy, was premiered on 27/08/2017 after a week of rehearsals and workshops.

Before I began composing this work I contacted Tom Clucas, a poet I would later work with on my opera Voids, about composing a non-partisan but politically-themed poem relating to the idea of non-linear warfare: a method of purposely creating political apathy in populations by disseminating seemingly conflicting streams of
information.\textsuperscript{29} In tandem with this I was also strongly influenced by the staggering appropriation of meme culture by governments and also, more recently, the alternative right.\textsuperscript{30,31} I find the flippant and childish statements broadcast by organizations – some state run - in some of the most powerful countries in the world frightening and absolutely bizarre. My goal was to musically represent the deeply insidious role that politically-minded people in high-power positions have in bullying and controlling journalists and media outlets, I also wanted to represent the result of the strategic implementation of this informational static has on the populace.

Throughout \textit{Critical Apathy} I alter and transform musical ideas in a manner that causes the original source to become twisted and obscured. This process becomes more extreme and eventually leads to a final, violent, but unrelated musical statement that represents the resultant – desired - apathy of living under the communicational control of states that disseminate their information in such a manner. It is of particular importance that the main thematic material is quite light-hearted, with strange, sometimes a little jarring, gradual changes underneath. This reflects the idea that although the manner in which the media disperses information to us may seem inconsequential there are actions beneath the surface that reflect an appalling abuse of information. The structure of \textit{Critical Apathy} is detailed below.


<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-11</td>
<td>A</td>
<td>Bitonal feel; C major with Gb major (tritone relationship), enhanced with interval cycles.</td>
</tr>
<tr>
<td>12-25</td>
<td>B</td>
<td>Tritone repeat of A becomes starting point for transition material. Tonal material obscured with slides, later grow in to scalar patterns influenced by Slonimsky’s scales.</td>
</tr>
<tr>
<td>26-39</td>
<td>C</td>
<td>C minor melody obscured by bending.</td>
</tr>
<tr>
<td>40-41</td>
<td>Transition</td>
<td>A 2-bar tag, strong influence of minimalism.</td>
</tr>
<tr>
<td>42-56</td>
<td>D</td>
<td>Music derived from A section leading towards a focus on a single harmonic point rather than two.</td>
</tr>
<tr>
<td>57-78</td>
<td>E</td>
<td>Music derived from A split in to a freer counterpoint and with added, free microtonal aspects.</td>
</tr>
<tr>
<td>79-95</td>
<td>F</td>
<td>Narrators begin to read. A total collapse of the harmony and movement. Bends linger to create thick textures.</td>
</tr>
<tr>
<td>96-133</td>
<td>B’</td>
<td>A repeated version of earlier materials – changed, slightly offset, and re-framed to link to the aesthetic.</td>
</tr>
<tr>
<td>134-136</td>
<td>A’</td>
<td>A clunky, repeated version of earlier material.</td>
</tr>
<tr>
<td>137-141</td>
<td>D’</td>
<td>A modified repeat of earlier material</td>
</tr>
<tr>
<td>142-180</td>
<td>G</td>
<td>This section is an amalgamation of A, B, C, and D. The overlapping of material links to the idea of non-linear narratives.</td>
</tr>
<tr>
<td>181-188</td>
<td>H</td>
<td>Stabbing chords created by overlaying different types of musical material.</td>
</tr>
<tr>
<td>189+</td>
<td>I</td>
<td>The rhythmic profile from earlier is kept but the melodic shape is no longer recognizable.</td>
</tr>
</tbody>
</table>
In *Critical Apathy*, interval cycles are implemented to create and distort accompaniment figures. This distortion is extended in to other musical features too; microtonal bends are added, patterns of chromatically-shifting scales are overlaid, free microtonality contributes to the flow of the piece, and some serialism-influenced processes are in place. A wide range of interlinked, varying, and developing methods of musical organization were crucial in the representation of the aesthetic idea: the confusion and overwhelming nature of non-linear warfare. The following example shows an analysis of the initial musical idea in *Critical Apathy*, a melody in Gb major against an accompaniment rooted in C Mixolydian.

Example 17: *Critical Apathy*, opening melody ideas
One can see from the above example that these patterns are quite intuitively written, there are frequent changes in cycle usage as well as the type of cycle; semitone cycles, whole tone cycles, and gradually contracting cycles. The more stable, bitonal material is pulled towards a type of harmony not associated with either key. It is a separate logic underpinning the section, a fusion of different methods of musical organization – a confusion bubbling away.

These concurrently sounding interval cycles gradually build in to longer patterns (most obvious in bars 15-24, annotated in Appendix 10). The scalic patterns that follow, inspired by Slonimsky’s scale book, are continually developed in a manner that moves further away from the bitonality of the opening. Each instrument is assigned its own developing scalic pattern – the addition of new, often higher, pitches saturates the harmony and intensifies a sense of teleology prior to the following section. There are further sections of this piece that are important to a discussion of how to incorporate different methods of musical organization in to a single piece.

In bars 57-78 I use free microtonality to enrich the quasi-tonal harmony – the microtone usage is not systematic, it is free, contrapuntal, and linked to the rest of Critical Apathy in its motivic similarity. Bars 79-90 expand on this significantly. The motivic writing from 26-39 becomes the main musical figure in this section but the flexing glissandi create harmonically dense, simple-to achieve gestures that contribute to an unusual sense of harmony. It is at this salient structural point that I chose to have the poems recited: the music has collapsed in on itself, all of these different methods

of musical organization – these different viewpoints on an argument – have led to this overstimulation and caused this pulsating mass of sound, this character’s apathy.

There are two more sections particular to this piece that require discussion. The first section, bars 148-188 makes use of material from bars 26-39. The motifs are overlapped, transposed, lengthened with internal repetitions, and gradually spread between different parts. This culminates at bar 181 with the entire ensemble playing stabbing chords to bring the piece to a close. The impact is both aesthetic and physical: the build up of the material causes a loud and muscular sound that bears little relation to its starting point whilst serving as a metaphor for the build of information from media outlets (Appendix 11).

The final segment sees a total breakdown in harmonic organization. From bar 189 onwards I wrote freely but dissonantly. The rhythmic profile of the piano is derived from previous material but the harmonic material bears no relationship to previous ideas. The ‘character’ of the pianist is unable to process any more difficult and overlapped information and, instead, resigns itself to apathy.

With regards to my research output more generally, *Critical Apathy* is an exploration and expansion of more unusual forms of tonality with post-tonal means; bitonal gestures appended with interval cycles, arrays, process music, and microtonal movements. These are synthesized to represent an aspect of the world we live in – the plurality of which could not be represented without such diverse means.
Ten Acre Riots!

Ten Acre Riots! for solo piano was written for Benjamin Powell as part of Psappha’s Composing for Piano Scheme for which I was selected. This piece was written over the course of 8 months and 3 workshops before a final performance and video recording on 20th January 2017. Ten Acre Riots! was also placed 3rd in the first round of the 2017 International Antonín Dvořák Composition Competition, selected as a highly commended composition (first runner up) in the 2017 An Art Artistry Contemporary Piano Composition Competition, and shortlisted for the Welsh section of ISCM’s World Music Days.

Tredegar – my hometown - translates roughly as ‘ten acre town’, hence the title. The exclamation mark is borrowed from the title of a local band’s song (The Blackout – ‘I’m a Riot? You’re a Fucking Riot!’ from their EP TheBlackout! TheBlackout! TheBlackout!). For me, Tredegar, the Welsh Valleys, and the South Wales music scene of the last 30 years are all powerful symbols of decline; the legacy of the latter has come to be described as ’horrible torture’ and the biggest danger to young people in Wales is the increasing poverty. Many of the sociological problems relating to these communities stem from a mistreatment of poorer communities by

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David John Roche  PhD in Music Composition  Downing College

governments and wealthy parties.\textsuperscript{36} Furthermore, these areas have suffered with poverty for close to 200 years.\textsuperscript{37} Growing up in this part of the world has had a deep impact on my music and me.

During and after the EU referendum campaign much of the discourse from my Leave-voting hometown focused on feelings of abandonment, alienation, and violence.\textsuperscript{38} I wanted to draw attention to the similarities between the rhetoric and actions during the Brexit campaign (including a local march opposing Syrian refugees) and the discourse and behaviours during 3 riots that took place in Tredegar; in 1868 there was political riot after a Liberal candidate was not elected as MP; in 1882 there were major anti-Irish riots; and in 1911 there was an anti-Jewish riot.\textsuperscript{39}

My goal in \textit{Ten Acre Riots!} was not to write loud, unrelenting music as a literal representation of the violent acts. Instead, I wanted to compose music that created a murky snapshot highlighting the similarities in Tredegar’s sociological climate during the 3 riots and the climate surrounding Brexit. To do this I represented some tropes found in all of the events, each of which is ‘discussing’ the same idea; light-hearted and delicate figures turn into bickering and attacking gestures depicting the politer,

\begin{itemize}
\item\textsuperscript{38} Steven Prince, ‘Proposed ‘anti-refugee’ rally in Ebbw Vale’, \textit{South Wales Argus Online}, South Wales Argus, 20 August 2016, [accessed 25 September 2017]
\item\textsuperscript{39} Brian Turner, ‘Riots’, \textit{Tredegar Online}, Tredegar Online Ltd., [accessed 25 September 2017]
\end{itemize}
pub-bound citizen – of which I am one (bars 1-9); quiet gestures are washed away by louder voices acting as a metaphor for the local political figureheads capitalizing on these peoples’ feelings and ignoring the weak and desperate (bars 10-12); nostalgic melodies slip through the texture - an emblem of the fading voices of older generations (bars 60-96); and violent gestures seep away only to be repeated again and again – just louder, signifying the casual but intense violence of the local political extreme (bars 111-141).

Not all of the voices represented are brash and serious but they all contributed to the sociological and political sphere of each riot and the narratives surrounding the Brexit debate. They must not be ignored if one is to grasp an understanding of why communities such as these continue to commit such seemingly gratuitous acts of self-harm – this is part of what I wanted to draw attention to in *Ten Acre Riots!* Following on from the completion of this piece I ensured it was publicised to the communities it related to – I wanted to make sure it reached those that it was written about, and I wanted them to engage with the music. Although the audience was small (Tredegar is a small place) the response was positive and impactful.

Table 3: *Ten Acre Riots!* structure

<table>
<thead>
<tr>
<th>bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-9</td>
<td>A</td>
<td>Melodic idea derived from Boulezian multiplication with fixed intervallic movements and harmonization.</td>
</tr>
<tr>
<td>10-21</td>
<td>A’</td>
<td>Gestures either end of the piano’s register inspired by Bolcom’s <em>Poltergeist</em>.</td>
</tr>
<tr>
<td>22-24(2)</td>
<td>B</td>
<td>Cadenza</td>
</tr>
<tr>
<td>Time</td>
<td>Section</td>
<td>Details</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>24(3)-26</td>
<td>A’’</td>
<td>Quick repeat as a transition.</td>
</tr>
<tr>
<td>27-31</td>
<td>C</td>
<td>Significantly modified version of A, new section and transition.</td>
</tr>
<tr>
<td>32-39</td>
<td>D</td>
<td>4 separate 2-bar sections consisting of 3 elements; minor 3rd related harmonies (similar to octatonic, reminiscent of Scriabin in the structure and LH), Enescu-inspired spectral influence, and virtuosic lines taken from B.</td>
</tr>
<tr>
<td>40-50</td>
<td>E</td>
<td>Change ringing and alterations of Enescu harmony representing corruption. Cadenza in final 2 bars.</td>
</tr>
<tr>
<td>51-59</td>
<td>E’</td>
<td>Modified E acting as a transition</td>
</tr>
<tr>
<td>60-71</td>
<td>F</td>
<td>LH melody in different tempo.</td>
</tr>
<tr>
<td>72-91</td>
<td>F’</td>
<td>Multiple modified repeats of F reflecting the Elliott Carter-style metric modulations.</td>
</tr>
<tr>
<td>92-96</td>
<td>G</td>
<td>First usage of harmonics, derived from my piece <em>Depths</em>.</td>
</tr>
<tr>
<td>97-104</td>
<td>A’’</td>
<td>A modified repeat of A.</td>
</tr>
<tr>
<td>105-123</td>
<td>H</td>
<td>A new section made from bars 10-11. Spinning it out over and over.</td>
</tr>
<tr>
<td>124+</td>
<td>I</td>
<td>This is an amalgamation of A, G, and H.</td>
</tr>
</tbody>
</table>

*Ten Acre Riots!* was influenced by a significant number of different compositions. The following examples are typeset segments of my original sketch material for *Ten Acre Riots!* (the handwritten document is displayed in Appendix 12).
Example 18: *Ten Acre Riots!*, original sketch material

I decided to start with two notes a semitone apart and then move from each note by gradually expanding or contracting interval classes according to the bifurcating lines process discussed in the introduction (although the bottom stave of the first example shows that I didn’t stick to this process rigorously at all). The vertical harmony was initially systematized to include lots of fourths and fifths but I became more concerned with following my intuition.

The second of the two examples shows two pitch collections generated by moving from a starting point by a fixed pattern of intervals. This is applied in several points throughout *Ten Acre Riots!*; bars 27-31 are a particularly clear example. These rows are used in combination with the multiplication-influenced material from the start of the composition to lead to new harmonic areas.
The next important section of music in this composition can be found at bars 32-39. During this section I use minor third related harmonies to create contrast between repeated material (bars 32-33, 34-35, and 36-39). These Scriabin-inspired harmonies are coupled with a chord taken from Enescu’s *Carillon Nocturne*. The dominant-seventh harmony of Scriabin’s music can be overlaid and made compatible with the harmonic series because, when represented using 12-tone equal temperament, the harmonic series contains a dominant seventh chord. This harmony gradually transforms into the spitting rhythmic gestures at bar 40-71. These rhythms were created according the change ringing procedures outlined in the introduction (see Example 20). As the music progresses from bar 40 I gradually dispense with the fixed rhythmic process and instead imitate and repeat rhythms that have already been generated – one can still see remnants of the initial process, however.

Example 20: initial change ringing process in *Ten Acre Riots!*

The melody introduced in the left hand (treated with interval cycles in the same manner as the bar 29 melody of *Ozartmay*) at bar 60 prepares a section later on in which there are multiple simultaneous different tempi – this section is bars 73-77. The melody at bar 60 is placed in different tempi in the outer two voices. My original plan was to use these different tempi to prepare metric modulations for the following sections but I found that the musical place the process led me to was more engaging if
altered. The original melodic cells that were transformed into different tempi and the interval cycles associated with them are displayed in Example 21.

Example 21: *Ten Acre Riots!*, melodic cells

A penultimate point to make regarding *Ten Acre Riots!* relates to collage. In several moments of this piece I decided to interrupt the musical flow I had set up with sections of new material constructed from different ideas gelled together. This is most noticeable from bar 119 onwards which contains lots of different breaks and silences to allow the music to shift.

The final point I would like to make about *Ten Acre Riots!* relates to how my own research in making new timbres and sounds fed into the development of this piece. Several years ago I wrote a piece entitled *Depths*. In preparation of that piece I had spent a long time engaging with strategies relating to affecting note bends inside the piano – one can effect pitch bends on a piano by opening the lid of the instrument and pressing down on the string. I implement this technique in bars 92-96, and bars 125 onwards. I also wanted to engage with how to make unusual timbres using the higher partials of the piano strings – the piano is one instrument in on which it is particularly
easy to manipulate very high partials, the nodes are very close to the performer. This can be heard throughout the piece and, once they moved past what I considered to be notateable range, they are indicated on the score using idiosyncratic nomenclature (see the penultimate bar).

[Ten Acre Riots!] engages with a lot of post-tonal techniques as a starting point. My main desire during this piece was to integrate different types of non-tonal writing alongside instrument-specific methods of musical organization and difficult rhythmic techniques that are more achievable by a soloist than an ensemble. I feel of my entire portfolio that this piece is one of my more ambitious and successful works.

**Hold on to Joy**

*Hold on to Joy* for 6 pianos was written for Grand Band as part of the Inaugural Peter Reynold’s Composers’ Suite at the Vale of Glamorgan Music Festival. First performed on 22nd May 2017, *Hold on to Joy* was particularly inspired by my work as a private music teacher providing lessons to people who could afford to pay for tuition after state funding cuts removed the provision from schools.\(^{40}\) The impact of a musical education is obvious and proven.\(^{41}\) It is appalling that people are denied this on the basis of their sociological status and I feel some guilt for providing private


tuition and, in this way, supporting this inequality. The music of *Hold on to Joy* reflects my conflicting feelings of upset and joy: unsettled, vicious sections act as simultaneous representations of my anger and powerlessness but the dancing, groovy refrain is reflective of the happiness I find in providing people with access to something so valuable, regardless of the dubious ethics. It is important to hold on to the positive aspects of one’s work.

Table 4: structure of *Hold on to Joy*

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-7</td>
<td>A</td>
<td>Modal but based on Boulezian multiplication in a similar manner to <em>Ten Acre Riots!</em></td>
</tr>
<tr>
<td>8-16</td>
<td>B</td>
<td>Similar construction to A but focuses on the noisier elements of the process.</td>
</tr>
<tr>
<td>17-34(2)</td>
<td>A’</td>
<td>Lots of repeats with serial treatments of the main melodic idea.</td>
</tr>
<tr>
<td>33(2.5)-40</td>
<td>B’</td>
<td>Minimalist treatment of the B ideas.</td>
</tr>
<tr>
<td>41-48</td>
<td>B’’</td>
<td>Modified repetition of B</td>
</tr>
<tr>
<td>49-54</td>
<td>C</td>
<td>Splitting apart the texture.</td>
</tr>
<tr>
<td>55-81</td>
<td>A’</td>
<td>A with a new bassline developed out of previous processes.</td>
</tr>
<tr>
<td>82-91</td>
<td>B’’’</td>
<td>Suddenly begins repeating earlier material.</td>
</tr>
<tr>
<td>92-108</td>
<td>D</td>
<td>Music derived from a chord from the <em>Texas Chainsaw Massacre</em> with minimalist material from B’ helping the transition.</td>
</tr>
<tr>
<td>109-114</td>
<td>A’’</td>
<td>A final repetition of material heard previously.</td>
</tr>
</tbody>
</table>

---

I will focus on two particular elements of *Hold on to Joy*; the use of quasi-serial procedures to generate quasi-tonal, rhythmically and acoustically consonant harmony, and the manipulation of the Boulezian-influenced harmonic organization to produce music that has a significant resemblance to more tonal structures.

Firstly, from the opening few measure one might already spot a rhythmic and harmonic similarity to *Ten Acre Riots!*, In *Hold on to Joy* I make use of very similar techniques to generate a varied soundworld and, having just finished *Ten Acre Riots!*, I wanted to develop out some of the ideas that were left undeveloped in that piece.


It is easy to discuss aspects of the piece as being in a key, the opening bars, for example, clearly present as B♭ major. Indeed, this is something that is particularly marked when considering clear shifts in harmony such as the switch to G major in bar 37. This type of tonality is expanded in different ways throughout the piece. The music that begins in bar 34 dwells on a single harmonic area as a means of creating musical interest – the music here clearly expresses some influences relating to minimalism. I consider the insistent repetition of musical ideas as something more akin to a ‘hook’ or ‘riff’ in rock music than a compositional scheme relating to procedures used in minimalism. This rock influence is also definitely reflected in the ‘power chord’ style harmonization in perfect 4ths and perfect 5ths found in bars 49-
54, I was actually thinking of Justin Hawkins’s use of his death chord in these sections. This leads to a very intense soundworld prior to the repeat of the main melodic idea that pervades the refrain.

Example 23: *Hold on to Joy*, bar 49

![Musical notation](image)

Also of note in this section (bars 49-54; Piano 1, Piano 3) is the use of two out-of-sync strata highlighting different dissonant chords in the build-up to a repeated section. The dissonance here is partly generated by the different harmonic paths they take as part of the quasi-multiplication development. The paths are not designed to generate diatonic pitches; they are designed to produce more dissonant material (see Appendix 13).

Another important aspect of this piece relates to rhythm. Appendix 14 highlights the clear relationships between the main melodic ideas and their developments throughout bars 55-81. These were developed from a melodic idea created by highlighting some of the notes that jut out of the semiquaver line that starts in bar 1. Most of the developmental procedures thereafter are strict and indebted to more rigorous process music; retrograded, inverted, and transposed rhythmic ideas are overlaid.

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43 This description was taken from an issue of *Total Guitar* my secondary school guitar teacher gave to me as a young student. The magazine has since been discarded.
A final point of note in this composition relates to my usage of a chord from the in-film music of *The Texas Chainsaw Massacre*. This is used in bars 92-108 and is created by gradually collapsing a major 9th by a semitone (another type of interval cycle). This very dense chord was used to create a sense of cadence towards the end of the piece. This is arranged, very flexibly, for the ensemble with rhythmic arrays preventing certain lines from overlapping – I wanted the audience to be able to hear certain elements of the chord, a technique I repeat in *Bright Paths to New Worlds*.

Example 24: *Hold on to Joy, Texas Chainsaw Massacre* chord (process)

In conclusion, *Hold on to Joy* expresses a strong influence from rock, pop and minimalism. It also expresses a way to apply serial procedures and post-tonal harmonic constructions to different contexts simultaneously to create new soundworlds relating to tonality. With regards to my research output it is a piece that had a significant impact on my ability to develop very different musical ideas in the context of the same piece successfully. The next piece I will explore is *Voids*. 
Voids

Voids was selected as the Cambridge ADC Theatre’s Corpus Playroom Lateshow for November 2016; the production was independently funded by the Fletcher Players and performed for three nights in November 2016. In this composition I set 9 new poems commissioned especially for this opera to music; these poems were based on 9 poems taken from Gilbert Adair’s A Void, a translation of Georges Perec’s La Disparition. The poems Perec imitated ranged from Shelley to Rimbaud and reflected a wide array or aesthetic standpoints, I wanted this to be part of my opera too and, in pursuit of this interest, I set to working with 8 different poets; Alexandra Clark, Tom Clucas, Michael Brown, Robin Lamboll (Slam Poetry Champion), Joel Lipson, Mathilde Sergent, Enis Yucekoralp, and Tom Peak. This work has a complex structure (Act 1 is bars 1-496, Act 2 is bars 497 onwards), the structure of two acts is described below followed by some of the more unusual features of the composition.

Table 5: Voids, ‘Vanishing Diary’ structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-7</td>
<td>Introduction</td>
<td>Primary theme for opera</td>
</tr>
<tr>
<td>8-44</td>
<td>A</td>
<td>Jazz chords with restricted movement for singer.</td>
</tr>
<tr>
<td>45-78</td>
<td>B</td>
<td>Spinning out patters of change ringing</td>
</tr>
<tr>
<td>79-93</td>
<td>C</td>
<td>Violent and choppy.</td>
</tr>
<tr>
<td>94-100</td>
<td>A’</td>
<td>A modified repeat of the end of A</td>
</tr>
<tr>
<td>101-160</td>
<td>A’’</td>
<td>A modified repeat of A with lots of new figures added.</td>
</tr>
<tr>
<td>161-216</td>
<td>D</td>
<td>A new section developing the fast rhythmic material</td>
</tr>
</tbody>
</table>
from previous sections. Ends with a vocal solo and a re-transition into a new section.

| 217-241 | A’’  | A finalizing repeat of the opening material. Complete with a repeat of the introductory material. |

Table 6: *Voids*, transition material structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>242-251</td>
<td>Transition material</td>
<td>This section bridges a gap between numbers</td>
</tr>
</tbody>
</table>

Table 7: *Voids*, ‘Ozymandias’ structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>252-273</td>
<td>A</td>
<td>Broken trio—freer, less-tonal writing.</td>
</tr>
<tr>
<td>274-286</td>
<td>B</td>
<td>Homophonic melody for trio.</td>
</tr>
<tr>
<td>287-302</td>
<td>C</td>
<td>Counterpoint resembling A leading into new section</td>
</tr>
<tr>
<td>303-314(2)</td>
<td>C’</td>
<td>Denser counterpoint with cadenzas at end</td>
</tr>
<tr>
<td>314(3)-375</td>
<td>A’</td>
<td>Repeat of opening with chunky chords from 344.</td>
</tr>
</tbody>
</table>

Table 8: *Voids*, transitional material structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>376-398</td>
<td>Transitional material</td>
<td>This bridges a gap between numbers</td>
</tr>
</tbody>
</table>
Table 9: *Voids*, ‘I ask; but calming spirits’ structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>399-418</td>
<td>A</td>
<td>Opening melodic material with microtonal bends.</td>
</tr>
<tr>
<td>418-428</td>
<td>B</td>
<td>Contrapuntal entries begin, still C major</td>
</tr>
<tr>
<td>429-463</td>
<td>C</td>
<td>Color filter section begins ends with huge chord in 4ths</td>
</tr>
<tr>
<td>464-496</td>
<td>A’</td>
<td>Repeat in B major with tags from 480</td>
</tr>
</tbody>
</table>

Table 10: *Voids*, introduction to Act 2 structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>497-501</td>
<td>Introduction to Act 2</td>
<td>Recalls thematic material.</td>
</tr>
</tbody>
</table>

Table 11: *Voids*, ‘No!’ structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>502-517</td>
<td>A</td>
<td>E major with some light dissonance.</td>
</tr>
<tr>
<td>518-525</td>
<td>B</td>
<td>In relative minor key.</td>
</tr>
<tr>
<td>526-546</td>
<td>A’</td>
<td>Back in E with some changes in arrangement and a coda</td>
</tr>
<tr>
<td>547-580</td>
<td>C</td>
<td>Lots of over-bright bent notes to make a wackier sound</td>
</tr>
</tbody>
</table>

Table 12: *Voids*, ‘As our shadows always say’ structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>581-611</td>
<td>A</td>
<td>Unpitched but violent</td>
</tr>
<tr>
<td>612-684</td>
<td>B</td>
<td>Similar melodic material with pitch bends. Lots of repeats, developments, gradations and sectional divisions lead to the climax.</td>
</tr>
<tr>
<td>Bars</td>
<td>Section</td>
<td>Notable features</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>685-710</td>
<td>C</td>
<td>New section built out of spectral retuning of guitar</td>
</tr>
<tr>
<td>711-712</td>
<td>Transition</td>
<td>Little rhythmic motif.</td>
</tr>
<tr>
<td>713-732</td>
<td>C’</td>
<td>Same as C but with big climax.</td>
</tr>
<tr>
<td>733-739</td>
<td>D</td>
<td>Secondary section to C.</td>
</tr>
<tr>
<td>740-781</td>
<td>E</td>
<td>Canonic section.</td>
</tr>
<tr>
<td>782-803</td>
<td>C’’</td>
<td>C with elements of E, E is held over as a carter-style</td>
</tr>
<tr>
<td></td>
<td></td>
<td>metronomic addition</td>
</tr>
<tr>
<td>804-859</td>
<td>A’</td>
<td>Big build on the initial A section.</td>
</tr>
<tr>
<td>860-881</td>
<td>A’’</td>
<td>Crushing ending.</td>
</tr>
</tbody>
</table>

Table 12: *Voids*, ‘Monochromatique’ structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>882-901</td>
<td>Introduction</td>
<td>Rotational arrays create strong dissonance.</td>
</tr>
<tr>
<td>902-909</td>
<td>A</td>
<td>Obscured C major harmony</td>
</tr>
<tr>
<td>910-918</td>
<td>B</td>
<td>Traditional B section turns in to transitional material.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whole tone writing at end</td>
</tr>
<tr>
<td>919-924</td>
<td>C</td>
<td>Static new section, unexpected.</td>
</tr>
<tr>
<td>926-934</td>
<td>B’</td>
<td>Significantly modified B section.</td>
</tr>
<tr>
<td>935-952</td>
<td>Introduction’</td>
<td>Repeat.</td>
</tr>
<tr>
<td>953-970</td>
<td>A’</td>
<td>Opened up repeat with the addition of B</td>
</tr>
</tbody>
</table>

Table 13: *Voids*, ‘I carry your heart’ structure

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>971-993</td>
<td>A</td>
<td>Love duet</td>
</tr>
</tbody>
</table>
994-1001 | A’ | Alteration of A
1002-1005 | A’’ | Another harmonic alteration
1006-1038 | A’’’ | A further collection with a tag of the opening theme in the final 2 bars

My primary goal when writing this opera was to create something unusual and non-traditional. I wanted an unrelenting experience that bore very little resemble to a standard opera with no overarching plot, no real dramatic push, just a series of arias linked by scene. Furthermore, I wanted to create a large-scale piece that encompassed as many different forms of musical organization as possible. This is quite clearly presented in the structures listed above – there is a wealth of music in *voids*. I will discuss the most peculiar and important aspects of this opera as a work of this size could warrant a commentary of its own.

I will start with a clearly tonal aria titled ‘No!’ This number was originally composed as a tremolo piece for solo classical guitar. Traditionally functional tonal harmony can be found in the A and B sections which are securely in E major and C# minor respectively. The only non-traditional harmony in these sections is in the woodwind. Even though these contribute to the harmonic thickness they are still diatonic and do not detract from the established sense of harmony. The following section, bars 547-580, sees a different embellishment of a similar melody. Using these similarities to create a solid link and continuity between the two sections, one can then begin to embellish the music further. The glissandi present throughout this final section create a denser, less stable harmony – music that sits outside purely 12-tone equal temperament while maintaining links to that form of musical organization. Appendix
15 illustrates the diatonic, functional nature of the piece and the embellishments of the harmony that are present.

The next excerpt that I would like to discuss is an aria later in the second act that is primarily in C major titled ‘Monochromatique’. In this aria I subvert the formal expectation one has apropos a traditional aria and substitute it for something more associated with post-tonal structural organization (see the sudden arrival of the C section).

The most significant difference between this aria and ‘No!’ is in the harmonization of the melodic material. Both melodies have clear characteristics relating to functional, traditional harmony and these characteristics are embraced or ignored in different ways. In ‘Monochromatique’ we hear dissonant figures that result from the treatment of a C major melodic line (Example 25) using methods associated with post-tonal construction, this is outlined in Appendix 16.

Example 25: ‘Monochromatique’ C major melody

A third example of the varying the relationship to a harmonic center can be found in the final duet, ‘I carry your warmth’. In this duet I wanted to make reference to G♭ major, the key most commonly associated with love and elation in classical opera.44 Although I wanted this composition to evoke a sense of tonal ebb and flow, I wanted

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44 Hugh MacDonal, ‘G-Flat Major Signature Key’, 19th-Century Music, Vol. 11, No. 3 (Spring 1988)
it to be significantly different from the arias sounded previously. In order to do this I exploited the Boulezian multiplication technique described in the technical elements chapter to create an array of pitches that evoked a soundworld indebted to G♭ major.

In Appendix 17 I detail how I use linear interval cycles to create flourishes and variations in the harmony that sit outside a sense of G♭ major. One may also notice that the melodies are freer and have a more improvised feel. This aria, however, is tightly constructed through the use of process.

The final number of the first act, ‘I ask; but calming spirits’ contains many features previously discussed; small microtonal glissandi, diatonic clusters, rhythms that obscure a more stable rate of harmonic rhythm, and clear, quasi-tonal melodic material. One feature that has yet to be discussed, however, is a method of fixed harmonic change whereby a chord is altered a note at a time over numerous iterations with the goal of changing an initial harmony in to a larger, predetermined chord. In the case of this composition the predetermined chord is constructed using pairs of perfect fourths and arrived at over a long period of time using a pre-determined collection of chords (see Appendix 18). This allowed the non-tonal shifting of harmony to be organically woven in to the composition.

Example 26: ‘I ask; but calming spirits’, pre-determined 8-note chord (bar 460)
Two final features to I would like to mention relate to the use of unpitched musical material and its relationship to pitched material and spectral harmony. The former is used in ‘As out shadows always say’ to create strong and sustained rhythmic interest, it also made the composition more practical: this was a huge, intense poem that relied on its rhythm, it could not loose pace. Also, using unpitched vocal sounds gave me more room to use microtonal material as the singers required fewer harmonic cues owing to the nature of their parts - so I was free to explore this fuller texture (see appendix 19).

The final point to mention relates to the use of spectral harmony. Part of this composition was created by retuning the lowest string of an electric guitar to an F# and seeing what harmonics one could double stop. I eventually found that I could shift very high in to the harmonic series and so I re-wrote this as practically I could for the ensemble at hand. This is later repeated in the piece: after a section of canonic writing, I change tempo but preserve the previous speed in a string section. This is alongside the new musical material being performed (see Appendix 20).

Example 27: ‘As out shadows always say’, motif derived from guitar playing

In conclusion, Voids presents the biggest mix and integration of musical materials. They are, however, more stark rather than tightly integrated. They reflect the structure of the text and, as a result, cannot be as free and malleable as instrumental pieces.
Choose the Rising Fire

Choose the Rising Fire was written for the Cambridge University New Music Ensemble as part of Secret Theatres, the Cambridge University Sir Harrison Birtwistle Festival. The first performance of this piece was on 7th November 2014 by the Cambridge University Musical Society, conducted by Ben Glassberg. Choose the Rising Fire was inspired by a number of literary works and paintings (see the program note to the score). Many of these works explore the themes of isolation, destruction, and violence. I was particularly inspired by a work of art titled A Ship So Big, A Bridge Cringes, in which the artists claim the ultimate ownership over their work by destroying it – I annihilate my musical material in bars 118-168. The structure of the piece is as follows.

Table 14: Structure of Choose the Rising Fire

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>Introduction</td>
<td>Sets out modality.</td>
</tr>
<tr>
<td>5-27</td>
<td>A</td>
<td>Beginnings of serial melody, develops in to full serialism – in some instruments - by the end of this section</td>
</tr>
<tr>
<td>28-44</td>
<td>B</td>
<td>Modal and chordal melody blurred by rhythmic processes.</td>
</tr>
<tr>
<td>45-79</td>
<td>A’</td>
<td>Microtonal alterations of A with new rhythmic elements and developments of B</td>
</tr>
<tr>
<td>80-89</td>
<td>B’</td>
<td>Repeat of B with alterations</td>
</tr>
<tr>
<td>90-117</td>
<td>C</td>
<td>New rhythmic idea comes in to move things forward (focus around bar 105).</td>
</tr>
<tr>
<td>118-168</td>
<td>D</td>
<td>Massive section obliterating itself.</td>
</tr>
</tbody>
</table>
Much of this piece is composed out of transpositions and developments of a collection of 3 chords. These are treated as pitch-class sets and developed into different musical ideas throughout the piece. The chords in the following example are developed in the strings at bars 5, the first chord, bars 6-7, the second chord, and bars 7-8, the final chord.

Example 28: chords in *Choose the Rising Fire*

Another significant aspect of this piece relates to the usage of traditional 12-tone serialism. The initial semitonal idea, seen in bar 5 of the horn part, was designed so it could be developed into a derived serial row. I gradually overlap different transpositions of the [0,1,2] set-class throughout the piece to create a sense of intensification as the music approaches a cadence, see bars 5-28. The following example gives an example of the serial rows used in this piece (heard most clearly in the bassoon, bars 17-22). These rows (which aren’t always 12-tone) are elided, repeatedly irregularly and truncated throughout.

Example 29: serial rows in *Choose the Rising Fire*
Throughout the sections that make use of serialized pitches I use rhythms much more intuitively; the opposite is the case also. In bars 28-40 the rhythmic durations are created according to fixed patterns, but the harmony is a clear, more-straightforward, modal chord progression. This rhythmic serialization is designed to obscure the more straightforward harmonic rhythm and create a type of stilted, interesting harmonic development. This is something I use in many of my pieces including Ozartmay and Ten Acre Riots!. The blurring of the rhythmic patterns is according to fixed durations relating to individual instruments and a pre-composed harmonic rhythm – you only see and hear the former.

A final section that is of particular note can be found in bars 108-117. The rhythmic patterning of these bars was inspired metric difference I perceived with respect to the sound and feel of my steps while walking and the music playing in my headphones. Throughout this section I increase the length of individual beats in the music to create drama and interest. This contributes to the violence and offbeat feeling of the section – you can see the stretched beats in bars 93-104 in the strings (any duration longer than a quaver).

Example 30: Choose the Rising Fire, rhythmic set relating to extended beats in bars 93-104

In conclusion, Choose the Rising Fire was an earlier example of my interest in combining seemingly unrelated musical materials; softer tonal structures, 12-tone serialism, microtonal writing, highly focused rhythmic writing, and elements of noise.
Bright Paths to New Worlds

Bright Paths to New Worlds was completed for the London Graduate Orchestra as part of Sound and Music’s Portfolio scheme, for which I was selected. When I first started writing Bright Paths to New Worlds I wanted the music to relate aesthetically to the positive impact that a safe education and upbringing can have on a person, a family, and a community. The opening section was written in the familial home of two of my students; I find their excitement and happiness when making music extremely engaging, they remind me of when I started learning to play an instrument, and recalling the way they approach their music making helps me to find more enjoyment in the composition and performance of my own pieces. It was in this environment that I composed the uplifting, nostalgia-tinged musical idea that one hears at the start of the piece (the quintuplet figure in bar 1). The celebratory aspect of this composition was also inspired as a response to educational funding cuts – a particular concern for me as, had these cuts been in place during my youth, I would not have progressed as a musician. I wanted Bright Paths to New Worlds to be a jubilant anthem in praise and support of education.

Following on from this initial period of composition, I wrote Bright Paths to New Worlds in lots of different - some unusual - places; my home in Cambridge, somewhere in Cardiff near a flat I used to live in, the Artic explorer John Rae’s house on Orkney, a renovated farmhouse in Cornwall, and on a riverboat bar in Prague. Writing in different places pushed me into different compositional perspectives and this caused the journey and goal of the composition to become quite unclear which led me to think about musically representing the idea of reaching for something that we have yet to discover. This piece came to be about supporting people as they
transform and develop during their journey in to an unknown – perhaps great – future. The idea of personal transformation is reflected in the musical development of the C major opening (naïve, youthful exuberance) to the 16-note chords at the end of the piece (the new, the unknown). I was anxious about how the journey and life of a person is impacted by their educational experience. The bright opening ideas (people) are supported and become something wonderful and new (the strange, microtonal ending) because of the positive, supported, sometimes tempestuous journey they take.

The mandate for this project was to explore new orchestral sounds and I wanted to look at integrating hugely different soundworlds in a single piece. In comparing the opening to the ending I feel I was particularly successful in this endeavour. The following table indicates the structure for this work.

Table 15: Structure of Bright Paths to New Worlds

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-17</td>
<td>A</td>
<td>C major material with thick double stopping.</td>
</tr>
<tr>
<td>18-21</td>
<td>B</td>
<td>Opening rising gesture developed in to substantial scalar runs.</td>
</tr>
<tr>
<td>22-91</td>
<td>C</td>
<td>Sections inspired by Holst, Adams and my work <em>Gladly Above</em>.</td>
</tr>
<tr>
<td>92-121(1)</td>
<td>D</td>
<td>Secondary theme in A minor.</td>
</tr>
<tr>
<td>121(2)-142</td>
<td>A’</td>
<td>A repeat with trumpet melody and additions of the secondary theme.</td>
</tr>
<tr>
<td>143-154</td>
<td>E</td>
<td>Solo string section, free tonality.</td>
</tr>
<tr>
<td>155-178</td>
<td>F</td>
<td>Solos and brass fanfare – free, less-tonal writing.</td>
</tr>
</tbody>
</table>
A huge melody derived from the ending of section B.

Big cathartic melodic material with a final division with jazz-style chords.

Microtonal chords.

The most important aspect of this piece is the journey from the opening C major harmony to the huge, 16-note harmonies at the end. I feel this composition successfully illustrates strategies for moving in and out of very different types of musical organization. I could not have explored these methods of organization without the workshop environments that allowed me to test such things.

In order to create large chords that have a discernible identity I first looked to composers famed for using particularly dense harmonies with clarity in an orchestral context – Lutosławski was undoubtedly the clearest example of such a composer. My initial experiments in workshops (the scores are shown in Appendix 21) engaged with developing an ear for 12-tone chords and exploring how the stacking of intervals in a 12-tone chord could impact upon its colour. Following on from this I looked for practical ways to develop denser, 24-note harmonies– my initial strategy was to take a chord built on a +7 interval cycle and split it in two, giving a 24-note chord where each note sounds a different and often microtonal pitch. This proved to be successful. I found it much more difficult to integrate microtonal harmonies in to already established soundworlds (Appendix 22 shows a discarded draft illustrating the difficulties in implementing microtonal chords). Chords with 12 or more different pitches...

Charles Bodman Rae, The music of Lutosławski, (London : Omnibus Press, 1999), pp.49-74
notes work best when they are well-spaced and starting at an important structural event rather than appending a section of already established harmony.

A second important feature to mention in this composition relates to the transposition of material by interval class 5. Celebrated rock guitarist Eric Johnson is known for improvising using the major pentatonic scale and, during improvisation, transposing the first shape of the major pentatonic scale up by a perfect fourth and fifth – this gives him more pitches from the major key he is working in but still preserves the shape of the pentatonic scale. This is something I regularly engaged with in *Bright Paths to New Worlds*. One can see varying transpositions of (mostly) pentatonic material from bar 22. This material is gradually transposed further and further away (alongside F#s being added in the accompaniment) to create a sense of harmonic movement away from the initial material. More importantly, however, is the simultaneous shift from C major to F major and G major. This is all in anticipation of a chord that approximates the harmonic series at bar 92 – a Lydian Chromatic modality with B♭ and F♯ pitches heard harmonically. These IC5 transpositions are laying some of the early ground work for later 12-tone chords; the major scale, Lydian Chromatic, and pentatonic scales can all be generated using a cyclic movement by IC5.

Example 31: *Bright Paths to New Worlds*, Pentatonic and Lydian Chromatic scales

The bracketed pitches are common to the harmonic series on C, the final transposition of each pentatonic scale listed above, and it is harmonically similar to the pitches produced by a +5 or +7 cycle.
Bright Paths to New Worlds stands out in my portfolio as a composition that has both the most-researched, tested, and important use of microtonality and also the most unsystematic, intuitive use of quasi-tonal writing (bars 143-154). The following example illustrates the microtonal chord used at the end of the composition: non-microtonal pitches are on the left (note the limited intervals) and microtonal pitches are on the right (the lines indicate the pitches from which they are developed).

Example 32: Bright Paths to New Worlds, Microtonal Chord

As a final point in this composition I feel it is worth mentioning the rhythmic interest in section C. This was designed in response to two things; firstly, a composition I wrote at the start of my PhD titled Gladly Above – which used a similar rhythm (Appendix 23) – and secondly to John Adams’ idea of ‘joyriding on the great prairies of non-event’.\textsuperscript{46} I wanted the material to feel vast and expansive.

In conclusion, Bright Paths to New Worlds is the culmination of 4 years of working with orchestras to produce hugely varied works. It encompasses the freest forms of tonality with dense microtonality, 12-tone chords, free dissonance, and full, intense writing.

Estuary Airs

*Estuary Airs* was composed as part of the Composers’ Course at the 2017 St Magnus International Festival. The piece was workshoped over 5 days, rehearsed over 3, and first performed in St Magnus Cathedral on 21st June 2017 by The Assembly Project, conducted by Iain McLarty.

This piece has been arranged for 5 different ensembles; in order to properly respond to compositional briefs and contexts one must draw on different, appropriate aspects of culture and musical heritage as well as the ensemble at hand. *Estuary Airs* was written to make use of the violinist Fenella Humphries with additional solos written for the strongest players of the ensemble. The following table clarifies the structure of *Estuary Airs*.

Table 16: Structure of *Estuary Airs*.

<table>
<thead>
<tr>
<th>Bars</th>
<th>Section</th>
<th>Notable Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-38</td>
<td>A</td>
<td>Jazz chords from ‘Blue in Green’, minor inflections, air tones.</td>
</tr>
<tr>
<td>39-49</td>
<td>B</td>
<td>Ticking, change ringing interrupted.</td>
</tr>
<tr>
<td>50-71</td>
<td>C</td>
<td>Clarinet solo and features reminiscent of B.</td>
</tr>
<tr>
<td>72-92(1)</td>
<td>D</td>
<td>Violent, leading in to solos, random notes at points.</td>
</tr>
<tr>
<td>92(2)-116</td>
<td>A’</td>
<td>Starts with the end of A with microtonal inflections and builds forward.</td>
</tr>
<tr>
<td>117-157</td>
<td>A’’</td>
<td>Scurrying gesture with melodic material building in to waves and subsiding.</td>
</tr>
<tr>
<td>158-175</td>
<td>E</td>
<td>Bubbling duet.</td>
</tr>
</tbody>
</table>
I wrote the first melodic kernels of this piece when I was living near the Gower Estuary in South Wales. The contrast between the natural beauty and poverty of the surrounding areas is striking and upsetting and I wanted that to be reflected in my music; smooth, lyrical lines contrasting with jagged, attacking gestures. The Landscape in Orkney reminded me strongly of the areas around these estuaries and my plan during my stay on Orkney was to allow the influence of the place to alter and shape some of the music I had already composed.

The most significant structural changes were made during my stay at the Artic explorer John Rae’s house on Orkney. Staying up for very long periods of time in Rae’s house granted me the opportunity to experience the fast-changing weather at different times of day; sunrise, sunset, night, day, dusk, and dawn. I experienced most of these views through huge windows in my accommodation – which was a large estate – and I wanted some of these small ‘windows’ of experience to be represented musically.

The first significant point to make regarding Estuary Airs relates to the influence of jazz harmony. During the initial composition of this piece I was interested in creating jazz standard-style layout with a head and chords indicated as accompaniment. As part of my research relating to this I began playing through The Real Book and was particularly struck by the chart for ‘Blue in Green’, a piece in which most of the harmonies can be expressed more simply if one ignores melody notes. With this in mind I began working on my piece again. In response to this I wanted to see if I could use melodic lines to alter more simple harmonies in my own music. If one considers bars 1-3(2) of Estuary Airs (see the example below) they may notice that the segment
David John Roche  PhD in Music Composition  Downing College

outlines a C#m7(#9) chord, this chord grows melodically out of an E minor chord in bar 1 and a C#m chord in bar 2. The melodic material then becomes a pedal point for a change to Bbm7 in bar 3(4). Removing the more dissonant material and extended harmonies from these first 4 bars would leave us with much simpler material. It also worth noting that I add a few further features to disrupt a more standard sense of musical ebb and flow; a melody with wide leaps, note bends that produce unusual dissonances, and blending sounds between instruments (a technique borrowed directly from Bruno Mantovani’s *Jeux d’eau*).

Example 33: *Estuary Airs*, bars 1-4

Example 34: ‘Blue in Green’, bars 1-4
A second important aspect of this piece relates to process and the interruption thereof. The sections I have in mind specifically are bars 39-50, 72-79, and bar 101 onwards with specific reference to events at bars 117 and 158. The material at bars 39-50 was originally written using the change-ringing technique that I discussed apropos *Lorem Ipsum* and *Ten Acre Riots*!. Here, however, the process is shaped much more frequently and abandoned much earlier – I allow the process to lead to musical shapes I might not normally create myself until I arrive at sections that I feel intuitively need something new. This is also true of the section at bars 72-79, the original process is interrupted to give space for a new musical idea. In the case of *Estuary Airs* these intuitive moments are the solos at bars 50-57, 79-80, and 83-89 – these moments are the ‘windows’ discussed previously. The music from bar 101 onwards uses a similar process with different material. The semiquaver material that occurs is transposed and transformed into larger patterns. This lengthy process originally lasted from bar 101 onwards but was altered to create musical interest at bar 117. The material here is designed to emphasize the swells in the melodic ideas – the original process was significantly modified to contribute to the musical flow. The duet at the end of the work, from bar 158, retains the original process but orchestrates it differently to create new musical interest.

A final point regarding process relates to pitch process: the pitch material at bars 57-59 and 89-92 was initially batch processed so every pitch would be totally random. On randomizing all of these pitches I found aspects of the processing that I preferred above others and chose to emphasize those aspects of the composition over others. The balance between process and intuitive composition is perhaps most pronounced in this piece.
My third point relates to the use of silence in this work. The ebb and flow of tidal winds that inspired the original melodic idea strongly influences this work – it was something one certainly felt in both Wales and Orkney – and I wanted to represent the small periods of still one feels between gusts of wind in these areas: this is reason the silences and musical stillnesses in bars 5, 13, 17, 29, 32, 34, and 38. These silences take on a different function as the piece progresses as they separate process-driven sections from each other; bars 72, 93, 116, and 175. My feeling that the processes required interruption led to the usage of silences as a pronounced structural element.

A final significant feature relates to the use of microtonal inflections. These are present during particular glissandi (bars 3, 7-8, 12, and 35-36) and during a particular section at bars 94-100. These are used to create further interest away from the more standard forms of musical presentation one may hear in this work.

Example 35: notated microtonality in *Estuary Airs*

In conclusion, *Estuary Airs* presents listeners with a strong synthesis of process led, non-tonal composition alongside some microtonality, more standard jazz-style harmony, and an elevated, structurally-important use of silence. The outcome is hopefully an expressive works that evokes a sense of sadness, grandness, and beauty.
Conclusions

The conclusions I have drawn from my research have helped me to develop a strong, expressively flexible and multifarious compositional language. In order to integrate different soundworlds one needs to consider all methods of musical organization as related in some way and an important part of the compositional process is finding ways to relate these different methods. I have found that best ways to do this are as follows: using interval cycles to create commonalities between distantly related harmonies, using processes to create commonalities between distantly related harmonies, manipulate tightly-organized themes and motifs so new developments can be traced clearly to older materials, and place substantial changes to harmony at salient structural points. More significant than all of this, however, is developing a sense of ebb and flow relating to a single harmonic point of reference – I have found that this is the most unifying feature when considering how to synthesize different methods of musical organization.
Appendix 1: examples of interval cycles taken from Ernő Lendvai’s Béla Bartók: An Analysis of His Music
(a) To begin with, let us try to situate Bartók's tonal system in the circle of fifths. Let us take C as the tonic (T). Then F, the fourth degree, is the subdominant (S); G, the fifth degree, is the dominant (D); A, the sixth degree and relative of the tonic, functions as a tonic; D, the second degree, and relative of the subdominant, functions as a subdominant; E, the third degree and relative of the dominant, functions as a dominant. The series of fifths, E–A–D–G–C–F corresponds to the functional series D–T–S–D–T–S:

![Diagram of the circle of fifths with labels for different axes and chords.]

We note that the sequence D–T–S repeats itself. When this periodicity is extended over the entire circle of fifths the scheme of the axis system may be clearly seen:

![Diagram of the circle of fifths with a clearer view of the axis system.]

Let us separate the three functions and call them tonic, subdominant and dominant axes, respectively.

![Diagram showing the separation of the functions into tonic, subdominant, and dominant axes.]

Chords based on the fundamental C, Eb (=D#), F# (=G♭) and A have a tonic function.

Chords based on the fundamental E, G, B♭ (=A♯), C♯ (=D♭) have a dominant function.

Chords based on the fundamental D, F, A♭ (=G♯), B have a subdominant function.

It is essential that the particular axes should not be considered as chords of the diminished seventh, but as the functional relationships of four different tonalities, which may best be compared to the major-minor relations of classical music (e.g. C major and A minor, Eb major and C minor).
Appendix 2: excerpts and analyses of Anna Meredith’s *Axeman* and Caroline Shaw’s Partita for 8 Voices.
axeman

Anna Meredith

freely and very aggressive!

Gestures

1. D minor blues scale (minor pentatonic with b5)
2. Emul. gliss, vibr. strings
3. add Bb key

open string

fff throughout

Bassoon

Emulating a bend

Gestures 2

add C# key

Gestures 3

Emulates unison bends

Gestures 1

Gestures 1

Gestures 1

Bsn.

see notes on multiphonics at start

Gestures 3

Gestures 1

Gestures 1

Gestures 1

Transitory modulation to G minor, pentatonic

Bassoon specific; goes below what would be the lowest string on a guitar.

Both are akin to x'
Guitar-style rift material

Partita for Voices

Canon treatment of limited pitch material; G and D is quartet.

Spoken word (recitation) is a device more common to contemporary classical music.

Quartet harmony.
Appendix 3: Excerpts from *Semiquaver City*
Inertia, bars 17–19: bifurcating lines treated flexibly

IC2

Isorhythms, Boulezian multiplication

IC4 (IC3 is skipped)
Inertia, bars 72 - 74: bifurcating lines marked on score

One of several gradually expanding intervallic patterns.
Appendix 4: examples of microtonality in *Lorem Ipsum*
Lorem Ipsum, bars 4-8 - 6 gadgets
for solo electric guitar
specific, non-standard tuning

Talking sounds. Pitch not specified.

36-note interval cycle used for flurries

36-note interval cycle used for chords

The start of a rhythmic process incorporating elements of change ringing

Double and triple node harmonics: microtonally-tuned strings, harmonics producing microtonal pitches
Appendix 5: example of change ringing process
1. (21 crotchets and a semiquaver)

CHORD 1 PRIME - A DIVERGING PATTERN

2. (21 crotchets and a quaver triplet)

3. (21 crotchets)

4. (20 crotchets and a demisemiquaver)

5. (20 crotchets and a dotted quaver)

6. (20 crotchets and a quaver)

CHORD 1 RETROGRADE - A CONVERGING PATTERN

1. (20 crotchets and a quaver)

CHORD 3 PRIME - A DIVERGING PATTERN

2. (20 crotchets and a dotted quaver)

3. (20 crotchets and a demisemiquaver)

4. (21 crotchets)

5. (21 crotchets and a quaver triplet)

6. (21 crotchets and a semiquaver)

CHORD 3 RETROGRADE - A CONVERGING PATTERN

1. (20 crotchets and a quaver)

2. (20 crotchets and a dotted quaver)

3. (20 crotchets and a demisemiquaver)

4. (21 crotchets)

5. (21 crotchets and a quaver triplet)

6. (21 crotchets and a semiquaver)
Appendix 6: concurrent interval cycles in *Ozartmay*
Appendix 7: *Ozartmay*, pre-compositional fugue plan
s-w
\text{Exposition} \text{ proper, preceded by the wispy thing I wrote earlier}
first 3 up p 5

sequence up M3+M2

Pno.
4th chord from end up p5

trudgey pianissimo chords
7 chords, first 4 up p5, second 4 down a M3
first 7, final 2 have an extra transposition

the texture thins here

bass solo
Pno.

first 3 and final 4 transposed
trudgey quaver
movement continuing

final entries and coda
Appendix 8: Ozartmay, pre-compositional gradation of dissonance relating to the fugue
Piece (c.2.8 = 175 + 7 φ)

Cadence into C major.

SET 4

Roll............(14)  \( \frac{3}{2} \) Fanfare
Appendix 9: Ozartmay, discarded drafts containing microtonal writing
Appendix 10: *Critical Apathy*, overlapping scale patterns
Lots of gradually-developing Scalar Patterns. Chromaticism gradually increases.
Appendix 11: *Critical Apathy*, overlapping melodic lines
Overlapping, transposed melodies make chords.

lots of repeated interwoven movements.
Appendix 12: *Ten Acre Riots!*, pre-compositional sketch material
Appendix 13: *Hold on to Joy*, examples of bifurcating lines
Two bifurcating lines, both contributing to the harmony in their individual manner.

These gestures support the lines.
Appendix 14: *Hold on to Joy*, implementation of canons
the melodic lines come from making a feature of this.

another line/port in the canon

two lines in canon
another transformed / canonical entry

fff pesante
L poco a poco delicato

mf cantabile

new, transformed
canonic entries

mf poco a poco morendo

mf pesante, poco a poco morendo
Appendix 15: *Voids*, ‘No’, examples of quasi-tonal writing
clear E major feel

E major sonority

Denser, non-diatonic material

No woe now no devotion No pause no brace No salt to save our timed-out
Appendix 16: *voids*, ‘Monochromatique’, harmonization of C major melody
Nous avons tant appris par tu surraction

Fixed rhythmic values help obscure C major harmony
Appendix 17: *voids*, ‘I carry your warmth’, examples of Boulezian multiplication
Appendix 18: Voids, ‘I ask; but calming spirit’, pre-compositional chord array
Harmonize array of melody of Hawaiian choral piece.

\[ \text{Inverse division} \]

2-note change.

Start intensifying the harmony to lead to the grad
chord.

present in goal chord.
Appendix 19: *Voids*, ‘As our shadows always say’, examples of unpitched material
Fl.

Ob.

Cl.

Bsn.

S. Solo

draws a nigh-in-hu-man bray

From my sha-dowt lack of say.

harmonically dense lines elsewhere.

T. Solo 1

From my sha-dowt lack of say.

T. Solo 2

From my sha-dowt lack of say.

Vln. I

Vln. II

Vla.

Db.
Appendix 20: *Voids*, ‘As our shadows always say’, examples spectrally influenced material
Contradiction is a mandatory affliction a compulsion all must pay in our war.

no say? As I blink I think I

Certain elements articulate a separate tempo
Appendix 21: *Bright Paths to New Worlds*, examples of workshop materials
MICROTONE CHORDS 2
PLAYTHROUGH 1: as written
PLAYTHROUGH 2: trem. all the way through
PLAYTHROUGH 3: molto sul pont.
PLAYTHROUGH 4: trem. molto sul pont.
Appendix 22: *Bright Paths to New Worlds*, discarded material from earlier workshops
Appendix 23: *Gladly Above*, example of rhythms used
Compressed, thick, with terraced dynamics

Similar rhythm used in My Mind Directs My World.
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