A PORTFOLIO OF COMPOSITIONS
DEVELOPING NOTATIONAL AND COMPOSITIONAL TECHNIQUES
IN NEO-LITURGICAL MUSIC INCLUDING HANDPAN

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Table of Contents

List of Figures

List of Tables

Acknowledgements & Dedication

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Abstract

The objective of this portfolio is to develop a system of notation and compose neo-liturgical music featuring the handpan. Until this point, no means of written communication has been in place to express advanced handpan techniques in printed sheet music. My process in researching and creating this portfolio entailed a fourfold methodology: cultivating new elements of handpan notation using an existing knowledge of composition and percussion, interviewing percussionists and handpanists to test the viability of these notation advances, adapting the notation based on the feedback, and creating original music that incorporated the subsequent findings using both traditional and electroacoustic composition techniques. I have also made progress toward combining the handpan with other forces, including a variety of diverse instruments and voices, with a scope that had not been previously undertaken. Throughout this project, I have researched principles of meditative music and have found that there are four primary characteristics: cohesion, repetition, instrumentation and duration. I applied that research by composing neo-liturgical music, that is, music inspired by sacred texts or topics, but intended for performance in a concert setting instead of a religious venue. The primary readership for this research is composers and performers writing music for handpan, who would benefit from both the repository of notation developed here, as well as the practical means of application offered in the seven compositions. The descriptions, notation, and examples presented in this portfolio offer a starting point for the information needed to write competently for the handpan, as it continues to develop as a concert instrument today and into the future.

Keywords: Handpan, Music Notation, Neo-liturgical, Meditation, Composition, Percussion

Part I: Composition Portfolio

Composition Portfolio

The scores and audio files may be found at the following DropBox link:
https://www.dropbox.com/sh/c28zndvlctrj2lc/AAC_9tDHGdWBR-v4XihN3CQca?dl=0

Title	Year	Instrumentation	Duration
Triptych Meditation	2017	Handpan solo	15'30"
Le Feu de la Pentecôte	2018	Undefined ensemble	20'— 45'
La Création du monde	2018-2019	Organ and handpan	12'
Lux aeterna	2018-2019	Electronics (fixed media)	15'
Meditari	2019	Undefined ensemble with fixed media track	10'30"
Magnificat	2019	Mixed quartet (SATB), piano, handpans	10'
Selah	2019-2020	Full orchestra (piccolo, 2 flutes, 2 oboes, cor anglais, 2 clarinets, bass clarinet, 2 bassoons, contrabassoon, 4 horns, 3 trumpets, 2 trombones, bass trombone, tuba, timpani, vibraphone, chimes, glockenspiel, xylophone, crotales, triangle, gong, bass drum, ratchet, wood blocks, suspended cymbal, vibraslap), harp, strings, handpans	13'

Part II: Commentary

Chapter 1: Introduction

In 2015, I first heard of the handpan, an intriguing instrument with a relatively short history, having been invented only in 2000. The handpan was first shared with me by a fellow student, Aaron Marsala, whilst we were in graduate school. At the time, the instrument was only a passing interest to me, as it seemed distant from my primary focus. However, the following year, Aaron commissioned me to write a piece to be played for an all-handpan recital he was preparing. This piqued my curiosity and eventually led to the portfolio that I am submitting here. Throughout my study of composition, I have also been working as a church musician. The practical work in this field has prompted an interest in composing neo-liturgical music for the concert hall and, specifically, has involved researching music used for meditative purposes. The distinctive interests of composition, handpan, and sacred music are unified through the topic of study in this portfolio.

Notation

When Aaron Marsala first approached me about writing a piece for his performance, he shared that there was a fundamental impediment vis-à-vis sheet music for handpan. Since I am interested in notation and innovative notation techniques, this exploration was an ideal starting point for the broader task of writing for the handpan in its emerging state as a concert instrument. The notation for handpan and its development is described in Chapter 6.

Meditative Music

In my first compositions for handpan, some of those who kindly listened to my music were interested in the meditative qualities that were present in the music. Someone specifically asked if this quality might be precipitated by the unique timbre of the handpan. This early dialogue prompted me to ask the question—what causes music to have a meditative quality? If I were a sociologist, I would design formal trials and create surveys to determine the public perception of the qualities of music for meditative purposes. But as a musician and scholar, my skills lie more in the analysis of the traits of historical music with these

characteristics, and as a composer, the practical experimentation with the observed traits. The cycle of observation followed by composition-experimentation has become the consistent pattern of this PhD research.

This investigation into the properties of meditative music led to the codification of a sub-genre of music, namely, 'neo-liturgical music.' This is a term which refers to music inspired by sacred texts or topics, but is intended for performance in a concert setting instead of a 'religious' venue. This type of music, though previously uncategorized, is widespread throughout music history. From Baroque-era oratorios, to Romantic-era Requiems the genre of sacred concert music is well established. More recent examples include the music influenced by John Cage's Zen-Buddhism, Shulamit Ran's choral music based on Hebrew texts, and the religious concert music of James MacMillan. All of these examples fit in the neo-liturgical categorisation, as they are music for the concert hall that are inspired by sacred themes. The music in this portfolio can be categorised as neo-liturgical as well. This topic is explored in further detail in Chapter 5.

Research Questions

Three research questions have guided the composition of this portfolio:

- What developments can be made to standard notation in order to communicate the many techniques and effects playable on handpan?
- How can the handpan be effectively integrated with other instruments and voices, in both traditional and electroacoustic composition?
- What are principles of meditative music and how can they be applied in neo-liturgical composition?

Some clarifications about the scope of this portfolio are necessary before starting the main body of the commentary. First, this PhD is presented in the form of a composition portfolio with commentary. As a composition PhD, instead of a traditional research PhD, the focus of the project has been on the composing of the music itself, rather than on

musicological or sociological pursuits. This written commentary is made up of supplementary information that supports the primary work, namely, the pieces in the portfolio.

As a specialised PhD topic, the project must be appropriately narrow in focus. Because of that, it is important to clarify what is intentionally omitted from this portfolio and commentary. This is not a pedagogical study, developing methods of teaching someone how to play the handpan. The principles found herein could potentially be applied to music education, but that is beyond the scope of this project. This PhD is also not a sociological or ethnographical study, as no measurable experiments or surveys have been undertaken to analyse the culture, background, or demographics related to handpan playing. It is also not a musicological study, as I did not focus on the historical development of notation, tone colour, or timbre. All of these areas are of related interest to this portfolio and would be valuable topics for future research. However, the focus of this PhD has been on the compositions themselves and is most accurately understood in that way.

Background

Due to the dearth of information written about the handpan in traditional academic contexts, it is appropriate that this commentary contains a brief history of the instrument. Additionally, a basic knowledge of the construction and terminology of the handpan is essential to understanding the context in which this portfolio was written.

Creation

The first instrument of its type, known as a Hang®, was invented in 2000 by Felix Rohner and Sabina Schärer, through their manufacturing company PANArt[1]. The Hang came about as the result of twenty-five years of Rohner's study and performance as a steelpanist (Rohner & Schärer, 2007). After a good deal of research about the physics required to create a properly balanced Helmholtz resonator, they created the first Hang, so named because 'hang' means 'hand' in the Bernese dialect of German, designating the means by which this

[1] Originally this company was founded in 1993 to manufacture steelpans, giving 'cultural and commercial support to the growing steelband movement in Switzerland' (Rohner & Schärer, 2007).

innovative instrument was played. Rohner envisaged the Hang as a marriage of the best characteristics of his beloved steel pan with the traits of the 'stiff, domed clay vessel of the [Indian] Ghatam' (Berz, 2014).

In 2001, the Hang was presented at the Musikmesse in Frankfurt, and burst on the scene as German musicians and percussionists were drawn to the new timbre and distinctive manner of playing. Then, surprised by this sudden rise to fame, Rohner 'decided to recalibrate and halt production, in order to avoid the pitfalls of mass production,' specifically, poorly-constructed instruments and over-saturation of the market (Amkie, 2016). Because of this intentionally delayed process, Rohner's second and third generations of Hangs were not released until 2006 and 2008. Prospective buyers were required to submit a hand-written statement that expressed their personal motivation for purchasing a Hang, as well as the manner in which they proposed to use the instrument (Strauss, 2014).

Throughout this time, other makers, eager to recreate the distinctive sound of the Hang, began to create replications of their own. These instruments came to be known as handpans.[2] Eventually, due to an overwhelming demand, 'PANArt shutdown production of the Hang in 2014, leaving the music community stunned' (Amkie, 2016).

Today, handpans are now created by 170 makers around the world, according to the recent comprehensive list by Martin Zoepfl (2020). This number has increased considerably since October 2014, when 'there were approximately 80 handpan makers worldwide' (Alon & Murphy, 2015, p. 1). Clearly there is a burgeoning desire amongst musicians and music aficionados to purchase and perform on handpans. With an increasing interest in academic study by serious percussionists playing this new instrument, the importance of developing and codifying a system for notation is paramount at this point in the history of the handpan.

[2] 'Hang® is a registered trademark and should not be used to describe other musical instruments such as handpans, nor should the term handpan be used to refer to the Hang®' (Alon & Murphy, 2015, p. 1).

Construction and Terminology

Handpans are made of two convex steel shells that are glued together along the edges (Alon & Murphy, 2015, p. 1). Each handpan usually consists of eight or nine notes, played by rapid, yet relatively gentle, strokes to each respective tone field.

On the top, or pitched side of each handpan, the centre note is called the 'ding,' and therefore this side of the instruments is referred to as the 'ding side' (Beever, 2017). This term is borrowed from the foundational note in the Balinese gamelan scale, called the 'ding' (Remus, 1996).[3] The underside of the handpan, typically considered to be comparatively 'unpitched,' is known as the 'gu' side. 'Gu' means 'drum' in Chinese (Collinsdictionary.com, 2018). Sometimes a more generic term for this is used, referred to as the 'port' side (Beever, 2017).

Range and Pitch

Each handpan is created with a specific, limited collection of pitches which makes up the scale of a given instrument. Because of this, only eight or nine tonefields are generally included on any one handpan. Due to the highly resonant nature of the instrument, makers tend to choose pentatonic or hexatonic scales so that all the notes sound well together. This leads to little, if any, harmonic dissonance within each pan itself.[4]

When more than nine tonefields are included on a single handpan, three issues in construction and design arise. First, the amount of space required to include more than nine notes makes the handpan too large to comfortably hold and fluently play, for most performers. Second, a phenomenon known as impedance may occur. Handpan impedance occurs when certain tone fields sound muffled or muted due to the diameter or depth of the resonance chamber, that is, the 'gu' part of the handpan's shell. Mark Garner notes that since impedance

[3] Each pitch in a Balinese gamelan scale is referenced by a different tone, based on how the native musician teach the relative tone of each pitch. For example, C = ding, D = dong, E = deng, G = dung, and A = dang (Remus, 1996). The ding is usually played by only one instrument in the Javanese orchestra, the Ketuk (kettle gong) (Han, 2000). This gamelan instrument plays a similar foundational role to that of the ding on the handpan.
[4] This is part of the reason why the instrument is quite appealing to new musicians; since here are no 'wrong' notes on a typical handpan, new players are able to create a consonant, pleasant sound from the outset.

technically creates ‘a resonance problem with specific frequencies’ on the handpan, a more precise name for the phenomenon may be ‘wave interference’ or ‘phase shift’ (Garner, 2016b). Third, handpans with over nine pitches are more inclined to ‘crosstalk,’ that is, ‘the dissonant sympathetic interaction that occurs between two or more notes on a handpan when one tonefield is struck’ (D’Ambrosio, 2020). Due to the close proximity of tonefields and the increased number of half-steps, the potential for crosstalk increases with each additional note that is added to the handpan beyond the typical eight or nine.[5]

Within the eight-to-nine-note limit, handpan makers have incorporated a variety of different scales into their instruments. Different companies offer many scale options in the handpans they have for sale. A survey of four well-known makers revealed that they offer between fourteen and forty-two scales in the handpans they make. Of the makers surveyed, Saraz offers the most, listing forty-two scales on their website (Garner, 2020b). HaganeNote offers twenty-three scales in their scale comparison guide (Zappani, 2020). The Makai company lists nineteen ‘sound models,’ that is, scales, on their website (Galleher, 2020), and Isthmus lists fourteen scales that are available in their shop (Robinson, 2020). Each of these makers also has shared on their website that they are willing to make custom instruments for those players who would like to request a specific collection of pitches that are not typically available for purchase.

Through my own observations and anecdotal conversations with a number of handpanists, I have gathered a list of five handpan scales that are among the most common. These scales are made by a variety of builders and are frequently employed in handpan

[5] It should be noted that some effort has been made to create a fully chromatic single handpan, with varying levels of success. A well-known example of this type of handpan is the thirteen-note chromatic Evolution Spacedrum, created by Metal Sounds in France. According to the maker, “this drum allows for far more melodic and intricate combinations than other handpans and is the most versatile drum to date” (Maignaut, 2019). The handpan company Saraz has also attempted to design fully chromatic handpans but has deemed each attempt a ‘complete failure.’ To summarize the reason for this, Mark Garner stated that ‘the problem that we have found with all of these attempts to build a single chromatic instrument is the resonance of the chamber. Even on the best of the experimental instruments that we built, there was still 5% of chromatic dissonance in the resonance of the chamber. This was particularly obvious between half steps, which want to often couple or sympathize with each other to some degree’ (Garner, 2016a).

recordings and performances.[6] The following scales are commonly used by handpanists, and I have personally heard or played each of the following through the course of my research.

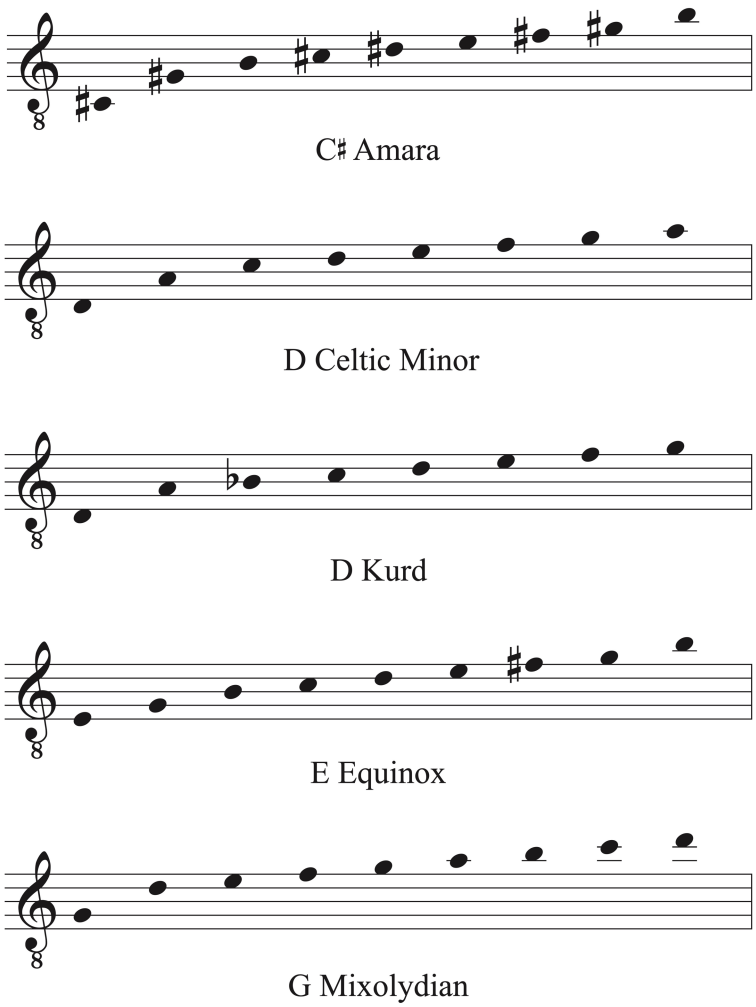

Figure 1.1. Representative scales used in handpan playing

Historiological Observations

In the early days of the instrument's history, the handpan community flourished as a group of primarily amateur music-makers, with varying levels of reading ability and music education. The popularity of the handpan has grown exponentially since its inception because of the prevalence of YouTube training and performance videos. The ease with which novice players can gain education and ideas about improving their skills is largely, or perhaps exclusively, thanks to the Internet and the widespread availably of such training videos.

[6] Though it is beyond the scope of this commentary, an interesting area for further research would be creating a statistics-driven survey of handpan makers and players to formally determine the most frequently used scales, and the reasons players have for selecting those scales. Due to the nature and parameters of my project, the anecdotal evidence I have gathered will suffice.

Though the speed at which handpan popularity is growing has been accelerated by the Internet, the historical timeline seems to have a great deal in common with the original Hang's cousin, the steelpan.

Steelpan

The handpan's genesis is similar to the history of the steelpan, and to understand the social and historical trajectory of the handpan, the foundation of the steelpan must be considered in tandem. The steelpan was created and developed in Trinidad in the 1930s and 1940s (Tanner, 2010). Like the handpan, the steelpan had its start as an improvisatory instrument, with skills, tunes, and techniques passed down through an exclusively oral tradition. When the steelpan was brought to United States shores by the West Indian immigrants in 1949, the popularity of the instrument spread from city to city, with street performers busking their way to a modest income. Still, the steelpan remained a purely improvisatory instrument until the late 1960s, when Al O'Connor began the first steel band at an academic institution, Northern Illinois University, in 1968 (Martin, Funk & Remy, 2017). It was during this season that composers began to develop notation and repertoire for steelpan in a classical manner, for the first time composing serious and academic works for this instrument (Martin, 2011).

Vision

Similar to Al O'Connor and his role with the steelpan, Aaron Marsala and I have the intention to develop the handpan's place in the academic context as well. Like the steelpan in the late 1960s, we see this as the time to develop the notation and repertoire for the handpan. Our work will be promulgated through both recordings and written notation. The hope is that this will develop the role of the handpan in society. We would like to see it expand from being viewed as an instrument primarily for casual music-making, to one that can also be employed for rigorous classical study and expression. Throughout the process, we have striven to

maintain the original meditative quality of music that has been performed by handpanists from the beginning of its brief history.

Chapter 2: Research Context

The research context of music for handpan is quite different than the traditional research context of most PhD portfolios. I began researching the music being performed on handpan in 2016 whilst composing my first piece for the instrument. Due to the relatively short history of the handpan, as mentioned above, and the fact that it is essentially uncharted territory in academic writing, the context of my work has existed more in the areas of videos and recordings than traditional books and journals. Because of this, the standard 'literature review' has, for this portfolio, become a 'source review,' as the material being researched is primarily in the form of videos, interviews, and websites. Since this portfolio has broken new ground that has been previously unexplored in academic writing and composition, one of the joys and challenges of the project has been gathering and codifying the available sources, drawing from a wide variety of available formats and media.

This lack of educational resources was especially the case at the start of my PhD studies in 2017. Since that time, two educators in the field of handpan have shared basic notation systems that seem to be working well in the pedagogical realm. My hope is that these educational systems of notation will, in the future, be combined with my ideas for advanced performers, and will merge into a more universal system of notation that can be used as a foundation for handpanists and composers for generations to come.

Because of this unusual research context, this chapter is made up of a list of prominent handpan performers today. I will share details here about the influence and scope of each performer's music, as well as noting what specific impact the given performer has had on my compositions and creative process. Due to the nature of this subject matter, this following summary of the handpan research context serves as my adapted source review for the PhD portfolio.

Vladiswar Nadishana

Vladiswar Nadishana is a multi-instrumentalist, percussionist and composer from Siberia (Nadishana, 2013). He specializes in world music instruments, and he was well-positioned for success in the field of handpan music based on his previous experience with ethnically diverse sources and styles. Nadishana's first handpan video was uploaded on 21 September 2009, performed on a Spacedrum® in the studio of the French-American percussionist Steve Shehan. Spacedrum was one of the early French-made handpans, inspired by the original Hang by PANArt. Since 2009, Nadishana has been a frequent collaborator with many handpanists and world-percussionists. His most popular video as of this writing, with 1.1 million views, is a performance of his piece *Tales of Ro*. This was recorded in Rennes, France, as part of the Solus Locus Orchestra project, along with other members of the ensemble playing a Hang, cristal baschet, and an ondes martenot.

Nadishana has become known for his distinctive sound that strives to push the bounds of what is typically expected in handpan music. He calls this type of music 'progressive handpanism' (Nadishana, 2019). Along with his duet partner, percussionist Peter Somos, Nadishana has recently composed and shared music in this style. Giving a jocund warning to his Facebook followers, he posted 'Beware: complex progressions and unconventional techniques ahead!' (Nadishana, 2019). Nadishana has an important voice in the next generation of handpan players, as he leads the way in elevating an entire genre of music to creating fresh, innovative, and inspiring sounds. Though Nadishana has not forayed into the area of handpan notation, his advances in metre, rhythm and harmony are an important predecessor to the work I have done in this portfolio.

Kabeção

Carlos Rodriguez, known by his pseudonym Kabeção, was the first professional handpan player I listened to whilst exploring the instrument online. He is a multi-instrumentalist from Portugal and started his career as a percussionist. On 10 November 2012,

he uploaded his first video to YouTube, improvising on his new Disco Armonico handpan, apparently having just picked it up from the maker in Italy (Rodriguez, 2012). Since that first upload, his videos have been viewed 3.5 million times, reaching handpan players and enthusiasts from around the world.

Kabeção describes himself as a 'sound healer' and his music is known for its meditative qualities (Rodriguez, 2019). His 2017 album *Touching Souls* was a crowd-funded project, financed entirely by followers who were profoundly impacted by the contemplative 'moments and deep emotions' of the music that was promised and subsequently recorded (Rodriguez, 2019). This music had a significant impact on my composition as I observed characteristics of meditative music and implemented certain stylistic elements into my compositions. Whilst writing *Triptych Meditation*, I was especially impacted by extended techniques found in Kabeção's popular videos at the time, *Land of Cole* and *Sun of God*. I found his knocking special effects and brushing technique to be very influential as I developed my own interpretation and notation for these techniques in this portfolio.

Yukiko Koshimoto

Yukiko 'Yuki' Koshimoto had an important role in the increasing popularity of the handpan, largely due to her video posted in October 2011 (Koshimoto, 2011). In this video, currently with over 15 million views, Koshimoto plays her composition *New Moon* on a Spacedrum handpan. This Spacedrum is one of the early attempts at creating a chromatic handpan, as it includes all twelve notes of the western chromatic scale. The video likely rose in popularity due to the tropical location in which the recording was made, as well as the hypnotic nature of the composition, further enhanced by the lapping waves audible in the background.

Koshimoto first interacted with the handpan in 2009, when, 'inspired by a busker she met in London, Yuki acquired, and began to perform, on what has now almost become a Yuki-signature instrument, the thirteen-note chromatic Spacedrum (a HandPan produced in

France)' ('Yuki Koshimoto', 2014). Now that Koshimoto has become a well-known musician, she travels the world performing and is largely financed by her videos shared via social media (Koppensteiner, 2014).

Jacob Cole

Jacob Cole is another significant voice in the handpan community today. Based in the United States in Scranton, Pennsylvania, Cole is known as a frequent collaborator with other musicians, as well as a noted organizer of handpan and percussion-related events (Cole, 2019). He also performed as a world percussionist, uploading many videos on a variety of instruments since 2007. Cole famously recorded his first time playing a handpan, sharing the entire start-to-finish experience with his viewers. In video format, he documented how it was delivered, then as he opened the box, and finally as he began playing the first notes himself (Cole, 2013). As he already had a significant following from his other percussion instrument demonstrations and recordings, he was well-situated to become an influencer in the online handpan community.

His collaborative work with other musicians is especially innovative. A model of this collaboration is his duo piece entitled 'HOPE' for handpan and violin. The manner in which the violin tone is paired with the idiomatic techniques of the handpan is an excellent example of collaboration between the handpan and other instruments (Cole, 2014). Also, the clear give-and-take between the duet partners was motivating for me whilst composing *La Création du monde* for handpan and organ. Cole's use of editing and manipulation in the sound design process is also a model followed by other handpanists. A fine example of this is in *String Theory,* which makes creative use of DAW pan techniques to create innovative effects, and also uses elements of meditative music to create a 'truly unique sonar experience' (Cole, 2015). My own innovations in *Lux aeterna* share a similar sonic world with Jacob Cole's music.

Laurent Sureau

French percussionist and educator Laurent Sureau is amongst the virtuoso handpanists who reads music fluently, in addition to having well-developed improvisational skills. As a formally trained musician, he undertook higher education studies at *Centre de formation des enseignants de danse et de musique* in Poitiers, France, where he earned the National Diploma in Music Education and Percussion (Sureau, 2019). This formal training as a classical musician has led to a rare skill amongst well-known handpanists—namely, Sureau's ability to adapt standard pieces of classical repertoire to be playable on handpans. The first video he uploaded to YouTube was a transcription of the Prelude from Bach's first Cello Suite. Other notable adaptations of classical pieces include Bach's Prelude in C from *The Well-Tempered Clavier,* BWV 846, and Erik Satie's *Gymnopédie* 1. According to a personal interview with Sureau, he does not actually transcribe or write out the adapted pieces. 'I used the original sheet music, but I had to change sometimes low octaves or [rearrange] chords in Satie, because [they were] impossible to play on handpans.'[7]

Sureau played a role in my research and composition because he represents part of the target audience for my notation system. He is an accomplished percussionist in his own right, can read printed music fluently, and performs on handpans. Sureau is also distinctive because he performs on a fully chromatic set of handpans. I have striven to move beyond simply one diatonic scale in my handpan writing thus far. Though I have not yet composed a fully chromatic handpan piece, which for practical purposes has not been available to me, I believe that the future of handpan composition lies in the addition of more chromatic options. Sureau's inclusion of the full chromatic scale necessitates the use of many handpans set up at one time. Because of this, he generally has between six and eight handpans surrounding him whilst he performs. This set up is shown in Figure 2.1 and has proven influential in the

[7] Sureau, L. (2020, 9 May). Personal interview.

arrangement of handpans that Aaron and I have used in recording some of the compositions in this portfolio.

Figure 2.1. The arrangement of handpans used by Laurent Sureau in his recording of the Prelude from Bach's Cello Suite. (Source: Laurent Sureau, printed with permission.)

Jeremy Nattagh

Another French percussionist, Jeremy Nattagh is making a significant contribution to the handpan community. Nattagh has earned his place amongst well-known handpanists primarily through sharing videos via Facebook, instead of the more common YouTube (Nattagh, 2020). He is best known for his collaborations with other world musicians, playing on a variety of wind and percussion instruments from a range of ethnically diverse backgrounds. His most recent album *Life Equinox* featured illustrious musicians in the field of world music, including Cyrille Lecoq, Trita Sinha, Kengo Saito, and Zalem Delarbre (Nattagh, 2020).

Nattagh has informed my compositions for handpan through his innovative use of metre, as well as his affinity for combining handpan with unexpected instrument pairings. One of his most-viewed videos is an excellent example of both of these characteristics, namely a live video of his piece '7=8' with his band Funky Trio (Nattagh, 2017). This piece is

distinctive because of the use of changing metres and the unusual instrumentation of flute, jawharp, handpans, and auxiliary percussion. Nattagh also is extremely adept at playing handpan simultaneously with other instruments, either with hands, feet, or both. A major step forward in handpan-playing is the addition of extra instruments to create unique timbres and colours. This combination of diverse instruments was informative as I composed *La Création du monde* for handpan and organ.

Adrian Portia

With approximately ten million views on YouTube, Adrian Portia is the most widely-viewed handpanist currently making videos today (Portia, 2020). In the first video he uploaded, purportedly the first time he played handpan, he was already demonstrating an impressive, virtuosic technique (Portia, 2013). This is partially due to the fact that he has been a percussionist since the age of ten and has performed regularly with his father's band since the age of twelve. In addition to Portia's improvisatory prowess, his videos tend to be visually compelling, shot from distinctive angles and incorporating a wide spectrum of colours and backgrounds.

Due to his remarkable followership, and the fact that he is such a strong improviser, Portia is always listed amongst the ranks of prominent handpanists. According to his website, he 'is widely known for his speed, control and dynamic range over the instrument,' having 'the ability to play all styles of music on the handpan, whilst maintaining his own unique signature style and sound' (Portia, 2019). Considering his improvisational skills and popularity, his music has made a lasting impression on the wider handpan community. Portia tends to perform on only one handpan at a time, which works well for his manner of playing and is aesthetically appealing for his particular audience. The pieces he performs tend to be rather moderate in metric and harmonic scope. Since my piece *Triptych Meditation* was written for only one handpan, Portia's performance style is probably most similar to that

piece. As the foremost online influencer in the handpan community, Portia is well-positioned to continue making a substantial impact on future generations of handpanists.

Manu Delago

An Austrian musician who is now based in the UK, Manu Delago has done more to integrate handpans with the contemporary classical community than any other handpanist. He was classically trained in percussion at the University Mozarteum in Innsbruck, Austria, followed by his studies in composition at Trinity College of Music in London. Amongst handpan performers listed in this chapter, he is the one who has received the most formal music education. In addition to his academic training, he has also risen to international fame since 2011 as the touring drummer for the Icelandic singer-songwriter Björk (Delago, 2020). These various influences have given Delago a distinctive voice in the world of contemporary classical music today.

Amidst the handpanists listed here, Delago was the first to share a video of himself playing handpan on YouTube. Released in 2007, his solo piece *Mono Desire* received more than five million views. In fact, 'it was the most popular Hang video on the internet and charted in the Top30 [sic] of all music videos on YouTube' at the time (Delago, 2020). Surprisingly, he has a relatively lower number of videos available, when compared with other musicians in this chapter. However, the videos he shares tend to be exceptionally high quality, including meticulously produced audio with visually stimulating settings. A quintessential example of his scenic style is the video of his piece *Freeze.* Set in the Austrian Alps, this piece was recorded live in one take. The stunning camera work and breath-taking views of the Alps compliment the composition in an especially striking way. This type of multimedia production is what makes Delago's work so innovative and ground-breaking. The composition itself is harmonically and metrically diverse, and the video is compelling both visually and aurally (Delago, 2017).

Of special note are Delago's videos filmed at LSO St. Luke's London, as they are primarily related to the field of contemporary classical music. The particular performance from 24 October 2010 had a remarkable diversity of musical styles (Delago, 2011). The ensemble included two violins, bass clarinet, saxophone, cello, voice, and handpans. The integration of handpan with other traditional Western instruments is something that I found very compelling, and the idea of diversity in instrumentation has grown to represent a large portion of my portfolio. Also noteworthy is Delago's *Concertino Grosso,* a mini-concerto for handpan and small string orchestra (Delago, 2012). This particular piece was written for Delago to perform with string players from the London Symphony Orchestra, and it was performed live at St. Luke's as well. In preparation for this composition, Delago says he '…intensely listened to orchestral music, always looking out for quiet and interesting textures that [he] could pair with the delicacy of the Hang' (Delago, 2011). As far as I am aware, this is the only other concerto for handpan and orchestra that has been written prior to my composition *Selah.* The goal for my work in *Selah* was to propel the handpan concert repertoire to the next level. I intended to further Delago's foundational work by writing a piece that, in addition to strings, now includes woodwinds, brass, and percussion as well.

Dan Mulqueen

Dan Mulqueen is a percussionist who has become widely known for his handpan playing, largely because of his extensive touring throughout Australia, Europe, and the United States, as well as his growing YouTube channel. Due to his background as a trained percussionist, Mulqueen's music often features more complex metres and rhythms than most handpanists who share their music online (Mulqueen, 2018). Mulqueen is distinct in that his recordings 'also feature instruments such as upright bass, piano, electronic beats, guest vocals and more' (Mulqueen, 2020). His ability to integrate handpan with other musical forces has provided context for my efforts in this portfolio, as I have endeavoured to create new timbres and textures through the combination of diverse instruments.

In an interview with students from William Patterson University, Mulqueen explains that his background has been performing as a drummer with a profusion of diverse genres, including ‘rock, metal, blues, jazz, hip hop… it’s [a] pretty broad spectrum, I suppose’ (Mulqueen, 2013). These multifarious influences are well-represented throughout Mulqueen’s music for handpan. He uses popular genres as a connection point for audiences who are unfamiliar with the handpan. Accoring to Mulqueen, ‘...it's important to me to take my favourite elements of multiple genres and blend them into something different. You'd be really surprised how open people are to music when they can identify with even a tiny element of it’ (Mulqueen, 2020). A fine example of Mulqueen’s amalgamation of handpan with diverse genres is found in a video from 10 September 2019 (Mulqueen, 2019). In this video, he plays his composition over a trap beat, that is to say, a syncopated, electronic beat he created, idiomatic to the hip-hop genre (Neumann, 2000, p. 51). This type of integration with other music communities is essential to the promulgation of handpan music and will certainly help to spread its influence in the future.

David Kuckhermann

David Kuckhermann is a world percussionist and educator from Germany and is at the forefront of handpan instruction today. Kuckhermann’s YouTube channel is highly visible in the world percussion community, and since 2011 the channel has been primarily focused on handpan. His first Hang solo video entitled ‘Hang (no drum) solo - David Kuckhermann’ was uploaded on 17 June 2011 (Kuckhermann, 2011). This video set a standard for audio recording, style of solo performance, and video presentation for the time. Kuckhermann has a well-regarded handpan training programme known as HandpanDojo.com, aimed at handpan students. The instructional videos in his series are amongst the most widely viewed in the field of handpan education.

Kuckhermann is of special note in this commentary due to his interest in basic handpan notation. His system is based on assigning a number to each pitch on the handpan, which is

illustrated in Figure 2.2. Each number is then written in order to express what note is played at what time. The rhythm is assumed to maintain a consistent quaver or semiquaver groove, as demonstrated in Figure 2.3 and Figure 2.4.

Figure 2.2. Kuckhermann's Numbering System overlaid on handpan (Kuckhermann, 2018). (Source: David Kuckhermann, printed with permission.)

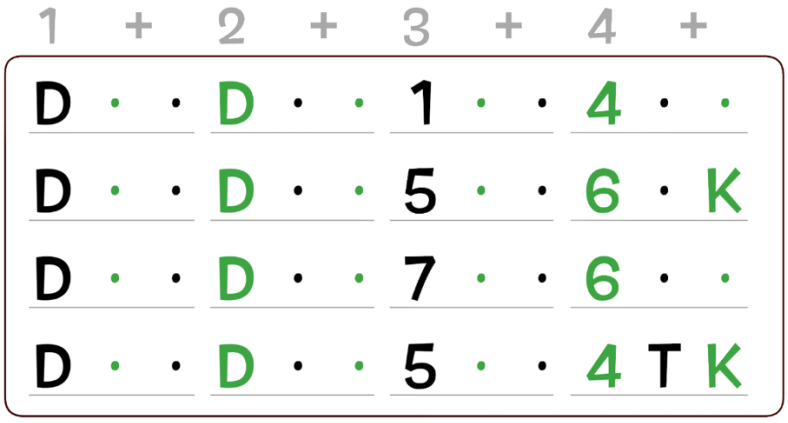

Figure 2.3. An application of Kuckhermann's numbering notation system.[8] (Source: David Kuckhermann, printed with permission.)

[8] Kuckhermann, D. (2019, 11 May). Personal interview.

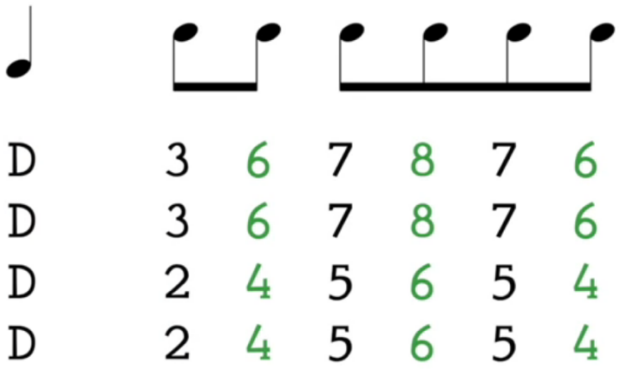

Figure 2.4. A second application of Kuckhermann's numbering notation system, using the minim and quavers above the numerals as points of reference (Kuckhermann, 2018). (Source: David Kuckhermann, printed with permission.)

Kuckhermann's notation has many strong points in its favour. It is easily understood by musicians without a background in reading standard Western music notation. This system also allows for the lack of convention amongst the scales found on various handpans. The numbering method can be applied to any scale and any handpan. Finally, Kuckhermann's numeral notation system is well-suited to education, and is clearly communicated in the instructional videos he creates.

In an interview with Kuckhermann, I asked him about the notation system he had developed, and his preference for 'relative notation.' According to Kuckhermann, 'relative notation like the one I use allows [you] to play a piece on any instrument and scale, but the resulting piece sometimes can sound quite different. The trade-off is definitely worth it though, and it has the big advantage that you train your muscle memory, since the "notes" (relating to the tone fields) are always located roughly at a similar spot on the instrument.'[9]

Whilst Kuckhermann's system works well for its specific purpose, it may be limited in its ability to communicate frequently changing rhythms, metres, and techniques characteristic of modernist and contemporary music. The numeric system may also be seen as rather cumbersome and spatially inefficient. Though it is extremely useful for its intended

[9] Kuckhermann, D. (2019, 11 May). Personal interview.

pedagogical purposes, it may be less practical for communicating complex, extended musical forms and genres.

Mark d'Ambrosio

Multi-percussionist and educator Mark d'Ambrosio is also making a significant impression on the future of handpan education. As a classically trained musician, he brings a broad range of influences and experiences to his music (d'Ambrosio, 2020). Whilst d'Ambrosio is a formidable performer in his own right, he is currently impacting the handpan community through a new method book for beginning handpanists (d'Ambrosio & Robinson, 2020). Though this book was recently written, it contains some ideas that are similar to the ones I developed when first starting to study handpan notation in 2016. The system developed by d'Ambrosio is well-suited to handpanist students, which is the target audience of the book. His ideas are presented very clearly in the method, and they could likely be adapted to suit more advanced players as well.

Specifically, even before starting my PhD work, I had the idea of adapting some type of tablature system, like the music notation used by guitarists, and altering it to fit the handpan. This type of notation would solve the perennial issue of adapting handpan music based on the given tuning of any instrument. I found that the tablature method, as I conceived of it at the time, was not detailed enough to clearly express the music I was writing. However, it was clear that, with the right development and creativity, it could potentially be useful in the future. The method book by d'Ambrosio wisely embraces a straightforward form of this tablature notation (d'Ambrosio & Robinson, 2020). The tablature makes perfect sense for beginners especially, and the method is appropriately marketed to a wide audience. Its greatest strength is that tablature is adaptable to any tuning of the instrument. In order to meet the needs of advanced and professional players, it may need to be developed further. Though it lay beyond the scope of this portfolio, I believe that the next step in handpan notation is to

combine tablature with my notation ideas presented in this commentary. The hope is that this will in turn meet the needs of a wide variety of handpanists at all levels of development.

Jenny Robinson

Along with Mark d'Ambrosio, Jenny Robinson co-authored the handpan method book referenced above (d'Ambrosio & Robinson, 2020). It is quite significant in its approach to handpan education. Robinson is notable in that she founded Isthmus Instruments 'in 2013 after years of building and research, as the world's first women-owned and operated handpan company, located in Madison, Wisconsin, USA' (Robinson, 2019). She also well-suited to creating handpans as she has 'professional training in science & machining and a lifelong and abiding love for playing and appreciating music' (Robinson, 2019). Robinson notes that her unique background allows the team at Isthmus to '...create instruments with character, having notes that are soft to the touch and that resonate freely with the lightest touch' (Robinson, 2020). Though not as well-known as a performer as the other names in this source review, Robinson's impact in handpan construction and education has given her an important voice in this burgeoning community.

Other Literature

As noted at the beginning of this chapter, little, if any, rigorous academic work has been done thus far specifically concerning the notation or method of playing the handpan. However, many reputable performers and instrument makers maintain blogs on their websites that provide information to the general public about education, construction, and history (Charrier, 2020; Garner, 2020a; Paniverse, 2020a; Paslier, 2020). Additionally, some bloggers maintain lists of the many handpan makers around the United States (Garner, 2020c) and around the world (Paniverse, 2020b). These lists of instrument makers provide a helpful centralised location where composers may discover more about the instrument.

Regarding the existing handpan literature in the academic context, the topics that have been studied are more scientific than musical. The properties of the handpan have been

researched by scholars in the fields of acoustics, electronics, physics, and engineering. An initial example of this scholarship was presented in a paper by Wessel, Morrison, and Rossing (2008) for the Acoustical Society of America. This early writing in the field discusses the modal analysis and sound spectra of the handpan, and the acoustical implications of a few playing techniques. Morrison and Rossing also went on to expand this topic for an article the following year in *Physics Today.* This article focused on the analysis of the vibrational modes, as well as the relative sound intensity based on the energy emitted by striking a tone field (Morrison & Rossing, 2009).

Another important paper on this topic is Eyal Alon's doctoral dissertation in the discipline of Electronics (2015). In his thesis, Alon details 'the design and implementation of an experimental procedure to record, analyse and synthesise the handpan sound' (p. 2). Expanding on the report by Wessel, Morrison, and Rossing in 2008, Alon's work provides a detailed exploration of the soundwaves produced by the handpan as well as a spectral analysis of the vibrational modes created by the instrument. His research also includes a subjective listening test regarding 'the minimum number of vibrational modes required to synthesise the handpan sound' in a studio context (p. 119). This work is a rigorous, thorough, and complete study of the acoustical implications of the handpan's physical design.

Liam O'Donnell has also written a paper regarding the construction of handpans (2017). This thesis involved a study about the geometric shape of the handpan and the implications of its unique shape. This research demonstrated how changing the geometry in the design can alter the resulting tone and tuning of the handpan. An analysis of the major modal frequencies of the handpan is also included, as well as the author's insight into the application of the research. This report would be especially useful for those interested in the design and construction of handpans.

One final academic paper about the handpan came from Alan Angliss (2018). In this study, the frequency of a specific Pi Drum handpan was analysed via MATLAB and a Fast

Fourier Transform. Additionally, a spectrogram analysis was undertaken to evaluate the clarity of the specific tone fields on the handpan. This paper approached the handpan from the disciplines of engineering and acoustics.

These four papers represent the scholarly work that has been undertaken in regard to the handpan thus far. Based on these papers, it is clear that the acoustical and design properties of the instrument have been meaningful fields of study in certain scientific disciplines. My hope is that the PhD work I have undertaken will encourage further academic research into the music and notation components of handpan scholarship, adding to the small body of literature already in place about the acoustic and physical properties of the instrument.

Chapter 3: Methodology

For this PhD, the composition process has been rather unlike that of most composers, as the majority of composers are writing for established instruments. For example, when writing for piano, one has a colossal selection of scores to study for reference and insight. The starting point of writing for a traditional instrument is an awareness of what has been written before, including the styles, idioms, and techniques that have historically informed the composition process for the given instrument.

However, the impetus of this PhD dissertation is to undertake something quite different, specifically, to compose for an instrument that has no written history. No study scores exist, and the primary sources of historically available material are videos passed on through what is, at this point, a technologically-enhanced oral tradition. For this reason, as detailed in Chapter 2, the principal sources for my study have been videos and interviews.

'Practice-as-Research'

Composing music has historically been considered a primarily creative experience, and the great composers of past generations are indeed remembered for their creativity and originality. When undertaking music composition in the modern-day academic context, the act of composition is increasingly considered to be, in addition to a creative endeavour, proper research in and of itself. Whenever composers enter into the creative process, they, sometimes unknowingly, ask what are, essentially, research questions. These questions are asked as the composer solves a particular 'problem' in composition.

Though he may not have thought of it in these specific terms, Beethoven, whilst composing his Ninth Symphony, effectively asked the research question 'how does one introduce voices into an historically instrumental genre, namely, the symphony?' Tchaikovsky, when writing the score for his Nutcracker Ballet, may have subconsciously asked the 'research' question, 'how does one communicate the essence of a Christmas scene through the instruments in an orchestra?' Schoenberg, when developing the twelve-tone

method, may have formulated the question ‘how does one move beyond chromaticism and make the next natural step in music history?’

Some, like composer and author John Croft, argue that music composition should not be considered research, for the reason that composition and research have two different ultimate purposes. Specifically, Croft posits that

> …there is a fundamental distinction at work here: research describes the world; composition adds something to the world. Research, at least of the scientific kind to which musical composition is generally assimilated, aims to produce generalisable results; the significance of a piece of music lies, on the contrary, in its particularity. This is not to say that music has no cognitive dimension, or that it does not have a kind of truth – only that it does not have the kind of truth that is discovered by research. (Croft, 2015, p. 8)

There is some soundness to this argument, specifically that composers’ creativity may be stifled in the pursuit of research funding, or by trying to fit the compositional method into something more scientific and systematic than the typical creative experience allows.

My preference, however, and the methodology that I have employed and adapted in developing this portfolio, is the method described by Robin Nelson in his book *Practice as Research in the Arts: Principles, Protocols, Pedagogies, Resistances.* Practice as Research, as defined by Nelson, ‘involves a research project in which practice is a key method of inquiry and where, in respect of the arts, a practice (creative writing, dance, musical score/performance, theatre/performance, visual exhibition, film or other cultural practice) is submitted as substantial evidence of a research inquiry’ (Nelson, 2013, p. 8-9). This definition fits the essence of my PhD portfolio quite well, as the result of my work does indeed, first and foremost, take the form of written scores and recordings.

In the midst writing this portfolio, I did ask some research questions that informed my compositional process. Like the ‘questions’ subconsciously asked by Beethoven, Tchaikovsky

and Schoenberg above, my inquires serve as a means to an end. The 'end,' in this case, is to create new compositions to the best of my ability, adding to the body of neo-liturgical concert pieces discussed in Chapter 5. In the course of this primary objective, namely composing a portfolio of music, I have undertaken the secondary goal of developing music notation for a new instrument, the handpan. In an effort to serve composers interested in writing for this instrument, I have commenced the first small step toward modifying modern Western notation to make it more suitable for expressing the many sounds, tones, and colours that the handpan is capable of creating.

Specifically, the practice of composition itself, as well as experimentation with notation, has been a thoroughly informed by a discovery-led method of research. Since the field of notation for handpan is relatively uncharted territory, the research questions and the gradual development of their answers has been developed through this method. In the discovery-led method, according to Sarah Rubidge (2005), 'the researcher enters an initially inchoate field...then using his or her professional experience insights and skills, embarks on a research journey in which initially even the research pathway may not be clearly defined.' This research journey has indeed been a process of consistently reshaping my ideas and hypotheses by applying what I have learned through interviews and feedback received from handpanists and performers. As detailed in the following section below, 'the systematic research and reflection upon that research is genuinely embodied in the practice' (Rubidge, 2005), and that process of research and reflection has shaped the formation of my questions and subsequent findings.

The compositional process itself is always a delicate balance of the composer asking the question 'what *could* happen next?' versus 'what *should* happen next?' in a piece of music. The practice of composing-as-research and the asking of such questions is described by John Young (2015) as investigating 'the musical function'. Specifically, 'research is integral to a compositional practice that has to unfold within the realm of undefined potentials

and possibilities' (Young, 2015, p. 150). The 'potentials' and 'possibilities' are a constant source of evaluation and decision-making in the composition and research process. The composer's subsequent decisions come about through both his or her practical and theoretical knowledge and experience. Composer and teacher Simon Emmerson has suggested the importance of receiving feedback from a variety of sources is imperative to the 'production-reception loop' of practice-based research. According to Emmerson, 'it is my contention that the notion of testing works during the process of composition must be extended in the first instance to groups of like-minded people – and that does not mean stylistically uniform – and conceivably to audience participation also!' (Emmerson, 1989, p. 136). While receiving feedback from performers, other composers, and audience members, the composer-as-researcher undergoes the cycle of practice and reflection to determine the relative 'rightness' of a solution to the problem of composition. Young goes on to describe the resulting effect: 'as compositional problems are elucidated through practice and reflection, criteria for "rightness" emerge both within an individual work and in the consolidated style of the composer' (Young, 2015, p. 158). Throughout my own practice-as-research I have experienced this consolidation in my personal style as a composer.

Another important component of the practice-as-research method is maintaining rigorous and detailed documentation of the research process. In the book *Artistic Research in Performance Through Collaboration,* Blain and Minors explain the difference between a performer undertaking a typical recording verses the different needs of the academic 'practitioner-researcher':

> A pianist recording a CD for release will look at the recording for its aesthetic value, for its production technique and for what makes it original and marketable, whereas the academic practitioner-researcher is likely to be guided by a different agenda: a research enquiry, a question, to find out something which was unknown at the start of the process and which has been found out as a result of the process. Whilst new

> knowledge may result for both types of practice, it is the latter, the practitioner-researcher, that would benefit from developing appropriate documentation that makes explicit the work's originality, significance and rigour... (Blain & Minors, 2020, p. 23)

The goal of 'developing appropriate documentation' is extremely important in the practice-as-research model. My assimilation of research largely involved the threefold documentation method: taking notes in my journal, 'semi-structured'[10] interviews, and audio recordings. The journal notes trace my process through the steps outlined below, specifically as they relate to notation development and studying characteristics of meditative music. The semi-structured interviews were held with various musicians as outlined later in this chapter, and, in a more systematized setting, with Aaron Marsala throughout the duration of the project. Finally, audio recordings proved to be a useful tool in capturing both the various techniques while assigning notation and categorizing them, as well as the important final recording of each piece in the portfolio. Similar research methods are well-established among composers undertaking practice-as-research, notably Collins (2005), Collins & Dunn (2011), Clarke, Doffman & Lim (2013), Frohlich, Armstrong, Calic, Yuan, Knights, & Desbruslais (2015), and Armstrong (2019).

One highlight of working on this PhD portfolio has been developing the myriad skills that were required to create a diverse body of compositions and work toward answering my research questions. According to Robin Nelson, the rigorous use of a variety of skills is not uncommon for research-based PhDs: 'I recognize that [Practice-as-Research] projects require more labour and a broader range of skills to engage in a multi-mode research inquiry than more traditional research processes and, when done well, demonstrate an equivalent rigour' (Nelson, 2013, p. 9). Throughout the preparation of this portfolio, I have developed skills in a number of areas, including opportunities to research topics in meditative music and its role in

[10] 'Semi-structured interviews' is the term I have adopted from David Collins to describe the relatively informal meetings I had with musicians about my notation ideas and their application on handpan. To my knowledge, this term was first used by Collins in his article about the synthesis process model of music composition (Collins, 2005).

historic and modern sacred music, conduct interviews, develop skills in notation using Finale notation software, perform as a pianist, perform as an organist, serve as a conductor for both vocal and instrumental ensembles, record in state-of-the art studios in both the US and the UK, begin the process of creating samples for an instrument, serve as an audio editor and producer, use the Logic Pro X software, research and define neo-liturgical music, and of course the primary work of actually composing the pieces in this portfolio.

Components of My Methodology

Though I had the opportunity to undertake a variety of supporting activities throughout this project, my process in researching and creating this portfolio primarily entailed a fourfold methodology: 1) cultivating new elements of handpan notation using an existing knowledge of composition and percussion, 2) interviewing percussionists and handpanists to test the viability of these notation advances, 3) adapting the notation based on the feedback, and 4) creating original neo-liturgical music that incorporated the subsequent findings using both traditional and electroacoustic composition techniques. As is often the case in the creative process, these four steps did not always occur in a clearly defined numerical order. Instead, they were often simultaneous and rather concurrent as I worked through each piece in the portfolio. The following section discusses the elements of the methodologies as a four-step progression, but it is important to note that the process was not always as sequential as it might initially seem.

Notation

The first component of my methodology was adapting modern Western music notation to fit the needs of composers who want to write for handpan. I had begun this process whilst earning my Master of Music degree in composition, as I wrote my first solo piece for handpan. This initial experience provided some foundational information coming into the PhD programme. More of the rationale, development, and justification for the notation itself is found in Chapter 6 on Notation.

During this phase of the research, I brainstormed ways that various techniques and effects could be communicated on the written page. When Aaron Marsala initially approached me about writing a piece for handpan, he mentioned that the first obstacle to overcome had to do with notation. The challenge was that no one had developed a succinct system of writing anything beyond notes and rhythms, and as a result, the various techniques used by handpanists could only be properly learnt through verbal explanation and in-person demonstration. Whilst these technique explanations had been predominantly promulgated thus far through videos, Aaron expressed a need for a more mature system of printed notation. It is this notation that I have attempted to develop through this first component of my methodology.

Through this design process, I regularly thought of myself rather like a scientist in a laboratory. I related the process of experimentation to the scientific method, outlined as follows: First, make an observation. Second, ask a question. Third, form a hypothesis, which would be essentially a testable explanation. Fourth, make a prediction based on the hypothesis. Fifth, test the prediction. Then the process would repeat again, using the results to make new hypotheses or predictions (Krapp, 2010). In this initial stage of my process, my methodology included making the observation about the lack of useful handpan notation and then asking the question about what notation would best serve handpanists and composers. The primary work in this phase was to craft a hypothesis and prediction based on my knowledge of percussion music and notation. I have taken applied percussion lessons in the past on a variety of instruments, not with the intent of actually performing on them myself, but instead with the goal to understanding the notation and becoming better able to write for percussionists. This prior training proved invaluable to this stage in the process.

In the hypothesis-and-prediction stage, I developed various ways to notate the handpan techniques and effects with which I was familiar. As a non-percussionist, I proposed solutions and notation that I thought would communicate the techniques clearly and concisely.

Along with the notation itself, I wrote out explanations of how to execute these techniques based on what I had learnt from Aaron and others in the past. Many of my notation ideas proved to be accurate and at least a good starting point in the next phase. However, my explanations and descriptions of techniques generally needed some editing and modification in the subsequent stage of actually working with percussionists. My lack of personal playing experience in handpan proved to be a challenge to overcome as I wrote descriptions of the various techniques. During this process, I kept careful 'field notes' in my journal about observations and insights. Through semi-structured interviews in the next phase I honed the rough descriptions and greatly improved them with the help of the musicians I interviewed.

Interviews

The next component of my methodology was interviewing a variety of musicians about the usefulness and clarity of the notation developed in the hypothesis stage. This was the fifth step in the standard scientific method mentioned above, namely, testing the hypothesis. It was during these semi-structured interviews that I worked out many of the issues and resolved any lack of clarity in the notation under consideration. Whilst working primarily with Aaron Marsala, I also showed my notation ideas to other musicians, including experienced handpanists, percussionists with no handpan experience, and non-percussionist musicians, who all provided insights into the level of clarity and understanding they had regarding the notation itself.

Aaron Marsala has been a partner through this entire process and needs to be credited for his significant contributions along the way. Due to the relatively limited scope of the interviews with other musicians, and the varying degree of knowledge about percussion and handpan music, the majority of them preferred to remain unnamed in this dissertation. Therefore, I, along with my supervisor, have chosen to keep the identities of the other interviewees anonymous, with the exception of Aaron Marsala.

Most musicians are quite accustomed to sharing ideas with one another and receiving informal feedback about new concepts or techniques. Because of this established practical among musicians, I strove to glean information naturally, whilst not making the interviews any more formal or official than they had to be. Of course, those who were surveyed knew the topic and relative scope of my PhD research. Still, it was decided by my supervisor and myself that more formal means of discussion and interview would be counter-productive to the natural feedback that would come about from the interview. The aim of the semi-structured meetings with the interviewees was to keep the process as ordinary as possible, replicating the typical nature of interactions of amongst musicians.

The specific results of the methodology used in this stage of the process are laid out in more detail in Chapter 6 on Notation. In regard to the process itself, I initially thought it would be better to give the notation example to the musician ahead of time so that he or she could test it out individually before our meeting. However, after the first couple of meetings, I discovered that it was actually invaluable to personally observe the process that the musician went through when learning to read the notation. I would subsequently ask each of them to audibly share their thought process as they looked at my ideas and the concepts I attempted to communicate in print. By hearing the musicians verbally process this new material, I learnt a great deal about the strengths or weaknesses of each item under consideration. I took careful note of questions they asked or elements that needed extra clarification beyond what was already written on the paper. Whilst much of the feedback and practical clarification in performance came from Aaron through the rehearsal and recording processes, the notation advice from the other interviewees offered valuable insight as well.

Adaptation

The third component of my methodology was adapting the notation based on the responses I heard through the aforementioned interviews. Many of my initial ideas worked well in the testing, that is, interview, stage. However, several of them needed adjustment or

clarification based on the feedback I received. In some cases, I would be able to ask the same interviewee if he or she felt the improvement was clearer. Other times I would simply make the modifications and then show them to the next person. Throughout the process, Aaron gave the final practical authorisation of different decisions as we moved close to the recording phase. Since he had agreed to record the pieces for this portfolio, it logically follows that his voice would predominate as we moved into the finalisation of each piece.

Composition

The fourth component of my methodology used in the development of this portfolio was the zenith of the PhD, namely actually composing the music itself. The other three elements in the methodology led to this one. They were essential steps on the journey to ultimately do the work of creating new music. Six of the seven pieces in this portfolio have written-out sheet music, created in Finale Music Notation Software. Two of the pieces are partially or entirely made up of digital sound design created in Logic Pro X, demonstrating and highlighting the electroacoustic component of my research and composition. One piece is comprised of both media: a soundscape I composed in Logic, as well as sheet music that is meant to be performed live and combined with the track.

As a composition PhD project, in contrast with a traditional research PhD, the portfolio is the pièce de résistance. The composition portfolio must demonstrate rigour in research and preparation, whilst also showcasing a range of styles and media. And, of course, it must accurately represent the creativity and skills of the composer.

Modification

Regarding the methodology of composition, one modification came relatively early in the process. At the start of my PhD course of study, I had intended to compose only virtuosic, technically demanding music, designed exclusively for the advanced percussionist. The motivation for this was to demonstrate my aptitude as a composer and substantiate the thoroughness of my notation system. During the first few months, I worked hard to complete

the research and interviews required to establish the notation, and composed *Triptych Meditation.* This was the type of tour de force virtuosic piece that I had planned to continue exclusively writing. I clearly intended to include this in my final portfolio.

In the second semester of study, I wanted to write a piece for the Adelphi Contemporary Music Group and include handpan in the ensemble. Because of the relatively short rehearsal time available to the ensemble, and the variety of experience levels amongst the musicians when it came to reading printed sheet music, I composed a piece that was not as technically demanding, and could be therefore performed by a less experienced handpanist. This proved to be a challenging feat, because, as all composers know, it is sometimes harder to write technically simpler music well, than to write technically advanced music for a virtuoso. Still, I did not initially expect to include *Le Feu de la Pentecôte* in the portfolio due to its relative level of difficulty when compared with *Triptych Meditation.*

An important change in perspective occurred during my Internal Assessment held later that year. Rather than being concerned that *Le Feu de la Pentecôte* was not technically demanding enough, the committee was instead cautioning me against writing exclusively virtuosic music, attainable by only the top echelon of percussionists. Considering the relatively small community of advanced handpanists who can also read music fluently, the committee members encouraged me to include compositions in the portfolio that represented a wide spectrum of not only varied styles, but also diverse levels of difficulty. Working through this reasoning was an important part of the methodological process. For this reason, I have included two pieces in the portfolio that are attainable by handpanists who are newer to either handpan-playing or music-reading (*Le Feu de la Pentecôte* and *Meditari)*. The purpose of this is to demonstrate a capacity to compose for various stages of notation fluency, and to represent the rigour of research I have undertaken when working with a wide range of experience levels, in both interviews and performances. Rather than engaging with only virtuosi, I have endeavoured to represent a wider spectrum of members of the handpan

community by including various levels of technical difficulty in these compositions. This realisation was a critical component of the development of this heterogeneous portfolio.

Electroacoustic Composition

Another significant part of the composition stage was working in the Logic Pro X software. We felt it was important to include a broader range of media in the portfolio than traditional printed sheet music alone. As a twenty-first century composer, I wanted to demonstrate recent innovations in composition and sound design. Since the handpan is a relatively new instrument, I also felt it was necessary to use it in relatively new technology, namely that of manipulating its sounds in a digital audio workstation (DAW).

The methodology for the electroacoustic composition included recording, undertaking sound design in the DAW, editing, and performance. With the help of Dr Adam Hart, a PhD candidate at the time, we had a recording session in one of the excellent audio studios at the University of Salford. We made samples of many of the techniques possible on a handpan on each of the pitches on my instrument. I then used those samples whilst composing in Logic to create two pieces, *Lux aeterna* and *Meditari.* This process inspired the idea for future application of this project: to create high-quality samples that could be used in virtual composition in various DAWs. After the samples were created, I use the software to alter the sounds, the specifics of which is explained in more detail the commentary section in Chapter 7.

Production

Organising, directing, and producing the recordings of each piece in this portfolio was another important component of the completion process. In the recording of each piece, I played various roles depending on the needs and performance conditions. For *Triptych Meditation,* I served as producer for the recording session, coordinating the project between the soloist and the audio engineer. I also answered questions from the performer throughout the session and helped shape the piece as it was recorded. In *Le Feu de la Pentecôte,* which

was performed and recorded live, I served as one of the keyboardists, and offered advice about the piece to the performers and conductor during rehearsals. During the recording of *La Création du monde,* I played the organ part, which took most of my focus during the recording session. However, I also coordinated between my duet partner and the recording engineers to ensure that the session remained well-organized and on track. *Lux aeterna* is unique within this portfolio as it is the only piece that did not have a live recording component. As such, I edited and produced the piece electronically on my own from start to finish. Also, I played handpan for the samples used to create this piece, and in that way also served as the performer of the source material. The track for *Meditari* was also created from samples I personally performed, recorded and edited. In the live performance I conducted the ensemble as they played over the track. For the recording of *Magnificat,* I performed in the first recording session, in which we recorded only the piano and handpan parts. In a subsequent session, I conducted the vocalists as they recorded their parts simultaneously. I also produced both sessions by coordinating the performers and audio team. For *Selah,* after composing the piece in the traditional way and entering it into the Finale Notation Software, I then created a digital orchestration by assimilating and editing samples in Logic Pro X software. After the orchestral version was completed, Aaron Marsala recorded the solo handpan part whilst listening to the orchestral track. I coordinated the production of this piece and took part in the editing stage as well.

In addition to the composition of these pieces, I have appreciated all the opportunities to develop skills in other areas as well, namely as a performer, conductor, producer and editor. A key component of my methodology has been the practical application of the research that has been undertaken in this portfolio. To echo the words of Robin Nelson (2013), this undertaking has been a ‘multi-mode research inquiry,’ and I have striven to ‘demonstrate an equivalent rigour’ to that of traditional research processes by engaging in this multi-faceted methodology.

Title	Composer	Performer	Conductor	Producer	Editor
Triptych Meditation	X			X	
Le Feu de la Pentecôte	X	X			
La Création du monde	X	X		X	
Lux aeterna	X	X		X	X
Meditari	X	X	X		X
Magnificat	X	X	X	X	
Selah	X			X	X

Table 3.1. A table noting the roles I played for each piece in the portfolio.

Chapter 4: General Considerations and Analysis of My Musical Style

As a composer who is also a performer, my background is rather diverse, having been influenced by a variety of styles and genre. I have had three main spheres of professional experience, with varying levels of time spent in each area through different seasons of my career. These three areas of expertise are in piano performance, choral conducting, and composition. The work I have done in piano and conducting have impacted my personal style as a composer considerably.

Influences

20th Century Piano Composers

As I began my career as a pianist, I played a great deal of 20th Century music, including pieces by Debussy, Bartok, and Sofia Gubaidulina, amongst others. My symphonic compositions tend to reflect the richness of the orchestrations and some of the harmonic qualities of Impressionist composers. Debussy and Ravel have had an especially meaningful impact on me. Ravel's *Daphnis et Cholë* is a piece to which I return time and time again for direction about the use of orchestral colours to create specific effects. The music for this ballet has become one of the cornerstones of modern orchestration (Morrison, 2004), and the insights found when studying that score have certainly been relevant for my growth as an orchestrator. In my composition *Selah,* the climactic section that begins at bar 216 is rather reminiscent of the expansive texture in *Daphnis et Cholë.* Regarding the harmonic language of Debussy, I found *L'Isle joyeuse* to be especially instructive. When studying this piece as a pianist, my teacher encouraged me to think about it orchestrally, as Debussy likely had orchestral instruments and effects in mind whilst composing it for piano (Klein, 2007). In *Selah,* the long chords at bars 245, 249, and 252 are rather reminiscent of the sumptuous, lush pillars of sound that one often finds in Impressionist and late-Romantic music.

I also relate to Bartok's voice as an orchestrator, especially in his imaginative harmonic material and his use of percussion. I appreciate his level of respect for percussion

instruments as having an independent musical voice, rather than simply doubling or emphasizing other instruments, as well as the specificity that he includes in the score for percussion articulation and expression (Valiquette, 2000). I have endeavoured to emulate that in my orchestration as well. As an example, my vibraphone writing in *Selah* in bar 234 and following is quite independent and provides its own unique tone colour.

In my compositions for piano, one of my influences is Sofia Gubaidulina, particularly her *Chaconne* (1962), in her rich harmonic vocabulary, the use of specific registers for intentional pianistic effects, and the orchestral manner in which she writes for piano. Giving an apt summary of Gubaidulina's piano writing, Kadisha Onalbayeva-Coleman wrote, 'She treats much of her piano writing almost like an orchestral effect, with use of sonority and a variety of tone color [sic] both with extended techniques and a creative use of the various registers on the piano' (2010, p. 33). I have taken these techniques and strong characteristics of Gubaidulina's music to heart and often remember these principles in my writing for piano. An example of the use of specific registral choices is found in the piano part for *Magnificat.* The first note of the piano score, C-sharp, is chosen to double the handpan and also add the fundamental tone an octave below it. This specific registral choice is made intentionally to maximize the remarkable overtones created by the piano and handpan playing the same unison pitch. Also, in the section of *Magnificat* beginning at bar 60, I have intentionally chosen to place the piano part in the highest register of the instrument, well out of the range of the singers and handpan, to communicate the expansive and empyrean quality of the verse 'all generations shall call me blessed.'

English Choral Music

During my training as a conductor, I was especially drawn to the choral music of English composers of the early- to mid-20th-century, namely Vaughan Williams, Elgar, Howells and Britten. In my compositions for choir, the influence of English choral music on the style, content, and harmony is often mentioned by both critics and enthusiasts alike. In the

piece for voices included in this portfolio, *Magnificat,* some characteristics of English choral music are evident.

The most obvious element is that it is a setting of the Magnificat, and choral versions of this text have been the cornerstone of the English evensong service for generations. Secondly, the enigmatic opening is best performed by employing a distinctly English choral interpretation. Eric Whitacre described the English choral sound as being 'bright and clear, with a healthy spin and not too much vibrato' (Whitacre, 2010). This is the precise sound I had in mind whilst composing, and this is the technique I drew out of the singers during our rehearsals and recording session. Finally, the use of modes in composition is frequently a trait of the English choral tradition, extensively implemented in the music of Vaughan Williams, Holst, Parry, Stanford, and Rutter. According to Chad Steffey (2018), the use of modes is often thought to evoke a particularly English choral sound. Due to the tuning of the handpans available for the recording, I chose to incorporate the mixolydian mode specifically in my piece for voices, the Magnificat. As an observation, several performers and audience members have since told me that the mixolydian section has a distinctly English sound. This is no doubt a resultant effect of the impact English choral music has had on my career as a conductor, performer and composer.

Olivier Messiaen

The music of Olivier Messiaen has also had a tremendous impact on my organ composition, most notably in this portfolio in the piece *La Création du monde.* I have always felt a close kinship with Messiaen, due to his ability to bridge the gap between concert music and sacred music. His remarkable career spanning a variety of interests and disciplines is something to which I aspire as well. As a composer, I have studied his organ music with some fascination. The manner in which he draws emotion out of his music is quite compelling. I have striven to communicate that deep sense of emotion and meaning in the organ piece in

this portfolio. A contemporary of Messiaen, Nicholas Armfelt wrote the following about the scope of Messiaen's work:

> One of the most striking features of some of Messiaen's music is that it makes one conscious that everything in it is within a context of something bigger. There is the sound behind the sound, the longer duration behind the shorter one, the slower rhythm behind the quicker one. And behind all movement there is an awareness of stillness, behind all sound an awareness of silence, and behind all measured time an awareness of eternity. (Armfelt, 1965, p. 857)

I believe this exact description is the means by which Messiaen creates such emotion behind his music. The overwhelming sense of 'the sound behind the sound' and the quality of 'something bigger' is precisely what I have endeavoured to express through *La Création du monde.*

I have also been influenced by Messiaen's quintessential use of mutation stops on the organ, which is an important characteristic of the tone colour that he captures in much of his organ music. 'Messiaen had a deeper understanding of the overtone series and [organ] registration than did most composers' (Shinew, 2004). I hope to have incorporated this quality, unique to the organ, in the composition for this portfolio. The use of mutation stops represents the complex and multi-faceted story of creation and the creative process that I strove to express in *La Création du monde*. Messiaen is distinctive as a composer in that he had a broad impact in both sacred music as well as concert music. I hope to succeed in both of these areas too and was inspired by Messiaen to continue to develop the heritage of 'neo-liturgical' music, described in Chapter 5.

Process

When composing some of the pieces in this portfolio, I was rather flexible in the development of form. As I compose, I usually think on two levels, the first of which is the immediate detail, and the second being the overall shape and form of the piece. Though my

music is quite different from his, Iannis Xenakis expressed this duality of mind adroitly as he reflected on the similarities between architecture and composition:

> One thing I learned from architecture . . . is to consider the overall shape of the composition, the way you see a building or a town. Instead of starting from a detail, like a theme, and building the whole thing up with rules, you have the whole in mind and think about the details and the elements and . . . proportions. (quoted in Matossian, 1986, p. 69)

In *Triptych Meditation*, *Le Feu de la Pentecôte*, *La Création du monde,* and *Magnificat*, I began by creating motifs and developed them organically from there. In those instances, I allowed the motifs to drive the conception of piece, all the while keeping the form and larger arc of the composition in mind. With the two electronic works, *Lux aeterna* and *Meditari,* I placed specific limits on the timing and shape of the piece before starting the composition process. As the various material developed, I fit it into the overall form and direction of the piece. In *Selah*, I fully sketched out the motifs and form before beginning to compose, creating a graphic representation of the score first. Then the actual composition process was the realization and interpretation of the graphic score I had initially created.

My methodology for composing tends to more in the manner of pre-modernist composers, when compared with other contemporary compositional techniques. The focus of this portfolio is on writing for a new instrument, rather than specifically creating a new compositional technique. My approach tends to be led by my ear and a need to communicate the specific meaning I hope to express in a given piece. This method of discovering new sounds tends to come about organically, through the intuitive use and discovery of original material. I have also attempted to write music that is approachable to those handpanists and percussionists not fully integrated into contemporary classical idioms, whilst still writing compelling and captivating music that demonstrates the necessary rigour required for a PhD in composition.

Throughout the process of researching and writing this PhD portfolio, I have grown considerably in the understanding of my personal musical style. As this chapter about the 'general considerations and analysis of my musical style' has gradually taken shape over the past years, I have observed an increasing clarity about my voice and perspective as a composer. With gratitude to the myriad influences discussed throughout this chapter, and whilst writing meditative and neo-liturgical music for handpan, I am beginning to see my own musical style emerge.

Chapter 5: On Neo-Liturgical Music

Throughout the course of this study, I have become increasingly interested in 'neo-liturgical music,'[11] which is a term referring to music inspired by sacred texts or topics, without necessarily being written for performance in a religious setting.[12] The venue for this sacred concert music is intended to be the concert hall rather than the church sanctuary. It is important to note that, when using the prefix 'neo-' here, I am not referring to 'new' liturgical music. The performance of sacred-inspired music in the concert hall is not new and, indeed, has occurred for generations, as outlined below. Instead, I intend that this idea of neo-liturgical music refers to the 'modified or expanded' definition of the prefix 'neo-' (Oxford, 2020). It should also be noted that my definition of this term does not apply to music influenced by Christian themes exclusively but applies to any sacred source by which the composer is influenced. Specifically, the term neo-liturgical refers to music that has been extended beyond the margins of its religious context, and now modified or expanded in some way to embrace the realm of the concert hall, the internet platform, or whatever medium the composer has chosen for its expression.

Historical Foundation

This type of sacred concert music has precedent in compositions at least as far back as the Baroque- and Classical-era oratorios, which were based on sacred themes, yet typically performed in secular concert environments (Hunter, 2000, p. 36). In the Romantic era, Brahms' *Ein deutsches Requiem* and Verdi's Requiem, along with many like them, are clearly

[11] When I use the term neo-liturgical, it is important to note that the word is not meant to be associated with the broader theological use of the term. The term has been used by some (Bevins, 2019; Covarelli, 2019; Connell, 2015) to refer to a return of evangelical worship practices to historical 'liturgical' or historically based roots. Others use the word to refer to a format of worship derived from the specific manner of Isaiah's interaction with God, recorded in Isaiah 6 (Chappell, 2009; Cosper, 2013). An incidental mention of the term, used in passing in a biography of Messiaen, refers to the composer's concert organ works having a possible 'neo-liturgical' function, capable of being potentially performed in a church service instead of the intended recital setting (Johnson, 2009).

[12] The word 'liturgical' is derived from the ancient Greek word 'leitourgia,' which means 'the work of the people' (Lewis, 1965). In the context of Christian worship, it has come to reference the order of worship, that is, 'the work of the people' during a church service (Senn, 2012).

envisioned as concert music with sacred themes, rather than intended for use in an actual church mass (Heisey, 2010).

In the 20th Century, some composers continued writing this type of music as well. *Prelude for Meditation* by John Cage is an example of his early interest in bringing principles of Zen Buddhism into the concert hall (Nelson, 1995). Even Cage's famous *4'33"* seems to be a 'concert manifestation' of the Zen Buddhist practices he was implementing in his personal life (Low, 2007). Coming from a different tradition, Arvo Pärt said that in his compositions, whether overtly sacred or secular, 'religion influences everything' (quoted in McCarthy, 1989, p. 132). Similarly, composers like spectralist Claude Vivier strove to find a spiritual nature in the midst of concert music. In an article in 1970, Vivier described this religious aspiration, saying, 'I want art to be a sacred act, the revelation of forces, the communication with these forces' (quoted in Gilmore, 2014, p. 49).

Contemporary Expressions

Modern day composers continue this tradition of neo-liturgical music. The music of Scottish composer James MacMillan '…is infused with the spiritual and the political. His Roman Catholic faith has inspired many of his works…' (Johnson, 2008). Similarly, Israeli-American composer Shulamit Ran has written many concert pieces with rich expressions of her Jewish faith, perhaps most notably her *Supplications (for chorus and orchestra),* premiered in 2002 (Clark, 2003). Also, Eric Whitacre, though he is 'wary of organized religion,' has stated in a 2016 interview that the principles of Zen Buddhism have had a tremendous impact on both his process of composition as well as the music itself (Swan, 2016, p. 18). Another musician in the neo-liturgical realm is Welsh composer Paul Mealor. His symphony that premiered in 2015 was clearly designed for the concert hall, but it still was an expression of Anglican themes and faith. In an interview with Ken Walton, Mealor explained, '[This symphony] brings together everything I've been doing compositionally and theologically over the past twenty years in a huge rhetorical symphonic statement' (2015).

Walton goes on to observe that it is Mealor's Christian faith which '…has been key in driving the evolution of his new symphony…' (2015).

Providing this list of composers is an important part of setting the context for my compositions, and it establishes a foundation amongst the ranks neo-liturgical composers. I find profound meaning in connecting my compositions with something transcendent, propelling thoughts and ideas beyond what can be immediately seen. I always endeavour to keep the music as the primary focus, and always without a hint of propaganda. My hope is that the music itself will be meaningful and interesting, whether or not the original impetus for an idea is known to the listener. In my opinion, even the most programmatic music should not rely on the 'programme' for its intrinsic value and meaning. Though most of my work is not truly programmatic, my intention is that the means by which I have found inspiration would not prove vital to the understanding of the music itself.

Music for Meditative Purposes

Foundations

From its inception, the handpan has been associated with music used for meditation (Charrier, 2017, Paslier, 2018, and Garner, 2019). The creation of music for meditative purposes is a particular interest of mine and is therefore germane to the understanding of this portfolio. Mark Garner, amongst others, has written extensively about theories regarding the specific frequency and resonance unique to the handpan that makes it particularly fitting for meditation. Though this commentary does not include a sociological survey, as that is beyond the scope of the project, it is important to make observations about the role of meditative music and how it relates to the handpan.

Music for meditative purposes can be a subset of neo-liturgical music. However, music may have meditative characteristics without any specific sacred connotation. For example, early minimalism was 'associated with new forms of spirituality' in 1960s (Auner, 2013, p. 281). Nevertheless, Terry Riley's *In C*, though an example of early minimalism, has

no overtly sacred connection. In the music in this portfolio, some of the pieces fall into both categories, and some lie in one or the other. The principles of meditative music that I have observed below aid in making the distinction between the categories.

For millennia, humankind has used certain types of music for meditative purposes (Morely, 2013, p. 298; Sacks, 2006, p. 2528). Time and time again, generations have found that music can have an intrinsic quality which in some way ushers in a sense of contemplation (Biswas, 2011, p. 293; Rouget, 1985, p. 266). Whether for sacred worship purposes or broader introspection, certain types of music lend themselves to this meditative experience. In a modern age which seems to increasingly value silence and meditation, the interest in pausing to contemplate one's life and present environment has taken on a veritably therapeutic role in the lives of many. Following in the steps of past generations, now medical and psychology experts are turning to music as a means of accompanying and ushering the participants into the mindset of meditation (Campbell, Burger, & Ala-Ruona, 2019; Lee, et al., 2017, and Wu, et al., 2017). Musicians, and especially composers, are wise to develop their ability to write music designed for meditative purposes, especially as the genre is becoming increasingly visible and relevant. Because of this, during the composition of this portfolio, I spent time reflecting on the characteristics of meditative music. In the future I am interested in writing more about how composers might use this information in their original works. For the purposes of this portfolio, however, I have made several observations that have proven useful in shaping the idea of how music and meditative practices interact.

Observations

In order to note qualities of meditative music, I have undertaken a study of both historic and modern music that has been categorised, either by the composer or by the broader music community, as having contemplative characteristics. The following is the collection of works studied that have a foundation in meditative music, informing the contemplative nature of some of the compositions in this portfolio: Gregorian Chant: Alleluia: Vidimus stellam

(date unknown), Palestrina: Pope Marcellus Mass ('Kyrie') (1555), Bach: Toccata in F, BWV 540 (1714), Bach: Prelude in C Major, BWV 846 (1722), Bach: Goldberg Variations, BWV 988: 1: Aria (1741), Chopin: Etude Op. 25, No.1 'Aeolian Harp' (1836), Messiaen: *Quatuor pour la fin du temps* (1941), Cage: Prelude for Meditation (1944), Pärt: Credo (1968), Riley: In C (1968), Stockhausen: Mantra (1970), Pärt: *Spiegel im Spiegel* (1978), John Tavener: Song for Athene (1993), and Max Richter: Sleep (2015). I listened to these works and have made observations that informed my knowledge of music for meditative purposes, which has thereby shaped my composition process.

Piece	Cohesion	Repetition	Instrumentation	Duration
Gregorian Chant: Alleluia: Vidimus stellam (date unknown)	Smoothly connected and flowing Medieval Chant	Motivic and rhythmic gestures present some repetitive elements, though literal repetition is not common	Unaccompanied voices (monophonic texture)	3'
Palestrina: Pope Marcellus Mass ('Kyrie') (1555)	Unified sound of cohesive four-part polyphony	Motivic repetition characteristic throughout	Unaccompanied voices (polyphonic texture)	37'
Bach: Toccata in F, BWV 540 (1714)	Steady stream of semiquavers, perpetual motion throughout	Rhythmic repetition; motivic repetition	Organ	15'
Bach: Prelude in C Major, BWV 846 (1722)	Steady stream of semiquavers, perpetual motion throughout	Rhythmic repetition of semiquavers	Keyboard instrument	3'
Bach: Goldberg Variations, BWV 988: 1: Aria (1741)	Unified sound of cohesive four-part polyphony	Not present	Keyboard instrument	6'
Chopin: Etude Op. 25, No.1 'Aeolian Harp' (1836)	Unified sound of cohesive texture throughout	Rhythmic repetition of sextuplet semiquavers	Piano	3'
Barber: Adagio for Strings (1936)	Consistant palate of similar tone throughout	Little rhythmic repetition	String orchestra	10'
Messiaen: *Quatuor pour la fin du temps,* Mvt. 5 'Louange	Changes occur gradually, leading to a sense of	Highly repetitive rhythm in the piano chords	Cello, Piano	8'

à l'Éternité de Jésus' (1941)	cohesion throughout this movement			
Messiaen: *Quatuor pour la fin du temps,* Mvt. 8 'Louange à l'Immortalité de Jésus' (1941)	Slow yet intense movement, with a generally cohesive and unified character	Highly repetitive rhythm in piano	Violin, Piano	8'
Cage: Prelude for Meditation (1944)	Uses only four tones, meant to sound like meditative bells	Repetition of the same four tones	Prepared Piano	1'
Riley: In C (1968)	Cohesive quality as all musicians move through the same score at their own pace	Each cell is repeated an indefinite number of times	Undefined ensemble	16' to 78'[13]
Stockhausen: Mantra (1970)	Created from a pair of melodies in counterpoint (the 'mantra'), expanded and contracted but based on the same cohesive material	The 'mantra' is not literally repeated, but the pieces moves through 13 iterations of the same mantra material.	For two pianists (each playing a ring-modulated piano, crotales, and woodblock), electronics	67'
Pärt: *Spiegel im Spiegel* (1978)	Smoothly connected and flowing, remaining consistent in texture and tone throughout	Rhythmic repetition of crochets at a peaceful pace; tintinnabuli style	Piano and violin	10'
Glass: 'Evening Song' from *Satyagraha* (1980)	Gently undulating strings throughout, light and delicate tenor voice and flute parts generate smoothly and cohesively from the string ostinati	Highly repetitive string, vocal and flute parts	Strings, woodwinds, tenor	8'
Pärt: Berliner Messe (1990)	Flowing and reverent throughout, with	Occasionally present, especially for	SATB choir with organ or string orchestra	29'

[13] No specific duration is given by Riley in the score, but recordings exist between 16 and 78 minutes.

	each movement cohesive within itself	movements employing tintinnabular style		
John Tavener: Song for Athene (1993)	Cohesion is maintained throughout due to the slow moving vocal parts and the consistent pedal F in the Bass 2 part	The repetition of the 'Alleluia, alleluia' refrain six time provides the repetition in this piece and delineates the various sections.	Unaccompanied SATB choir	7'
Pärt: *Da Pacem Domine* (2004)	Slow-moving and meditative throughout, very little harmonic growth or development	Repitition of text and harmonic material	Unaccompanied SATB choir	6'
Max Richter: Sleep (2015)	The music is calm and mellow, with changes in chords and instrumentation happening very gradually	Repetition of crochets and quavers depending on the movement, drones present throughout	Piano, Cello, 2 Violas, 2 Violins, Organ, Soprano vocals, Synthesisers and Electronics	504'21" (8:24:21)

Table 5.1. A table describing the relative meditative qualities of each of the pieces studied.

Based on study of the above-mentioned pieces, as well as consideration and reading on the topic (Lee, et al., 2017; Bonde & Wigram, 2002; Thaut, 1990), I have determined that four main variables exist which inform the contemplative nature, or lack thereof, ascribed to meditative music.[14] While each of these variables exist in all music to some extent, based on the literature and my own observations, these four elements, described below, are the primary means used to specifically measure a piece of music's relative 'meditativeness.' Therefore, each of these four variables operate along a spectrum of suitability for meditative purposes. Each element represents varying levels of potential for creating a meditative atmosphere. The success of meditative music and its relative 'contemplativeness' depends on two elements:

[14] The study by Lee, Sung, Liu, & Chang (2017) is very specific in the description: 'The music consists of the following characteristics: slow and flowing relaxing music, a tempo of 60–80 beats per minute, instrumental with no lyrics and volume level of 50–60 db.' Bonde & Wigram (2002) unintentionally described characteristics of the handpan when their study recommend using instruments with 'fundamentals, vibrations and [a] rich spectra of overtones' (p. 149), though they were referring directly to gongs, sound bowls, and other struck idiophones.

firstly, where the given characteristic falls on its respective spectrum, and, secondly, the suitability of the amalgamation of the four variables when considered together. The four variables to consider vis-à-vis meditative music are: cohesion, repetition, instrumentation, and duration.

Categorisations

Cohesion

Regarding cohesion, meditative music is often made up of one type of pattern or sound. When changes do occur, such as the introduction of new material, or a shift from one tonal centre to another, the transformation must occur so gradually that the resulting effect is a seamless shift to the new idea or material. Composer La Monte Young has described this type of musical experience as 'getting inside the sound.'

> I remember one night when it took one of the dancers, who was hanging from the wall, at least half an hour to work his way around the room. These evenings were especially conducive to the discovery of new sounds. We found many we had never heard before. Along with the new sounds, of course, we found new ways of producing them, and we also reconsidered sounds we had never previously listened to so closely. Sometimes we produced sounds that lasted over an hour. If it was a loud sound my ears would often not regain their normal hearing for several hours, and when my hearing slowly did come back it was almost as much a new experience as when I had first begun to hear the sound. These experiences were very rewarding and perhaps help to explains what I mean when I say, as I often do, that I like to get inside of a sound. (Young, 1969, p. 74)

This type of experience, that is, 'getting inside the sound,' is exactly what happens with uninterrupted consistency. Without sudden changes to divert the listener's attention, meditative music provides the opportunity to become fully immersed in the sonic atmosphere.

This type of cohesion is used in my portfolio in at least four pieces. The most overt example in this case is *Lux aeterna*, the fixed media piece. When changes do occur, they are added gradually. Eventually the newly introduced sound becomes part of the consistent texture. The intention is that this piece would give the sense of eternity, as if it could go on continually. Another example of cohesion is in *Le Feu de la Pentecôte.* The theme slowly spreads from the first performer, to the next, and the next, with each member of the ensemble subtly joining the texture. The key to a seamless performance is the gradual introduction of changes, maintaining the ideal of consistency.

Repetition

Related to cohesion, meditative music often contains an element of repetition. With regard to this topic, Stockhausen once commented that repetition is found in music because it is built into the very biology of humanity. 'Repetition is based on body rhythms, so we identify with the heartbeat, or with walking, or with breathing' (1999). Since repetition is such a universally human characteristic built into our very bodies, even working largely unnoticed in the heartbeat as Stockhausen noted, it is no surprise that an element of repetition would be found reassuring in meditative music. John Dewey wrote that 'underneath the rhythm of every art and of every work of art there lies, as a substratum in the depths of the subconsciousness, the basic pattern of the relations of the live creature to his environment' (2005, p. 156). The patterns found in meditative music are likely so ubiquitous due to their connections with the 'depths of the subconsciousness.'

Music intended for meditative purposes tends to be made up of short, repetitive patterns (Gibson, 2004). The number of repetitions could range from a few (for example, the beginning of Morton Feldman's Piano and String Quartet (1985)), to the dozens (Steve Reich's *Different Trains*), to even the hundreds in some cases (La Monte Young: *Arabic Numeral (Any Integer)*). After a series of repetitions, it becomes clear that the respective motifs are not developing in the traditional manner of Western music; rather the listener and

performer are themselves developing, since the way they hear and experience the sound evolves as time progresses. Repetition carries the air of deeper meaning and reflection.

In this portfolio, two instances of repetition are worth special note. In *La Création du monde,* a feature of the piece is its frequent interruptions and quick cuts from one bit of material to another. However, beginning at bar 64, the handpan enters a section of repetition that last for about twelve bars. In a piece with so many quick changes, this type of repetition stands out distinctly. The handpanists who have played this piece have remarked about the meditative reprieve they observed at that part of the piece and communicated a sense of introspection induced by this section. Another clear example of repetition occurs in *Meditari.* The very essence of this work lies in the reiteration of each cell of material, with each cell being repeated for about thirty seconds. Specific directions are given in the performance notes about the importance of embracing the repetitive design of the piece.

> *Meditari* is designed to encourage musical meditation and contemplation, allowing the repetition of the notes to lead to a sense of peace and calm. This should foster meaningful individual expression, while still maintaining one's place in the entire ensemble. The performer should allow for this experience to be a significant time of contemplation about the beauty of the instrument's tone as well as the role of time passing in music and life. Performers are encouraged to listen carefully to their individual sound and make as beautiful a tone as possible. (Mattix, 2019)

The emphasis on listening and engaging with the recurring sounds produced is often at the heart of meditative music. My aim is that the repetitive elements in my portfolio allow the listener and performer to have a reprieve from their current experience and visit, if only for a few minutes, the 'depths of their subconsciousness.'

Instrumentation

The choice of instrumentation is one that is extremely important when writing music for meditative purposes. Historically, certain instruments have gained associations with specific

impressions, activities, and emotions. Composers regularly take these implications into account when creating music, with the intention of choosing the best instrument to stimulate a certain atmosphere or mood. Because of these associations, some instruments tend to be better suited to meditative music than others. Whilst this may be a matter of personal opinion and taste, research has pointed to trends in this area of general perception. As Kirsty Whatley has observed, 'musical instruments are symbolic objects. Visually arresting, each can conjure an abundance of historical, social and personal associations into a persuasive mythology and distinct identity. As such, the instrument "performs" before a note is even played' (2007, p. 39). The trumpet, for example, has historically been associated with the military, hunting, and royalty. In fact, 'the first recorded use of the trumpet was for military signals' (Monelle, 2006, p. 135). Due to these historic links, few people would connect the trumpet with a peaceful or meditative experience (Grocke & Wigram, 2006, p. 52). On the other hand, some instruments are typically associated with a more gentle and serene atmosphere. Harpist Stephan Haluska has referred to the harp as traditionally being 'a symbol of elegance, gentility, and the divine' (2014, p. 4). This has historically been the connection since the early days of the harp, first recorded 'during the 3rd millennium BCE in the Middle East and Egypt' (Lawergren, 2001). Due to these long-term associations, music played by the harp is more likely to be connected with a meditative or spiritual experience.

Scholars in the fields of music therapy and music education have researched the effect of certain instruments on mood, relaxation, meditation, and student performance (Gaston, 1951; Gaston, 1968; Maurer, Kumar, Woodside, & Pekala, 1997; Grocke & Wigram, 2006; Hoeft, 2007; Elliot, Polman & McGregor, 2011; Gadberry, 2011; Canga, Hahm, Lucido, Grossbard & Loewy, 2012; Koenig et al., 2013; Matney, 2017). Based on these studies, as well as my own observations and experience, I have complied lists of instruments that are more effective and less effective for incorporating in music for meditative purposes. The instruments deemed more effective for meditative music are the flute, violin, cello, strings in

general, harp, mellow percussion instruments (for example, marimba or low bells), handpan, piano and organ. Depending on the taste and ability of a composer of electronic music, digitally manipulated sounds can also have a meditative and calming quality (Matviitseva, 2014). The instruments considered by some to be less effective in meditative music are trumpet, tuba, brass in general, more strident percussion instruments (for example, snare drum or ratchet), bassoon, and harpsichord. Though the studies noted above give more information and detail about this topic, these lists of instruments provide a foundation for the composer who is interested in writing music for meditative purposes.

In this portfolio, I have given careful consideration to the instruments and sounds used in the more meditative pieces. Since each piece in this portfolio involves the handpan, the meditative atmosphere is already set in a way simply by the presence of that instrument.[15] The *Meditation Triptych* is written for handpan solo and embodies many of the qualities of meditative music. The fixed media piece, *Lux aeterna,* was created from handpan samples, though manipulated digitally to sound like something altogether different. Additionally, *Le Feu de la Pentecôte* and *Meditari,* though written for an unspecified ensemble, are both meant to be intentionally meditative experiences. The indefinite nature of the ensemble allows room for the performers' individual interpretation of the music for their instrument. In the live performances we have had a variety of instruments and voices that have participated with high levels of engagement personally reported by performers and audience members alike.

Duration

In order for meditative music to have its intended effect, that is, to allow the listener and performer to engage in a session involving some combination of contemplation, prayer, and meditation, the piece of music needs to be of a substantial length. The application of this principle is the fourth characteristic of meditative music: duration. The meditative piece of

[15] Some observations have been made regarding the frequency, overtones, and rate of vibration present in the handpan (Garner, 2016b, Garner, 2019, & Malzer, 2019), though additional scholarly work in that field should, in the future, be undertaken as to the specific reasons for the handpan's meditative quality.

music must allow ample time for a state of calm and rest to come over the listener. This process should not be rushed and compacted into the typical three-to-five-minute popular song. Tom Johnson remarked that meditative music, which he characterizes as being 'hypnotic,' should 'always be rather long, extremely persistent, and highly repetitious' (1978, p. 191). During this type of contemplation, prayer or meditation, one's perception of time may change. According to a study on mindfulness, this type of meditative practice often leads 'to a relative overestimation of durations' (Kramer, Weger & Sharma, 2013, p. 846). The process of contemplation, prayer or meditation is one that is ideally calm and not hurried.

Because of this observation, I have created pieces of meditative music that are between approximately ten to twenty minutes in duration. The first piece in this portfolio, *Triptych Meditation,* is fifteen minutes and thirty seconds in length. This amount of time allows for each of the three sections to settle into its respective groove, allowing the listener to enter a time of contemplation and reflection. In *Le Feu de la Pentecôte,* the performance time is quite flexible and is left up to the discretion of the performers. Though my material is entirely original, and the guidelines are different in these performance directions, the piece has a similar intent as Terry Riley's *In C*. My performance notes express that 'the piece may last from 20 minutes to 45 minutes, or even longer, depending on the preference of the musicians. A minimum of 20 minutes is encouraged, to allow time for each cell to truly take shape and not feel rushed' (Mattix, 2018). The electronic *Lux aeterna* is a fixed media piece and is therefore always the same length in performance, lasting approximately fifteen minutes total. Finally, *Meditari* is also a specific length, since it is played by live musicians along with a track. It lasts ten-and-a-half minutes altogether.

Application

These four pillars—cohesion, repetition, instrumentation, and duration—are important elements for a composer to consider when writing music for meditative purposes. Though other characteristics may be observed, these are the four primary variables to keep in mind.

Since they are broad guidelines for consideration, exceptions will certainly occur. These categories are not meant to stifle composers or create categories that might limit creativity. Instead, the purpose of these categorisations is to provide a metric that gives musicians a sense of the relative meditative qualities of a piece of music.

In my own compositions in this portfolio, some of these characteristics were applied more strictly than others, depending on the needs of the piece. I have been careful to keep the primary focus on creativity and expression and let the four categories be applied simply as observations, not as rigid structures that hinder the composition process.

Triptych Meditation has been described by handpanists I have interviewed as being a very meditative piece to play. So practically speaking, with anecdotal evidence, this may be interpreted rightly as meditative music. The instrumentation of the handpan solo along with the 15-minute duration are both characteristics that would place it in that category. However, the changes between ideas and sections do not always happen gradually, and the piece is not consistently made up of literal repetition (though the overall effect has been described anecdotally by listeners as being engagingly repetitive).

Le Feu de la Pentecôte is clearly meditative in the characteristics of cohesion, repetition and duration. The instrumentation is left up to the director and performers, so the customary categorization of the 'meditativeness' of the given instruments may or may not be traditionally applied. Still, the point of a piece like this is clearly not to exclude any performer or instrument, but rather to be radically inclusive of all instruments and voices.

La Création du monde is more of a narrative piece with few sections that could be called meditative. The cohesion is intentionally lacking; indeed, the very essence of the piece is its quick cuts between disparate material. However, there are some moments of repetitive material in the handpan and, less frequently, in the organ. Both instruments do fall under the 'meditative instrument' categorisation above. However, the length of the piece is less than the

recommended meditative length of ten minutes or more. Based on a consideration of all these characteristics, I would not call *La Création du monde* a meditative piece of music.

Lux aeterna, on the other hand, designed expressly as a meditative electronic piece, fits all the categories of meditative music well. Changes occur gradually, there is a great deal of repetition, the duration is 15 minutes, and the digital manipulation is created from handpan samples.

In *Meditari,* changes happen slowly as well, and the piece is very cohesive. The cells are each highly repetitive, and the duration is of a suitable length to be categorised as meditative music. Like *Le Feu de la Pentecôte,* the instrumentation here is flexible and, based on the available instruments, could thereby be interpreted as more or less contemplative.

Magnificat is very diverse in its material, and, based on the episodic nature of the text, the piece has little need for cohesion. Hardly any repetition exists, other than the sections in which the repetition is used to achieve a specific effect. And that effect is never meant to be one of meditation in this piece. The instrumentation could be considered meditative, with handpan, piano and voices all falling into the meditative category delineated above. The duration is just long enough to be considered an appropriate length for the meditative piece, ending right at ten minutes. For these reasons, I would not consider *Magnificat* to be a meditative composition.

Similarly, *Selah* is not very meditative in nature. There are quick changes between texture, tone, and dynamic level. Some repetition may be found amongst accompanying motifs, but it rarely occurs in the foreground. The presence of repetitive elements is typically meant as a device to create a certain texture rather than to induce a meditative experience. The instrumentation is very diverse, as a full symphony orchestra is required to perform this piece. The intensity of the brass and percussion parts largely disqualify this piece from being categorised as meditative, though the length is right to potentially fit in that description. All

things considered, *Selah* falls more into the category of a narrative piece of music than one meant for meditation.

Narrative vs. Meditative Music

Broadly speaking, I have come to consider my compositions as fitting into two categories: narrative and meditative. Narrative music takes a journey and ends somewhere different than it began. Meditative music remains in one place, though the listeners themselves might be changed by the end. Narrative music might share a story or communicate a message. Meditative music has no lesson or tale to tell. Both of these types of composition are present in this portfolio and my wider oeuvre.

The discussion about the 'narrative' music categorisation is well-represented in the literature (Lang (2019), Millard (2018), Almén (2017), Levinson (2004), Micznik (2001), Maus (1997), Treitler (1997), Kramer (1990), Newcomb (1984), and Cone (1977)). In contrast to meditative music, which tends to simply 'exist' in time, narrative music is defined as such largely because of its movement through time and its direction through motivic development. The adaptation of the term 'narrative' to refer to music is borrowed from the literary sphere. Whilst defending the adoption of a literary term to have a musical meaning, Fred Maus asserts '...vocabularies previously used in relation to drama or narrative may also be useful for music criticism' (Maus, 1997, p. 294). James Levinson has written extensively on the narrative and, specifically, dramatic nature inherent in certain music, and claims that the parallels between the language used to describe literary narrative are readily borrowed by musicologists as they describe musical narrative:

> It is, after all, not surprising that music, as an intentionally arranged, temporally extended sequence of sounds, one that often displays a character of utterance, is readily thought of as recounting something or other, and likely something that is itself temporally extended, such as a sequence of actions, events, or mental states. (Levinson, 2004, p. 429)

Similarly, Micznik claims that, when using literary terms like ‘narrative’ to describe elements of music, ‘...the gap between music communicating “intrinsic” or “intramusical” ideas and “extramusical” (including “narrative”) ones is not as significant as it may seem’ (Micznik, 2001, p. 197). Additionally, in his writing on narrative music, Byron Almén asserts that ‘the degree of kinship between music, literature, and drama itself lends support to the possibility of narrative organization in the former’ (Almén, 2017, p. 14). Regarding examples in music literature of narrative music, some musicologists have evaluated and described the specific narrative qualities of certain pieces: Beethoven’s Sonata Op. 14, No. 1 (Maus, 1991), Chopin’s Prelude in G Major, Op. 28, No. 3 and Schubert’s Piano Sonata in B-flat Major, D. 960 (Almén, 2017), Brahms’ Intermezzo, Op. 118, No. 1 (Cone, 1977), Schumann’s Second Symphony (Newcomb, 1984), and Julian Anderson’s Symphony (Small, 2017). The designation of my compositions as they fall into the narrative and meditative categories are outlined and explained below.

The narrative and meditative categorisations are, of course, not always cleanly-defined classifications, and no music is forced to be all one or all another. Like the four pillars of meditative music listed above, these two designations are simply manners of organising and analysing the music that I have written. *Triptych Meditation* has many meditative qualities, but there is also a sense of it ending in a different place than it began. This piece is a hybrid, with characteristics existing in both categories. *Le Feu de la Pentecôte* is clearly in the meditative group. Though *La Création du monde* has a few sections that could be deemed meditative, I consider overall to be a narrative piece. The electronic *Lux aeterna* is meant to be meditative from start to finish, with careful attention given to the piece’s cohesion, repetition, instrumentation and duration. Similarly, *Meditari* was conceived from the start as a meditative experience, for both performers and audience alike. The hope is that as each performer repeats just a few notes at a time, they can truly focus on finding beauty, rich tone, and peace within each thirty second experience. When considered all together, the intent is

that it will give a sense of rest and contemplation. Due to the nature of the *Magnificat* text, it is very episodic and hence a narrative piece. The singers did report that the humming sections (beginning at bars 119, 130, and 142) had a sense of otherworldly reflection during the rehearsals and performance. Lastly, *Selah* also has a strong sense of narrative direction to it as well, with a rather discernible arc to the overall story. Due to the volatile nature of some of the brass and percussion parts especially, this would be hard to categorise as a meditative piece.

The Venn diagram below (Figure 5.1) offers a proposal of how the pieces in this portfolio fit into the categories described in this chapter. Other representative pieces from well-known composers are listed to provide context. Additionally, the table below (Table 5.1) lists the specific categorisations and compares the relative meditative qualities of each piece in this portfolio.

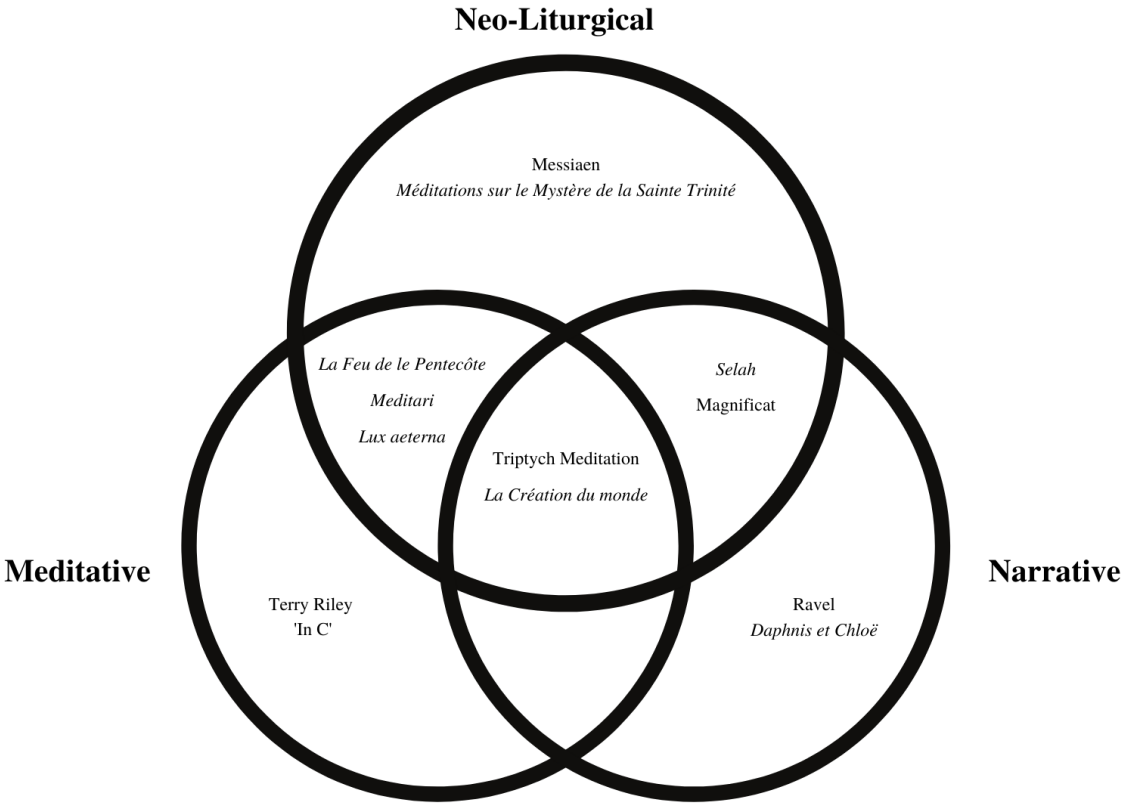

Figure 5.1. Venn Diagram representing the relative neo-liturgical, meditative, and narrative qualities of the pieces in this portfolio, as well as other representative pieces mentioned in the commentary.

	Cohesion	Repetition	Instrumentation	Duration	Categorisation
Triptych Meditation	Some changes happen gradually over time, though there are some quick transitions between diverse material	Somewhat repetitive, some sections are quite repetitive whilst others are not	Handpan solo	15'30"	Meditative and narrative elements
Le Feu de la Pentecôte	Very cohesive, changes happen slowly over time	Very repetitive, each cell is repeated many times	Undefined ensemble (Flexible)	20' to 45' (Flexible length)	Meditative
La Création du monde	Frequent jumps between diverse material, not 'cohesive' in the sense of encouraging meditative music	Some elements of repetition, especially in the handpan part and occasionally in the organ part	Handpan and organ	12'	Meditative and narrative elements
Lux aeterna	Changes happen very gradually to maintain a meditative atmosphere	Highly repetitive	Electronics (manipulated sounds from handpan samples)	15'	Meditative
Meditari	Changes happen gradually, though there are brief pauses every 30 seconds	Highly repetitive	Undefined ensemble (Flexible), with fixed media track	10'30"	Meditative
Magnificat	Very diverse material, based on the episodic nature of the text	Very little repetition	Mixed quartet (SATB), piano, handpans	10'	Narrative
Selah	Diverse material with sudden changes of texture and tone	Some repetition amongst accompanying motifs, but repetition rarely occurs in the foreground	Full orchestra (piccolo, 2 flutes, 2 oboes, cor anglais, 2 clarinets, bass clarinet, 2 bassoons, contrabassoon, 4 horns, 3 trumpets, 2 trombones, bass trombone, tuba, timpani, vibraphone, chimes, glockenspiel, xylophone, crotales, triangle, gong, bass drum, ratchet, wood blocks, suspended cymbal, vibraslap, harp, strings), handpans	13'	Narrative

Table 5.2. A table comparing relative characteristics of meditative music in each piece in this portfolio.

Chapter 6: Development of Notation System

Developing a new system of notation for the handpan is a foundational part of this dissertation's rigorous experimental process. In any instrument's evolution, someone has to be the first person to put pen to paper and write music for that particular instrument. In the 14th Century, the anonymous composer of the Robertsbridge Codex was the first to write down music for the organ (Arnold, 1984, p. 7). Monteverdi was the first to write for violin in his opera *Orfeo* (Grout & Williams, 2003, p. 51). Lodovico Giustini wrote for the first music specifically for the nascent fortepiano in 1732 (Persone, 2006, p. 3). Similarly, the work done for this PhD is at the forefront of writing down music for handpan.

As mentioned above, I began this process whilst earning my Master of Music degree in composition, as I wrote my first solo piece for handpan. This initial experience gave me some foundational data as I entered the PhD programme. I am compelled to clarify that I do not feel that I have improved music notation in this project, but that I have simply added a few elements to it that I hope will bring specificity and clarity to the various techniques available to handpanists today. As a composer and engraver, I have a deep respect and admiration for Western music notation and its evolution, from Guido d'Arezzo to today. There is immense beauty, clarity and simplicity in the written notation that we have received from past generations. Out of the respect and honour for this heritage, I began with a sense of cautiousness and trepidation at the thought of adding anything to this inherited system of notation.

Because of this sense of respect, I have striven to change notation as subtly and unobtrusively as possible. My specific modifications for handpan have not affected the way rhythm is communicated, as I have left the flags and beams on quavers and semiquavers unaltered. I have also kept the layout of the staff the same as in standard notation. Throughout the development, I have modified the notation in a way that is relatively straightforward for

composers to produce in software, like Finale and Sibelius, as well. In general, my goal has been to keep my adjustments as unified and seamless with standard notation as possible.

Throughout this process, I have met with handpan players to interview them about what sounds and techniques that they think should be part of handpan notation. In order to communicate these effects, we have adapted some elements to fit the specific needs of handpanists. This chapter is a summary of my notation system, intended as a reference especially for composers interested in writing for handpan.

Clef

One of the important foundational recommendations regarding writing for handpan is to use the 'octave clef,' that is, the clef which designates that notes should sound an octave lower than written. Due to their range, most handpans would either have to straddle the bass and treble clefs, use an inordinate number of ledger lines, or employ alto clef if they were written at the actual pitch. We have experimented with all three of these notation methods, each receiving suboptimal feedback from the interviewed handpanists.[16] Writing the handpan part as a transposing instrument has proven to be the best way to allow for maximum readability for the player and ease-of-writing for the composer.

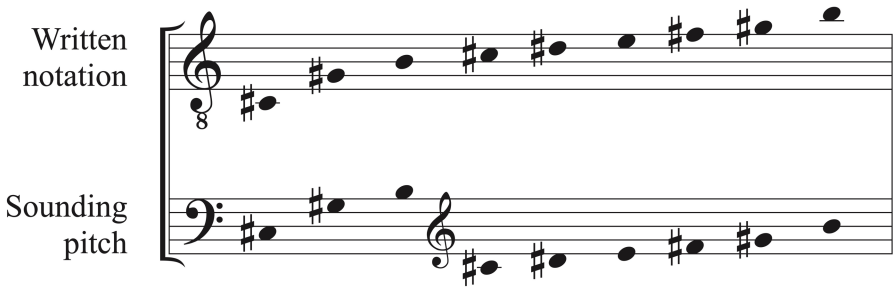

Figure 6.1. Example of the octave clef in handpan music, on a C-sharp Ayasa handpan.

Notation for Pitched Tones on the Ding Side

Handpan players use many diverse techniques to draw a variety of sounds and effects from the instrument. In order to concisely communicate these effects, I have assigned certain noteheads for each one of the primary techniques. By reading the key found at the beginning

[16] This interviewing process and methodology is described in greater detail in Chapter 3.

of each handpan score, the performers can then apply the information from the key as they play through the piece. This section deals with the implementation of these effects on the pitched side of the handpan, known as the 'ding' side. The next section will outline the various effects available on the 'gu' side, that is, the underside of the pan.

'Knock'

The first technique is simply called 'the knock,' where the performer knocks on or near the tone field. When played on the ding side, the knock does produce a pitch depending on the tone field on which it is played. However, the overall effect is fairly percussive.

The knock can be performed on either of the two knuckles on the finger. In my compositions, I have included the performance note that the performer may choose whether to use the first or second knuckle, that is, the distal or middle phalanx. This decision depends on the performer's interpretation, based on the context and the appropriate sound projection in the performance space. This choice may also rely on the technique of the performer, the quality of the instrument, and other factors having to do with construction of the handpan. The knock is designated by 'x-notation,' common in percussion music, generally representing an un-pitched sound. In this context, we place it on the line or space representing the tone field by which the note should be performed.

Figure 6.2. Symbol for the knock, played on or near the tone field of the designated pitch.

Figure 6.3. The arrow indicates a location where the knock may be played on the ding side. (Source: Creative Commons.)

‘Four-finger Roll’

Next is the technique called the ‘four-finger roll.’ This technique may be performed in two ways, depending on the preference of the performer and the dynamic level. At soft to moderate dynamic, this technique may be played with only one hand. It is performed by essentially tapping fingers quickly, starting with the fifth finger and followed by fingers four, three and two.[17] When played with one hand in this manner, the first three fingers should be played more softly, and before the beat. The final finger, which would be the index finger, should be loudest and played on the beat. When played at a forte dynamic or louder, this technique may be played with two hands. The grace notes should be played lightly with either hand, whilst the opposite hand prepares to play the louder primary note, precisely on the beat. This technique is quite effective in creating dramatic accents in the overall forte dynamic context.

To create a more percussive and dry sound, it can also be performed using the fingernails, whilst maintaining the other aspects of the rhythm and manner of playing. The notation consists of standard noteheads, with the notes preceding the beat written as grace notes. When it is played at a forte dynamic, designation for the use of two separate hands is added, with RH referring to the right hand and LH referring to the left hand. When this technique is to be played with fingernails instead of fingertips, the word ‘nails’ is added directly above the note in 10-point italic font.

Figure 6.4. The four-finger roll, when at a soft to moderate dynamic with one hand.

Figure 6.5. The four-finger roll, when at a loud dynamic, designated to be divided between two hands.

[17] The numbering of fingers here assumes the standard manner of assigning numbers to fingers in keyboard playing, specifically, that the thumbs are the first finger, index finger is the second finger, etc.

Figure 6.6. The four-finger roll, when the technique is performed by the fingernails instead of the fingertips

'Muted Fingertip Cluster'

Next is a technique that we have named the 'muted fingertip cluster.' This technique is played directly on the apex of the ding, and therefore should be played with a lighter touch so as not to dent that delicate part of the instrument. It is performed by clustering the fingertips together whilst keeping the fingers elongated, and then playing a light muted stroke. This should be done with the tips of the fingers and without striking the nails. The stroke should not rebound, but instead stay on the surface of the pan, thereby producing a muted tone quality. Depending on the context and necessary hand placement, the same effect may be accomplished by lightly striking the ding with the heel of the palm, playing directly on the hamate bone at the base of the hand. This effect is portrayed in the score by using an open triangle for the notehead, which represents the triangular shape formed by the hand when the fingertips are clustered together.

Figure 6.7. Muted fingertip cluster, represented by a triangular notehead.

Diamond Noteheads

Diamond noteheads, used in contrast to standard oval noteheads, signify a change in tone, playing technique, and, consequently, dynamic level. In this system of notation, I use diamond noteheads to show that the given pitches should be played more lightly and with the fleshy part of the finger pad instead of the typical method of striking the instrument closer to the fingertip. I often use this technique to provide an echo effect to the standard notes that came before, in order to provide a contrast in timbre and tone colour. The diamond noteheads,

shown in Figure 6.8, are an efficient method of communicating this contrast succinctly and without the need for any additional text directions to be given in the score itself.

Figure 6.8. Diamond noteheads, representing a lighter stroke with the finger pad, and a subsequent change in timbre and tone colour.

'Underside Strike'

The next technique is technically played on the *gu* side of the handpan, but since it is performed whilst the instrument is with the pitched side up, it is included here. For this effect, the handpanist reaches under the handpan and strikes the rim of the gu. Because of the placement of the pan, this has to be done by touch alone, without turning the instrument over. The effect should be a bright clear tone that is a distinct contrast from the rest of the material played on the ding side. It is visually interesting, as it is rather surprising to see the performer play a note on the opposite side of the pan; it is also aurally engaging, providing a contrasting sound borrowed from the 'non-pitched' part of the instrument. This effect is notated by replacing the notehead with the 'turn' symbol, representing that the underside of the pan should be played. The notehead should be lower than the actual pitches of the handpan, demonstrating that it is not meant to be played on the ding side.

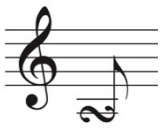

Figure 6.9. The 'underside strike,' indicating that the rim of the gu should be struck underneath the instrument.

'Butterfly Roll'

The following technique is a type of roll that is very dramatic and impressive, both visually and aurally. It is called the 'butterfly roll' because of the manner in which the hands move as it is played. To perform the butterfly roll, the handpanist rapidly rotates and supinates the hand whilst simultaneously oscillating the hand over various tone fields. By doing this, the

performer creates a flurry of sound and activity, so dramatic that it should be used sparingly, saved for the most grandiose climactic moments. The gesture of this technique should the primary focus of the player, with the resulting notes coming about randomly as the performer's hands move quickly around the tonefields. All tonefields on the handpan, not including the ding, should be activated and played randomly as part of the butterfly roll. The notation for this is the 'segno serpent' symbol replacing the notehead.[18] If both hands are meant to perform the butterfly technique, two symbols should be used.

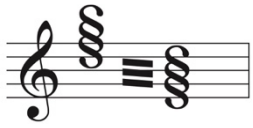

Figure 6.10. The 'butterfly technique,' incorporating the segno serpent symbol in place of the notehead.

'Wave'

The final pitched effect is called the 'wave' (or 'vibrato') technique.[19] To create this effect, the performer strikes one of the tone fields and then gently waves the hand just above the tone field, making something like a wafting motion. This movement interrupts the soundwaves and creates a gentle and subtle vibrato sound. This technique is only effective during a rest, or at the end of a piece, when the vibrato can be truly heard. It is so subtle that any other concurrent sounds will render it ineffective. The tone field also must be struck rather loudly to create enough sound for the vibrato to be effective. Therefore, this technique is best used when dynamic has been at least moderately loud and is followed by a pause whilst the sound dissipates; this is the ideal time to employ the wave effect.

One caveat for this technique is that it does not work well with pitches played on the ding itself, likely due to the convex shape of the ding, compared to the concave tone fields.

[18] This seldom-used symbol is also sometimes referred to as a 'guida' or 'presa,' and is not well represented in standard notation literature (Blood, 2017).

[19] This technique has also been referenced as the 'butterfly technique' by one handpanist (Foulke, 2010). However, we feel this 'butterfly' designation better represents the rapid roll effect mentioned above, based on the way it descriptively portrays the hand movement in performance. This disparity in terminology is further evidence that the terms relating to the handpan are still evolving, and the literature concerning the instrument is still in its nascent stage.

Because of this, the wave technique is best played on the tone field notes only, avoiding the ding. The notation for this is the wavy line that typically extends the trill symbol.[20] I chose this symbol because it resembles the shape of a sound wave. Also, due to its linear nature, the symbol can be extended horizontally to specify how long the composer would like the wave gesture to continue.

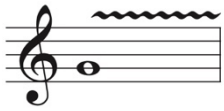

Figure 6.11. The 'wave' technique.

Notation for Non-Pitched Sounds on the Ding Side

Interstitial Shoulder Tones

Handpanists frequently employ 'interstitial shoulder tones,' which means they play percussive material to fill in the parts of the beats that are not occupied by melody. They do this by playing in the non-pitched area, which is known as the interstitial region, just below the shoulder of the handpan. In improvisation, filling in non-pitched material between beats becomes almost second nature for the intermediate or advanced handpanist. This type of playing is what often gives handpan music its active groove. This sound produced by this manner of playing is distinctive to handpan, as it initiates the complex overtones and creates sympathetic resonance on the pan.

[20] During the time of the Baroque and early Classical eras, this extended line following a trill was known as a chevron (Neumann, 1983, p. 581). However, that terminology has fallen out of use, and the modern consensus is to refer to it simply as 'the wavy line' (Stone, 1980, p. 75, and Gould, 2016, p. 136).

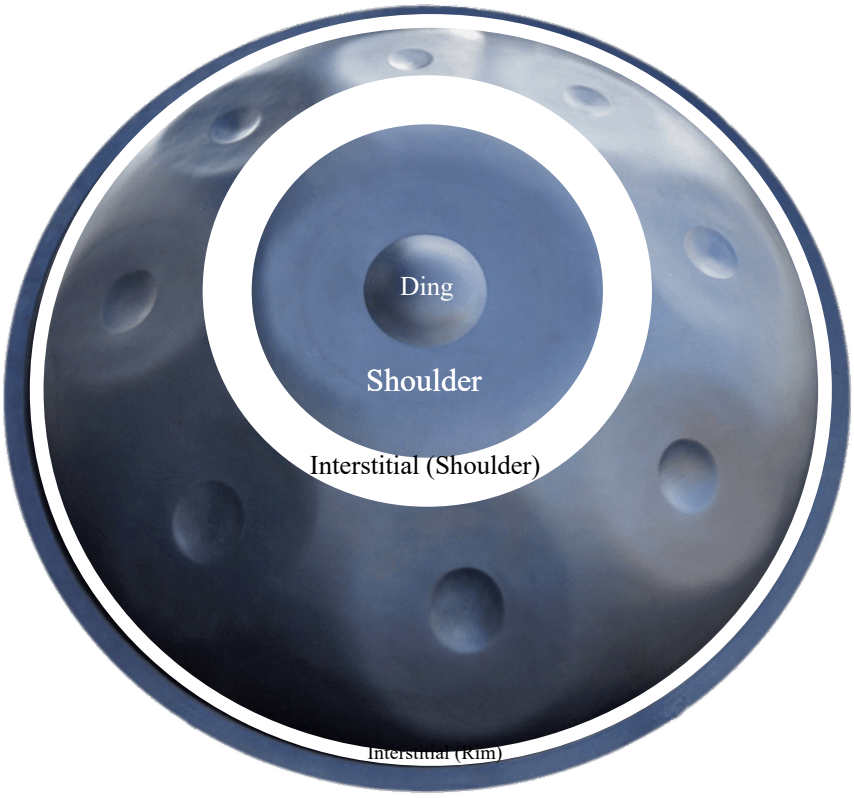

Figure 6.12. Diagram demonstrating my division of the interstitial areas of the handpan. (Source: © Chris Hooper, https://aoxoa.co/ (altered). Used by permission.)

The challenge I found was developing a way to clearly notate the interstitial shoulder tone playing. I initially attempted to write shoulder tones on the same staff as the regular, pitched notes. However, this quickly made the treble staff look cluttered. It was challenging to visually distinguish between the primary melodic voice and the secondary shoulder tone groove. The addition of accents to bring out the melody further cluttered the score and led to the question of how to show the actual extra emphasis of a note if all the melody notes are already 'accented.'

The most successful idea was to add a separate single-line staff below the primary treble staff, as demonstrated in Figure 6.13. This separate staff allows the clear distinction between melody and interstitial shoulder tone material. It also provides a straightforward method of communicating any technique that can be employed on the shoulder of the

handpan, like knocking, tapping, and using different parts of the hand to create various sounds. These techniques are expressed through notehead shapes, which was outlined in some detail above. By allowing the melody and interstitial shoulder tone staves to share the beams for common quavers and semiquavers, the performer can clearly see where the notes and beats fall within each bar, especially in sections with a characteristic semiquaver groove.

I also have found it works best to use a brace to present both staves together as a grand staff. This visually cues the performer to view the complete grand staff as clearly being played by a single instrument. Since musicians are accustomed to seeing the braced grand staff in piano, marimba, and harp scores, it translates well to handpan sheet music too. For all these reasons, this method of interstitial shoulder tone notation has proven to be the most useful for composer and performer alike.

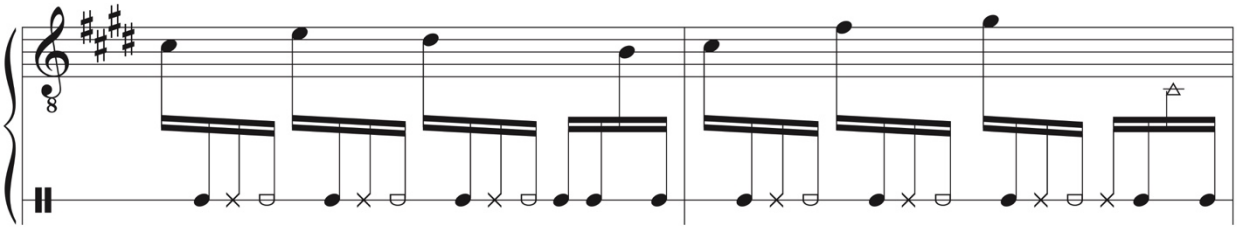

Figure 6.13. An example of interstitial shoulder tone notation on grand staff.

'Pound'

Another technique is the 'pound,' shown in Figure 6.14, In this technique, the performer lightly pounds on the interstitial shoulder region with the base of the hand, that is, the fleshy part at the bottom of the palm. On the ding side of the handpan, this effect should only be played along the shoulder of the pan. If it were played on the pitched tone field or dimple of any given note, there is risk of denting the thinner metal of that tone field, thus bending the pitch out of tune. For this reason, the pound should only be played on the shoulder area of the pan, and still somewhat lightly at that. This is an extremely distinctive and resonant sound unique to the handpan, as the pound activates the overtones of the whole instrument whilst also engaging some of the bass tone of the ding. The notehead for this looks

rather like a horizontally placed capital letter D. This is meant to represent the shape at the base of the fist as the hand is contracted to play this technique.

Figure 6.14. Notation for the pound technique, played by the base of a clenched fist.

Figure 6.15. The arrows point to the interstitial shoulder of the ding side, where the pound technique may be played.
(Source: Creative Commons (altered))

'Butterfly Roll'

The 'butterfly' roll technique has been mentioned above as a pitched effect. It should be noted, however, that technique may be alternatively performed in the interstitial shoulder region for a similar percussive effect but without any tone fields being directly activated. Due to the smaller surface available on the interstitial shoulder area, the technique will also be lighter when performed in this part of the handpan. The overtones will still ring whether this is played on the tone fields themselves or on the interstitial shoulder region, but few, if any, pitches will be heard if it is performed on the shoulder. As mentioned above, the notation for this is the 'segno serpent' symbol replacing the notehead.[21] If both hands are meant to perform the butterfly technique, two symbols should be used.

[21] As noted above, this seldom-used symbol is also sometimes referred to as a 'guida' or 'presa,' and is not well represented in standard notation literature (Blood, 2017).

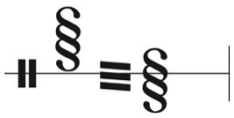

Figure 6.16. The ‘butterfly’ roll technique, written on the single-line staff to designate that it should be played in the interstitial shoulder region.

Interstitial Rim Tones

‘Tak’

The next effect is played on the lower side of the tone fields, what I call the ‘interstitial rim’ area, as it is played in the region just above the rim. Two techniques may be employed here, with varying intensity. The louder of the two is referred to as ‘tak’ by many in the handpan community.[22] The term ‘tak’ is borrowed from a technique used by dumbek players when playing near the edge of the drumhead (Danziger, 2005). The tak in handpan is played near the edge with a good deal of force from the finger pads. In this notation system, I write the tak as a plus-sign notehead with an accent.

Figure 6.17. Symbol for ‘tak,’ played with a sharp stroke in the interstitial rim region.

‘Tap’

The similar but rather lighter effect I have called the ‘tap’ technique. This effect is played in the same location as the tak, on the lower side of the tone fields, in the interstitial rim region. Unlike shoulder tones, which are played near the ding, the tap technique may be played in any convenient location below any tone field. The sound created is fundamentally a lighter version of a tak and a softer effect than a shoulder tone. The tap will activate fewer overtones of the nearby tone fields based on its lighter stroke and less resonant location. The effect will be far less percussive and strident than the tak. This technique may be written on either the treble staff near the tone field by which it is meant to be played, or on the shoulder

[22] ‘Tak’ is pronounced like the English word ‘tock.’

tone single-line staff, which leaves the playing location to the discretion of the performer. The notehead for this effect is a plus sign, with no accent.

Figure 6.18. Symbol for ‘tap,’ played with a lighter stroke in the interstitial rim region.

Figure 6.19. The arrows indicate locations where the tak and tap may be played on the ding side.
(Source: Creative Commons (altered))

‘Whoosh’

A final extended technique for the ding side is very distinct from the others due to the manner in which is it played. This sound is created by the legs rather than the hands. Whilst the handpan is held in the lap, the player moves the legs together or apart to create a crisp ‘whoosh’ sound. This is a soft technique that is best used on its own, or with close mic placement. The effect should last for approximately one quaver. The sound is essentially identical regardless of whether the performer moves the legs up or down. The symbol for the ‘whoosh’ is a thin chevron, a V-shaped symbol that may be inverted based on the intended direction of the performer’s movement.

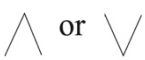

Figure 6.20. Symbols for the ‘whoosh,’ where the performer holds the handpan in his or her lap and moves the legs up or down.

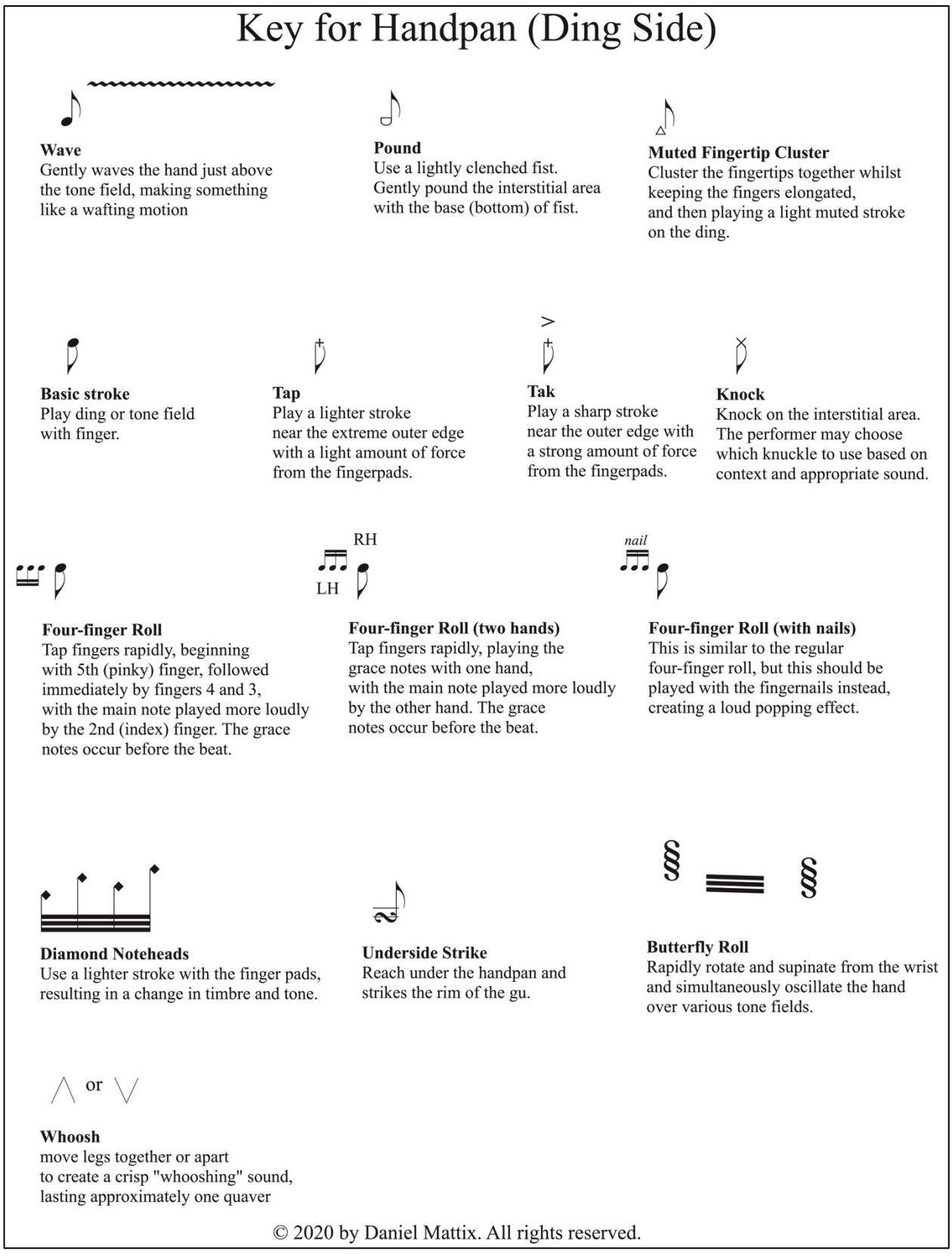

Figure 6.21. Key for the ding side of the handpan.

Notation for the Gu Side

The handpan is typically played on the pitched side, known as the ‘ding’ side, referencing the convex metal ding that protrudes from the centre. However, the non-pitched side, known as the ‘gu’ or ‘port’ side, can also produce a remarkably large number of sounds, tones and timbres.

Process

The notation of this part of the instrument went through perhaps the biggest evolution from start to finish of any techniques I have explored. Originally, I planned to divide up the gu side of the handpan into four quadrants. Each quadrant would be represented by a specific space on the staff. The location of a note in the given space would then communicate to the player in which quadrant the note should be struck.

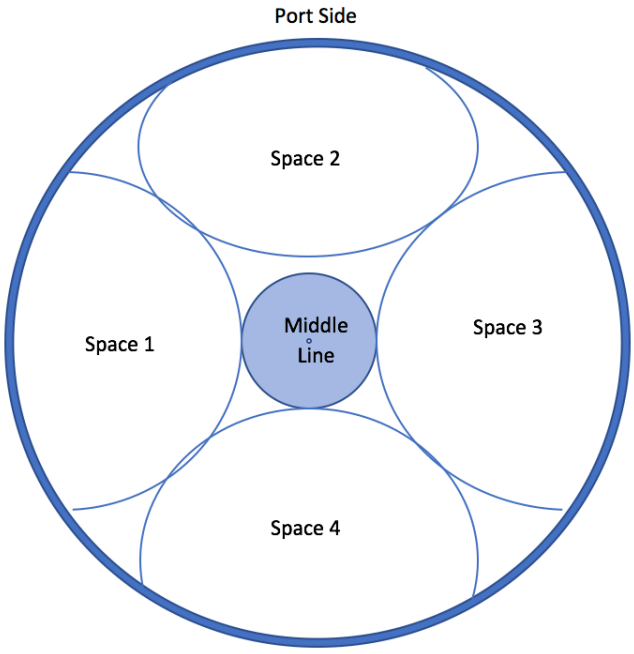

Figure 6.22. Original diagram describing the new system of playing on the gu side.

However, after working with handpan player Aaron Marsala, and subsequently surveying other handpanists as well through semi-structured interviews, we determined that this system of notation was not the best for advanced handpan music. We realised that, in

most cases, it would be better to leave the choice of where to strike the pan up to the performer instead of specifically writing the quadrant for each note. Also, the difference in sound between the Space 2 quadrant verses the Space 4 quadrant, for example, is negligible, if not entirely indistinguishable, to the listener. The one use we did find for this type of notation was for education: a beginning handpanist might find value in being told in which exact quadrant they should be playing. However, for an experienced player, the choice of the location for each strike is best left up to the performer.

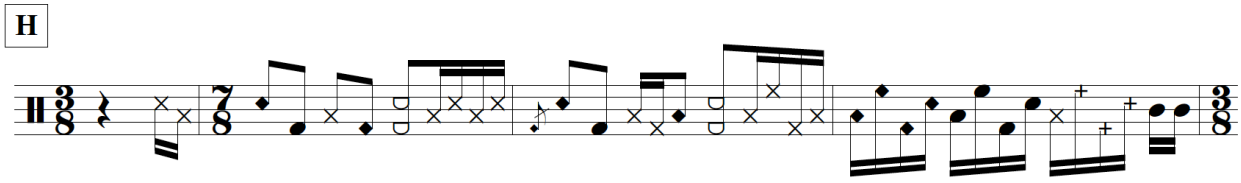

Figure 6.23. Sample from original concept, wherein each space reflects a specific quadrant.

We also discovered that it is preferable to use the spaces of the staff to describe relative pitch of the different tones. Though the gu side is referred to as the 'non-pitched' side, there are clear distinctions between low, medium, and high sounds, depending on where and how the pan is struck. Since percussionists, and indeed all musicians, are accustomed to seeing lower pitches at the bottom of the staff, my first system of notation turned out to be rather disorienting. In that original plan, each space represented a quadrant, and all of the different sounds produced in that quadrant were represented by a variety of notehead shapes and styles. The surveyed handpanists found it confusing to see low tones written in the top space, which at the time simply signified that they would be played in the fourth quadrant of the pan. Samuel Solomon, a percussionist and notation expert, explains that the physical and aural characteristics of the instrument should correspond to the representative notation chosen for percussion music:

> In addition to the physical setup, it is equally important for the notation to represent the relative pitch relationships... It can be difficult to accurately notate pitch relationship when combining indeterminately pitched

> instruments, but even a close approximation will help the readability for the performer, as well as make it easier for the composer to understand the setup's function during the composition process. (Solomon, 2016, p. 69)

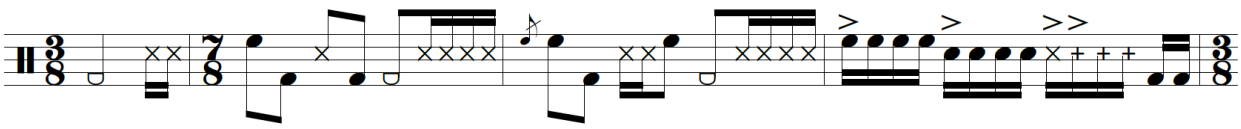

Figure 6.24. Update of material from Figure 6.23, reflecting newly developed system of notation.

The new system of notation I developed uses the spaces on the staff to express the relative pitch of the sound produced, not to communicate the location for playing. The choice is then left up to the performer as to the place on the pan where he or she decides to play the corresponding sound. This improved system has allowed for more options and descriptions of the techniques created, as well as a more intuitive notation for percussionists learning to read and interpret this type of music.

Figure 6.25. Diagram of labelled parts on the gu side of the handpan. (Source: Creative Commons (altered))

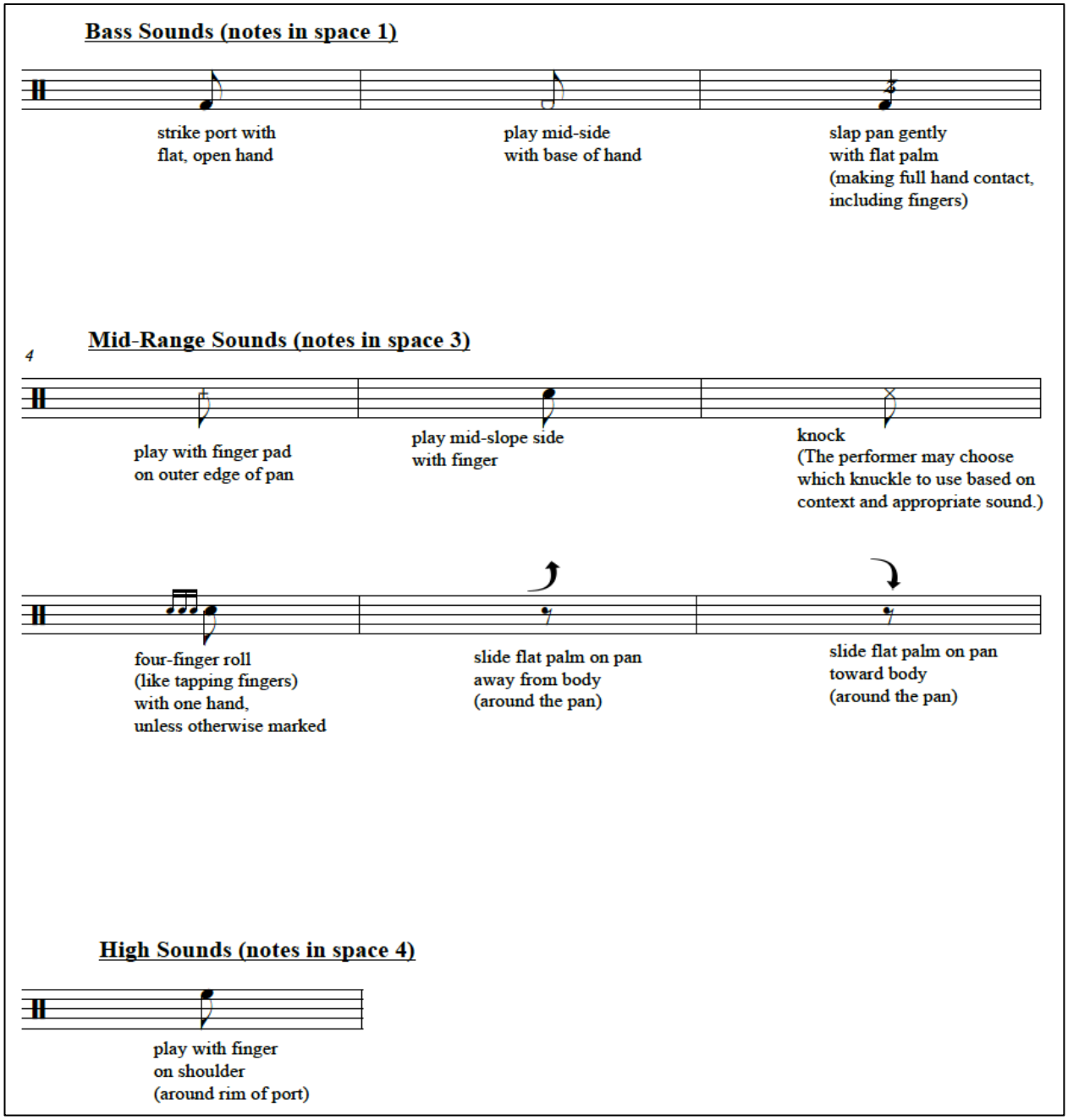

Figure 6.26. Second version of key for playing different relative pitches (bass, mid-range, and high) on the gu side, created for *Triptych Meditation.*

Some issues remained with the second version of the key, which became increasingly evident through subsequent interviews with handpanists. The updates I made are described below. Figure 6.37, found at the end of this chapter, is the current version of the key. While Figure 6.37 is the 'final' version of the gu-side key for the purposes of this portfolio, I readily admit that room for improvement still exists. My hope is that I, and other composers, will continue to refine and develop these notation ideas in the future.

Due to the variety of sounds playable on the gu side, it is necessary to use a five-line staff that employs the percussion clef. The percussion clef is typically used for indeterminately pitched instruments (Solomon, 2016, p. 64), so it is logical that this clef would be used for the gu side of the handpan. Percussionists are accustomed to reading 'non-pitched' notation on a five-line staff, assuming that a key or legend exists to explain the techniques or instruments represented by each line and space (Stone, 1980, p. 216). According to Samuel Solomon, 'different lines and spaces on a staff can be used to denote different notes, different instruments, and even different playing techniques' (Solomon, 2016, p. 65). He adds that individual lines and spaces on a five-line staff may also be used for '...different sounds on one instrument,' assuming, of course, that a clear key is given explaining the notation at the beginning of the score (Solomon, 2016, p. 65). Also, by distinguishing the clefs used for each side of the handpan, it is immediately obvious if the section should be played on the ding side, signified by the treble clef, or the gu side, signified by the percussion clef. These notational conventions are well-established in percussion literature and has proven to be an effective means of communication for the percussionists surveyed throughout this course of study.

Techniques

'Boom'

The first technique for the gu side is the 'boom.' This is played on the gu itself, by striking the gu with a flat, open hand. The hand should gently rebound after the strike. The resulting sound is a warm, resonant 'boom' tone. This technique is represented by a regular notehead in the bottom space.

Figure 6.27. The 'boom,' played with an open hand on the gu.

'Pound'

Another technique is the 'pound,' shown in Figure 6.28. This is performed in much the same manner as it is played on the ding side. In this technique, the performer lightly pounds on the mid-side slope of the gu side, using the base of the hand, that is, the fleshy part at the bottom of the palm. This is a subtle yet resonant effect that is a welcome contrast to the other sounds played on the mid-side slope. The pound is written on the bottom space in percussion clef, as it is considered a bass sound. The notehead for this looks rather like a horizontally placed capital letter D. This is meant to represent the shape at the base of the fist as the hand is contracted to play this technique.

Figure 6.28. The pound, played by the bottom of the fist on the gu side.

'Slap'

Next, the 'slap' is performed with a relaxed, flat palm, by striking the mid-side slope. The full hand, including fingers, should come in contact with the surface of the handpan. This creates a crisp, percussive effect that provides a distinct change from the other bass sounds.

The original notation for this, first used in *Triptych Meditation,* was the buzz roll symbol, placed on the stem, used in snare drum music (Figure 6.29). However, since that symbol is commonly used to refer to a roll, it presented unnecessary confusion when first read by percussionists.

For this reason, the symbol for this effect has since been changed to a star taking the place of the notehead (Figure 6.30). This image was used to represent the release of the damper pedal in older scores. The star shape represents the spread-out hand technique used to create this effect.

Figure 6.29. The original designation for the slap, found to be ineffective.

Figure 6.30. The current designation for the slap, played with a relaxed, flat palm.

The mid-range sounds for the gu side are written on the third space of the staff. The performance of the specific effects in this range are largely the same as the manner in which they are played on the ding side, detailed above. The symbols and their explanation are found in Figure 6.31.

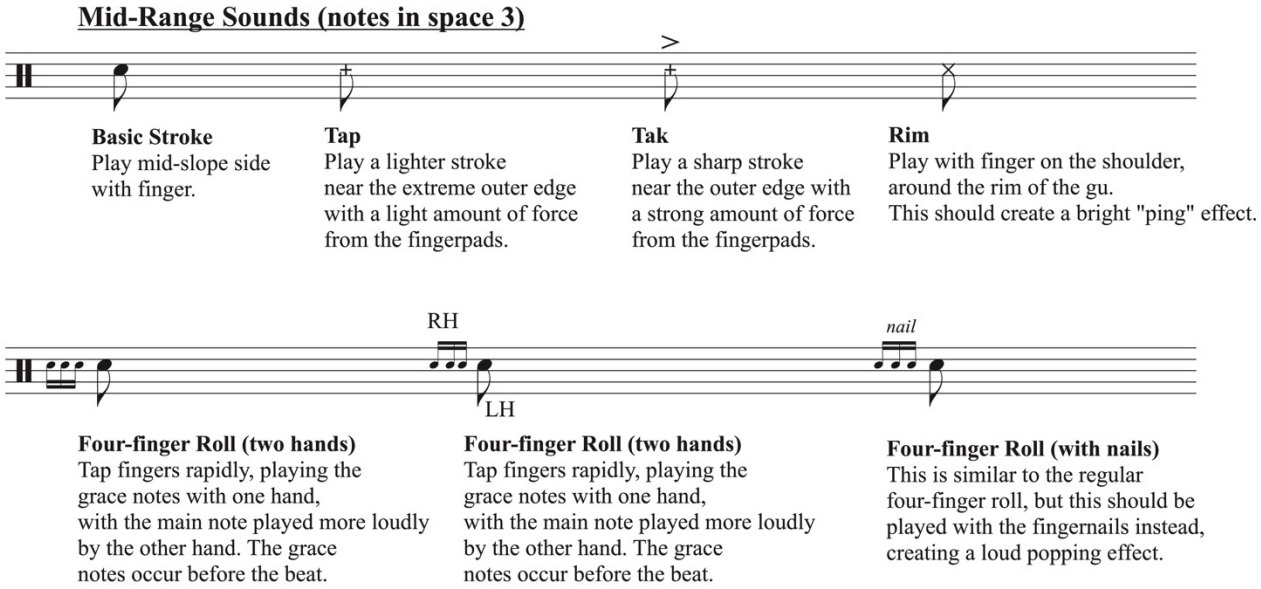

Figure 6.31. The mid-range effects played on the gu side.

'Rim'

The high sound on the gu side is written above the staff. The technique known as 'rim' is played by striking the shoulder around the lip of the gu opening. This creates a high, bright 'ping' effect. One element we discovered in the experimentation process was the distinct interruption of sound that occurs when a 'boom' (low sound on the gu) is immediately followed by a 'rim' (high sound). Since these sounds are played in the same area, and both are quite resonant, the interaction between the two effects needs to be taken into consideration

when placing them adjacently in a composition. The symbol for this is simply a regular notehead, written in the space right above the staff.

Figure 6.32. The 'rim' effect, notated above the staff.

Vertical Position

Another notation figure that is written above the staff, needed only when holding the handpan vertically, as in the third section of *Meditation Triptych,* is written as the high A on the treble clef staff. This note is not available on the pitched side of the handpan, so it represents playing on the interstitial area of the ding side. This idea was developed as a way to represent the interstitial region on the ding side, needed only when playing vertically. This effect is used so infrequently that it is not included on the key but is a footnote direction given directly in the score (Figure 6.33). In *Meditation Triptych,* this effect is only used in the vertical section, in bars 301 through 317.

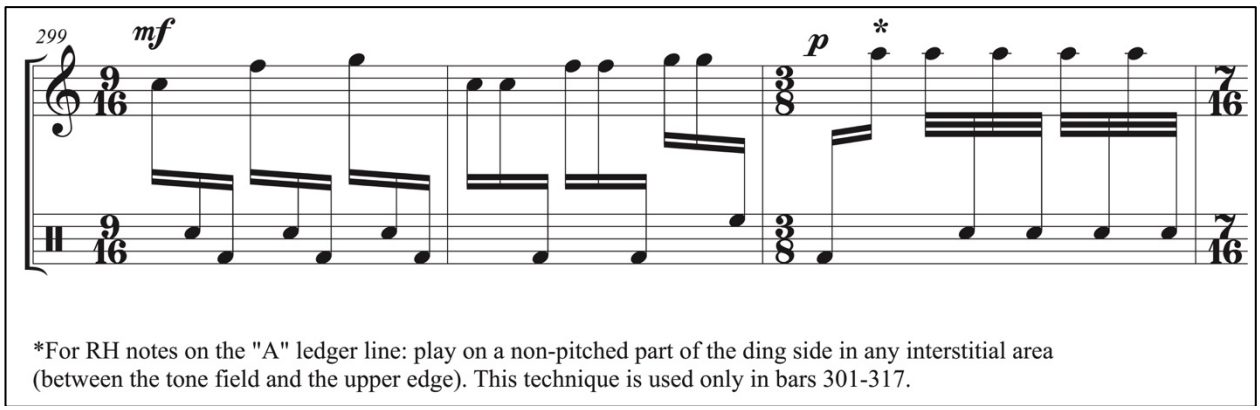

Figure 6.33. Example of notation that represents the interstitial area of the pan when played vertically; excerpt from *Triptych Meditation,* bars 299-301.

Non-Pitched Sound Effects

'Brush'

Two non-pitched sound effects may also be played on the gu side. The first is called the 'brush' technique, performed by sliding the flat palm on the mid-slope section of the handpan in a graceful sweeping motion. The hands may move toward or away from the performer's

body. The resulting sound is a gentle brush that is a welcome contrast to the more direct percussive sound resulting from most of the other techniques. The symbol for this is a rounded arrow, representing the intended direction of the brush gesture (Figure 6.34).

A variant of this technique contains the same type of gesture, but the brush sound is constant. In *Triptych Meditation,* I use this effect in bars 329-330, 333-334 and 337-338, by including both arrows and providing the note 'constant slow brushing with LH on gu side.' This is followed by a line representing the duration of the brushing effect (Figure 6.34). The resulting effect created is something like the sound of legato brushes on a snare drum.

Figure 6.34. Arrows representing the 'brush (away)' and 'brush (toward)' techniques.

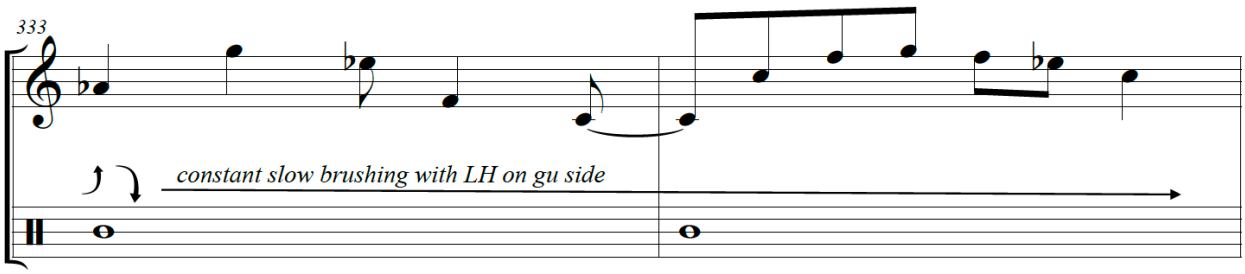

Figure 6.35. Example of notation for constant brushing on the gu side, whilst holding the handpan vertically.

'Whoosh'

The other non-pitched technique is called the 'whoosh' effect. This may be done on either the gu or ding sides, as briefly described above. This technique must be performed whilst holding the handpan in the lap. The performer's legs are brought together or apart, and that sliding on the bottom of the pan makes a whooshing sound effect. It is most effective in a soft context so it can be clearly heard. This is an attention-catching way to begin a piece of music, both visually and aurally, though it can work well in the middle of a piece as well, provided the technique can be adequately heard by the audience.

The whoosh technique is used in the first twelve bars of *Triptych Meditation* (Figure 6.36). The symbol used to represent this technique is a chevron-type symbol, that is, a V shape, or inverted V. The direction of the symbol represents the direction the handpan should move. The symbol may be placed directly under the beat when the movement should be performed. Composers should use this technique sparingly, and in thin textures only, as the performer needs to carefully support the pan whilst the legs move. Because of this, at least one hand needs to be available to steady the instrument as the legs move and the other hand plays. When employed by itself, as in bars 1 through 4 in Figure 6.36, this technique is easy. When used whilst also playing notes, as in bars 9 through 12, the technique quickly becomes very difficult and requires a good deal of coordination.

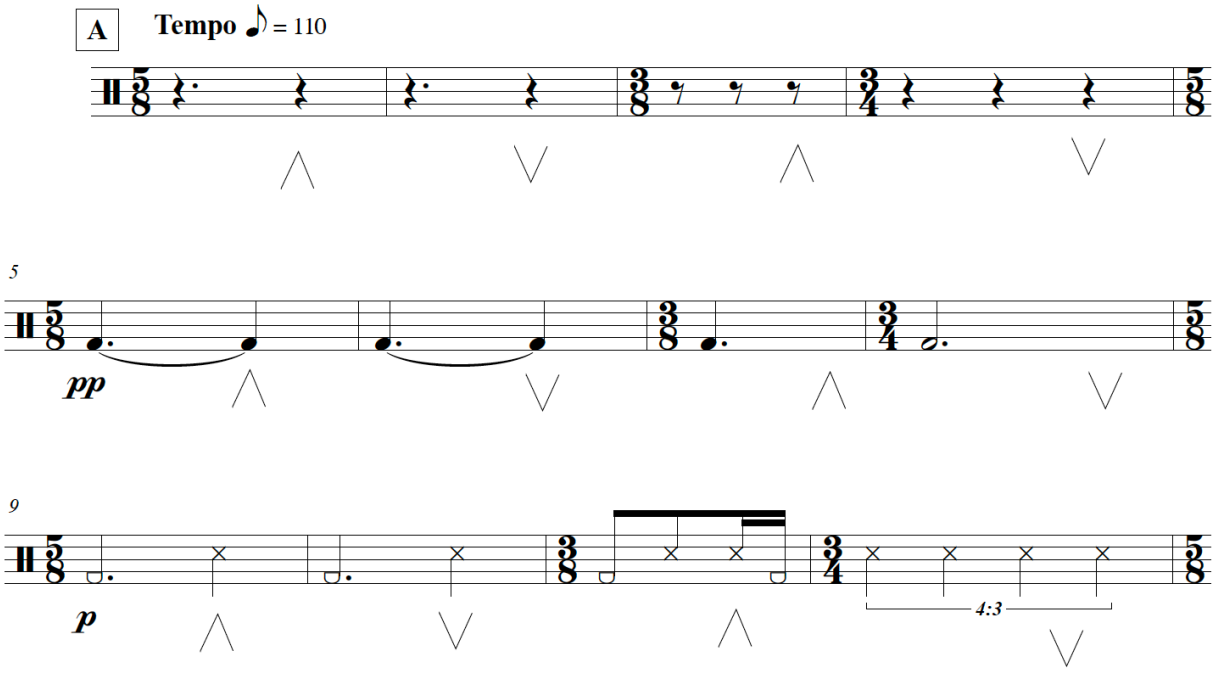

Figure 6.36. An example of the whoosh technique, from *Triptych Meditation,* bars 1-12.

The process of developing this notation and writing out definitions for each technique was a challenging but rewarding process. Figure 6.37 is the current chart of techniques used on the gu side. Though notation is always evolving and there are, no doubt, improvements that can still be made to the ideas presented here, I hope this guide proves to be useful for other composers who are interested in writing for handpan.

Key for Handpan (Gu Side)

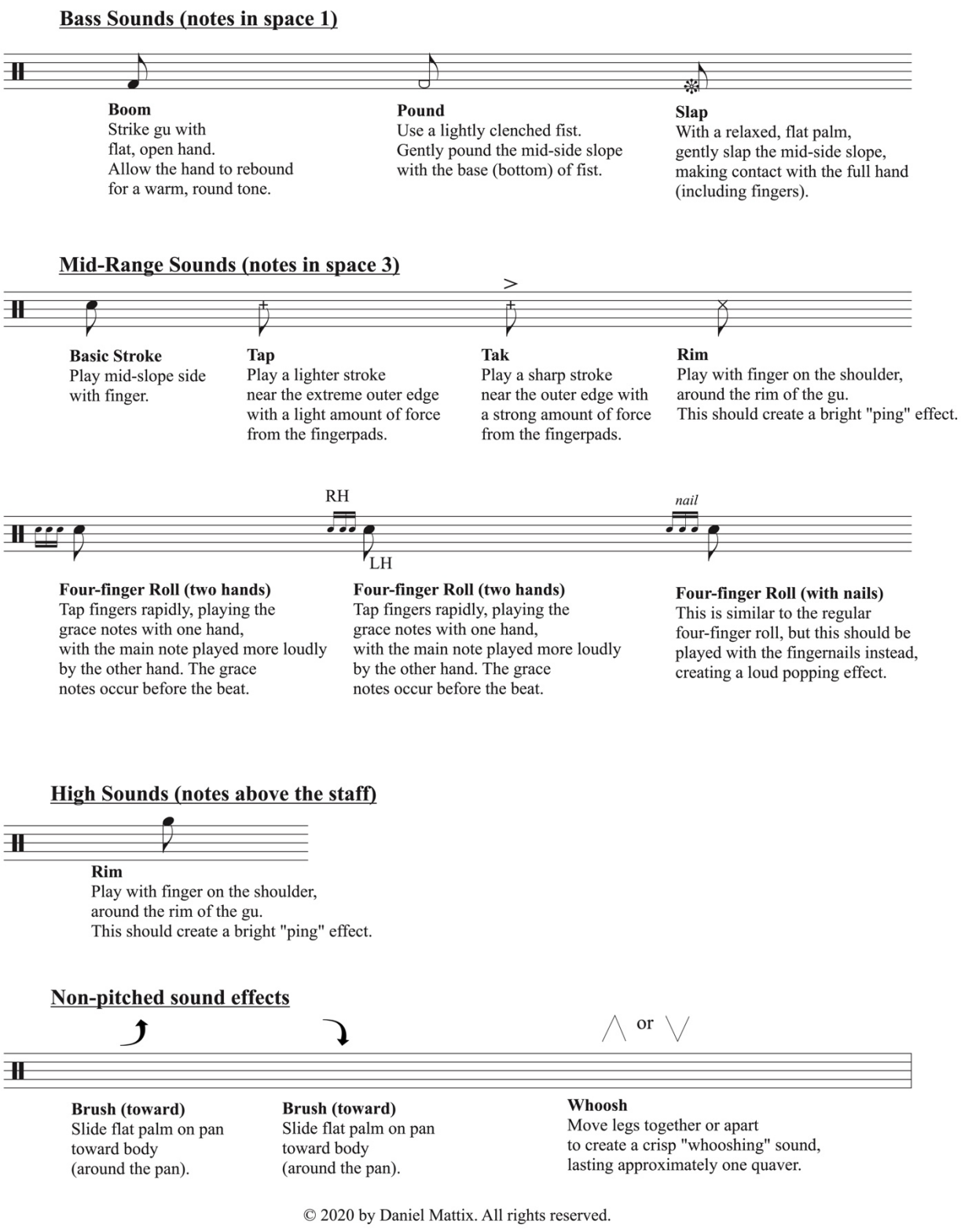

Figure 6.37. Current version of the key for the techniques playable on the gu side.

Chapter 7: Commentary on the Portfolio Pieces

The following sections describe the seven neo-liturgical pieces within my portfolio, including the ways in which they apply my new system of notation as well as the principles of meditative music listed above.

Piece #1: *Triptych Meditation* (2017), for handpan solo

From the outset, the goal of this piece was fivefold: 1) test my system of notation for the many sounds created by the non-pitched 'gu' side of the handpan, 2) create a compendium of techniques, expressing the vast array of manners of playing this instrument, 3) explore the possibilities of playing the handpan vertically, 4) intentionally limit the harmonic capabilities by using only one handpan to achieve a complete piece, and 5) explore the principles of meditative music while applying them to a new piece of neo-liturgical music.

It was during the creation of *Triptych Meditation* that I began to develop the four principles of meditative music outlined in Chapter 5. This piece exhibits many of these qualities of meditative music, namely, cohesion, repetition, instrumentation, and duration. Each of the three sections creates a distinct aural environment in which the listener may have a sense of meditation and contemplation. Because of this, the piece also fits into the broader category of neo-liturgical music. I have received anecdotal evidence from listeners and performers that, whilst experiencing *Triptych Meditation*, they have experienced a sense of peace and calm, due to the resonance of the handpan, the repetitive nature of the motifs, and the gentle rhythmic pulse that pervades most of the piece.

At the start of writing *Triptych Meditation*, a considerable amount of time was invested in developing the notation. The composition process involved experimenting and adapting the notation system as the music itself was taking shape. In a way, this composition provided the training ground for notation experimentation and often served as a testing mechanism to see if the notation developments made sense to the handpanists. The innovations in notation took a long time to develop and included many meetings and revisions

whilst working primarily with handpanist Aaron Marsala. The changes that took place and the details of the notation system are explained in more detail in Chapter 6.

This piece has a three-part form, set out as a triptych of three meditative experiences. Each section begins rather slowly and gradually opens up into an undulating groove. In all three parts, the texture becomes increasingly rhythmically active by the end, and all sections end in a sweeping crescendo.

Each of the three segments explores a different manner of playing the handpan. The first section starts with the handpan being played on the gu side. I was intrigued by the idea of starting from a place of percussive sounds only, without any definite pitch. Then when the first tone field is played in the second section (in bar 169), it is a totally different sonic experience. The addition of melody and harmony creates a freshness that provides new momentum to the piece, since it had lacked definite pitch during the gu-side opening section. The second section proceeds in the typical manner of handpan performance, by playing on the ding side. Some harmonics are used as a contrast to the standard playing of tone fields, for example in bars 187 through 188, and 196 and 197. A lighter manner of playing on the finger pads, again for added variety, is in bars 198, 209, and 213, amongst others.

In this piece I also explored the unique sonic vibration that occurs when the handpan is flipped from one side to the other. Specifically, this happens in bars 136, 150, 154, 158 and 271. Depending on which notes or unpitched material has just been played, the ringing effect that this technique produces is quite colourful. This is an effect that is subtle but aurally very distinct. It is best employed after a crescendo, building up a lot of notes and overtones. Then when the handpan is flipped, assuming the instrument itself has a good deal of resonance, the interrupted sound waves create an intriguing sonic effect. The flip should take place during a long note or rest, so there is time to allow the sound to settle and fully absorb the effect.

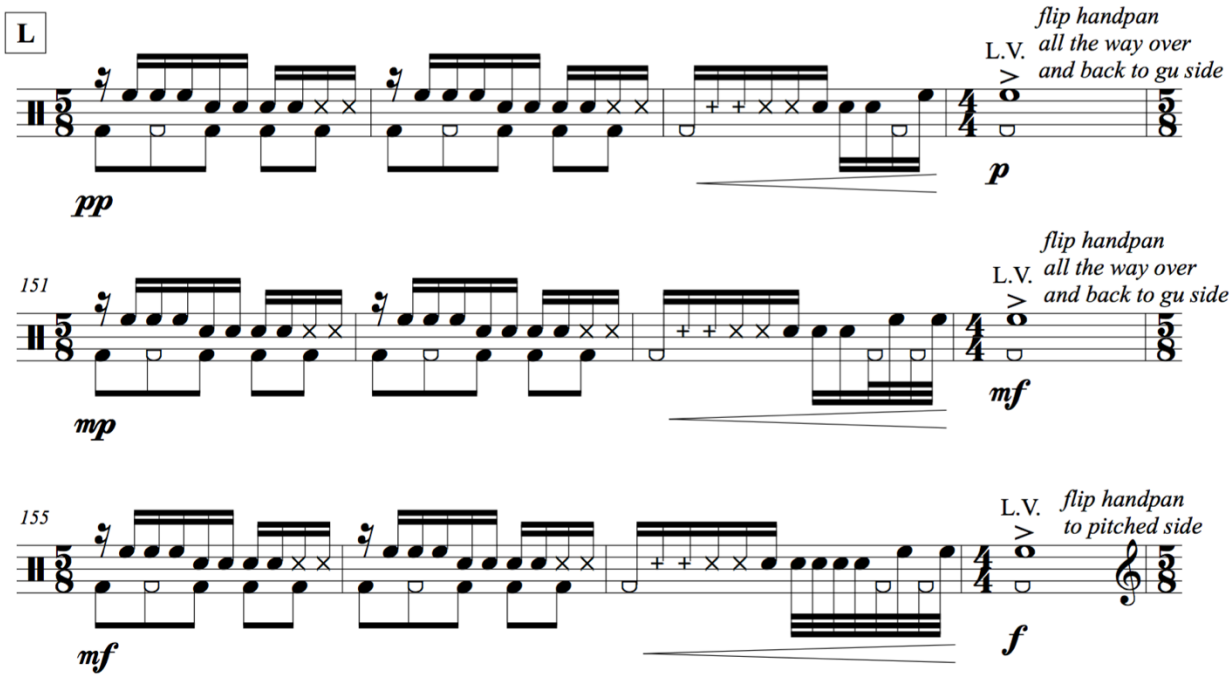

Figure 7.1. Demonstration of directions given to create sonic vibration from flipping handpan.

The third section of this piece, from bar 272 through the end, incorporates an atypical style of playing, specifically the technique of holding the instrument vertically whilst playing with right hand on the ding side and left hand on the gu side. To design notation for vertical playing, I looked to keyboard music for insight. The right hand is notated on the top staff, using treble clef. The left hand is the lower of the two staves and uses the 'neutral clef' typically employed in music for non-pitched instruments.

Of note from bar 272 is the use of a technique that produces a vibrato effect, created by waving the hand parallel to the tone field that was just played. This effect is most useful during a pause when the subtle interruption of the typical sound wave can truly be heard. The vibrato technique is used at the beginning of the vertical section, specifically bars 272 through 278. This is used as a connection between the vertical section and the end of the second section, which concludes with the handpan being rotated. The rotation and waving effects both interrupt the normal sound wave. The two manners of interrupting the sound waves shows their similarity back-to-back at the transition into the vertical section aids the transition between the two parts.

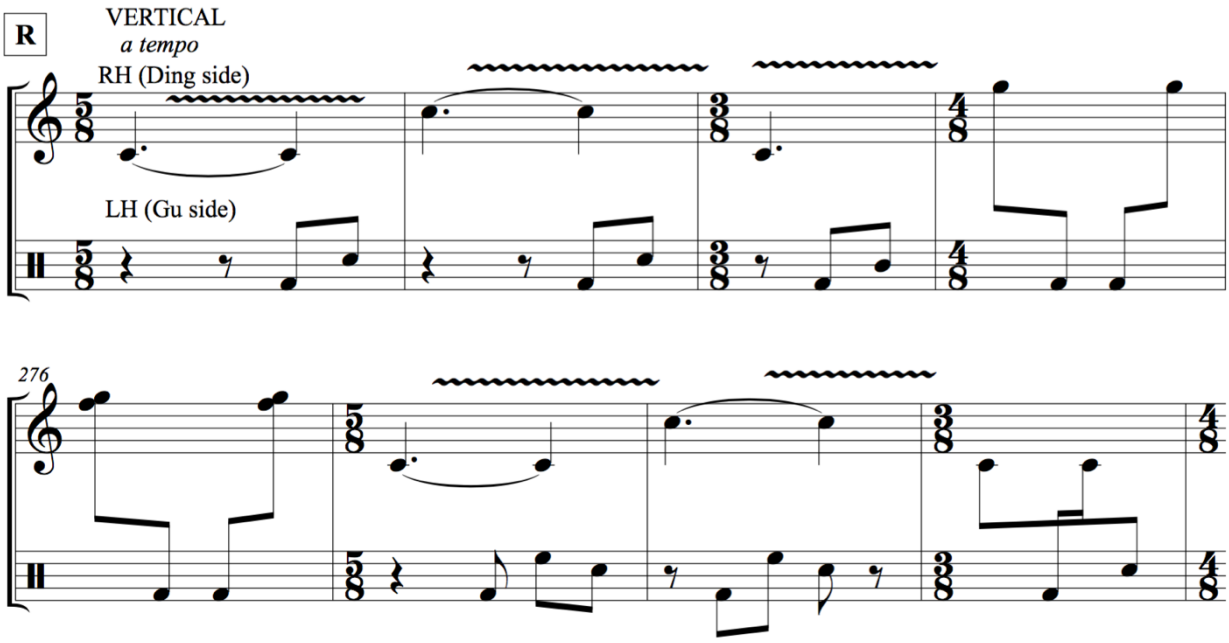

Figure 7.2. Demonstration of page layout for vertical position playing, as well as the notation for vibrato-waving effect.

Another innovative technique occurs in bars 327 through 338. This section explores the sound created by the performer slowly brushing the hand around the gu side of the handpan. This type of playing produces a sound reminiscent of a snare drum being played with wire brushes, common in various jazz genres. The effect is interspersed with short, brisk brushes to punctuate the melody and add variety to the slow brushing technique. To my knowledge, this is the first piece to use a constant brushing effect on the gu side as an accompaniment gesture.

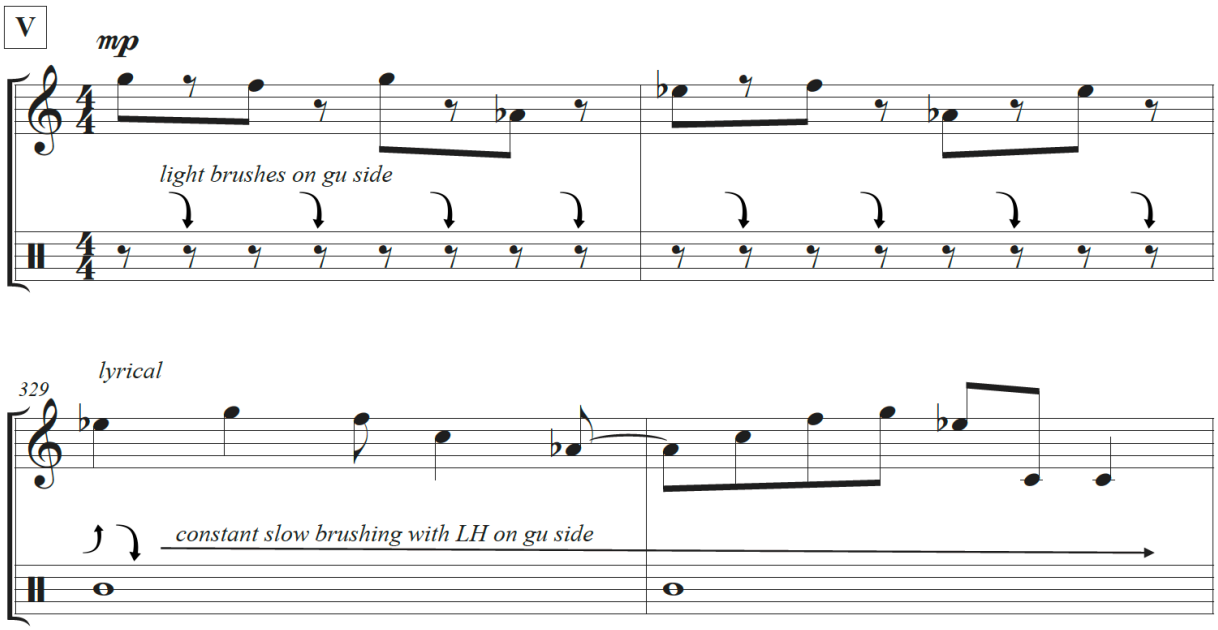

Figure 7.3. Example of contrasting brushing techniques used in the vertical playing position.

Throughout the composition process, *Triptych Meditation* became a repository of nearly all essential handpan techniques joined together in one piece. It could serve as an extended etude, providing a solid foundation for handpan technique to a percussionist who is learning how to play the instrument. It would work well as a college recital piece for percussionists who want to demonstrate competence in handpan. My goal is that any percussionist who learns *Triptych Meditation* would come to have a solid understanding of all the essential handpan techniques. The intention is that it will also serve as a resource for composers who want to include these techniques in their own compositions for handpan.

Piece #2: *Le Feu de la Pentecôte* (2018), for unspecified ensemble

Le Feu de la Pentecôte was developed for a very practical and particular purpose. Whilst planning for an Adelphi Contemporary Music Group (ACMG) concert, we determined that it would be fitting to incorporate the handpan into the ensemble in some meaningful way. The challenge in this idea was that, though I would have a handpan available for the concert, we did not have an experienced handpan player in the group. Therefore, any piece I wrote for this ensemble would need to be suitable for a percussionist to pick up quickly, and therefore

should be of rather modest proportions, free of the technical virtuosity required in *Triptych Meditation.*

In reflecting on what type of piece this might become, I determined that it should be flexible, yet compelling, whilst using only the diatonic scale available on the given handpan. After some consideration, Terry Riley's *In C* came to mind, offering inspiration for the form of my piece. Because of the limited harmonic capability, the piece would need to rely on the intensity of rhythmic development to give it momentum and direction. Also, the notes in each melodic motif needed to be playable on a variety of instruments, including handpan. This self-imposed restriction limited the complexity of each melodic cell.

The final version of *Le Feu de la Pentecôte* ended up as a piece for an undefined number of players. It was practical as well, both in level of difficulty and in the potential to be learned rather quickly, aided by the fact that all musicians could use the same sheet music. The ACMG members were quite pleased with the final performance. The piece met the needs of incorporating the handpan and provided a compelling conclusion to the concert that evening.

Le Feu de la Pentecôte functions on two levels—both as a practical piece, and as an academic work of scholarship in my PhD portfolio. As a practical piece, its versatility, flexibility, and approachability make it useful for diverse contemporary ensembles and accessible to a wide range of audiences. As part of my academic scholarship in writing for handpan, the circumstances in which the piece was composed created a unique set of limitations. I used the opportunity to explore aleatoric composition and included the handpan in an ensemble of this kind for the first time. This type of rather flexible composition also acknowledges the traditional role of handpan, that is, as an instrument used for improvisation. *Le Feu de la Pentecôte* is an example of how the typical usage of a handpan in improvisation can be combined with a formal classical setting to create music in a compelling, unprecedented way.

Le Feu de la Pentecôte is another example of neo-liturgical music, permeated with a sacred theme but meant for the concert hall instead of the church service. I consider the gradual spread of the individual cells of music throughout the ensemble to be reminiscent the spread of fire at Pentecost, as described in Acts 2:2-4. 'And suddenly from heaven there came a sound like the rush of a violent wind, and it filled the entire house where they were sitting. Divided tongues, as of fire, appeared amongst them, and a tongue rested on each of them. All of them were filled with the Holy Spirit and began to speak in other languages, as the Spirit gave them ability' (quoted in VanderKam, 2002). This piece is a reflection of the scene due to the nature of the spreading fire, the rush of rhythmic momentum, the ensuing flurry of activity, and the sense of unity at the conclusion.

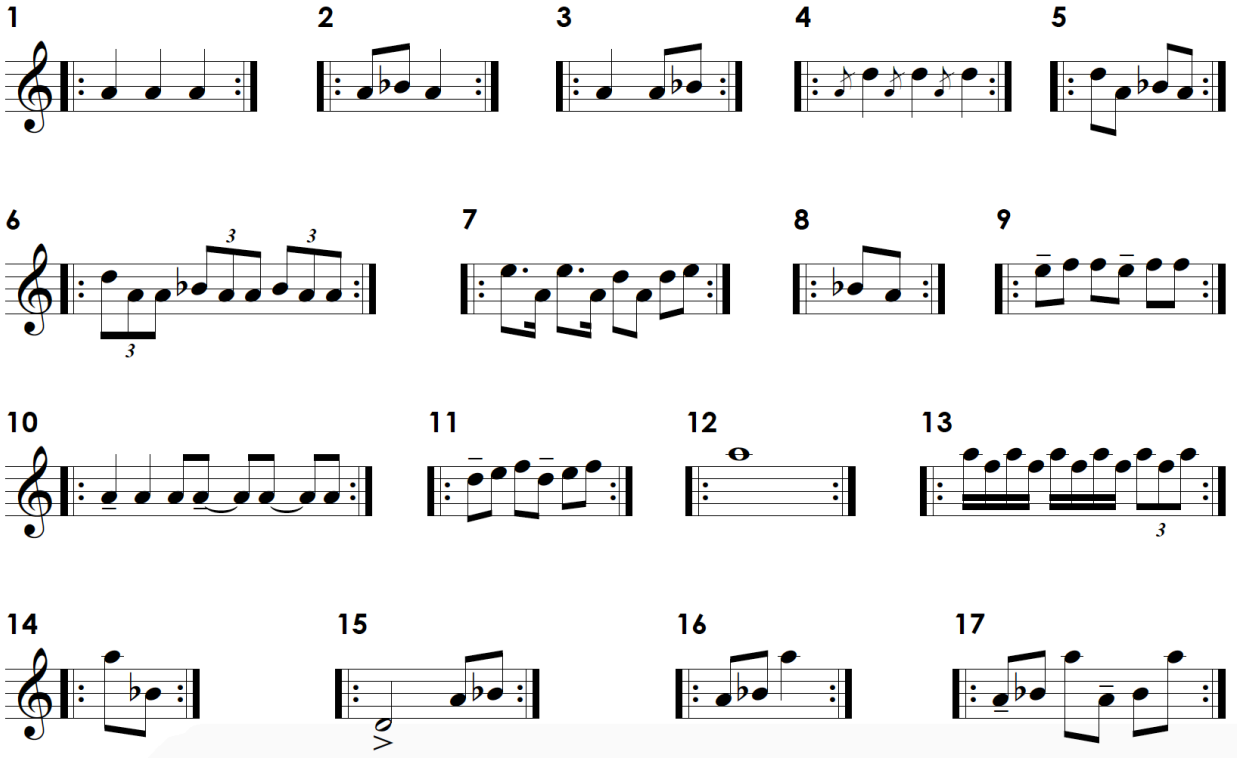

Figure 7.4. Opening seventeen cells from *Le Feu de la Pentecôte.*

Piece #3: *La Création du monde* (2018), for handpan and organ

Whilst considering how to develop the repertoire of music for handpan, I deliberated about the available customary instruments and the unique pairings that might be produced with each. One of those unexpected pairings is the combination of perhaps the most formal and established of all instruments, the pipe organ, with a more spontaneous and recent instrument, the handpan. Both of these instruments have historically been used for meditative purposes, and the thought of writing a duo that would combine them was an appealing, yet challenging, undertaking.

Somewhat ironically, these two instruments are made in a similar fashion, in that they are both made of metal and shaped with tools to produce a distinct tone. However, the manner in which they are played is entirely different – one by forcing wind through the metal of the pipe organ and the other by gently striking the metal of the handpan. The transportability of the instruments also provides a stimulating juxtaposition – the unmovable pipe organ with the portable handpan. Finally, the pipe organ has existed for centuries, whilst the handpan is still in its early stages of development.

In the midst of many contrasts, both tonal and historical, the challenge of uniting two diverse instruments was quite engaging. The juxtaposition of tradition and innovation, wind and metal, smoothness and percussiveness, proved to be an appealing amalgamation of concepts and timbres.

One of the initial challenges of this piece was how to balance the potential loudness of the organ with the intimacy of the handpan. When thinking of the pipe organ, often the association is with *grand orgue*, pull-out-all-the-stops, forte playing. Whilst that is a popular option in organ composition, the instrument can also produce very quiet, almost imperceptible, sounds, all based on the registration selected by the composer or organist. In this composition I have endeavoured to write thoughtfully for the combination of the two instruments. Specifically, I kept in mind the strengths of both handpan and organ and strove to

write idiomatically so that both instruments can thrive. The goal from the start was that this would not become an organ piece with handpan, or a handpan solo accompanied by organ. Instead the two instruments do what they each do best, whilst leaving room for the other to flourish in a truly egalitarian duet.

La Création du monde has a foundation particularly in the music of Oliver Messiaen. Like many of Messiaen's compositions, the pitch material for this piece is intentionally designed and crafted with self-imposed limitations. Though I have not employed the strictness of the modes of limited transposition, I did put some restrictions on the pitches used and the timing of their use. Due to the handpan's narrow diatonic note options, with this pan restricted to a D natural minor scale, I chose to limit the organ's initial pitches as well. Then when the handpan comes in with its first material on the ding side at letter C, it comes as a welcome contrast to the organ's predominantly B pentatonic scale up to that point. The prominent use of mutation stops is also a characteristic of Messiaen's organ music that I have incorporated often in this piece.

A point of innovation in *La Création du monde* is the use of the very low range of the organ pedals, creating an underlying rumble for the first 72 measures. The sonic beats produced by the cluster of low pitches produces a murky backdrop for the percussiveness of the handpan. After the first measure, it is nearly inaudible, and eventually blends into the background texture for the opening sections of the piece.

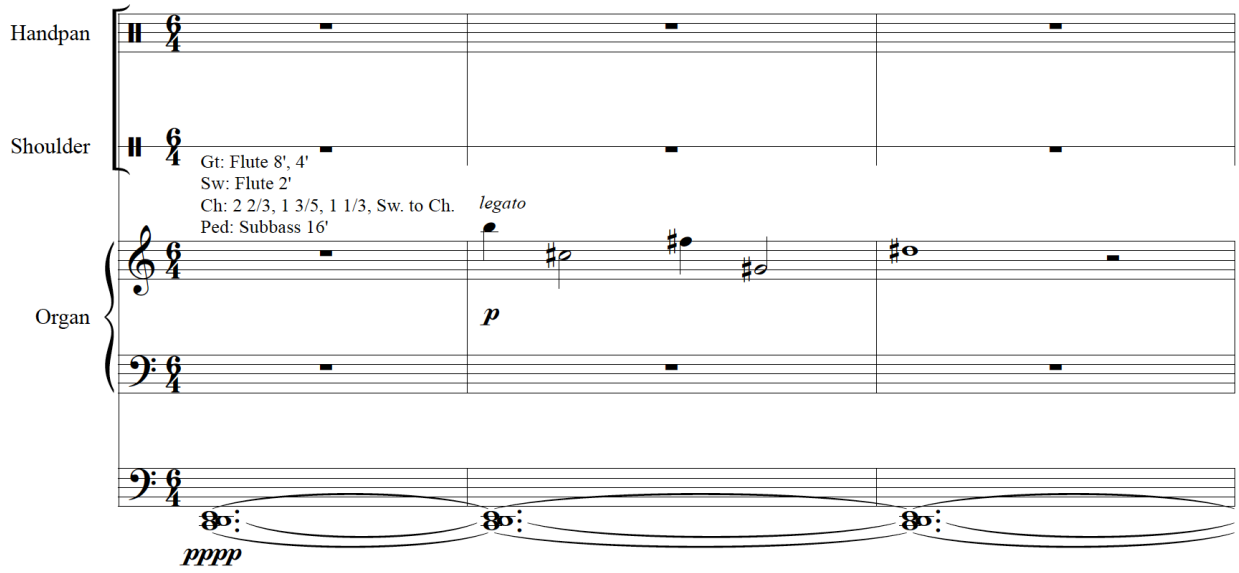

Figure 7.5. Opening measures, demonstrating the cluster in the pedal.

La Création du monde also has a connection with the style of Igor Stravinsky. This piece is about the creative process, which, in my experience, often happens in sudden bursts of ideas and energy. To express this, I have included quick 'jump cuts' between different ideas, and occasional fanfare fragments, foreshadowing the fanfare material at letter L. Stravinsky's music is known for this type of sudden movement between materials, evidenced in *Rite of Spring,* as well as *Symphonies of Wind Instruments.* The technique works well in this duo, since it provides opportunity for a quick back-and-forth between the two instruments, and the abruptness escalates into a dramatic climax.

The recording process itself was informative as well, confirming my research and progress in studying meditative music thus far. *La Création du monde* was recorded in May 2019 by handpanist Aaron Marsala, and I played the organ part. After the recording sessions, Aaron said he could sense the characteristic of a contemplative experience through the playing of this music. The ethereal quality of 'meditative music' became tangible and palpable in real-life practice. In the laboratory of the recording hall, the research and application of meditative principles were tested and proven to be legitimate by actual musicians.

As the first piece written for a handpan and organ duo, much care was taken to accomplish the specific goals mentioned above. The ideals of creating original sounds, leaving room for each instrument to thrive, and writing in idiomatically appropriate styles were at the centre of my thoughts throughout the composition process. These goals were accomplished in conjunction with the overarching objective of studying what works and does not work to create a meditative musical experience. The hope is that, through this composition, both organ and handpan are seen in a new and effective light as this piece has expanded each instrument's repertoire in an innovative way.

Piece #4: *Lux aeterna* (2019), for electronics

Electroacoustic music is increasingly seen as the vanguard of contemporary classical composition. Because of the prominent role, it was important to include representative pieces from this medium in my portfolio. In *Lux aeterna,* I have developed an electronic piece by taking pre-recorded sounds and manipulating them in a creative, imaginative fashion.

The raw material for this piece was recorded in one of the University of Salford recording studios on 12 March 2018. Adam Hart was the studio engineer and I served as the handpanist. I used many methods of playing and various techniques on each pitch of the ding side, at a variety of dynamic levels. The same process was implemented on the gu side of the pan, using a number of various sound effects and manners of playing.

Using samples from this recording session, I employed audio effects to manipulate the original source material. Throughout this stage, the principles of meditative music were at the forefront of the composition process. I used Logic Pro X software to transform the original raw samples into the final composition.

I included a number of audio effects in the creation of this piece, based on an intuitive process of sound design. I used five categories of techniques, including time-based, spectral, dynamic, and modulation filter effects. For time-based effects, I incorporated delay, echo and reverb. These are especially evident in the opening and closing sections of the piece. Spectral

effects also played an important role in the composition. EQ manipulation and panning were regularly a part of my manipulation of the original source material. To add variety, I also included dynamic effects. Compression and distortion aided in the transformation of the original samples beyond recognition as 'handpan sounds.' For modulation effects, I employed the tremolo and phaser. These sound processers were used to filter the signal and make a 'synthesized' and electronic sound out of the original source recording.

This is the first composition we know of that was written exclusively as a stand-alone, fixed media piece based on manipulated handpan samples. Due to the rich sonority of various handpan tones, as well as the complex overtone produced, the instrument provides a plethora of opportunities for digitally altering the original raw material. Since the time of my recording in 2018, two companies[23] have begun producing audio samples, so the presence of handpan in digital media and composition is likely to increase considerably in the near future.

In this piece, I also maintained the meditative quality of the instrument whilst using the software to change the sound. The opening section has the element of repetition, as the swelling initial motif repeats dozens of times throughout the piece. Changes generally take place gradually, leading to an increased sense of cohesion. The instrumentation is informed by the source material, namely the handpan, and the manner in which it is manipulated is rather mellow and contemplative. Finally, the duration of *Lux aeterna* is approximately fifteen minutes long, which is an appropriate length for a piece of meditative music.

As a piece of neo-liturgical music, *Lux aeterna* is meant to be a meditation on the text of the same name, which is commonly used in settings of the Requiem. Through the compositional elements mentioned above, I used electronics means to reflect on the ideas of light and eternity. This piece is a musical interpretation of 'perpetual light,' communicated through the means of electronic composition.

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[23] Connor Shafran (2020) and Soniccouture (Powell & Thompson, 2020) have robust and thorough handpan samples now available. Shafran's tend to be warmer with a less percussive attack. Soniccouture has a wide range of articulations available with a more percussive sound.

Piece #5: *Meditari* (2019), for electronics and unspecified ensemble

Meditari is perhaps the most direct exploration of the principles of meditative music in the portfolio. Its purpose is to give both performers and listeners the opportunity for ten minutes of contemplation as the piece progresses.

The structure of the piece is held together by a fixed media track. This track has a gong-like sound every thirty seconds, which signifies to the performers that they should move on to the next 'cell' of notes in their sheet music. The audio track was created from the raw material from the handpan recording session on 12 March 2018, and altered in Logic Pro X using audio effects like reverb, EQ manipulation, panning, compression, distortion, and filters.

The sheet music contains twenty cells of music, each one made up of a collection of notes that will be repeated for approximately thirty seconds. The cells ('measures') should be played sequentially, with each performer deciding what rhythm to play for each cell. Since the cells are repeated for thirty seconds each, the number of repetitions is left to the individual players based on the tempo and rhythm they choose. At the end of each thirty-second timeframe, the 'gong' sound in the fixed track cues the performers that it is time to move to the next cell.

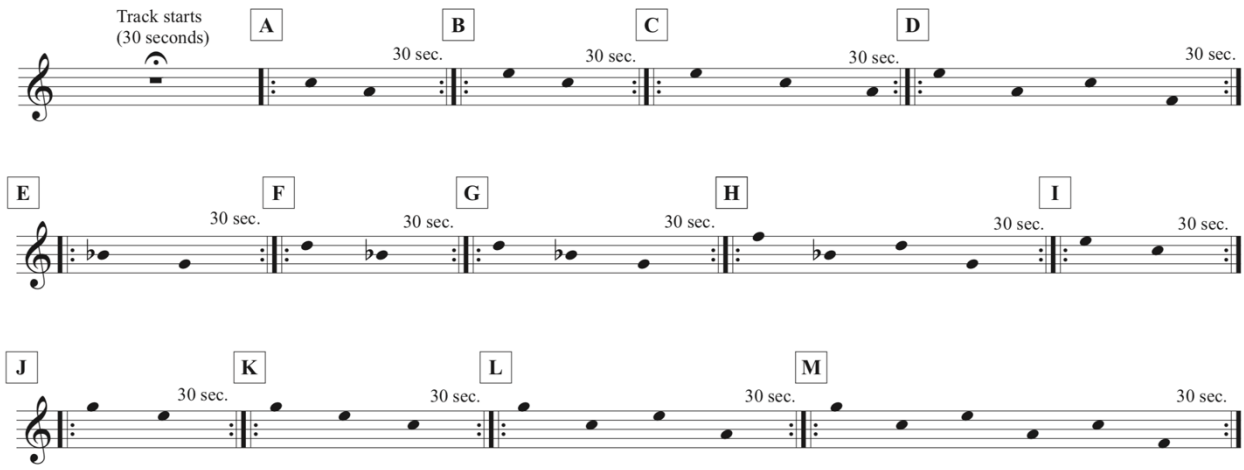

Figure 7.6. Opening fifteen measures of *Meditari,* demonstrating the manner pitch collections and timing are communicated in the piece.

According to the notes for performance, *Meditari* is designed to encourage musical meditation and contemplation, allowing the repetition of the notes to lead to a sense of peace and calm. This should foster meaningful individual expression, whilst still maintaining one's place in the entire ensemble. The performers should allow this experience to be a significant time of contemplation about the beauty of their individual instrument's tone as well as the role of time passing in music and life. Performers are encouraged to listen carefully to their individual sound and make as beautiful a tone as possible.

The pitches in *Meditari* are relatively limited and diatonic. This is due to the piece being based on the modality of the 'Kurd 8' handpan that is essentially in the key of d minor. In the recording, another unique instrument is also used, namely, the kora. The kora is a twenty-one-string lute-bridge harp that is used primarily in West Africa (Durán, 2008). By a happy coincidence, both the kora and the handpan we used had the same diatonic notes readily available.

Though *Meditari* looks relatively straightforward on the page—and indeed it is; even a musician with the most rudimentary skills could play these pitches—the concentration required to successfully play this piece requires a rather mature level of focus and musicianship. What looks simple in the score is actually a fairly vigorous exercise in meditation and focus. For musicians, this piece hones two vital skills for successful musicianship: concentration and repetition.

Regarding concentration, Richard Wolf writes that 'the ability to concentrate is at the heart of both musical and meditation practice…It takes a great deal of concentrated energy to put all the necessary elements of harmony, rhythm, melody and sonic textures together in order to perform or complete a song or piece of music' (Wolf, 2019, p. 17). The aspect of concentration is required of every profitable practice session and successful performance. In *Meditari,* many of the typically more challenging variables are stripped away, until only a few

notes remain at any given time. Concentration is a necessity that is at the heart of what it means to be a musician, and the skill of concentration is prominent in this piece.

Repetition is also an essential element that good musicians must embrace. Because of that fact, I strove to explore the idea of repetition in *Meditari*. Though seen by some as a Sisyphean task, the best musicians learn to love the art of repetition in order to perfect their craft. The challenge given to the performers in this piece is to explore the great art of meditation thorough repetition— how beautifully, how expressively, how poignantly can they play this small collection of notes in each cell? The famous choreographer Pina Bausch claimed 'Repetition is not repetition. The same action makes you feel something completely different by the end' (Kisselgoff, 1985). Similarly, I received feedback from performers that, as they played the repeated cells, a sense of transformation occurred. They heard the notes differently between the first playing to the last iteration. This is exactly the experience we were hoping to achieve; again, the laboratory of the performance hall anecdotally proved the principles of meditative music to be accurate.

In this piece, the performers are responsible for maintaining the meditative quality throughout. They do this through applying the various principles of meditative music, including cohesion, repetition, instrumentation, and duration, discussed in greater detail in Chapter 5. As neo-liturgical music, this piece is designed to facilitate contemplation, meditation, prayer, or a combination of these elements. Though these disciplines can occur in private, this piece allows them to be experienced in a concert setting. Of course, the act of having a 'spiritual' experience is entirely optional, and the piece still functions successfully when separated from that intention. The purposeful study of this overt expression of meditation was an important component when creating this portfolio of neo-liturgical pieces that include handpan.

Piece #6: *Magnificat* (2019), for mixed quartet, piano, and handpan

The Magnificat is amongst the most frequently set poems in vocal music. Lyrically and historically rich, this text has been the source of hundreds of compositions, spanning generations of composers. In addition to the Latin Vulgate setting, the English translation from the Book of Common Prayer has received special attention due to the prominent placement of the Magnificat at the heart of the Anglican evensong service (Milsom, 2006, p. 699). The lineage of Magnificat composers stretches back to the earliest extant example by John Dunstable in the early 15th century. Subsequent composers of Magnificat settings include Orlando di Lasso,[24] Schütz, Bach, Mozart, Schubert, Mendelssohn, Bruckner, Franck, Rachmaninov, Vaughan Williams, Howells, Finzi, Pärt, Penderecki, and Tavener, amongst many others.

The rationale behind my selection of this text for the vocal piece in my portfolio is threefold. First, since I am writing for the unfamiliar, that is, the handpan alongside classical singers, I thought it best to pair it with the familiar, namely the timeless Magnificat text. Secondly, I was eager to add my voice as a composer to the substantial list of those who have written settings of the Magnificat. As I had not yet written music for this text up to this point, this presented the perfect opportunity. Lastly, this setting of the Magnificat furthers my goal of creating neo-liturgical music for the concert hall, which, due to the length of the composition, is likely a more suitable fit for this piece than a traditional sacred venue.[25] My hope is that vocal ensembles will find the familiar text of the Magnificat to be a good fit for their performance needs, and that the addition of the inimitable sounds of the handpan will provide a fresh perspective on an historic text.

The Magnificat, also known as 'The Song of Mary,' is one of the canticles that are reactions sung by four characters regarding the birth of Christ. These canticles are found

[24] Orlando de Lasso notably composed over one hundred settings of the Magnificat alone (Crook, 2014, p. 64).
[25] This piece is an example of neo-liturgical music that is not meditative, as it does not truly follow the meditative principles outlined in Chapter 5 (cohesion, repetition, instrumentation, and duration).

interwoven with the narrative of the first two chapters of the Gospel of Luke and are sung by Mary, Zechariah, the Angels, and Simeon. The text of the Magnificat is the response from Mary, the mother of Jesus, after she has been told that she will bear the Messiah. The lyrics are found in Luke 1:46-55. I have chosen to use the traditional Latin Vulgate translation of the text, which is widely known to singers of classical repertoire.

This piece is set for a mixed quartet, piano, and two handpans. The handpan tunings are based around the C-sharp natural minor scale and the G major scale. These two dissimilar key areas provided an abundance of contrast, giving a considerable amount of colour and variety in moving between the tonal centres.

Before journeying into the description of what this piece eventually *became*, it is important to share some insight into how the piece began. By this time in my PhD research and ongoing collaboration with Aaron Marsala, I had reached the point of wanting to be more harmonically adventurous in writing for handpan. Up until now, I had primarily written for a single handpan, and in some pieces had added the occasional 'borrowed' note that would supplement the limited notes of the scale on the given handpan. So, while consulting with Aaron about this piece and the idea of more chromatic variety, he recommended that I 'write whatever I want' pitch-wise, and then he would do his best to make my composition work on the six handpans he had available.

Therefore, I did just that, at Aaron's recommendation, and wrote the first draft of the Magnificat without any thought about the specific notes available on any given handpan. The process of composing in this way allowed me to experiment with different tonal centres and chromatic variety, treating the handpan as if it were a fully chromatic instrument. This system of composition worked well in theory, as the other members of the ensemble were four singers and piano.

However, when coming to the first rehearsal with Aaron, after I was already far into the composition process, we quickly realized that my ideas thus far would not work well in

practice. After setting up all of the available handpans around him, Aaron had to move around from one to another more quickly than was feasible, based on how I had composed the piece. Since we had intentionally not set limits on the 'playability' of the music I had written, the actual physical requirements proved to be unrealistic. The reality is that the handpan, in its current form, is simply not a chromatic instrument than can easily play any given note in quick succession. The only way this could work is if careful consideration was given by the composer as to the relative location of those notes and the ease of physically moving between the scales on various handpans.

Another significant problem inherent in chromatic writing for handpans came up during this initial meeting about my Magnificat setting. One of the unique and beautiful aspects of handpan music lies in the natural resonance of the individual instrument, which is the result of only containing 'diatonic' notes of a given scale. The overtones and resonance that results from this unique construction is a major part of the inimitable sound drawn from the handpan. In our meeting, as I was singing through the lyrics and Aaron and I were playing our respective instruments, we realized that, due to using so many handpans simultaneously, the resultant overtones were combining in a way that was not as I had intended in the composition process. Aaron attempted dampening the tones immediately after they were played so the overtones would not be so pronounced and lengthy. However, when this happens, a good deal of the characteristic handpan sound is lost due to dampening. Also, I had been anticipating that the natural overtones of the voices would interact in an interesting way with the handpan overtones, but it would have been lost with the constant movement between handpans, or the dampening attempted by Aaron.[26]

For this reason, it seemed best to return to a more idiomatic approach to writing for handpan. Instead of struggling to 'force' the instrument to fit into the Western chromatic

[26] A case could be made, in future compositions by myself or other composers, for intentionally blurring the handpan overtones and natural resonance. That effect, for the right piece and acoustic environment, has the potential to be very distinct, original, and noteworthy.

mould, I decided to highlight the unique characteristics of the handpan and allow it to do the things it naturally and idiomatically does best. So I returned to the concept of primarily employing one handpan at a time, and left the chromatic alterations and non-harmonic tones to the piano and voices. Eventually, to establish a sense of momentum and contrast in the piece, I switched between the tonal centres of C-sharp minor and G mixolydian, as described in further detail below. Occasionally, while playing primarily on one handpan, a note will be borrowed from the other scale. In fact, this happens fairly frequently throughout the piece, beginning as early as bar 5 when the F-double-sharp is added to the established C-sharp minor key centre. Focusing one primarily one handpan at a time, while allowing chromaticism from the piano and voices, seemed to eventually work well and elicited the overtone effects for which I was striving.

Whilst composing my setting of this Magnificat text, I have spent a long time thinking about the emotional impact such a message would have had on a young woman like Mary in the ancient Middle East. The Magnificat text is often sung with a joyful, exultant style, with loud dynamics expressing the lyrics, ‘my soul magnifies the Lord.’ This is certainly an appropriate interpretation of the text, and one that has been employed by the majority of composers. However, I have chosen to see the poem as beginning from a place of quiet, reverential awe at the reception of this message. I imagine that Mary would have had a sense of questioning apprehension at this news and that her first response may not have been one of exuberant joy. In my setting of the beginning of this piece, I have chosen to interpret the text as one of quiet concern, from the perspective of a young woman who is experiencing both joy and a sense of trepidation.

To express this emotion, the piece begins with handpan alone, repeatedly striking the C-sharp ding. This gradual unfolding allows the audience and singers alike to engage in the rich overtones of the handpan and become acclimated to its mysterious tone. When the piano enters with the same C-sharp pitch and doubles it an octave below, the overtones of the

handpan and piano interact in a very distinct manner. The slowly unfolding first six bars allow time for the sounds of the two instruments to intermingle and create a mesmerizing series of overtones based on the C-sharp minor scale. The stillness of this beginning represents the arid stasis of a Middle Eastern desert, setting the stage for the dramatic text that will be revealed by Mary's voice. A sense of mystery and wonder pervades this enigmatic opening.

The rhythm introduced by the handpan is the most important rhythmic pattern of the piece. This rhythmic motif ties the piece together. The characteristically dotted rhythm returns in many sections of the piece and foreshadows the joyful 'Gloria Patri' conclusion when the same rhythm is interpreted in an entirely different manner. This rhythm, shown in Figure 7.7, connects the initial fear at the beginning of the piece to the sense of joy and praise at the final 'Glory to God.'

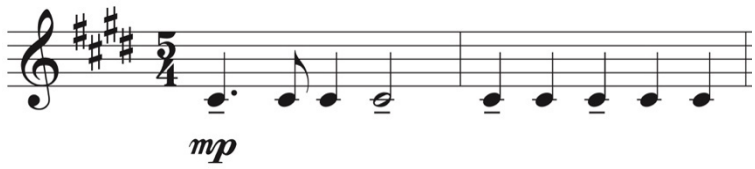

Figure 7.7. Opening handpan statement, presenting the unifying rhythmic motif (bars 1-2).

The entrance of the F-double-sharp in bar 7 changes the atmosphere considerably, moving from stillness to a sense of enigmatic concern. The movement from the fifth, that is, C-sharp to G-sharp, descending to the F-double-sharp is a motif that sounds like a question and expresses a feeling of uncertainty. The presence of the tritone resolution from F-double-sharp to C-sharp also presents a sense of uneasiness in the unfolding scene. A practical reason for this motif was part of the process as well. The addition of this F-double-sharp, which is the ding note on the G-scale handpan, activates the ding on both available handpans. The overtones interacting from both handpans played together creates a very rich sonic effect.

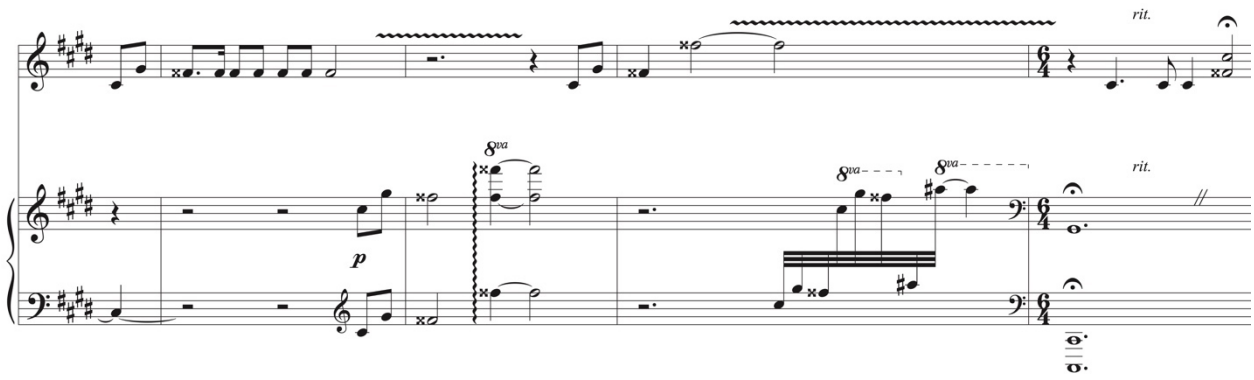

Figure 7.8. Five examples of the 'question motif' found in bars 6-9.

In the section beginning at Letter A, the 'question motif' continues to interject occasionally from the piano. At bar 11, the soprano voice enters alone, representing Mary's solitary response. After the statement of the first line, the other singers add barely audible hums that support the harmony. The humming from the lower voices offer further richness to the lush overtones of the handpan part. The pensive opening continues with the soprano voice taking the lead through the statement of this initial verse.

At Letter B (bar 22), the atmosphere is altered somewhat. Due to the episodic nature of the text, changes in style and texture occur rather frequently in this piece, as I have set each verse in a manner that reflects the lyrics. The lyrics here are translated as 'and my spirit hath rejoiced in God, my Saviour' (Church of England, 2016, p. 50). The sense of rejoicing is expressed through a lilting 7/8 metre. The singers engage in a joyful passing of the melody from one voice to another, reminiscent of a rhythmic hocket technique, featured in the 13th and 14th Centuries. Reflecting the text at bar 34, the same joyful melody continues, but now with a sweeter interpretation. The insertion of 2/4 bars in between the 7/8 slows the pace of the lyrics, an aid in reflecting the gentle 'lowliness of his handmaiden' (Church of England, 2016, p. 50).

At Letter C, the texture changes considerably. Here I have written that the singers should engage their speaking voices from bars 46 through 57. The bass voice begins a canon, with the subsequent voice entering in two bar intervals: tenor, alto, and then finally soprano.

The spoken effect becomes rather complex as all the voices enter with their respective parts. The clamour of the spoken word is meant to reflect the idea of 'all generations' gathering to call Mary blessed. With the re-entrance of the handpan at bar 56, the key changes to G Major, and the handpanist begins to use the G-scale handpan predominantly in the upcoming sections.

The 'blessed' lyric becomes much gentler at letter D, with the voices aligning in a homophonic texture. This section is in the G Lydian mode, with the fourth scale degree raised to C-sharp. Here I have engaged both handpans in a different way than before. In this case, the G handpan takes the lead role, but the C-sharp is still present. The inversion of the G-C-sharp relationship creates a subtle sense of moving from concern to joy through this harmonic reframing of the two primary pitches, as demonstrated in Figure 7.9.

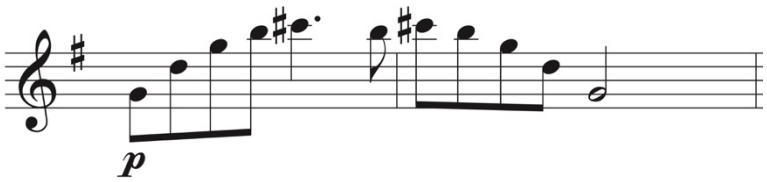

Figure 7.9. The use of C-sharp in the key of G in the handpan part, bars 60-61.

The section at letter F represents a sense of reverence and holiness. Because of this, is it very soft and accompanied only by gentle rolled chords on the handpan. The lyrics here were the impetus behind this change of atmosphere: 'And holy is his Name, and his mercy is on them that fear him' (Church of England, 2016, p. 50). At letter G, I have expressed the idea of 'generations' again through an increased rhythmic activity. The incessant triplets and quavers in the tenor and alto parts give a flurry of motion and energy, which leads seamlessly into the next powerful phrase: 'He hath showed strength with his arm' (Church of England, 2016, p. 50). These lyrics erupt powerfully from the voices, supported by strong clusters in the piano part.

At bar 93, the first aleatoric section begins, where each voice is given a specific phrase to sing unaligned with the rest of the ensemble. This is quite a chaotic effect, meant to

represent the line ‘he hath scattered the proud in the imagination of their hearts’ (Church of England, 2016, p. 50). This cacophony leads into a key change back to the original tonal centre of C-sharp minor. Another heroic gesture, incorporating the recurring dotted rhythm, occurs at Letter J. This is followed by a gentler expression, representing the exalting of the ‘humble and meek’ in bars 111 through 113.

At bar 114, the piece enters into a new section where the handpan plays a solo interlude that is followed each time by aleatoric hums from three of the singers. The remaining singer comes in approximately a bar after the hums begin with an expressive solo line. The first soloist, beginning at bar 120, is the soprano, contrasting the lines ‘filling the hungry with good things’ and the rich being ‘sent empty away.’ After a handpan interlude, with the key centre changing to G-sharp minor, the alto voice is the next solo, beginning at bar 130. The low melody here is warm and comforting, representing the lyrics ‘He, remembering his mercy, hath holpen his servant Israel’ (Church of England, 2016, p. 50).

After another handpan interlude, the bass voice enters strongly, guiding the tune to a dramatic climax: ‘As he promised to our forefathers, Abraham and his seed forever.’ The word ‘saecula,’ meaning ‘forever,’ is quite extended and dramatic, which propels the voices through a key change into the final section, the Gloria Patri.

Traditionally the Gloria Patri conclusion to the Magnificat is set apart from the rest of the piece, varied in some manner from what came before. In addition to the key change back to a radiant G Major, the piece returns to 7/8 again. At Letter B, the 7/8 metre was also briefly employed, representing a hint of ‘exaltation.’ When the metre returns now at Letter N, the sense of ecstatic exaltation is fully embraced, and the lilting asymmetrical metre establishes the Gloria Patri as a final joyous expression.

When the voices enter in bar 156, the melody is now the full statement of the dotted rhythm that has been foreshadowed since the bar 1. The fresh atmosphere is also communicated through the use of the G Mixolydian Mode, which I have always considered to

have a distinctly joyful quality. Other composers have found this mode to have a particularly jubilant character as well.[27] To my ear, this section sounds something like 20th Century English choral music, perhaps because I have been impacted by the melodies of composers such as Vaughan Williams, Holst, Parry, Stanford, and Rutter.

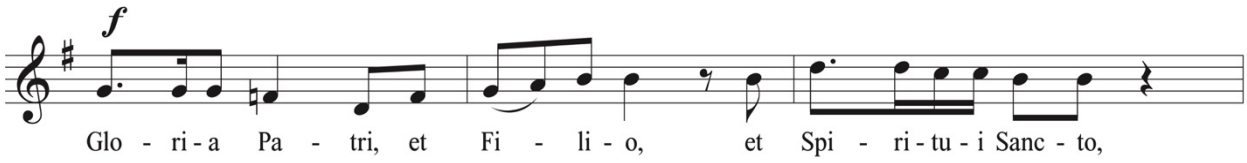

Figure 7.10. The dotted rhythm representing the joyful expression of the Gloria Patri, bars 156-158.

At Letter O, there is a return the G Lydian mode, reminiscent of the harmony present at Letter D. This addition of the C-sharp to the established G scale is another revisiting of the opening sections that explored the interaction between C-sharp minor and G natural (written at the time as F-double-sharp). Here at the end of the piece, the inverse relationship is highlighted: the presence of C-sharp as the raised fourth scale degree in the key of G. This reversal of roles between C-sharp and G is representative of the paradigm shifts present in the lyrics: taking down the mighty from their seat, yet exalting the humble and meek; filling the hungry with good things, yet sending the rich away empty. Another interesting connection comes from Messiaen, who has written about the melodic contour of the tritone. Whilst many deem this interval to be dissonant, Messiaen considers the top note of the tritone to be 'endowed with an attraction toward' the lower note in the tritone. He believes the descending augmented fourth to be the 'natural resolution' of the top note of the interval (Messiaen, 1956, p. 31). This natural resolution of my C-sharp to G in the closing section might be the reason for the satisfying conclusion and the sense of release moving from C-sharp minor in bar 146 to the key change to G Major by bar 148.

[27] As an example, Messiaen incorporates the mixolydian mode in his expression of joy in *Regard de l'esprit de joie* from his piano piece *Vingt Regards sur l'enfant-Jésus* (Bruhn, 2007, p. 223).

In bar 170, the Lydian mode is highlighted again, with chords oscillating between I and V_2/V (that is, between G and the third inversion of A7) (Figure 7.11). I use this chord progression in the final section to represent words that have an eternal quality. The repetition of the phrase ‘et nunc, et semper’ communicates the eternal nature of the phrase ‘now and always.’ Then in bars 176 through 177 (Figure 7.12), bars 179 through 180, and 184 through the end of the piece (Figure 7.13), I use a similar progression for the lyric ‘Amen.’ This lyric also has an eternal connotation and is the reason for the utilisation of this ‘now and always’ progression from bar 170.

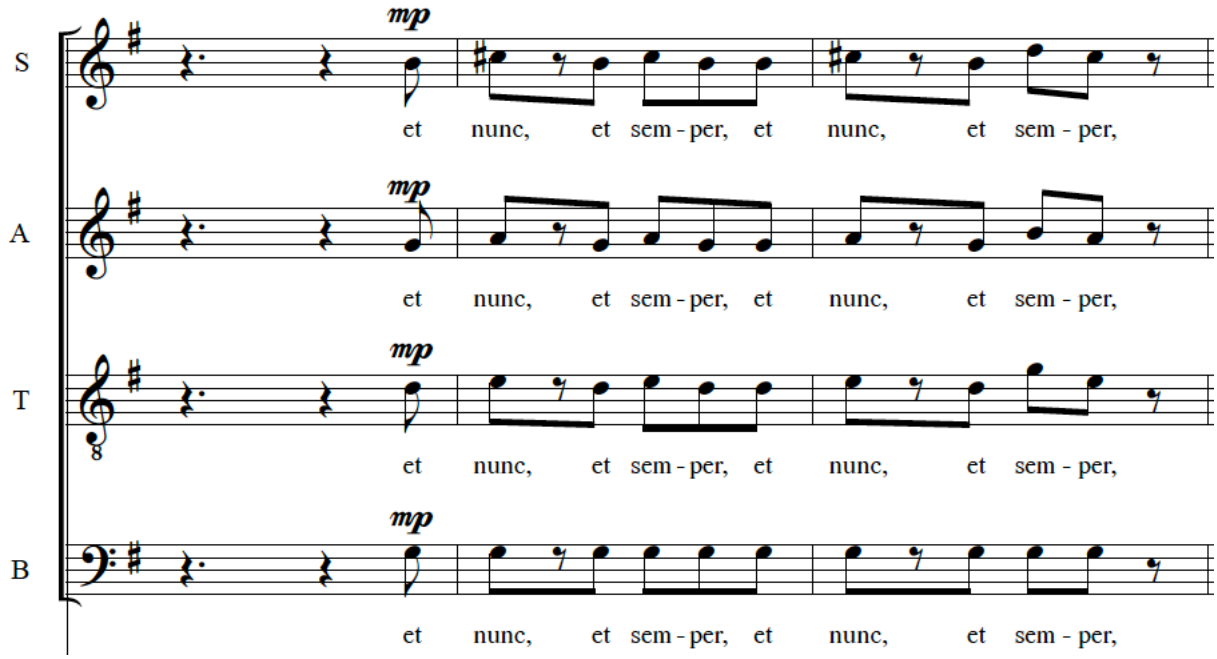

Figure 7.11. First example of the ‘eternity progression,’ oscillating between I and V_2/V (G and A7/G) in bars 170-172.

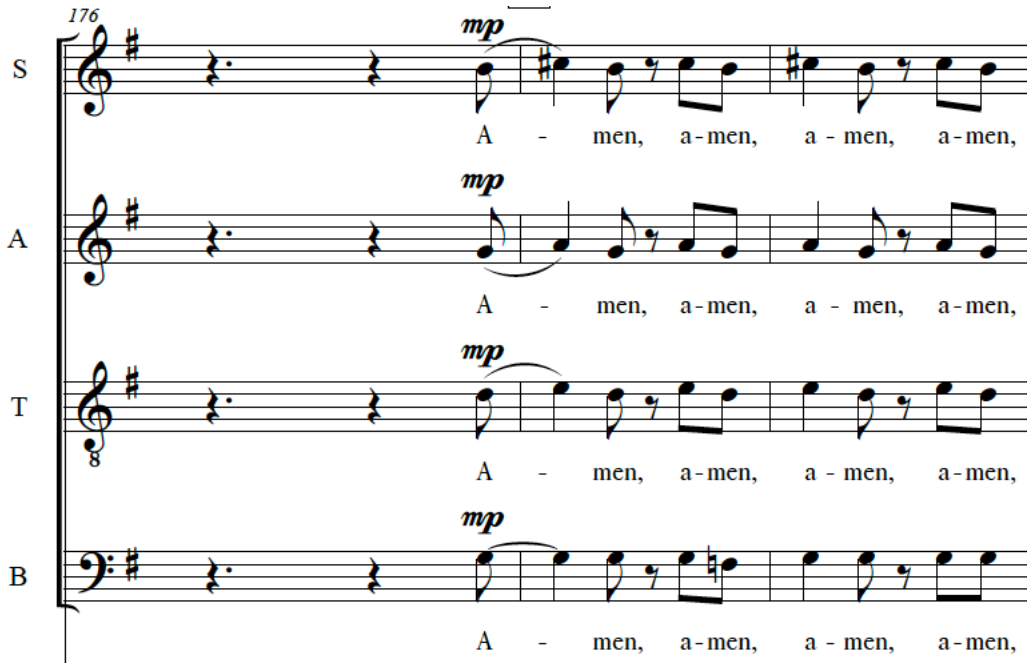

Figure 7.12. Another example of the 'eternity progression,' oscillating between I and V_2/V (G and A7/G) in bars 176-178.

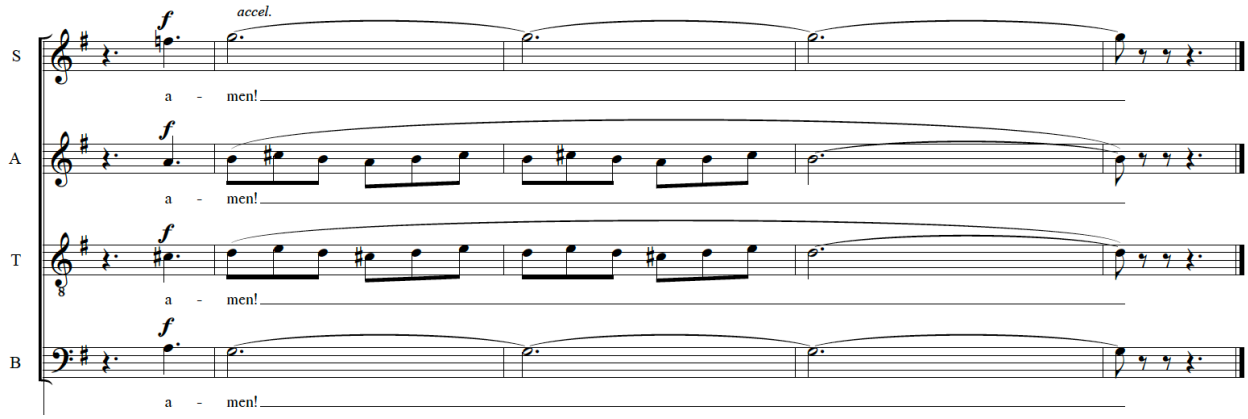

Figure 7.13. Final statement of the 'eternity progression,' oscillating between I and V_2/V (G and A7/G) in bars 183-187.

One final element to note in the concluding section is the scalar material used in two phrases. It is a combination of the two modes used in this piece, Lydian and Mixolydian. The raised fourth scale degree, C-sharp, gives the initial impression that it is a standard Lydian mode. However, the lowered seventh (F-natural) gives it a distinctly Mixolydian sound. Variations of this scale occur in bars 173 through 175 (Figure 7.14), and bars 179 through 180 (Figure 7.15).

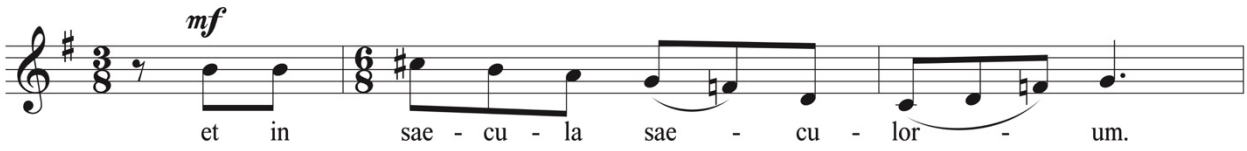

Figure 7.14. Scalar material combining elements of Lydian and Mixolydian modes, bars 173-175.

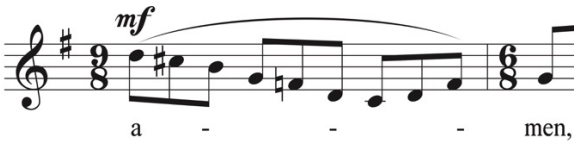

Figure 7.15. Scalar material combining elements of Lydian and Mixolydian modes, bars 179-180.

Throughout this setting of the Magnificat, I have striven to communicate the meaning and atmosphere of the various parts of the text. Due to the episodic nature of the poem, the emotion and mood of each verse changes rather frequently. By including elements of unifying rhythmic, intervallic, and accompanying content throughout the piece, I hope to have provided a cohesive expression of this timeless text. With the completion of this piece of neo-liturgical music, I humbly add my voice to the long lineage of composers who have set this poem to music, grateful for the encouragement they have provided to generations of performers and audiences alike.

Piece #7: *Selah* (2019-2020), for orchestra and handpan

The work is scored for an orchestra comprising one piccolo, two flutes, two oboes, one cor anglais, two clarinets, one bass clarinet, two bassoons, contrabassoon, four horns, three trumpets, two tenor trombones, one bass trombone, tuba, timpani, three percussionists (playing vibraphone, chimes, glockenspiel, xylophone, crotales, triangle, gong, bass drum, ratchet, wood blocks, suspended cymbal, crash cymbals, and vibraslap), handpans, harp, and strings.

This piece for orchestra and handpans is an experiment in combining diverse musical forces. Designed as the apex of the portfolio, *Selah* has provided the opportunity to hone my skills in orchestration whilst exploring the various ways to apply the notation system for

handpan within a full orchestral setting. This is the first piece of its kind to use a set of handpans with a complete symphony orchestra. It integrates the notational and compositional aspects explored in the portfolio. The scope of the piece, as well as the foray into combining such a wide variety of musical forces, moves into uncharted territory in the current repertoire.

Selah is influential in the experimentation and exploration of my second research question: 'how can the handpan be effectively integrated with other instruments and voices, in both traditional and electroacoustic composition?' In *Selah,* I have integrated the handpan with all the primary instruments of the symphony orchestra. Many of the composition decisions, outlined in more detail below, were made based on the way in which the handpan interacts with specific orchestral instruments or families.

Before we begin the specific commentary through the piece, an explanation of the title and a clarification of the form is necessary. Additionally, an understanding of the title and consequent meaning is important to the neo-liturgical context of this piece. In *Selah*, I explore the struggle between peace and conflict. Navigating the mêlée between calm and chaos seems to be a common challenge throughout life, especially in the arduous times of the global pandemic during which this piece was composed. In *Selah* the emotional material oscillates between periods of serenity, including the almost pastoral scene evoked at times, to the chaotic material that intermittently erupts. After these spasmodic eruptions comes a respective period of rest and reflection, and these serene interludes are the impetus behind the title *Selah*. In the book of Psalms, the Hebrew term 'Selah' seems to give the direction for a rest or pause for musical reflection (Lyon, 2018). These pauses for reflection are experienced in this piece through the sections that follow the chaotic clusters at Letters B, J, and S. After the sweeping presentation of the folk song at Letter V, the Selah-rest is ultimately expressed in the peaceful resolution from Letter Y through the end of the piece.

In writing *Selah,* I wanted to explore the idea of using the handpan as a solo instrument, with the virtuosity expected of a standard concerto, whilst also integrating the instrument as

another member of the orchestra. Though the solo nature of certain techniques lends itself to a typical concerto interplay between soloist and orchestra, the mellow quality of the handpan also allows it to blend well as a supportive member of the ensemble. My goal is that *Selah* demonstrates the handpan's ability to function as a featured soloist, whilst also merging seamlessly with other orchestral instruments. I hope to have shown that the handpan has the potential to hold a permanent place within the orchestral percussion family, available for composers to use its inimitable tone as they see fit.

To accomplish this goal of demonstrating the dual purposes of the instrument, I have striven to create a quasi-concerto, a piece that both features an instrument and also interweaves it with the other orchestral families. Well known examples of these quasi-concerti include the following representative pieces, with the respective solo instruments noted in brackets:

- Hector Berlioz (1848): Harold in Italy (viola)
- César Franck (1885): Symphonic Variations (piano)
- Vincent d'Indy (1886): Symphony on a French Mountain Air (piano)
- Camille Saint-Saën (1886): Symphony No. 3 (organ)
- Nikolai Rimsky-Korsakov (1888): Scheherazade (violin)
- Aaron Copland (1924): Symphony for Organ and Orchestra (organ)[28]
- George Gershwin (1924): Rhapsody in Blue (piano)
- Karol Szymanowski (1932): Symphony No. 4 (*Sinfonia Concertante*) (piano)
- Olivier Messiaen (1948): Turangâlila-Symphonie (piano; also ondes martenot)
- Leonard Bernstein (1949): Symphony No. 2 'The Age of Anxiety' (piano)
- John Adams (2015): Scheherazade.2 (violin)

Akin to Saint-Saëns inscribing his third symphony *'avec orgue,'* I consider *Selah* to be a piece for orchestra with handpan; the handpan is featured prominently as soloist, but it also sometimes functions and amalgamates as another member of the orchestra.

One important predecessor of this piece should be noted here, *Concertino Grosso,* written and performed by Manu Delago. Delago is an Austrian handpanist and composer, currently based in London. His piece was the first of its kind to combine handpan with the string section from an orchestra. The seminal performance of this piece included members of

[28] This was later arranged without organ and became Copland's Symphony No. 1.

the string section from the London Symphony Orchestra as part of the LSO St Luke's series in London. The *Concertino* started the process of combining handpan with a small chamber orchestra; my intention is that *Selah* will be the next step in integrating handpan with the collective forces of a full symphony orchestra.

Due to the large forces of this symphonic piece, and the intent for this unique interaction between the handpan orchestra, I felt it was especially important to make a detailed sketch of my ideas for the piece before writing. This sketching process, which is not a step I typically take, proved to be a valuable exercise in thinking of the 'big picture' and form from the start. In addition to the overall shape of the piece, I also sketched the ideas for several of the main motifs and gestures that would shape the narrative of the music. The instrumentation and idiomatic techniques were something about which I wrote notes in my sketch as well.

There are three elements to *Selah* that I envisage as pillars for support and unification. The first is the frequent use of metallic percussion. According to the Hornbostel-Sachs Instrument Classification System, the handpan is a metallic struck idiophone that, I hope, will find a regular place amongst the metallic percussion instruments of the orchestra (MIMO Consortium, 2011).[29] Because of this, I have incorporated many other metallic struck idiophones in the orchestration: vibraphone, chimes, glockenspiel, crotales, triangle, gong, suspended cymbal and crash cymbals. Whilst writing this piece, I found the combination of metallic instruments, and the resulting overtones they generate, to be a fascinating combination. The complexity of overtones produced when metallic instruments perform together is almost surreal, and the effects were the perfect fit for the otherworldly effects I occasionally wanted to include in *Selah.*

Another unifying aspect of this piece is the motivic function of the minor seventh chord. As noted below, the minor seventh is found in the first and penultimate bars of the folk-like theme. This minor seventh accompaniment is found throughout the piece as well.

[29] The handpan is in the Hornbostel-Sachs category 111.24, 'Directly Struck Idiophones: Percussion Vessels,' (MIMO Consortium, 2011).

The violins emphasize the minor seventh interval and the resulting C-sharp minor seventh chord creates the accompanying texture from bars 2 through 11. Another example of the minor seventh is found in the horn accompaniment in bars 6 through 8, and again in bars 11 through 13. The melody played by the handpan (bar 6), the cor anglais (bar 8), the first flute (bar 29), and the vibraphone (bar 34), amongst countless others, present the minor seventh chord outline clearly as a motif throughout the piece.

The final unifying material is the folk-like theme song is discussed in detail below. This melody, created to sound like a folksong, was limited to only pitches that are playable on the handpan (Figure 7.16). *Selah* is primarily based upon this one main theme, which is foreshadowed during the majority of the composition. The development of this melody is the impetus of the piece, and its many variations and derivations can be found throughout. The folk-like melody is not presented in its complete form until the penultimate section, when it is played by the violins and piccolo at Letter V (beginning at bar 216). The melody represents the tranquillity and rest found in the peace of *Selah.*

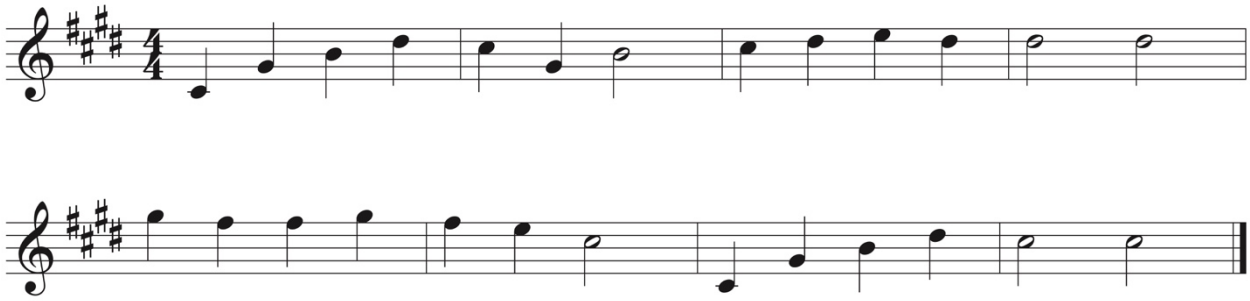

Figure 7.16. The folksong-like melody in *Selah.*

The piece begins with a demisemiquaver flourish on the handpan, outlining the pitches of the primary motif of the folksong-like theme. The undulating string milieu that follows from bar 2 onward creates a serene and tranquil backdrop for the following dialogue between the handpan and the cor anglais. At Letter A (bar 6), the handpan presents a deconstructed version of the folk melody. In the interchange that ensues, the cor anglais takes a snippet of

the melody and adds a descending whole tone scale, further ensconcing this opening section in an Impressionistic style. The sound of distant horns, outlining the crucial minor seventh interval, complete the pastoral scene of calm and rest, reminiscent of Debussy's *Prélude à l'après-midi d'un faune*.

At Letter B (bar 21), the sense of serenity is jarringly interrupted by three dissonant pillars of sound, cacophonous chords that represent the unexpected distress and circumstances in life.

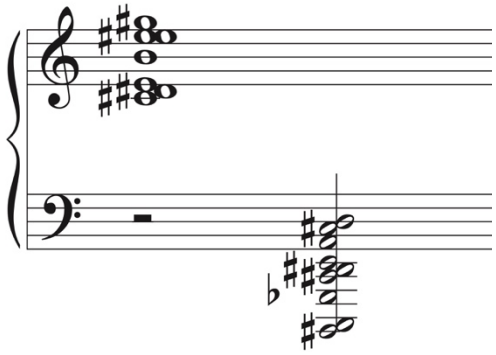

Figure 7.17. Chord clusters at Letter B (bar 21).

This cluster is made up of every note in the chromatic scale, save three: F-sharp, G, and B. Those three missing notes are added in the upcoming parallel sections, to build increasing dissonance and volatility. In addition to the full brass section and low woodwinds that are part of the cacophony at Letter B, the percussion section also plays a vital role, namely in the timpani, ratchet, bass drum, and gong parts. The gong is the featured metal instrument in this section, and its reverberant, jarring nature serves as a perfect complement to this discordant part of the piece. Additionally, the handpan plays its most percussive and fulgurating technique here, the 'tak,' which is a harsh snapping affect that pierces the orchestral texture like an arrow.

One element that evolved a good deal from the sketch stage to the final composition was the large pillars of sound meant to be interruptions to the otherwise relatively serene texture. In my initial sketch, these walls of sound were distinctly separate events, unrelated to

the material that came before and after. However, though it admittedly took some convincing, my advisor showed me how sudden, jarring events like these do not happen in music without some repercussions. Another way of thinking about this matter is to ask the question: 'what is the sense of consequence of the three big chord clusters?' I worked through the idea of the material fragmenting and shattering during these three cluster chords. Then I considered how the narrative might be richer if the dissonance had time to 'reverberate' after the clusters. This led to the vision for the dissonant chords to continue on in certain instruments whilst the texture transitions into the next section.

So at Letter C, the effects of the chaotic chords continues and are still felt, which I visualize like an earthquake's aftershock. Measures 24 through 28 represent the recovery period that must follow when life has been affected by a crushing blow. The dissonant clusters linger in the horns, which become increasingly unified and eventually settle into the tonic C-sharp minor 7 chord in bar 29. The violins enter feverishly after the chord clusters, with a frenetic energy that embodies the feeling of uneasiness after earth-shattering events. The harp quietly enters with a gently rolling triplet figure, like a flowing stream, unphased by the dissonance that just took place. A new percussion sound, the wood block, mimics the harp's triplet figure, perhaps moving the narrative to a more protected sylvan refuge. Underlying the transition occurring here is the handpan, now playing a more orchestral rather than solo role (Figure 7.18). The handpan's gentle melodic outline foreshadows the peaceful, expansive melody that the oboe introduces in the section at Letter D. In bar 27 and following, the oboe proffers a melody based on the intervals of the folk tune, but presented here in a different rhythm. The calmness of the opening section at Letter A eventually returns.

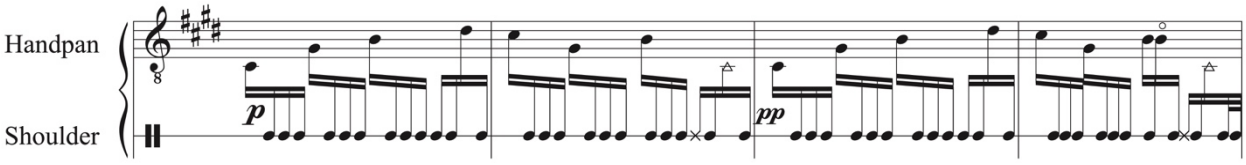

Figure 7.18. Accompanying handpan figure, bars 25-28.

In the section at Letter D, the horns and low woodwinds also foreshadow the ascending motif from the chorale melody that will be fully presented at Letter T (bar 162). The ascending scalar material forms the background material that supports the oboe melody. Just before Letter E, in bar 34-35, the violins and vibraphone take over the original motif with a large sweeping gesture.

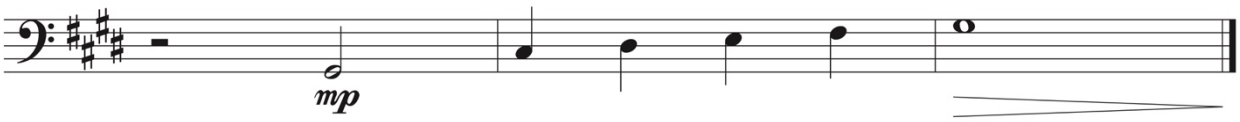

Figure 7.19. Motif played by horns and low woodwinds throughout Letter D.

At Letter E (bar 36), brief interruptions of the tranquil environment serve as a reminder that, despite the relative peace, not all is well. The flutes and oboes play descending whole-tone scales reminiscent of the lolling cor anglais melody from Letter A, but this new iteration of the familiar scale has a more angular rhythm and acerbic tone. Vibraphone, bassoon and clarinet all present the handpan's original motif around Letter F, in the midst of the undulant motifs that encircle them.

Measure 45 and following serves as a revisiting of material from the pastoral opening at Letter A. The handpan, back as the prominently featured soloist, dabbles again in motifs based on the folksong-like tune. The dialogical response in this section, however, is circulated between various woodwind soloists, each progressively a bit less tonal than its predecessor. The vibraphone, chimes and triangle are prominent in this section again as well, with their various metallic tones both bolstering and contrasting with the handpan.

Brass soloists enter boisterously at Letter G, in the first section truly featuring the brass family. After a dramatic fanfare-like entrance, angular motifs abound with dotted rhythms and whole tone leanings, passed between trumpet and horn soloists.

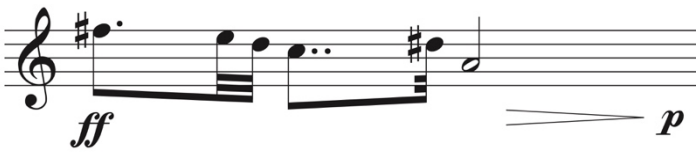

Figure 7.20. Trumpet and horn motif (bar 67).

Further development of this motif continues and builds until another chord cluster outburst erupts at Letter J (bar 79). Like the parallel surge at Letter B, this section contains a near-fully chromatic cluster, but a difference in this iteration is the addition of high woodwinds, as well as an active rippling vibraphone part outlining the principal motif.

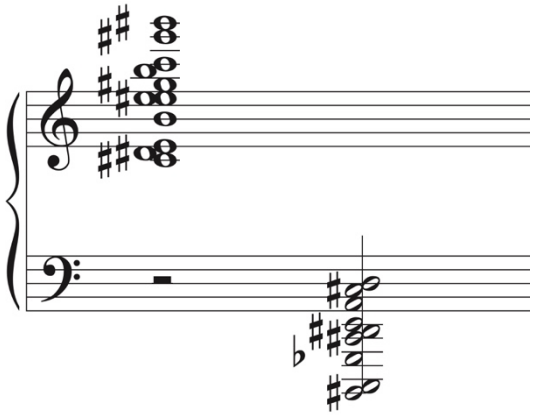

Figure 7.21. Chord clusters at Letter J (bar 79).

Following the second eruption of these chaotic chords, the dissonant clusters linger, this time in the oboes, cor anglais, and second clarinet. The remaining clusters become increasingly tonal and eventually reach the tonic C-sharp minor 7 chord in bar 87. In bar 82, the violins play high clusters as well, transitioning from the dissonant chords to a new background texture at Letter K (bar 86). As part of the transition the bass clarinet, bassoon, horns and chimes again foreshadow the chorale melody here.

At two bars after Letter K, the clarinet enters in with a tune that is a counter melody to the original folksong-like tune. It is slower moving than the primary tune, and has a more expansive, rustic feel. Though this countermelody is the principal focus, the original tune is still present, concealed surreptitiously in the viola line. In this section the handpan again

reverts to its role as an accompanying ensemble member. The part here is reminiscent of an ostinato and contains deconstructed elements of the primary theme.

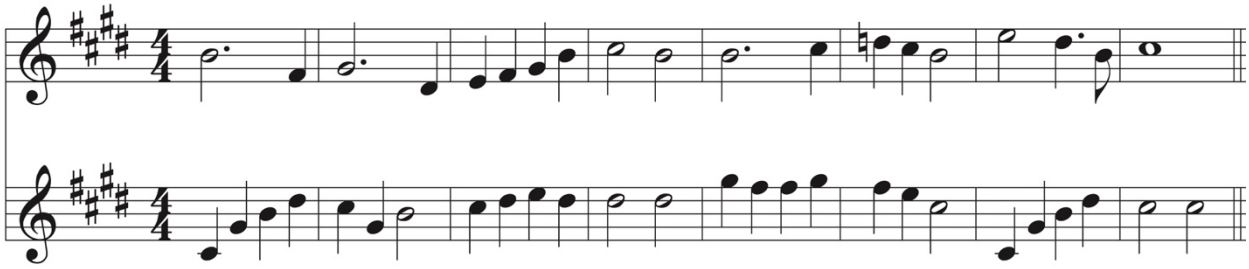

Figure 7.22. Counter-melody (top staff) paired with original folksong-like melody (bottom staff), beginning with bar 88.

At Letter L (bar 95), the violins, violas and piccolo take the lead with the secondary melody, followed in canon by the cor anglais, bass clarinet, and bassoons entering in bar 96, and the celli and double bass entering in bar 97. This canon creates some stimulating tension, including oscillation between traditional tertiary harmony and quartal harmony. Another notable element is that the violins have the primary melody for an extended period; in short, this is the first time in *Selah* that they function in their expected historical role in the orchestra.

As the effervescent backdrop for this melody in canon, many of the higher woodwinds present a sparkling milieu. Moving generally in staccato semiquavers and demisemiquavers (bars 96-103), the flutes, oboes and clarinets present a bubbly accompaniment that is a quasi-canon in its own right. The accompaniment motif is made up of a diminution of the note values of the secondary melody, followed by the minor sevenths that are a hallmark of the original folksong-like tune. This section is a scene of peace and abundant life, following the recovery from the chaotic material at Letter J.

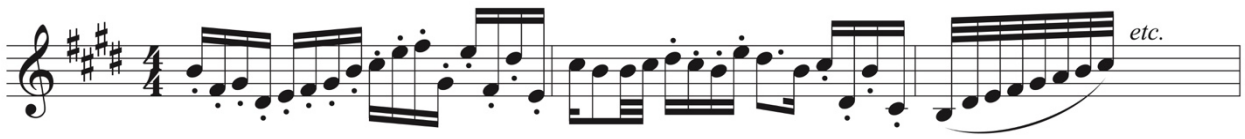

Figure 7.23. Countermelody in high woodwinds, beginning in bar 96.

The material at Letter M (bar 104) takes on an entirely new character, with fluctuating metres, sudden changes of instrument families, representing the uncertainty of the journey even in the midst of the tranquillity of the preceding section. The handpan is featured here, especially since it is played on the gu side for the first time in this piece. The quickly changing techniques and various effects produced on the underside of the pan make this passage quite virtuosic indeed. This part of the piece is the time for the handpan to shine whilst its rhythms and techniques are reinforced by a colourful orchestration.

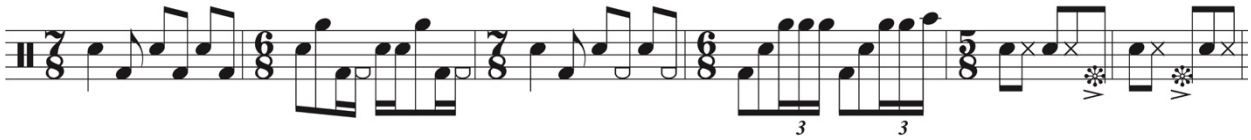

Figure 7.24. Handpan part, played on gu side, at Letter M (bar 104).

A jaunty trumpet melody comes to the fore at Letter N (bar 112), made up of some common traits of the other slower melodies, namely minor sevenths and whole tone scalar material. Underlying the brass featured here, the strings play the folksong-like melody very softly, with violins playing pizzicato and violas, celli and double basses returning to arco. The violins play Bartók pizziticati in bar 116 to highlight the trumpet melody, and the metre temporarily shifts into 6/8 time. Another layered element is in the bassoons: they play a version of the secondary melody from Letter K, but this time in an altered rhythm.

This material continues to develop, gradually increasing in intensity and thematic diversity, until the nearly the full forces of the orchestra are engaged at Letter P (bar 134). As the tension continues to mount, nine different elements are combined in various ways throughout this section. This list given here is enumerated from the most foundational parts to the most ancillary parts. First, the handpan provides rhythmic, driving virtuosic texture throughout this section. The instrument is also held vertically here, which allows it to be played on both the melodic ding side as well as the percussive gu side simultaneously. A variety of techniques and effects are used here through the section at Letter P. Second,

running through this entire section is a C-sharp natural minor scale in tremolo quavers that begins as low as C#1 in the double basses and reaches its apex on C#7 in the violins. This scale is played by the complete string section, bassoons and bass clarinet in their respective ranges, trading off based on the best register for each instrument. Third, the violins and violas have running semiquavers or demisemiquavers that fill in the harmonic and rhythmic substance missing from the other sections as needed. Fourth, the bass trombone, tuba and timpani play acerbic, biting accented notes in sevenths that cut through the orchestral texture. These accents are also highlighted in the handpan part. Fifth, the tenor trombones initially begin with descending glissandi that begin on alternating neighbouring minor seconds. After this, they join the bass trombone and tuba in playing accented octaves that pierce through the orchestra at a fortissimo dynamic. Sixth, the primary melodic focus of this section is found in the trumpet section, which promulgates the melody from Letters M and N amongst its members. Marked at fortissimo and played in the high register, this bold melody intentionally rises above the rest of the orchestra to create focused energy and dramatic tension. Seventh, the horns fill in the background texture by playing a shortened version of the chorale that will be the featured melody at Letter T. The symbolism here is that even in the midst of the growing chaos of life represented in this section, the tranquillity and calm of the chorale can still remain as an underlying source of peace and comfort. Eighth, the clarinets have a rhythmically altered version of the secondary theme here, which is interspersed with elements of the trumpets' rhythmic activity as well. And finally, ninth, the piccolo, flutes and oboes carry on with the triplets and sforzandi material that they initially played at Letter O.

All of these nine ideas and textures grow more active and chaotic throughout this section, increasing in intensity until reaching another eruptive point at Letter J. The three pillars of chord clusters return, now reaching a fever pitch with the full orchestra participating in the chaos representing earth-shattering events. The addition of the strings finally brings this

gesture to the highest level of force and power. In addition to the now fully chromatic clusters, the glissandi in the chimes add a new metallic timbre to the overall sound.

Out of this ultimate chaotic movement of the pillars of sound, a brass chorale emerges from the clusters (Figure 7.25). I find the chorale to be one of the most peaceful and contemplative types of music, perhaps because of its association with the sacred music of Bach and the Baroque era. There is something soothingly atavistic about the voice leading and harmonic progression of chorales, communicating stability and constancy. As a way of showing the ripple effect and time for recovery after the clusters at Letter S, some echoes of the chaotic chords are superimposed in the chorale in bars 167, 173 and 177.

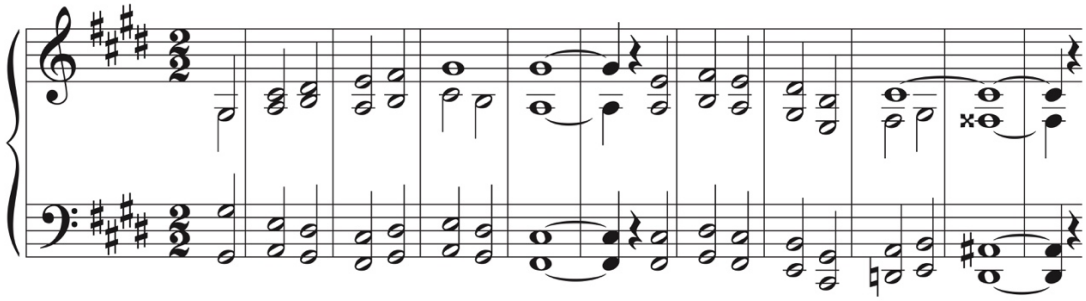

Figure 7.25. Reduction of the chorale section, from *Selah*, bars 162-172.

In earlier drafts, this chorale section initially came earlier in the piece, before the third eruption of chord clusters. My first vision was that the chorale would be interrupted by the third group of clusters. However, after some reflection and with the approval of my advisor, the initial ordering of events did not seem to provide the right momentum. The narrative and momentum did not have the right feeling or energy. This is, to some extent, a matter of taste, but the pacing of the big clusters and interruptions is extremely important in a composition like this. The process of fragmentation of ideas and then their subsequent reintegration is vital to the narrative direction of the piece. It was for this reason that the reordering of some of the material helped in the overall shape of the composition.

The chorale tune concludes in bar 211, after the addition of strings, chimes and harp to provide momentum and direction in the final phrase. In bar 211, the timpani and bass drum

enter and serve as a nearly inaudible pedal point under the quasi-cadenza played by the handpan in bars 212 through 215. Since this piece is a quasi-concerto, a full cadenza seemed out of place. Still the short virtuosic passage here provides the handpanist with an opportunity to demonstrate technical skills and to play with great élan right before the climactic moment of the piece. A dramatic scale from the woodwinds, strings and harp usher in the final section.

At Letter V, I have striven to create a sense of warmth, joy, and peace by combining various elements that have come before. This is meant to be a contrast to the orchestration at Letter P. At P, motifs are combined but in a way that creates chaos and disunity. At V, the intent is that the similar elements are combined in a way that expresses warmth, hope and a sense of triumph and confidence in the face of adverse circumstances.

For the first and only time in the work, the primary folksong-like theme is presented in its entirety, played by all the strings in octaves (with the exception of the double basses), as well as the piccolo, second and third trumpets, and chimes. The woodwinds play a varied version of their effervescent material from Letter L, this time as a peaceful complement to the primary melody. The horns primarily have triplets in a voicing that is similar to their role in the chorale texture of the sections at Letters V and T. Trombones and tubas add occasional biting accents that pop through the texture, as a reminder of the chaos and pain that was represented in sections before. Also, the first trumpet plays fragments of the acerbic melody first presented at Letter N. In the build-up to bar 220, horns and trombones join forces to present an heroic swell that surges through the orchestral texture.

All of this material intensifies and escalates through the remainder of the section, burgeoning into a climatic zenith of joy at bar 226. This apex represents the resilience of the human spirit, the *joie de vivre* in the midst of tumultuous and chaotic times. The trumpets and horns have one last emotional peroration as they present a final fanfare in bar 226. The strings and woodwinds express joy through their active semiquaver and demisemiquaver effervescence, and the handpan reaches its zenith through a flurry of virtuosity.

The dénouement begins in bar 228 as the woodwinds and brass fade out. The strings slow their pace from tremolos and semiquavers to quavers, and the percussion retreats into nearly inaudible rolls. At Letter X, a series of semibreve chords alternate between various sections, providing the handpan with a gentle backdrop. This lighter texture allows sonic space for the handpan to demonstrate some more subtle sounds, including the use of harmonics, softer techniques, and the various timbres of the different pans.

In bar 235, a return to the dominant G-sharp major chord, last heard at the climax in bars 226 and 227, ushers in a short recapitulation, loosely returning to the opening material and texture of Letter A. Here the handpan alternates again with various wind soloists and sections, all the while decreasing in dynamics and intensity. This is interrupted by a final upsurge from the horns and trumpets, leading into a swelling E Major 7 chord in bar 245. A horn solo in bar 247 brings the piece back to the original motif, moving from a B-flat major tonal centre that resolves surprisingly to a deceptive cadence of a G Major chord in the horns. This is followed by another swell from the strings, harp and percussion. Finally, the handpan and bassoon join to present the original motif of the folksong, returning to the original key, in bar 250. The final moments of the piece include a full orchestral swell, resolved now to a C-sharp Major chord widely spaced throughout the entire range of the orchestra. The last word goes to the handpan, playing the final C-sharps with the vibrato effect, representing a sigh of relief having come through the vicissitudes of the journey and finally arriving a *Selah*, a sense of veritable musical calm, reflection, and rest.

Chapter 8: Conclusion

Through this course of study, the handpan has proven to be a source of intriguing and distinctive sounds as a developing member of the percussion family. The handpan is the catalyst for many of the meditative qualities that have been explored in this portfolio. Through the neo-liturgical pieces mentioned above, I hope to have created a foundational resource of notation, techniques, and vocabulary for handpan. The intent is that this work will be a beneficial repository of information for percussionists and composers for years to come.

Research Questions

At the conclusion of any course of study, one must return to the original research questions. In the section below, I will consider the three primary questions, which were first outlined in the introduction, and the ways in which each has been answered.

- What developments can be made to standard notation in order to communicate the many techniques and effects playable on handpan?

I have made some strides in adapting Western notation to express the techniques and effects playable on handpan. The description of these techniques and effects, as well as their current notational representation, is described in detail in Chapter 6. For example, for the ding side of the handpan, I have developed a system of expressing both tone field notes and 'filler' material by the using a bracket to join the standard five-line staff with a single line staff, uses percussion (i.e. non-pitched) clef. For the gu side, through experimentation, and with guidance from Aaron Marsala, I have organized a system of notation that will aid communication between composers and handpanists. Additionally, I have also developed twenty-five symbols that refer to various techniques playable on the handpan. My intention is that the information found here could be used by composers interested in writing for handpan as a starting point for their research. The most extensive application of these notation

developments may be found in *Triptych Meditation, La Création du monde, Magnificat,* and *Selah.*

- How can the handpan be effectively integrated with other instruments and voices, in both traditional and electroacoustic composition?

Another research question dealt with the extent to which a handpan can interact with other instruments and voices. I have demonstrated the answer to this question through both the traditional and electroacoustic pieces in this portfolio, outlined in detail in Chapter 6. Through the process of writing this music, I have paired the handpan with nearly all of the standard instruments of the Western orchestra (in *Selah*), as well as with piano (*Magnificat)*, organ (*La Création du monde)*, and voices *(Magnificat)*. Additionally, in the aleatoric pieces *Le Feu de la Pentecôte* and *Meditari*, the potential for pairing of handpan with other instruments has proven to be essentially limitless.[30] In two pieces, *Lux aeterna* and *Meditari,* samples from the handpan have been recorded and manipulated in an electroacoustic medium.

The practical answer to the research question has been given through the creation of each of the compositions in this portfolio. Interestingly, I have found that some instruments pair especially well with the handpan. One discovery was the unique combination of the organ with handpan, explored in this portfolio in *La Création du monde*. A very colourful interaction between these instruments came about, due in part to the inimitable overtone series of the handpan. The combination of handpan with organ, both with the 'traditional' pipe sound, but also with the organ chimes, produced a variety of tone colours that to my knowledge had not been explored up to this point. The live perspective seems to differ somewhat from the sound that came through on the recording. In the future, I would strive to control the environment of the recording a bit more than we were able to do in the church location used for this session. Due to the nature of the space, including acoustic

[30] In the premiere recordings of these pieces, the ensemble included instruments as diverse as the reverse action piano harp, accordion, saxophone, kora, and electric guitar.

considerations and building ‘creakiness,’ we had less control than in a typical recording studio. This is the challenging nature of recording organ music, especially when making strides in combining rather disparate instruments. Still, some of the live tone colours and instrument interactions came through the recording quite well.

Regarding orchestral instruments and their pairing with handpan, I have made some initial strides in exploring the unlimited potential of these combinations. My experimentation with orchestral colours and instruments took place in this portfolio through the piece *Selah.* Through my course of study, I experimented with how the handpan can function as a soloist with orchestra, with proper balancing of the orchestration and the potential need for amplification of the handpan. The handpan can also function quite well within the background orchestral texture, blending seamlessly with strings, horns, and light woodwinds. The gentle percussiveness of the handpan strike creates a distinctive texture amidst a legato articulation from the strings and winds. Other aspects of the pairing of handpan with various instruments were discussed in the preceding chapter. This area of uniting handpans with other instruments is a largely uncharted territory, ripe for further developments in research and composition.

- What are principles of meditative music and how can they be applied in neo-liturgical composition?

The third question for this portfolio originated with the observation of meditative qualities associated with handpan music. The research question involves defining the principles of meditative music and practically demonstrating how they can be applied in neo-liturgical composition. As outlined in Chapter 5, in addition to reading about meditative and neo-liturgical music, I found many examples of music that was considered meditative in quality to study. Through observation and experimentation, I discovered four characteristics of meditative music, which are described in greater detail above: cohesion, repetition, instrumentation, and duration. The pieces in this portfolio apply those principles to varying

extents, based on the nature of the respective composition. Some types of meditative music fit under the broad neo-liturgical heading. Therefore, I defined and clarified the term neo-liturgical as a categorisation of music that incorporates sacred themes but is meant to be performed in a concert, instead of religious, setting. The pieces in this portfolio fall into the neo-liturgical category.

Potential for Further Research

The handpan has only just begun to be explored as an academic field of study. Because of this, many related topics are in need of additional research. One such area is the continued development of notation. A question still remains regarding the adaptability of notation to the many different scales represented on various handpans. A combination of the notation described in this commentary as well as some type of tablature layout is worthy of further consideration as a next step. This would provide greater adaptability of music from one handpan to another. Related to this area is the development of a fully chromatic handpan or set of handpans. The potential for handpan composition is considerably expanded if all twelve notes of the Western scale were readily available.

The notation explained above could be developed for pedagogical purposes into a handpan method book. Some recent strides have been made in this area for beginning handpanists, even since I started this PhD, by the handpanist-educators detailed in Chapter 2. Pedagogy for intermediate and advanced levels could also be explored further, as well as the implementation of a more robust system of notation than has been previously published.

Additionally, a sociological and ethnographical study of handpan players may prove useful to the fields of composition and pedagogy. Only anecdotal evidence exists regarding the culture, background and demographics of handpan players. Further research in this area could inform the direction and scope of music composed for handpan.

A final area for further progress harkens back to the initial goal that Aaron Marsala and I had as we started working together. Our intent is to encourage percussionists to pursue

handpan as another reputable course of study, at the college level and above. As the discipline of handpan training continues to build momentum, the music in this portfolio is presented as a small stride for the potential repertoire that can be developed for the instrument. I hope to have contributed new knowledge to the fields of percussion performance, collaborative composition, music notation, and neo-liturgical music in a way that will influence generations of future musicians to discover the joy of composing music for handpan.

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