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Seven Towers:
An Orchestral Cycle focused on Different Musical
Temporalities

Cécile Marti

Submitted for the Degree of Doctor of Music (DMus)

Guildhall School of Music and Drama
Department of Composition

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p. 48, Example 15- Felice Varini's 'Ellisse nel Trapezio'

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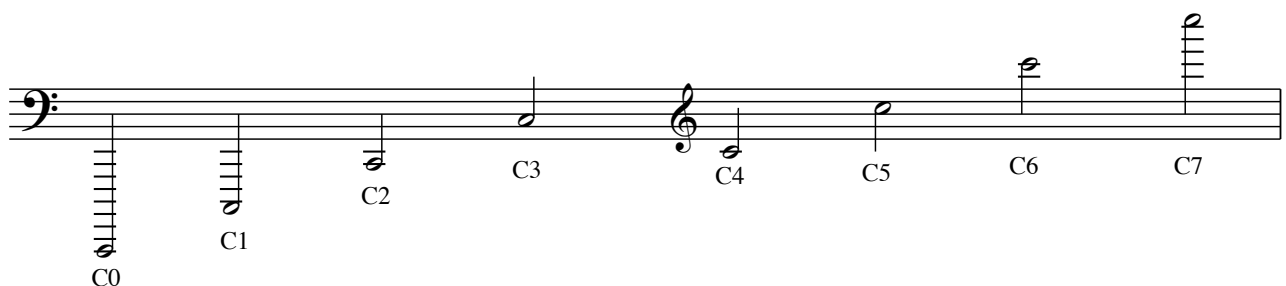
Submitted Work

One Score and one CD

Seven Towers 1 - 7: Cycle for large Orchestra and Choir, Seven joined Pieces by Cécile Marti, 2012 – 2015.

A Note on Octaves

Octaves are identified with various naming systems. Among the most common notation is *scientific pitch notation* which is used in this work. The pitch's octave is identified starting at sub contra (c_0)-contra (c_1)-great (c_2)-small (c_3)-1 line (c_4)-2 lines (c_5), etc.(see example below).



Abstract

This dissertation examines formal aspects of a seven work orchestral cycle. The composition is structured as a series of distinct pieces which can be played either independently or as one uninterrupted musical performance lasting 78 minutes. The temporal dimension of music is a determining factor in both the composition of music and its perception by the listener. This issue is particularly acute in the case of such a substantial, uninterrupted musical statement; therefore I have had to examine questions of temporality in some detail whilst composing this cycle. In the following research I try to distinguish different temporal structures from each other and show how they can shape music differently. Temporality will be first discussed in a wider context within the field of music generally. This is followed by a discussion of the seven different types of time exemplified in the seven pieces of the orchestral cycle. To achieve coherence throughout a cycle of 78 minutes' duration, one needs some linking elements. Some of these elements will be illustrated in the musical analysis of the cycle itself. This research aspires towards a deeper understanding of musical development in time. It is possible that the typologies might have a wider applicability and assist other composers to shape music over longer durations such as those I have employed in this cycle. This research can possibly also give some further indications as to how the listener might follow music over large spans of time.

1. Introduction

The desire to write a piece for orchestra lasting the full length of a concert grew over several years. A first step relating to the idea of writing a piece of large scale format occurred when my first orchestral piece *Bubble Trip* was rehearsed in Germany in 2008. When the work was played, I realised that the end of the piece was too short. As a result of this experience I transferred the musical idea of the end of this piece to the start of my next work, the violin concerto *AdoRatio*, which I began one year afterwards.¹ Through this unusual experience, I became more engaged with the idea of linking discrete pieces and combining them into a single continuous sequence. Another stage in confronting the idea of large scale time format occurred through attending several concerts. The “composer’s portrait concert” is a common type of new music event. In addition, programming series of concerts of one composer’s music of romantic repertoire and early 20th century’s music increases in popularity. It is not uncommon to experience more aesthetic and musical satisfaction listening to a single composer’s music over a whole concert than in more mixed concerts. One of the most striking was at Lucerne Festival 2010, featuring a trilogy of orchestral pieces performed lasting about 30 minutes in total, written by the composer in residence Dieter Ammann; it was played by the Lucerne Festival Academy conducted by Pierre Boulez.² After hearing the work, I realised I would have preferred to listen to more music by Ammann for the rest of the concert; consequently I left the hall.

¹ As it finally turned out, at this time I linked four pieces into a cycle, each one continuing material from the preceding piece to the following one. The pieces *Bubble Trip* (for orchestra), *AdoRatio* (violin concerto), *ProLogus* (violin solo), *Wave Trip* (for orchestra) are linked and formed to a unity that they can be performed either as single pieces or as an ongoing piece of 60 minutes duration. The pieces are written between 2004-2011 and have all been premiered as single pieces, but not yet as a continuous cycle.

² The concert took place at KKL Lucerne on 25 August 2010 and the program included: Anton Webern, *Passacaglia* for orchestra op.1 and *Variations* for orchestra op. 30, Dieter Ammann, *Core - Turn* (world premiere) - *Boost* for orchestra, Alexander Scriabin, *Le Poème de l'Extase* op. 54 for orchestra.

I then became obsessed with the possibility of realising a concert-length cycle of orchestral pieces. To devote an expanded period of time to one project released the creative freedom to concentrate how musical material develop over a whole evening. In a modern context, it is comparatively rare to encounter contemporary music of large scale format.³ By large scale format I think of pieces lasting at least one hour. One single movement orchestral pieces lasting over thirty minutes – Morton Feldman's *Coptic Light* reaches just a thirty minutes – are still of rare occurrence. Perhaps the rising predominance in 20th century music of this genre can be seen as a starting point for the use of increasingly long durations. A significant number of orchestral cycles, appearing in the second half of the 20th century, also demonstrate a tendency towards long time spans.⁴ The 2013 Donaueschingen Music Days had as its theme large scale pieces, culminating (among other premieres) in three new commissions of compositions each lasting a whole concert up to a length of seventy minutes. The idea of large scale format pieces can arguably be traced back to the 19th century, but is outside of the scope of this research. The focus of the present submission is not a historical exploration of the evolution of large scale orchestral pieces, but rather a personal creative exploration of the possibilities inherent in expanded musical developments evolving over the course of a single evening.

Originally the *Seven Towers* were devised to be composed as one single movement piece. I split the pieces into seven parts because of the fact that I initially started this work without commission of a performance. Thus, I decided to structure the composition as a

³ Morton Feldman wrote several chamber music pieces of unusually long duration in the early 80s, e.g. *For Philip Guston* scored for flute, percussion and piano (1985, lasting 4 hours) or the *String Quartet II* (1983, lasting over 6 hours).

⁴ Gérard Grisey's cycle *L'Espaces Acoustiques*, composed 1974-1985, is one of the best-known such cycles. This cycle already introduced the idea of joining movements together to form a continuing development, e.g. the final page of the 2nd part of this cycle, *Périodes*, becomes the opening page of the 3rd piece, *Partiels*.

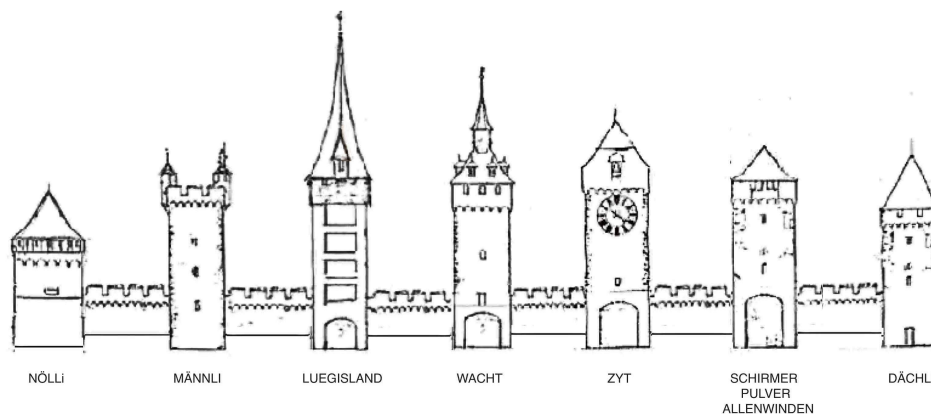
series of pieces which could be played independently by several orchestras. However, the outcome of the whole project was a cycle of seven distinct pieces which are linked to each other; they can be performed either separately or continuously as a large scale single work without a break between the seven pieces. Within the overall seventy-eight minute duration, each single piece lasts between six and nineteen minutes. The observation and differentiation of temporal development over the course of the entire cycle of pieces is the focus of this research. Several characteristics of temporal types are established which build a red thread across the whole work. Each of the seven pieces explores one of the established temporal types (for an explanation of the Seven Temporal Types, please see section 1.5 and 1.6). The fundamental question of how temporality may function in new music will be discussed first. The different time types will then be described in detail. The core of the discussion will be the deployment of these temporal types within the compositions of all seven pieces. Through this research I aim to achieve a deeper understanding of the relationship between large scale form and the temporal development of music.

1.1 The Composition Project and Title

At the time I began to compose the first piece of the orchestral cycle, the question of the title became important as a focus of my creative research. The very first inspiration was *Seven Towers*, reminding me of the beautiful chain of towers in Lucerne where I lived for many years. This chain of towers, called the *Museggtürme* (see drawing below), consists of nine towers joined by an 870m long thick wall and was built between the 14th and 18th century. Seven of the nine towers show a different shape and each tower has its own name: for example the 5th tower is called *Zytturm* ('tower of time'). What fascinates me is

the diversity of format within a unity. I considered devoting each of my pieces to one of these towers, but to build a project with nine parts within an overall 78 minutes would have shortened the duration of the pieces excessively. Seven orchestral pieces allowed me to write music of more extended durations; consequently this seemed a more exciting and appropriate compositional format for this temporal and formal research. I preferred to keep the idea of a chain of towers simply as a personal reference point throughout the creative process.

*Example 1: Museggtürme*⁵



A tower is characterised by its height and shape. It is structured internally either as a single open space, sub-divided into levels; or else it may include a spiral staircase to move upwards or downwards. The image of a tower split into several levels generated an interest in differentiating the musical spaces I was composing. In this way, the first part of the concept for my project, the micro-structure, was established: *Seven Towers 1 – Seven*

⁵ *Museggtürme* (known as well as *Museggmuer*) consists of two joined words: *Musegg* is the name of the hill where the towers are placed and *türme* means towers. The names of the towers are called and written by a Swiss dialect. The drawing of the structural facing of the towers are partly reproduced and illustrated here with permission. Verein für die Erhaltung der Museggmuer, (2012), *Die Türme* [Online]. Available from: <http://www.museggmuer.ch/index.php?id=2> [Accessed: 28th November 2014]

Spaces (ST1). I divided this into seven sections as an equivalent to the macro-structure of six further pieces in succession (*ST2-7*). The overall idea was to invite the listener to walk imaginatively through all seven different spaces, experiencing their diverse atmospheres in a shorter time span.

The term *space* is commonly used in describing both music and time. In daily language we describe temporal changes through spatial metaphors which relate changes to a before and after in space. The French philosopher Henri Bergson⁶, who has written extensively on time relating to space, asserts: “[...] We set our states of consciousness side by side in such a way as to perceive them simultaneously, no longer in one another, but alongside one another; in a word, we project time into space, we express duration in terms of extensity, and succession thus takes the form of a continuous line or a chain, the parts of which touch without penetrating one another.”⁷ As he implies, we experience time or duration – which is stated as the same - as a simultaneity of succession extended in space. For instance, he points out that we experience a melody consisting of a succession of tones as a whole, as if perceived simultaneously.⁸

Space has multiple definitions: as ‘an interval of time’, ‘a continuous area or expanse’ or ‘the dimensions of height, depth, and width within which all things exist and move.’⁹ The concept of a *sounding space* is a designation that corresponds to our habit of

⁶ Henri Bergson (1859-1941) was one of the most influential French philosophers of the late 19th century - early 20th century. His philosophy emphasises duration as the basic element and creates the leitmotiv of *élan vital* “vital impetus” the evolutionary process of natural growth.

⁷ Bergson, Henri, (1971), *Time and Free Will, An Essay on the Immediate Data of Consciousness*. Translated by F. L. Pogson, George Allen & Unwin, (first publ. 1910), p. 101

⁸ Bergson, Henri, (2013), *Philosophie der Dauer*. In Gilles Deleuze, (ed.), Felix Meiner Verlag Hamburg, (first publ. 1957), p.28

⁹ Oxford Dictionaries, (2014), “space”. *Oxford Dictionaries* [Online]. Available from: <http://www.oxforddictionaries.com/definition/english/space> [Accessed: 5th July 2014]

thinking of music as moving through something – e.g. in vertical space from a lower position to a higher one in terms of pitch, or in terms of time in lateral space – perhaps even from left to right, as in Western music notation. A *sounding space* is also the framework within which, and through which, the actual sequence of musical events is shaped through time. Erwin Stein pointed out: “Music extends in time, and a span of time filled with music is a real thing, as a sculpture is in space.”¹⁰

While exploring and discovering the differences of temporal transformation I found that at least seven types were clearly distinguishable. I kept seven in the title of my cycle of pieces as this number became an increasingly significant element in the entire structure of the cycle: the seven spaces of the first tower, *ST1*, became the seven towers of the whole cycle, and both of these sets of seven directly embodied the seven types of musical time.

1.2 Temporality

Temporality may be defined as the study of the passing of time, as we experience it, the change of one present moment to the next present moment. Depending on how moments are shaped and how a moment can be perceived, the notion of time might be deemed a subjective experience. Bergson describes time as the real duration as the experienced time or clock time. For him, time is experienced indivisibly as an uninterrupted continuity.¹¹ Bergson’s writings may well have influenced Karlheinz Stockhausen’s intensive studies of musical time and duration, as there appears to be some overlap of terms and thought. Stockhausen writes that “we experience the passing of time in the intervals between

¹⁰ Stein, Erwin, (1962), *Form and Performance*, Faber&Faber, London, p.38

¹¹ Bergson, Henri, (2013), *Philosophie der Dauer*. p.28

changes” – a somewhat Bergsonian notion. He calls the duration of time *Zeitdauer*. By *Zeitdauer* he means the distance or – as he expressed it – the interval between a start and an ending of a single action.¹²

Another philosophical exploration of temporality should be mentioned, not least as it too bears some resemblance to Stockhausen’s terms and theories. Edmund Husserl,¹³ who established the discipline of phenomenology, stated: “The now of the perception accords to the now of the memory. We run through the melody in our imagination, and hear the first tone then the second tone etc. At any one time a tone is in the present ‘now’ [*Jetztpunkt*].”¹⁴ Husserl adds that the primary tone merges both with the preceding and following tones, to aid the perception of the present moment within continuity. He describes the present moment as a tail of a comet: the tail follows the current now of our perception what he calls the ‘retention’. The ‘retention’ means the immediate moment after an action. For instance, when we listen to a melody the ‘retention’ is the moment of resonances left in our perception immediately after the melody has finished. The ‘action’ and its ‘retention’ then move further into the past and can be recalled in our memory at any time, what Husserl calls the secondary memory.¹⁵ This notion of the *Jetztpunkt* and its separation from past and future are closely echoed, consciously or not, in much of Stockhausen’s writing and talks about *moment form*: in one article, Stockhausen even

¹² Stockhausen, Karlheinz, (1963), “Struktur und Erlebniszeit”. In Dieter Schnebel, (ed.), *Karlheinz Stockhausen, Texte zur elektronischen und instrumentalen Musik*, DuMont Schauberg vol. 1, Köln, article originally published 1955. Original text: “Den Ablauf der Zeit erleben wir in den Intervallen zwischen Veränderungen”. (Translated by myself), p. 86.

¹³ Edmund Husserl (1859 -1938) was a German philosopher. Phenomenology is the study of appearances and the structures of experience and consciousness.

¹⁴ Husserl, Edmund, (1980), “Vorlesungen zur Phänomenologie des inneren Zeitbewusstseins”. In Martin Heidegger (ed.), Max Niemeyer Verlag Tübingen, writings originally published in 1928. Original text: “Dem Jetztpunkt der Wahrnehmung entspricht ein Jetztpunkt der Erinnerung. Wir durchlaufen die Melodie in der Phantasie, wir hören ‘gleichsam’ zuerst den ersten, dann den zweiten Ton usw. Jeweils ist immer ein Ton (bzw. eine Tonphase) im Jetztpunkt”. (Translated by myself). p.29

¹⁵ Husserl, (1980), p.29

refers to this type of form as ‘now-form’ – ‘*Jetztform*’¹⁶. He explains further that *moment* can be described as an autonomous thought in the present,¹⁷ which is analogous to Husserl’s idea of primary memory.

According to Husserl, therefore, the now is the ongoing continuity of the past, the state of existing in time which is termed temporality. Music unfolds continuously in time, as recalled in the memory of the listener. A whole piece can be remembered as a unity – however imprecisely. Morton Feldman emphasises that the listener only hears what he remembers: “We do not hear what we hear... [we hear] only what we remember.”¹⁸ This radical statement emphasises the phenomenology of musical perception – it shows that a whole piece of music can only be reconstructed by the listener through memory. We cannot hear an entire piece of music in the present; we only remember it (more or less accurately). Similarly Wolfgang Rihm has commented: “The listener hears the music after it happened.”¹⁹ He reflects on where music exists (e.g. in the score itself, in the performance or just only in the moment of releasing the sounds); and how music exists (e.g. as sound waves, energy or as a notion or a trace of the music before or after its real sound experience). Rihm even states that speaking about music is equivalent to speaking about something non-existent.²⁰

The focus on change in the present, in other words the change from one moment to

¹⁶ Stockhausen, Karlheinz, (1963), “Momentform, neue Zusammenhänge zwischen Aufführungsdauer, Werkdauer und Moment”. In Dieter Schnebel, (ed.), *Karlheinz Stockhausen, Texte zur elektronischen und instrumentalen Musik*, DuMont Schauberg vol.1, Köln, article originally published 1960, p. 205

¹⁷ Stockhausen, (1963), p. 200

¹⁸ DeForce, Arne, (ed.), (2008), *Morton Feldman, Patterns in a Chromatic Field* [Online]. Available from: <http://www.cnvill.net/mfdeforce.pdf> [Accessed: 20th June 2014] p.4

¹⁹ Rihm, Wolfgang, (2002), “Offene Enden – Loses zu Klang und Schrift”. In: Ulrich Mosch, (ed.), *Wolfgang Rihm, Offene Enden*, Carl Hanser Verlag, München Wien. Original text: “Der Hörer hört die Musik nachdem sie war”. (Translated by myself), p.131.

²⁰ Rihm, (2002), “Musik scheint vor und nach sich selbst existent zu sein als Ahnung und Spur. Dazwischen, als sich selbst, ist sie nicht. Man kann es radikal so formulieren: Reden über Musik ist reden über etwas, das es nicht gibt”. p.131

the next, is what we really experience acoustically. For this reason, I have focused my research on observing how temporal changes and continuities differ from each other. The differentiation of temporal change, and the consequent impulse to delineate categories of musical time, was strongly encouraged by studying the temporal categorisations set up by Stockhausen and Lachenmann. Both described particular characters of musical moments on the basis of their individual aesthetic standpoint. As a structural basis, both start from the most contrasting musical characters: the static versus the dynamic. In between these opposites, they shape and reflect on musical time quite differently in their theories (and, indeed, in their music). Before demonstrating my own view of temporal change, the explorations of Stockhausen's and Lachenmann's ideas are useful starting points on musical temporality, which in turn inspired my personal research on this topic.

1.3 Temporal Theories of Stockhausen and Lachenmann

Karlheinz Stockhausen began writing on musical time in the mid '50s. He explains: "When we listen to music, the processes of change occur at different speeds in succession. Sometimes there is more time given to register changes and sometimes less."²¹ He argues that we perceive time as a succession of changes. We can perceive time differently depending on the intensity of musical events – both their acoustical content and the rapidity with which they succeed each other. A great degree of acoustical contrast from one event to the next – i.e. a high degree of surprise – will result in a perception of very rapid change: time will appear to move very fast. On the other hand, when music develops in a less volatile way, musical time can be perceived as a long continuous period; in the

²¹ Stockhausen, Karlheinz, (1963), "Struktur und Erlebniszeit". In Dieter Schnebel, (ed.), *Karlheinz Stockhausen, Texte zur elektronischen und instrumentalen Musik*, DuMont Schauberg vol. 1, Köln, article originally published 1955. Original text: "Hören wir ein Musikstück, so folgen die Veränderungsvorgänge verschieden rasch aufeinander. Einmal haben wir mehr Zeit, Veränderungen zu erfassen, ein andermal weniger". (Translated by myself), p. 86

Bergsonian time sense of real duration. Stockhausen developed his time theories into his new concept of *moment form*. *Moment form* consists of independent single moments: on the one hand these are linked into larger relationships called *moment groups*; on the other hand they split into single sections of individual moments, called *moment types*. A *moment type* represents a distinctive musical characteristic.²² Stockhausen states: “When certain characteristics remain constant for a while a moment is going on”.²³ His first musical elaboration of *moment form* was the piece *Kontakte* for piano, percussion and 4-track tape, composed in 1958-60. He describes two musical characteristics of duration; one an individual shape and the other a divisible structure. In time these elements can occur within seconds or minutes as a non-directional stasis (static), a directional process (dynamic) – in German *Zustand (statisch)* or *Prozess (dynamisch)*²⁴ – or a combination of the two. The form of the work is built by measuring and varying the degree of change (*Veränderungsgrad*)²⁵ over the entire length of *Kontakte*. Stockhausens’ concepts of time as embodied in *moment form* were rooted in his reflections on the duration and timbre of single sounds as acoustical entities.

He recorded a wide variety sorts of sounds from daily life and investigated them in minute detail. This lead him to various further speculations on time and timbre. From the late 1940s, advances in recording technology had a powerful influence on composers’ concepts. The ability to speed up or slow down sounds with a relative lack of acoustical

²² Stockhausen, Karlheinz, (1963), “Momentform, neue Zusammenhänge zwischen Aufführungsdauer, Werkdauer und Moment”. pp. 189-210

²³ Stockhausen, Karlheinz, (2013), Lecture 3 [Part 1/3] – Moment-Forming and Integration (Momente), (1972), Available from: <https://www.youtube.com/watch?v=MFvynwLkGco&t=162s> [Accessed: 30th August 2016], time: 1’18”

²⁴ Stockhausen, (1963), “Momentform, neue Zusammenhänge zwischen Aufführungsdauer, Werkdauer und Moment”, p.201

²⁵ Further explanations on *Veränderungsgrad* can be followed in: Stockhausen, (1963), “Struktur und Erlebniszeit”, p. 90

distortion was especially crucial in this respect. Stockhausen speculates²⁶ that a whole Beethoven symphony compressed into one second (without pitch transposition) would create a unique characteristic of timbre and dynamic shape. Conversely, if a given sound of one second's duration were stretched in time to an extent over twenty minutes this would generate a whole piece of music. Its large form extended in time would be the expansion of the micro-acoustic time structure that was originally in the sound. Further electronic explorations and findings centred around the speeding up of electronically generated pulses to such an extent that the pulses were no longer perceivable as a rhythm but rather as a pitch in which the multitude of pulses created the pitch's timbre. Such experiments were crucial to *Kontakte* especially – almost every electronic sound made in this work was generated this way. Such studio experiments – involving the extreme compression or expansion of sounds, as in the passage from rehearsal mark X /17'0,5" to at least 18'4,5" in *Kontakte*,²⁷ where a single sound is broken down into its individual components, which in turn are expanded till they form a whole section of music – dissolved the threshold between temporal categories, between micro acoustic time structure and the larger musical structure of the piece, which must surely have prompted Stockhausen to develop his *moment form* concepts in detail over the same period.²⁸

Helmut Lachenmann developed the notion of the *moment* by focusing on the characteristics of sounds from a different standpoint. His categories of sounds are a summary of non-divisible textural and timbral characteristics based on: pitch, timbre, dynamic and duration. In addition to this denotation he outlines: "As important as these

²⁶ Stockhausen, Karlheinz, (2013), Lecture 5 [Part 1/3] – Four Criteria of Electronic Music (*Kontakte*), (1972), Available from: <https://www.youtube.com/watch?v=7xyGtl7KKIY>, [Accessed: 1st April 2016], time: 10' -13'

²⁷ Stockhausen, Karlheinz, (1966), *Nr. 12 Kontakte*, für elektronische Klänge, Klavier und Schlagzeug, Aufführungspartitur, Universal Edition, Vienna, p. 19-20

²⁸ Stockhausen, Karlheinz, (2013), time: 28' - 31'

four attributes [i.e. pitch, timbre, dynamic, duration] is the differentiation between sound as stasis and the sound as a process (...)”²⁹ – a finding which bears a striking similarity to Stockhausen’s thought, mentioned above. Lachenmann’s new vocabulary of musical terms for sounds and their characteristics date from 1966, two years before his first fully mature composition *Air* for percussion and orchestra, where it would seem he used these ideas in creative practice for the first time.

Lachenmann discerns eight different types of sonic events which he calls *Klangtypen* (“sound types”).³⁰ There are two basic types. One is called *Kadenzklang* (‘cadential sound’)³¹, based on an analogy with the sonic curve of a musical cadence: an increase and a following decrease in the volume of a sound. A schematic diagram shows this type simply as a single curve (see first figure in *Ex. 1*). The second basic type is the exact opposite: called *Farbklang* (‘timbre sound’), it is entirely static and without internal change. Six further types of sound are subordinated to the two basic types just explained. Three types belong to the *Kadenzklang* category: *Impulsklang* (‘impulse sound’) describes a sound consisting of an impulse followed by a fading resonance, like a piano attack with the pedal depressed. *Einschwingklang* (‘fade-in sound’) fades in from nothing, then fades away within an artificial reverberation. *Ausschwingklang* (‘fade-out sound’) starts at full volume but features a complex fade-out by gradually bringing new layers within a sound to the textural surface. The last three types are subordinated to the *Farbklang* category: *Fluktuationsklang* (‘fluctuating sound’) delineates a more or less periodically repetitive

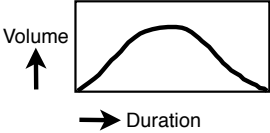
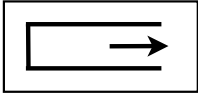
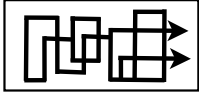
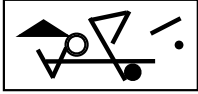
²⁹ Lachenmann, Helmut, (1996), “Klangtypen der Neuen Musik”. In Josef Häusler, (ed.), *Helmut Lachenmann, Musik als existentielle Erfahrung*, Breitkopf und Härtel, Wiesbaden, article written in 1966/93, Original text: “Genauso wichtig aber wie diese vier Bestimmungen ist die Unterscheidung zwischen Klang als Zustand einerseits und Klang als Prozess andererseits (...)”. (Translated by myself) p.1

³⁰ Lachenmann, (1996), pp.1-20

³¹ The translations of the *Klangtypen* by Lachenmann are translated by myself.

texture. *Texturklang* ('texture sound') stays within a given texture but may change its harmonic field. The *Strukturklang* ('structure sound') delineates polyphonic sound surfaces. The diagrams shown below, adapted from Lachenmann's article, illustrate his sound types. The musical examples indicated on the right side of the figures are given by Lachenmann.

*Example 2: Helmut Lachenmann Eight Sound Types 'Klangtypen'*³²

Kadenzklang		<i>Helmut Lachenmann, Trio Fluido, bar 183 and 186.</i>
Impulsklang		<i>Karlheinz Stockhausen, Gruppen, two bars before rehearsal mark 9.</i>
Einschwingklang		<i>Luigi Nono, La terra e la compagna, bar 159/160.</i>
Ausschwingklang		<i>György Ligeti, Apparitions, bar 49.</i>
Farbklang		<i>György Ligeti, Atmosphères, bar 1-6.</i>
Fluktuationsklang		<i>Anton Bruckner, Symphony No 4, strings at the beginning.</i>
Texturklang		<i>György Ligeti, Apparitions, score page 19.</i>
Strukturklang		<i>Karlheinz Stockhausen, Gruppen, score page 2.</i>

³² Lachenmann, (1996), pp. 3-18. The 8 figures shown are created by myself on the basis of Lachenmann's diagrams on his *Klangtypen*.

Both Stockhausen's explanations of the various temporal categories in *Momentform* and Lachenmann's categorisation of his *Klangtypen* were of crucial importance to my own creative research into temporality for the present project. Reading their writings on time and form described above, it became clear that different types of musical time and timbre could be viably organised into separate but clearly discernable categories. From the contrasts between these sonic or temporal categories it was possible to build forms from a fresh perspective. Such reflections on the shaping of music suggested to me an entirely new way of experiencing musical form – an area on which, however, they are less articulate (large-scale form is not discussed in their articles). This in turn led me to my own reflections on musical temporality.

1.4 Kramer's Concepts of Temporality

Two basic temporal developments as a linear and a nonlinear growth were widely discussed by Kramer³³ in the late 1980s. Both Stockhausen and Lachenmann created their ideas of moment forms on fundamentally opposed categories: as static or dynamic character. This can directly be compared with Kramer's idea of separating time sense into linearity and nonlinearity. Unlike either Stockhausen or Lachenmann, however, Kramer extends his investigation into the longer term development of temporal structures. It is clear that, until the 1960s, linear development was most common in our listening experiences of Western art music. Since the appearance of minimal music from the 60th which features music of limited materials as constant harmony, steady pulse and reiteration of motifs or musical phrases the perception of musical time has been broadened: *Composition 1960: #7* by La Monte Young might exemplify the most extreme

³³ Kramer, Jonathan D., (1988), *The Time of Music*, Schirmer Macmillan New York

of motionless temporal experience – consisting as it does of just the pitches B and F# ‘to be held for a long time’³⁴, as the composer instructs. Kramer defines his two opposite temporal modes: “While linear principles are in constant flux, nonlinear determinations do not grow or change.”³⁵ Furthermore, he discerns five different types of musical time.

Moment form defined by Stockhausen was transferred by Kramer into *moment time*.

Kramer’s view of *moment time* deviates from the notion I have: “Although a moment-form composition is not totally static, moment time does depend on stasis within moments.”³⁶

Kramer connects the sense of *moment time* to discontinuous development and calls it a static temporal progression. I myself have a different view on *moment time* as I will outline below. Stockhausen focuses on differentiating his various moments; Kramer, however, focuses on examining the whole form of a piece and its developmental characteristics. Here, we already see different views on how we perceive music sounding in time.

I have established a list of seven types of time which follows a similar path to Kramer regarding long-term musical development. Although I encountered Kramer’s book at a more recent stage of this research, when my orchestral cycle was nearing completion, I adapted his terminology in terms of *time type* to my own creative purposes. As explained above, aspects of Husserl’s phenomenological approach also helped focus my temporal investigations. The resultant temporal time types established by myself will be explained in the next section. I hope that the types outlined will give more information on how musical temporalities can be perceived both from moment to moment, and over a whole work.³⁷

³⁴ Mertens, Wim, (1983), *American Minimal Music*, Kahn & Averill, London, p.26

³⁵ Kramer, (1988), p. 21

³⁶ Kramer, (1988), p. 210

³⁷ To give a further example of the categorisation of time sense Gérard Grisey set up a different category of musical development in time explained in his article “Tempus ex Machina: A composer’s reflection on musical time”. This category is based on *order* as maximum predictability and *disorder* as zero predictability.

1.5 Temporal Types

My type times are rooted in observing the work of the living composers I met when I started composing in 2003. I began studying composition just one year later, at which time I had very little listening experience in the field of contemporary music. My discovery of new music thus coincided with the start of my composing. The music of my first teacher, Dieter Amman, left an especially deep impression on me. His aesthetics are much influenced by jazz improvisation. He writes music down as he hears it in the moment of creation, instinctively. He often told me that one musical idea releases an infinity of new ideas in his mind: it can sometimes be difficult for him to choose only one next idea for the next step in each composition. This unusually spontaneous method of composition results in musical shapes – on both small and large scale – of great unpredictability. I would liken his general aesthetics to my category, explained below, of **Moment Time**: a completely unpredictable succession of unforeseen self-contained moments.³⁸ Encountering Georg Friedrich Haas, who was invited for a guest lecture at Hochschule Luzern - Musik whilst I studied there, provided a sharp contrast. Haas's music differs from Ammann's music considerably in terms of the length of development of one idea. Unlike the music of Ammann, Haas's music focuses on long devotion to and observation of a sonic entity as it gradually transforms.³⁹ His musical elements and the durations of their transformation are carefully structured in advance. I would describe the development of Haas's most characteristic music with my category of **Transforming Time**. These two opposite temporal experiences in the music of Ammann and Haas respectively, are the starting point for my research on composers' aesthetics of time. Furthermore, my idea on time

³⁸ To give two musical examples: Dieter Ammann, *The Freedom of Speech*, for ensemble, 1995/96 and *Gehörte Form-Hommages* for string trio, 1998.

³⁹ To give two musical examples: Georg Friedrich Haas, *Natures Mortes* for orchestra, 2003 and *In Vain* for 24 instruments, 2000.

structured in sections evolved through listening to the music of Beat Furrer, which I encountered at the time I met Ammann and Haas. Furrer's music⁴⁰ often creates textures within a chosen pitch area, which is maintained for a period of time and then changes abruptly to a different texture and pitch area. These three composers and a number of others have shown me how differently music can be shaped over time. These reflections have aided me in thinking about temporal types in music.

Four basic types (see section 1.6) try to emphasise some distinctive characteristics of musical time structures. All four are based on their strength of transformational pace. While one type proceeds within a strongly goal oriented development, another type specifically avoids this. Transformation may happen at an extremely reduced rate of change, or may even be avoided altogether. If elements change frequently on a micro level **Moment Time** can be perceived. Three further types are set up which are a variation of the four basic types. These are called **Time in Sections**. When temporal development is interrupted and clearly contrasted with different material, new sections are built. For present purposes, the term **Section** is defined as lasting anything from approximately one minute up to several minutes in duration. Moments last from one second up to approximately one minute. Both **Moment Time** and **Time in Sections** create units, one on a micro level and the other one on a macro level. The example of timings given should not be seen as rigid but open and varying depending on the musical context. The temporal types outlined below are sometimes not easily distinguishable. Elements of one type may be found in the others, especially when examining micro moments. The separation into categories is therefore admittedly somewhat artificial. To recognise one of these types in its pure state whilst

⁴⁰ To give two musical examples: Beat Furrer, *Nuun* for 2 pianos and ensemble, 1995/96 and *Presto* for flute and piano, 1997.

listening to music may also be as much a personal experience as any kind of universal certainty. Music can never be entirely fitted into fixed categories, so some overlap and ambiguities within and between temporal categories cannot be avoided. The times outlined below should be seen as a guideline aspiring an ideal of distinctive characters.

More types could be imagined: for example, mixed types with several overlaying layers simultaneously. But as these are not used in the *Seven Towers* cycle as I conceived and realised it, they are not investigated here. On completing the last piece of the cycle the temporal types became more clear to me, as for the first time I could now had an overview of the entire cycle. Reflecting now on the resultant pieces and how the temporal types are perceived and distinguished from each other, I realise that in future I may wish to refine some musical details within the *Seven Towers* cycle in order to better emphasise the properties of the outlined types of time.

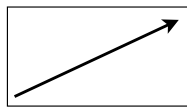
1.6 The Seven Types

- **Directed Time** (*strongly directed and goal oriented development*)
 - **Transforming Time** (*continuously transforming development without a goal*)
 - **Moment Time** (*micro moments, unpredictable development*)
 - **Static Time** (*very slow motion, static features*)
 - **Transforming Time in Sections**
 - **Moment Time in Sections**
 - **Static Time in Sections**
-
- Basic Types
- Variations

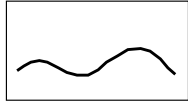
Directed Time in Sections was not considered in this research work for the reason that forming a clear goal was one of the most difficult components. Apart from composing a direction going to a high or low pitch (as instanced in *ST1-6th Space*, see section 2.2.2) I hardly could imagine forming a clear goal within this project. In addition, I wished to avoid confusion between two types of similar characteristics: **Directed Time** and **Transforming Time**.

The next diagram may assist to clarify the definition of my types of time. The last square (**Time in Sections**) summarises three variations of the basic types. The classification of one of the three variations depends on the predominant basic type involved.

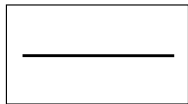
Example 3: The Four Basic Types and the Variations summarised in one further Square



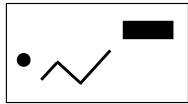
Directed Time



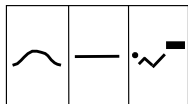
Transforming Time



Static Time



Moment Time



Time in Sections

Directed Time

Directed Time progresses within a strongly and persistently goal-oriented development achieving a final goal. This music proceeds continuously in one clear direction. Once the goal is reached, the music stops or a musical section ends.

Transforming Time

This type focuses on ongoing development, which continues without necessarily reaching a final goal or even implying one. This type may be described as a continuum of earlier successions transforming into new consequences. The new consequences or ideas are strongly connected to the earlier ones as they continue transforming the music, rather than providing a strong contrast.

Moment Time

This type of time offers a mosaic of discrete moments without any overall direction. It has no functional beginning or ending. Moments are either juxtaposed or else, they can fade into each other and build groups of moments. The form in moment time consists of little units of contrasting self-contained areas - micro moments of a length ranging from approximately one second up to one minute.⁴¹

Static Time

This is characterised by a very slow motion verging on stasis. “Slow motion” means that harmonic progression or timbral change develops so slowly that any change is nearly imperceptible. Since there is no beginning or end, this type of circular music just starts and stops at a certain moment, according to the needs of the musical context.

Transforming Time in Sections

The beginnings/endings of sections in this type can either change sharply or gradually according to musical context and expressive necessity. When a new section arrives by gradual transition the elements of the new section need to be clearly articulated and separated from the preceding section, despite the gradual nature of the transition.

Moment Time in Sections

Moment Time in Sections is characterised by coherent groups of musical moments forming a larger section. When new musical elements arrive and shape such groups of moments in many musical parameters simultaneously, a new area or section has started.

⁴¹ I do not use any kind of ‘open form’ notation in my scores (as instanced, for example, in Stockhausen’s *Klavierstück XI*), yet this type of musical time, with its intensely fragmented and discontinuous nature, aims to suggest analogous types of open form in sound, whilst being strictly notated in reality.

Static Time in Sections

Sections are clearly separated by an immediate change to a new texture, sound area or a new musical element. Change is sudden. The sections do not have transitions between one another. Each section is within itself purely static.

1.7 Relation of the above Seven Temporal Types with Jonathan

Kramer's Temporal Types

Kramer set up five types of time, but gives them slightly different names throughout his book 'The Time of Music'. The listed types below are a collection of his types (including the different versions given in the book), set up in comparison with my types of time. In addition, some musical examples from various composers are listed – those given by Kramer and some given by me.

Example 4: Comparison of Kramer's and Marti's Terminologies

Kramer Terminologies⁴²

Goal Directed Linear Time/
Goal Directed Time/
Directed Linear Time
Example (Kramer): All tonal music developing towards a cadence

Nondirected Linear Time/
Linear Time
Ex.: Alban Berg, Chamber Concerto, 1st movement

Vertical Time/
Nonlinear Time
Ex.: La Monte Young *Composition 1960: #7*

Moment Time/
Multiply-Directed (Nonlinear) Time/
Multiple Time
Ex. I. Stravinsky *Symphonies of Winds*

Discontinuous Time:
Moment Time/Multiply-Directed Linear Time
**Ex.: C. Debussy *Jeux*,
 Schönberg *Chamber Symphony No.1***

Marti Terminologies

Directed Time
Example (Marti): C. Nancarrow *Canon X*

Transforming Time
Ex.: J. Anderson *Diptych, part II - Pavillons en Air*

Static Time
Ex.: M. Feldman *Coptic Light*

Moment Time
Ex.: K. Stockhausen *Kontakte*

Time in Sections
Ex.: G.F. Haas *Natures Mortes (Transforming Time in Sections)*
Ex.: L. Andriessen *De Staat (Static Time in Sections)*

The examples cited in Ex. 4 give an idea of my types of time in a broader musical scope, and I hope to show their validity within a range of other music. The piece by Conlon Nancarrow will be discussed in greater depth in section 2.2.2. The other cited works are now briefly explained in terms of my own temporal types.

The second movement of *Diptych (Pavillons en l'Air)* by Julian Anderson develops as an on-going gradual continuous change, starting in a very low register, increasing in range, volume and dynamic, reaching a climax of intensity and pitch range after about two

⁴² Some of Kramer's terminologies outlined in Example 3 can be found on the following pages: Kramer, (1988), *Goal Directed Time* p.25 and p.61, *Linear Time* p.20, *Vertical Time* p.55, *Nonlinear Time* p.20 and p.40, *Moment Time* p.207, *Multiply-Directed Time* p.50, *Multiply-Directed Linear Time* p.46

thirds of the piece. The piece continues as the texture slowly decreases in volume and ends on d₄ (the piece then terminates within an unexpected gesture). Morton Feldman's *Coptic Light* exhibits a strictly limited range of harmonic change throughout its approximately thirty minutes' duration. The texture set out at the opening continues throughout the piece with very small changes. Within this defined range of activity, Feldman creates an impressive variety of micro-variations. The overall result, however, remains static - that is, within a clearly recognisable area of musical texture, timbre and pacing - despite these small changes. Karlheinz Stockhausen's *Kontakte* was already discussed in section 1.3 as an example of **Moment Time**. *Natures Mortes* by Georg Friedrich Haas transforms musical elements at a gradual pace. The elements within the sections change continuously. Each section shows a transforming development leading to a new section of sharply contrasted material. Louis Andriessen's *De Staat* exemplifies music structured as a succession of contrasting sections which change abruptly from one to the next. Each section stays within its established materials, and there are almost no transitions.

1.8 Seven Towers (ST) and their Types of Time

ST1 = Moment Time in Sections, 16' written in 2012/2013

ST2 = Transforming Time, 8' written in 2013

ST3 = Moment Time, 10' written in 2014

ST4 = Static Time, 6' written in 2014

ST5 = Transforming Time in Sections, 12' written in 2015

ST6 = Directed Time, 7' written in 2015

ST7 = Static Time in Sections, 19' written in 2015

2. Analytical Commentary

2.1 Composition of a New Orchestral Cycle: Seven Towers 1-7

The formal concept of the whole cycle has already been explained. Each type of time is explored separately in one of the seven individual pieces whilst in the first piece, *Seven Towers 1*, subtitled *Seven Spaces*, the outlined types are gradually introduced in each musical space of the movement. A diagram relating the form of *ST1* to other pieces in the cycle is seen below.

Whilst many composers do not work on a large scale piece in chronological order, an important feature of the composition process in *Seven Towers* is that it was composed in exactly the order of performance, i.e. the first piece to be composed was the first piece, and the final piece was the last to be completed. So the order in which the listener hears the events is exactly the same in which it was composed: each piece evolved from its precedent one. To achieve coherence throughout the large scale form, linking elements were used across the whole cycle: these are discussed in section 2.6.

An aspect of the composing process that became creatively fascinating as *Seven Towers* developed was the realisation that one musical idea implies infinite of possibilities of development and growth. I exploited this in many ways across the seven pieces. Choosing to introduce a new musical idea at a certain point in the cycle but only developing it later in the work within new circumstances offered many fresh creative possibilities. These possibilities are most evident in the 'Linking Elements' explained below

(see section 2.6 Linking Elements). This was greatly facilitated by the fact of all seven pieces being played continuously as a single concert event – rather than being separated by pauses. Joining movements together has been a strikingly frequent preoccupation of many composers over the past century. Henri Dutilleux, for instance, writes in his preface of the violin concerto *L'Arbre des Songes*: "(...) splitting a work into movements separated by pauses [...] seems to me to impair the power of "enchantment".⁴³

2.2 Seven Towers 1 – Microstructure and Macrostructure

Most of the musical material for the rest of the cycle is established throughout *ST1*, which anticipates in miniature all the subsequent pieces of the cycle. The micro structure – that is the form of *ST1* itself – is built up from these fragments – which are henceforth referred to as the seven spaces of *ST1*. Each of the seven spaces are devoted to a different type of musical time – see *Ex.6* – and this micro-structure was intended to form the basis of the macro-structure of the *Seven Towers* cycle.

As the cycle was composed, some changes to the scheme outlined in *Ex.6* evolved, with the result that the sequence of *Seven Towers* as finally composed is not a perfect replica of the sequence of temporal types evoked in miniature within the seven spaces of

⁴³ Dutilleux, Henri, (1985), *L'Arbre des Songes*, Study Score, Schott, Mainz. In the 50s, Dutilleux composed two symphonies which both have several movements separated by pauses. Dutilleux began joining movements together to form continuous whole works in the 60s with his orchestral work *Metaboles* (1965). This comprises 5 distinct movements, each with their own title (e.g. Incantatoire, Linéaire, etc.), which, as the preface emphasises, are to be played without interruption. He continued this practice for the rest of his non-vocal orchestral music, e.g. the violoncello concerto *Tout un Monde Lointain* (1967-70) or the string quartet *Ainsi La Nuit* (1974-77). Dutilleux's move away from traditional forms was highly influenced by the French novelist Marcel Proust particularly his concepts of time and memory in the monumental work *À la Recherche du Temps Perdu* (*In Search of Lost Time*). There are other numerous earlier twentieth century pieces that comprise joined movements played *attacca*, e.g. Arnold Schönberg *First Chamber Symphony*, Jean Sibelius *Symphony No.7* and Bela Bartok *String Quartet* No 3 (1907, 1924 and 1927 respectively). To some extent, this development was the outcome of two 19th century precedents: the composed transition between the 3rd and 4th movements of Beethoven's *Symphony No.5* (1808); and the several examples of fantasia form in the later works of Schubert such as the *Wanderer Fantasia* (1822) and the *Fantasia F-moll* for piano duet (1828). The *Wanderer Fantasia*, in particular, may have been one of the models for the Schoenberg piece.

ST1. Comparing *Ex.5* with *Ex.6* reveals that in *ST1* the second space is devoted to ***Moment Time***; in the large cycle, *ST2* explores ***Transforming Time***, which is the 5th space of *ST1*, whereas ***Moment Time*** is explored in *ST3*. This was done for reasons of musical contrast: it was essential for *ST2* to avoid any discontinuity and establish a quite different sense of time gradually evolving – in other words, ***Transforming Time***. This in turn resulted in shifting a number of the other categories around, as is evident in comparing *Ex.5* and *Ex.6*. Overall, the transforming component directs the cycle as gradual change predominates all music involved. Thus, I would categorise all seven pieces in ***Transforming Time in Sections***.

Example 5: Structure of the Orchestral Cycle

1st Piece 16' <i>Moment Time in Sections</i>	2nd Piece 8' <i>Transforming Time</i>	3rd Piece 10' <i>Moment Time</i>	4th Piece 6' <i>Static Time</i>	5th Piece 12' <i>Transforming Time in Sections</i>	6th Piece 7' <i>Directed Time</i>	7th Piece 19' <i>Static Time in Sections</i>
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Paradoxically, I gradually discovered the seven time types through working on *ST1* itself - they were not defined in advance of this composing stage. Some of them became more clearly defined in the musical profile *ST1*: ***Static Time*** and ***Directed Time***, those ones which were most unfamiliar to my aesthetics of composing, are the two perhaps most clearly defined aurally in *ST1*.

Prior to this, static music was not found in my work; nor was directed time.

Engaging with practices not previously found in one's own music was one of the most exciting aspects of the compositional research in *Seven Towers*. The cycle gave me the chance to step into new areas of temporal exploration, expanding my musical vocabulary. I would categorise my musical language before *Seven Towers* as exploring aspects of what I now call **Transforming Time**. Changing and transforming elements at a gradual pace was my predominant compositional focus up to 2012. In the 4th Space of *ST1* I attempted to shape music wholly lacking in any direction for the first time. This experience led to the idea of exploring **Static Time** in more depth in the 4th piece. Both **Static Time** and **Directed Time** are discussed in more detail in the next chapter. As specified in the next example most of the temporal types outlined in section 1.6 are introduced in the seven spaces of *ST1*. Only 'Moment Time in Sections' is missing – for the simple reason that the entire structure of *ST1* is itself an example of **Moment Time in Sections**. Each space presents a sample of one of the types of time. (See Ex. 6)

Example 6: Structure of *ST1*

1st Space 2'40" Transforming Time	2nd Space 2'30" Moment Time	3rd Space 5'20" Transforming Time in Sections	4th Space 50" StaticTime	5th Space 1'35" Transforming Time	6th Space 1'50" Directed Time	7th Space 1'15" Static Time in Sections
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Writing about this now, having completed the whole cycle, a critical reflection on *ST1* seems appropriate. Listening to the recording, it is clear to me that the musical definition of **Moment Time** (see section 1.6) in the 2nd space of *ST1* is vague and lacking

in focus. This is unsurprising: I had no clear definition of this type of time when composing this section. The idea consisted of composing little units after each other. I intended to form four moments of different lengths within the 2nd space: the first moment starts from bar 41, the second from bar 47, the third from bar 55 and the fourth as the longest moment from bar 61. After having composed the whole piece I realised that the first three moments do not contrast each other clearly. They are formed by chromatic textures that show too little contrast as regards articulation, dynamic and melodic development. The next two figures show excerpts of moment 2 and 3 from the 2nd space of *ST1* (see Ex. 7). Similarities in texture and pitch world are clearly evident from this comparison.

Example 7: Beginning of Moment 2 and Moment 3

The image displays two pages of a musical score. The left page, labeled '47', shows the beginning of Moment 2. It features staves for Oboe 1, Oboe 2, Oboe 3, Clarinet 2, Clarinet 3, Horns F1-F4, and Trumpets 1-3. The right page, labeled '55', shows the beginning of Moment 3. It features staves for Flutes 1-3, Oboe 1, Oboe 2, Oboe 3, Clarinet 1, Clarinet 2, Clarinet 3, Horns F1-F4, Trumpets 1-3, and Trombone 1. Both excerpts show complex chromatic textures with various dynamic markings such as *pp*, *ff*, *p*, *mp*, and *ppp*.

The intention was to distinguish the seven spaces of *ST1* clearly: as all musical material are being established in this piece its large scale structure is correspondingly

unpredictable. Unpredictability, being the main feature of **Moment Time**, occurs in the contrasts from one section to another, in other words from space to space. As already explained, moments can also be grouped together to form larger musical unities. The difference between this time type and **Moment Time in Sections** is that the latter has clearly distinguishable sections, which build the overall structure of the piece.

‘Distinguishable sections’ means that they contrast considerably in musical materials (such as intervals, harmonic areas, rhythmic types) or musical characteristics (such as textures, timbres, gestures, speed, expressive impact). The sections can be juxtaposed without transition, or else linked by short transitions. Stockhausen uses the term *Momentgruppe* to describe groups of moments (applied in *Kontakte*). He describes a group of moments as: “Several moments in succession which are related to each other by one or more attributes without weakening the individual character [of each moment].”⁴⁴ Stockhausen’s idea of *Momentgruppe* can be compared to what I call **Moment Time in Sections**. I agree with his definition, although I create groups of moments differently. This can be seen in *ST1* and *ST3* where moments are linked to form longer developments.

As discussed in section 1.5 the ambiguity of definition between the length of a moment and the length of a section can be seen in the 4th space of *ST1*: it lasts 50” and can either be perceived as an extended moment or as a section. This section was composed before defining the lengths of moments. This 4th space will now be examined in some detail.

⁴⁴Stockhausen, Karlheinz, (1963), “Momentform, neue Zusammenhänge zwischen Aufführungsdauer, Werkdauer und Moment”. Original text: “Mehrere aufeinanderfolgende Momente, die durch eine oder mehrere Eigenschaften miteinander verwandt sind, ohne ihre persönliche Charakteristik in Frage zu stellen, nenne ich eine Momentgruppe.” (Translated by myself), p. 201

2.2.1 Seven Towers 1, 4th Space: Static Time

To heighten the strongest possible distinction between two spaces and the type of time they are meant to exemplify, *ST1, 4th space* and *ST1, 6th space* will be discussed. **Static Time** is applied in the 4th space and **Directed Time** in the 6th space: while one seems to not progress anywhere, the other develops clearly in one direction. At the time when *ST1* was rehearsed with the Symphony Orchestra Berne, one of the participating musicians asked me for an explanation of the 4th space. He said: “That is the only part of the piece I don’t understand: the music does not go anywhere” – which was the whole aim of this space: to create a section of no musical direction. By contrast, the 1st – 3rd spaces and 5th – 6th spaces are based on permanent change. Glissandos in the strings, trombones and horns are the leading elements throughout the 4th space. Groups of strings, e.g. first violins or violas, progress in shifting perfect fifths and fourths (see *Ex. 8*). Although there is permanent change of pitch, there is no overall direction: the glissandi embody a momentary direction from one pitch to the next but the micro-direction of the glissando texture displays no long-term goal since the glissandi progress simultaneously in opposite direction, destroying any sense of harmonic progress. Working with mobile pitch content to create the absence of harmonic progression might be seen as paradoxical. The obvious way to represent stasis in music would be to have a sonic texture with no change at all: a single long-held sonority would be the simplest means to achieve this, but also the least imaginative and least satisfying aesthetically for my creative purposes (and in any case, this solution has been used many times before⁴⁵). Using an inherently variable sonic element, such as the glissando, to achieve stasis offers more compositional and imaginative possibilities, as well as some ambiguity for the listener.

⁴⁵ The first seven bars of György Liget’s *Atmosphères* might exemplify immobility most clearly as the inner texture remains uniform. Another example characterising stasis based on a more mobile textural composition is Feldman’s *Coptic Light* (approx. bar 1-48).

I have composed this glissando texture on the basis of *Melody 1* (see section 2.6, Linking Elements). *Melody 1* was already incorporated into the previous section of this same piece, i.e. the 3rd space, where it occupies the melodic foreground. In the 4th space, in contrast, *Melody 1* is used only as the background to determine the directions of the various glissandi. It is thus only intermittently perceptible. Its shift from a foreground presence (in the 3rd space) into the background (in the 4th space) may nevertheless assist subliminally in building some coherence to the glissandi patterns here, as well as in the longer term structure of *Seven Towers*. This same *Melody* – originally used to form ***Transforming Time*** – is subsequently used again to build the texture of the first section in *ST7* – a piece devoted to ***Static Time in Sections***. *Melody 1* was ideal to form a section of ***Static Time*** because of its extended duration despite its fluid, curvilinear shape.

The next example illustrates an excerpt of the glissando texture in *ST1* in the strings from bar 217-221. The combination of the layers of glissandi here is what led the orchestral player to complain that this music does not go anywhere.

Example 8: ST1-4th Space, bar 217-221

The musical score for Example 8, ST1-4th Space, bars 217-221, is presented in a 4/4 time signature. It features seven staves: Horn 1/2, Horn 3/4, Trumpet 1/2, Trombone 1/2, Violin 1, Violin 2, Viola, and Violoncello. The key signature has two sharps (F# and C#). The music is characterized by a 'glissando texture' where chords move in a rising direction. Triads are often marked with a '3' and a slur, indicating triplets or glissando groups. The texture is static, with many notes held across measures.

However, the continuation of this glissando texture (bar 223 until the end of the space in bar 230) proceeds in a predominately rising direction ending on the central tones c# – g# (see section 2.6, Linking Elements). The central tones are not settled yet aurally and therefore cannot be perceived as a predictable goal. Nevertheless, there is little more direction than in the figure shown above.

The experience of writing the 4th space revealed the fact that working with elements of microstructures, as shown above, assists the creation of a static texture. Static music does not mean that all development is completely avoided: repetition and variation of shorter elements are crucial to the shaping of static sections. The multiple glissando

texture exemplified in *Ex. 8* prompted me to work with this material again at length in *ST4*, which is devoted to **Static Time** exclusively. The glissando texture occurs in a different way: the six violoncellos play a texture of one perfect fifths ($c\sharp_2 - g\sharp_2$) on different speeds glissanding up and down throughout the whole piece. (See *Ex.9*)

Example 9: Beginning of ST4, Texture of Violoncellos

The image shows a musical score for six violoncellos, labeled Violoncello I through VI. Each staff is in bass clef with a key signature of one sharp (F#). The music consists of a continuous glissando of perfect fifths, specifically the interval between C#2 and G#2. Each staff is marked with the instruction 'non vibrato molto sul tasto' and the dynamic marking 'ppp'.

Further explorations on **Static Time** are discussed from section 2.4.2 - 2.5 when looking into details of *ST4* and *ST7*.

2.2.2 Seven Towers 1, 6th Space: Directed Time

Directed Time involves a musical unfolding towards a goal. Once the goal is reached, the music stops or a musical section ends. The direction of this time type is clearly structured and should be easily comprehensible to the listener. In *ST1*, this time type is deliberately confronted with its exact opposite, **Static Time**.

Creating an easily perceived musical goal is a problematic task in contemporary music. The massive syntactical changes in music since 1910 have made establishing clear

direction in pitch content very much harder than in the eras where some kind of goal-directed tonal common practice was the basis of the musical structures. Without that syntax, one way to generate goal direction in music is to use easily predictable patterns of change, in various parameters simultaneously or individually. In the present case, I chose gradual changes of register. To give a simple example, directionality can be created by going to a higher or a lower position in pitch, with maximum emphasis on the arrival pitch or pitches. The direction composed in *ST1-6th space* can simply be defined as a gradual rise achieving its maximum height on the two central tones of the cycle: c[♯]-g[♯]. These tones are very useful arrival points, as they form one of the simplest consonances in music: the perfect fifth (ratios 3:2 from the harmonic series). They will therefore stand out in most musical contexts, as hopefully, here.

As mentioned in the previous section these central tones of the cycle are not heard many times throughout *ST1* and therefore are not well established at this point. They appear gradually: *ST1* starts as the double bass and violoncello play a repetitive chord framed by c[♯]₂-g[♯]₂, bar 1-12. The two pitches appear than again as mentioned by the end of the 4th and 6th space. The semiquaver scales at the beginning of the 5th space start on g[♯]₄ and in bar 236 the double bass start introducing a harmonic spectrum starting on the fundamental on c[♯]₁, unfolding its spectrum in bar 243. The central tones are already part of the development of *ST1*, but it is not guaranteed that they can already be heard as a centre or as an axis of pitch within *ST1* – later in the cycle they will be much stronger as stabilising force.

As already explained, *ST1-6th space*, bar 274-295, uses a simple procedure

involving movement in one direction - an increasingly gradual rise of chromatically overlaid fields of sound. This can be seen in the first violins, starting on the fifth b_3 and $f\sharp_4$ from bar 274 onwards. In the next bar this fifth is followed by $c_4 - g_4$, then $c\sharp_4 - g\sharp_4$ in the violas, then $d_4 - a_4$ in the second violins, then $e\flat_4 - b\flat_4$ in the first violins and so on. (See *Ex. 10*)

Example 10: ST1-6th Space, from bar 274

The wind instruments play the same pitches an octave lower from bar 278 and follow the same strategy. The section progresses in a spiral shape as groups of instruments join the procedure, which ends up on the central pitches of a high perfect fourth $g\sharp_6 - c\sharp_7$ in bar 296. Once the perfect fourth $g\sharp_6 - c\sharp_7$ is reached, the 6th space ends. The whole procedure develops as instruments appear inconspicuously one octave lower following the same route. From bar 286, the dyads change their intervals from fifths to fourths to major thirds and again to fourths following the same procedure. The crescendos emphasise the chromatic ascent and strengthen the directionality. The next Example (*Ex. 11*) shows basic harmonic structure of the whole harmonic rise (without indicating how long each of the pitches are sustained). The squares and arrows show the entrance of lower octaves; some of these lower octave entrances occur simultaneously (e.g. last

crotchet bar 278); others are delayed by a short time interval (e.g. third crotchet bar 285 and first quaver bar 286).

Example 11: ST1-6th Space, bar 274-295

The musical score for Example 11, ST1-6th Space, bars 274-295, is presented in four systems. The first system (bars 274-275) features strings and winds. The second system (bars 282-283) features strings and winds. The third system (bars 287-288) features winds and strings. The fourth system (bars 291-292) features strings. Red boxes highlight specific notes, and red arrows indicate connections between them. Triplet markings are present throughout the score.

A development consisting of one direction evokes naturally shorter durations.

Following a chromatic scale from below to above through about seven octaves of medium speed generates approximately half a minute. I shaped the whole procedure by overlaying

the rising gestures several times to create more length within a lively texture. I could have written a scale of a distinctively slow pace, which however, had created a type time of almost static features. This could have competed the 4th space of **Static Time**. The ambiguity of **Directed Time** based on a simple scale going upwards or downwards creates either music of short duration or of slow development.

To date I have encountered only a few whole pieces of clear directionality, for instance, *Canon X Study No 21*, for player piano written by Conlon Nancarrow in 1950. This piece lasts nearly 3 minutes and consists of one simple idea: two lines in canon with regard to pitch but which progress in opposite directions in terms of speed. One starts high pitched at a fast speed and gets slower, the other starts low pitched at a slower speed and increases in tempo. Up-and downward register directions are equally involved in the procedure. The canon uses a 54-note melody, which is shortened at each repetition by one note. The melody loses the starting note at each repetition (not the final note as explained in the analysis of Nancarrow's sketch⁴⁶). When the shortening process ends on note 0, the composer starts the full 54-note melody again. The piece ends at the moment when the 54th note in the first voice is achieved at the same time the second voice ends the shortening process and starts the first note of a new cycle. Thus the final pitch in the first voice is a c (=54th note), whilst the second voice final note is also c. The structural goal of **Directed Time** in *Canon X* is therefore to reach that common pitch class c – which is why the piece is an example of **Directed Time** with a clear goal.⁴⁷

⁴⁶ Sandoval, Carlos, (no year given), *Conlon Nancarrow* [Online]. Available from: <http://www.carlos-sandoval.de/nancarrow/heisig.htm>, [Accessed: 13th October 2014]

⁴⁷ Another possible example of *Directed Time* might be the *Spectral Canon for Conlon Nancarrow* (1974) for player piano by James Tenney.

Further aspects of ***Directed Time*** are explored in *ST6*. At the time I was planning the whole cycle I intended to reduce the instrumentation at one point to a chamber orchestra formation. As the cycle evolves within a full range of a large orchestra it can be a refreshment to have one piece of a more transparent instrumentation. Shortly before I started work on *ST6* a commission arrived to write a piece for chamber orchestra. It was the first time in the whole working process that the instrumentation and duration of a piece was given to me. The basic instrumentation of the whole cycle was a decision by myself as I started the project without any commission. After the first year of writing on the cycle two commissions arrived: the Symphony Orchestra Bern asked me for a new piece of 15 minutes duration and the Symphony Orchestra Biel-Solothurn agreed to perform the whole cycle within a residency as a composer in season 2015/16. The commission for *ST6* arrived in mid April 2015 (definite instrumentation given by the commissioner one month later) for the performance in mid September in the same year, so I had to start the piece immediately.

The experience of generating directionality within *ST1-6th space* revealed the difficulty of composing music of longer durations within a clear direction. *ST6* lasts about 6 minutes. It was clear that using similar materials to those in *ST1- 6th Space* materials would have created a rather slow, possibly monotonous development over the whole piece. Considering the dramaturgy of the whole cycle I felt it was necessary to not write another piece of slow pace at this point. I knew that *ST7* is going to be a long piece of approximately 19 mins devoted to ***Static Time in Sections***. It became clear that *ST6* would, in contrast, need some vivid and virtuosic characterisation. ***Directed Time*** already explored in *ST1-6th Space* develops as outlined above within a slow motion. We have

seen an example of a clear direction of vivid character in the piece by Nancarrow. To compose such clear directionality for orchestral forces would probably be feasible but only by carefully elaborated work. Time for such explorations was not given to me. Arrived at this point I had to find a compromise. I decided to compose along my most familiar time structure, ***Transforming Time***, by following the attributes of ***Directed Time*** throughout all *ST6*, within several units.

2.3 The Types of Time related to a Temporary Peak or to a Climax

For my practical definition, a temporary peak is just that: a provisional culmination in tension or in some variety of musical intensity (not a goal). A climax is the definite culmination – the decisive moment of maximum intensity. Temporary peaks may assist in articulating or shaping a musical phase. A climax, by contrast, would usually suggest that a piece has reached its ultimate culmination (and, in consequence, might therefore end soon after). The difference between these two phenomena is largely a question of strength: of the degree of musical energy. Both can have different durations and stages. In some contexts, the clear definition of when the absolute climax is achieved may be deliberately ambiguous, or a matter of subjective perception (as emerges in one of the examples to follow).⁴⁸

Directed Time as well ***Transforming Time*** can feature a climax. A climax within ***Directed Time*** is equivalent to a goal that means a piece ends after its culmination (see

⁴⁸ Maurice Ravel's *Boléro* might be an example for this implication: the constant increase of dynamic and density of orchestration lasting about 14 minutes culminates in an extended climax formed in three states: the first state is reached at the moment of the modulation to E (at rehearsal mark 18). The second state happens when the reiterating melody ends and the glissandi in the trombones (and saxophones) start (six bars before the end of the piece). The last stage is achieved in the last chord. All belong to the maximum of intensity maybe even raised throughout the three stages (that might be of a subjective experience).

section 2.2.2). A climax within **Transforming Time** can be placed at any point of the piece – e.g. the climax in Anderson's Diptych, part II - Pavillons en Air (piece listed in *Ex. 4*) is located between approximately bar 64-74 of entirely 117 bars. In this case the climax delineates an extended moment of intensity that is gradually achieved from the beginning and, in turn, gradually decreased until the end of the piece.

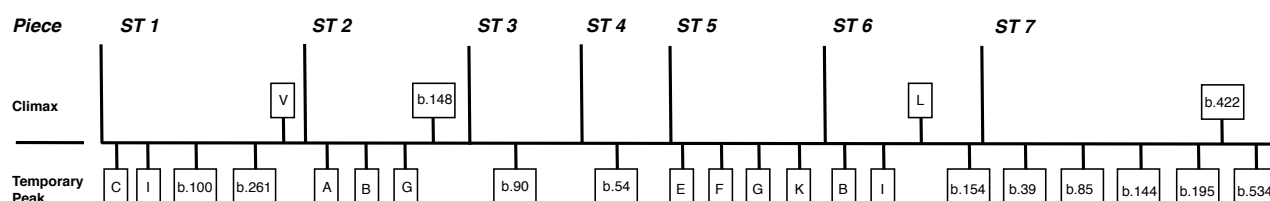
A similar way of reaching a climax can be seen in *ST2* – within, however, a less constant direction towards the culmination. The climax in *ST2* is reached by continuously increasing tension in terms of several parameters: density of pitch, dynamic intensity, breadth of pitch ambitus, etc. - starting from bar 109 culminating in bar 148 followed by a comparatively short decrease of tension in all these parameters to the end of the piece. Three temporary peaks (A, B and G, see *Ex. 12*) prepare the climax: they already build tension with similar musical materials (e.g. repetitive rhythms/figures). The overall development involves a variety of temporal changes within diverse materials e.g. a transformation of a chromatic procedure (from bar 33) towards the revelation of the *Chorale* (in bar 44) - see section 2.6 Linking Elements. The temporary peaks assist in linking the materials involved with the climax together and thus in increasing the musical energy towards the culmination – e.g. repetitive rhythmic patterns that develop throughout *ST2* which culminate in prolonged repetitive chords (bar 148).

It was difficult to build up enough tension within *ST1* leading towards a definite climax due to the types of time predominating within this section: theoretically music should proceed discontinuously within **Moment Time** and within all of the three types of **Time in Sections**. The contradiction of trying to build up tension through such

discontinuous forms resulted into a new type of formal structure: the music develops predominately through a sequence of temporary peaks. In the event, the climax of *ST1* (***Moment Time in Sections***) is created in the 6th section (***Directed Time***) by incorporating a very clear sense of musical direction towards the culmination – the goal of this type of time (see section 2.2.2). However, the virtuosic power of the 5th section weakens the strength of the climax at the end of the 6th space to some extent: to the extent that one might question if the music at rehearsal letter V (to be more precise, from bar 293-297) can or cannot be perceived as a climax or rather as another temporary peak. As already mentioned, this might be a matter of subjective decision by each listener.

The final culmination – the climax of the entire cycle – had to outdo all previous climaxes to herald the end of *Seven Towers*. When overlooking the macro-structure of the cycle, the three climaxes involved (in *ST1*, *ST2*, and *ST6*) turn into temporary peaks and eventually culminate in the final climax in *ST7* in bar 422. I devoted a whole section to building up an extended development on the basis of an uninterrupted rhythmic ostinato on E flat, reaching the C on the culmination point. The duration of this section is 3'40" which is by far the longest sectional structure of the whole piece. Subsequently, *Melody 4* (see section 2.6 Linking Elements) reappears in the piano (and partly in the oboe 1 and the harp) from rehearsal mark W – a reminiscence of the 2nd section – which assists in connecting the sections of *ST7* and building cohesion. See diagram of the structure of *ST7* on p. 54. The next diagram shows an overview for the whole cycle of temporary peaks and climaxes. (See *Ex. 12*)

Example 12: Culmination Points and Climaxes within the whole Seven Towers Cycle



Regarding culminations, it is by now clear that the 7 Types of Time influence the overall formal aspect of a piece considerably, not least as not all time types allow passages of increasing strength leading towards a peak; some of them even tend to avoid this. This fact stimulates speculations about overall structures of future compositional projects: for instance, in what way would the large-scale structure of a piece of similar length to *Seven Towers* be affected if the piece starts with a passage of **Directed Time**? These types of speculation may well evoke fresh compositional paths in the next few years.

2.4 The Qualities of Ambiguity in ST3 and ST4

2.4.1 ST3

Categorising time structures in music is, as already mentioned in this commentary, not possible without some degree of ambiguity. This can perhaps best be shown with reference to ST3 – the piece devoted to **Moment Time**, in which there is a notable deviation away from the time type. This was influenced by an unforeseen discovery of a new instrument: an accordion tuned in quarter tones. A commission for this instrument, coming near the start of my work on *Seven Towers*, was not composed. Nevertheless, the sonic possibilities of the instrument continued to haunt my imagination, so it was

incorporated into the orchestra for *ST3*, 4, 5 and 7 (the accordion used in *ST2* does not incorporate quarter tones).

This instrument is related to an idea going back several years: detuning the whole orchestra by a quarter tone at a certain point in a piece. *AdoRatio*, a concerto for violin and 16 instruments in 2009/10, already attempted to work with this idea. The almost vertiginous sonic result (to my ears) impelled further development of this idea on a full orchestra. It is incorporated into *ST3* since this piece deals with the unpredictable characteristics of ***Moment Time***. The instability of this special tuning highlights the formal instability of this time type. However, I had to break my own given rules on ***Moment Time*** – which normally exemplifies ‘a mosaic of discrete moments without any overall direction’ (see section 1.6 The Seven Types) as this procedure of a tutti detuning effect needed extended time to unfold clearly and distinctly. With this in mind, I created a new, longer melodic figure, *Melody 3* (see section 2.6 Linking Elements). The accordion fades in *Melody 3* (starting bar 47) within the three pitches of the *Motive* – a component of *Melody 3* – sustained as a chord. The accordion subsequently doubles the woodwinds, who play the whole of *Melody 3* a quarter tone lower (bar 58-69). From this moment the time structure gradually begins to elongate and therefore to alter into something more akin to ***Transforming Time***. As previously defined, in my time theories a moment may last between one second and one minute. As this passage substantially exceeded one minute’s duration, the time structure of *ST3* began to change. The more the *Melody 3* was worked with, the more it was clear the music could not return to the structure of ***Moment Time***.

At this point, there were three options: 1) to turn the *ST3* time structure into ***Moment Time in Sections***; 2) to rewrite all *ST3* music written up to this point to make it conform with the ***Transforming Time*** type; 3) simply to continue and allow the structure of *ST3* to develop more freely than anticipated. Since I enjoyed the ambiguity arising from a conflict of time types, and could not predict how long the procedure on the tunings would last, I chose option 3.

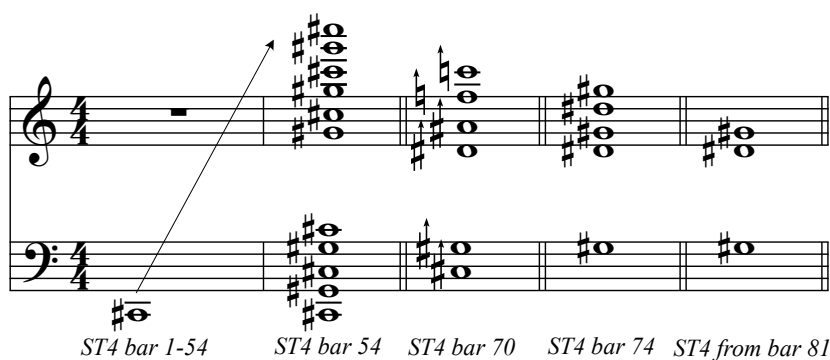
A tutti orchestral detuning is reached at bar 119, but the detuning continues to develop until bar 150. ***Moment Time*** normally implies a tendency towards hyper activity, but due to the sustained musical texture of the detuning passage, this was not musically appropriate. From this point on in *ST3*, the musical moments gradually elongated and turned into longer phases – so the music unexpectedly took on the character of ***Transforming Time***. *ST3* as finally composed encapsulates an uncertain middle ground between ***Moment Time*** and ***Transforming Time***, having characteristics of the former in the first part of the movement, inclining more towards the latter towards the end of the piece. The ambiguity thus engendered remains one of the most musically honest and meaningful aspects of my compositional research over the whole period of composition.

2.4.2 ST4

Most of the pieces involved in the *Seven Towers* cycle generate temporary peaks and/or a climax (as discussed in the last section) – paradoxically including *ST4*, despite the fact that this movement delineates ***Static Time***. *ST4* embodies the most extreme of repetitive components within the cycle; however, the danger was of monotony. Merely to generate a single, unchanging texture over 6 minutes seemed musically banal. A contrast was

needed, which occurs from around bar 54. It arises out of a sound that has been growing steadily since the start of the piece: an octave doubled perfect fifth $c\sharp - g\sharp$ sounding in the winds – gradually appears in the extreme background of the musical texture, slowly accumulating from bar 1 onwards. The full chord is heard alone in bar 54 when all other instruments are silent. It is then transformed into a chord of perfect fifths from $c\sharp_3$ to c_6 , tuned a quarter tone higher in bar 70. From bar 74 the chord is retuned into octave doubled perfect fifth $g\sharp - d\sharp$, simplifying steadily to three pitches, $g\sharp_3$, $d\sharp_4$ and $g\sharp_4$, in the last five bars of the piece. (See *Ex. 13*)

Example 13: Chords in the Winds in ST4

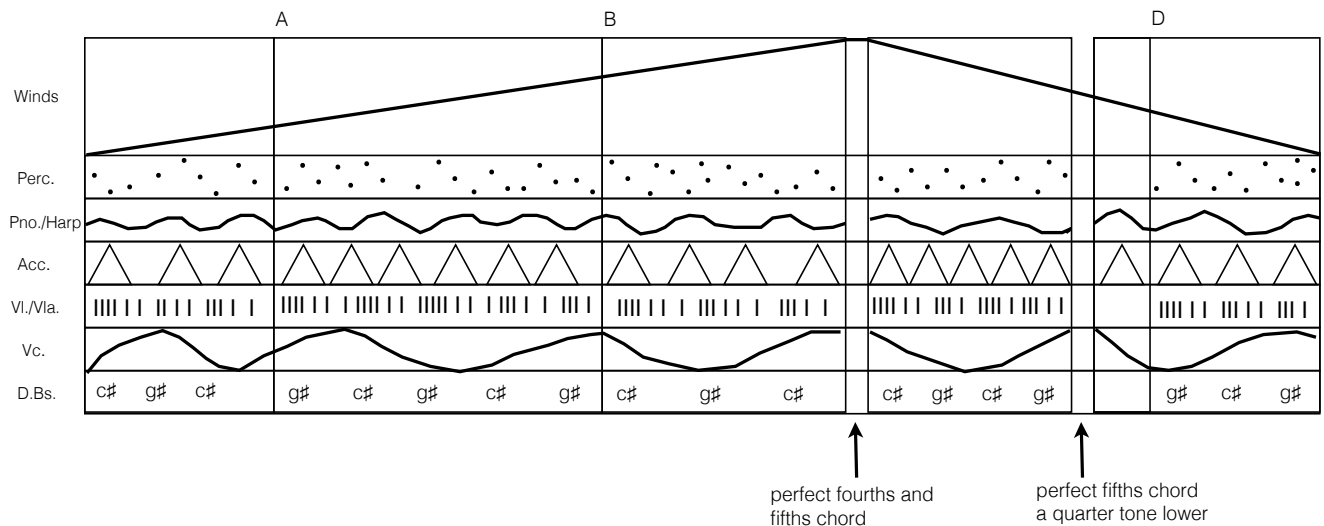


It is evident that the sequence of musical events just described enshrines a rather clear direction of increasing density as it nears a peak in bar 54, followed by a decrease. The procedure looks like a greater change than it is in performance when reading the score. In a sense, it has a more visual impact than an aural effect: the gradual change happens almost inconspicuously and is heard more or less simply as an increase of volume. Thus the moment when the chord can be heard on its own (bar 54) it is rather a surprise. To give an overview of the whole piece the next diagram shows the shape of change involved. The layers shown in the diagram demonstrate different textures in

different instruments superimposing each other. The highest notated layer in the diagram (indicated as wind instruments) delineates the chord progression pointed out above.

(See *Ex. 14*)

Example 14: Diagram of Structure in ST4



The second surprise involves the normally tuned fifths chord shifting to a similar chord of perfect fifths tuned a quarter tone higher. The uprating of the chord was chosen to be distant to all the detuned sounds of the harmonic spectra used throughout the cycle (the 7th, 11th and 13th partial tones are naturally lower tuned). The idea of shifting a chord to a distorted-like sonority was inspired by the discovery of Swiss artist Felice Varini's artwork. He is known for his geometric anamorphic illusions in public venues.⁴⁹ His thrilling transformations of urban spaces into anamorphic, illusive perspectives engender a new perception of space, form and dimension on the part of the viewer. Like most anamorphic

⁴⁹ One of his most recent work *Across the Buildings* was presented at King's Cross Visitor Centre, London, in autumn 2013 which I saw as the first of his works in public spaces.

visual illusions,⁵⁰ his paintings on walls or buildings can only be viewed as a whole from one vantage point. It usually consists of a simple geometric shape such as a line, a square or a circle. From other view points the whole shape looks fragmented in randomly ordered particles. His work stimulated me to think more deeply about space, form, transformation and surprise in music. The surprising moment in Varini's artworks happens when the geometric figure is viewed from the one correct vantage point and is suddenly perceived as a coherent form in space. (See Ex. 15).

*Example 15: Felice Varini: "Ellisse nel Trapezio" 2010*⁵¹



Seeing something, which can't be true but can be seen in reality evokes joyous confusion. *ST4* attempts some tentative analogies within the field of music. I have not found exact equivalences, however. The notion of shifting viewing position, resulting in a change from a coherent whole shape to incoherent distorted fragments, gave me the musical idea of the shifted quartertone chord, mentioned above: the second chord (see

⁵⁰ First paintings of anamorphic use came up in late Renaissance. The most famous example from this time might be *The Ambassadors* created 1533 by Hans Holbein the Younger. The painting depicts a double portrait surrounded by a still life including a distorted shape, which lies diagonally across the bottom. The distorted shape reveals its content (a skull) when viewed from a specific angle.

⁵¹ Varini, Felice, (2012), *Ellisse nel Trapezio* (2010) – Hors point de vue, Available from: <http://www.varini.org/doshpdv/dos2010/02-10-hd.html> [Accessed: 7th April 2015]

Ex. 13, bar 70) perhaps is an equivalent to the distortion of the visual image (analogous to the picture on the right side, see above). The premise of creating visual illusions is generated by the interplay between the expected and the unexpected. Ernst Gombrich says that the recognition of images is connected with projections and visual expectations. “Once a projection, a reading, finds anchorage in the image in front of us, it becomes much more difficult to detach it”.⁵² Varini’s art works obviously play with these conditions and additionally our senses with the confusion of illusory structures. I have tried to translate some of these conditions into music. However, the failure of the attempt to render such spatial anamorphic illusions into the acoustic world of sounds was inevitable and unavoidable. A spatial distortion of visual reality – as illustrated in the work of Varini – cannot directly be mirrored in music, for the simple reason that a sound wave has no precise optical equivalence. Nevertheless, this experience proved a new source of inspiration and stimulated new reflections on the possible connections between visual art and music.⁵³

This notion of surprise does not fit within the plan of enshrining **Static Time** in *ST4*, but as with *ST3*, following spur of the moment changes to a pre-existing formal plan proved musically enriching. There is some analogy here with the Stockhausen procedure of the *Einschub* – ‘insert’ technique – in which a strict formal design is broken open or enriched by means of unexpected additional sections or events.⁵⁴

⁵² Gombrich, Ernst H., (1960), *Art and Illusion – A Study in the Psychology of Pictorial Representation*, Phaidon Press London, p.181

⁵³ The most well-known experiment of an acoustical illusion might be the Shepard curve, named after the cognitive scientist Roger Shepard. It is a sound consisting of a superposition of sine waves separated by octaves. The French composer Jean-Claude Risset developed Shepard’s idea as the steps between each tone are continuous, called the *Shepard-Risset glissando*. It creates an acoustical illusion of an endlessly ascending or descending scale but at the same time it seems not to move from a higher to lower position or vice versa.

⁵⁴ In the 1950’s Stockhausen coined the term *Einschub* (trans. ‘insert’) to describe musical fragments outside his (generally) serially determined form plans, which were inserted within the music – e.g. *Gruppen* or *Carré*. The most

2.5 Time in Sections: ST5 and ST7

A piece formed by types of time in sections (there are three time types in sections, see section 1.6 The Seven Types) must, by definition, consist of at least two sections. The sections need contrasting material, technique or instrumentation, so that they can clearly be perceived as units. The *Seven Towers* cycle includes three pieces exploring these types of time (*ST1*, *ST5* and *ST7*).

Transforming Time contrasts with ***Transforming Time in Sections*** since the latter type features predominantly abrupt endings/beginnings to each section, as is the case in *ST5*, where all sections evolve as ***Transforming Time***. Sections can either be built by contrasting material or by literal or varied reprise of already stated material. To juxtapose perpetually new sections after each other could have led to formal difficulties: aside from the creative challenge of inventing ever new musical material, such a perpetual renewal of material could have lead to confusion in the listener as to whether new material marked merely the start of a new section of *ST5*, or the start of a completely new piece in the whole cycle.

For this reason *ST5* utilises literal or varied repetition of material as well as the invention of fresh material. This somewhat *rondo*-like formal procedure helps to further distinguish *ST5* from the surrounding pieces.

famous instance of this is the long climactic brass and percussion build up in *Gruppen* leading to the main climax of the whole work: this entire passage, including the climax, is a substantial insert into the pre-ordained musical structure of the piece. See full score of *Gruppen*, figs.122-123, UE, London, 1963. Interestingly, a recording of the first performance issued in 1982 by Deutscher Musikrat [F 668.099-668.101], shows that at the time of the premiere, this insert was substantially shorter than in the final published score, thus showing that it was indeed inserted after the rest of the work was composed. See: Stockhausen, Karlheinz, (2012), Karlheinz Stockhausen: *Gruppen* (1955/1957) /Stockhausen/Maderna/Boulez, Available from: <https://www.youtube.com/watch?v=6lZMWEtksII>, [Accessed: 1st October 2016], time: 17' -17:44"

ST5 is structured in five sections. Sections 1-3-5 and sections 2-4 belong to each other in character, material and instrumentation. Sections 1-3-5 start within a similar texture mixing two types of time: ***Transforming Time*** and ***Moment Time***. All single moments develop unpredictably in their linear and rhythmic direction. However, the unpredictable texture stays consistent in material and timbre and creates continuity. Therefore, these sections are a blend of ***Transforming Time*** with a hint of ***Moment Time***. (See Ex. 16)

Example 16: Beginning of *ST5*, Woodwinds

Furthermore, sections 1-3-5 reveal a new surprise in the cycle: a chorus of five voices and approximately 40 singers in total join the cycle from bar 14. The voices first appear in short fragments entirely embedded in the orchestra as a new colour. The timbre of the chorus is predominantly devoted to the *Chorale* which emerges first time in *ST2* in the woodwinds in bar 44 (see section 2.6 Linking Elements).

ST5 seemed to be the right piece to introduce the chorus for several reasons: the voices expand and refresh the timbres of the orchestra after 40 minutes of uninterrupted development. Furthermore, the chorus assists in separating the sections clearly as the voices are only present in sections 1-3-5. The voices also help to unify *ST5* and separate it from the preceding pieces. They will then appear again in *ST7*. Music within sections 1-3-5 contrasts with sections 2-4 considerably: sections 2-4 are characterised by stability, notably periodic rhythms - whereas sections 1-3-5 are much more unpredictable, as mentioned above. As another contrast, sections 2-4 are partly formed by *Melody 3* (see section 2.6 Linking Elements), played at low pitch in a solo quartet of one double bass, one violoncello, tuba and the contrabassoon, bar 40-52 (section 2) respectively bar 119-135 (section 4). *Melody 3* is completely absent from sections 1-3-5.

There were unexpected difficulties in composing this piece, due to the large number of sections it comprises. Effectively I had to artificially interrupt the compositional flow each time when a new section ended – even when I knew the creative work on the materials was far from exhausted. To start a new section was almost comparable to starting a new piece. A full and prolonged immersion in any one section was not possible due to the severe restrictions of time on each part of *ST5* if it was not to overrun its length. The freedom of the creative process was consequently restricted. This experience did not reoccur when I was writing *ST7* – another piece structured in sections.

Static Time in Sections explored in *ST7* is structured by composing each section differently. *ST7* includes two types of time: ***Static Time*** and ***Transforming Time***. The combination of ***Static Time*** with ***Transforming Time*** was exciting for a number of

reasons.

- Firstly, it allowed the investigation of a new creative process for this final piece of the cycle. Composing several sections all belonging to **Static Time** would have meant composing along similar lines to *ST4*: once the musical idea is established, there is no further possibility of change: unpredictability is kept to a minimum.
- Secondly, a sequence of **Static Time in Sections** would have completed the whole cycle in a correspondingly static way, which would not have produced a satisfactory conclusion. As the music headed towards the end of the cycle, a certain degree of renewal was needed - not only in terms of material but in terms of time perception as well.
- Thirdly, the combination of **Static Time** with **Transforming Time** was ideal because on the one hand, I could confront my most familiar type of time – **Transforming Time** – in direct contrast to my most unfamiliar type of time – **Static Time**. To heighten the contrast between these two types, paradoxically both use *Melody 1* (see section 2.6 Linking Elements) – an element, which was not otherwise developed through the cycle. Furthermore, the *Counterpoint* (see section 2.6 Linking Elements), developed from *Melody 1*, appears in both the types of time in *ST7*.

The next illustration outlines some distinct features and the types of time of the eight sections. (See *Ex. 17*)

Example 17: Diagram of Structure in ST7

B bar 41		D 96	E 126	F 148	H 200	V 440	W 488
Texture in Perc./Harp/ Celesta, the latter one plays the Melody 1	Winds Horn solo plays Melody 4	Bells	Bells	Repetitive patterns	Rhythm	Repetition of pitch	Tunings in Woodwinds
		Repetition on pitch	Repetition on pitch	Choir static in pitch	Repetitive phrases	Counterpoint in Strings	
	Counterpoint in Choir		Repetitive patterns	Counterpoint in Strings			
Static Time	Transforming Time	Static Time	Static Time	Transforming Time	Transforming Time	Transforming Time	Transforming Time

The opening section of *ST7* has some similarities to *ST4* as it progresses within a constant texture. Although there is considerable change – *Melody 1* and the *Counterpoint* are repeatedly transposed a seven times (see section 2.6 Linking Elements) shaping an overall crescendo from piano to triple forte – the texture per se stays consistent. The *Counterpoint*, played by a muted solo string octet and *Melody 1* by the celesta, contributes small degrees of change to the texture, whilst being well embedded in the surrounding sonorities. The *Counterpoint* is taken up further from section 5 onwards as a more exposed melodic element. In section 7 at rehearsal mark V the *Counterpoint* unfolds as an independent solo string quartet. Further strings gradually join this texture the *Counterpoint* is being played by the full string section shortly before W. The *Counterpoint* is built by eight sets of four repeating dyads (see *Ex. 27*). Its repetitive character was originally created to embody **Static Time**: the repetitious nature of this music was meant to evoke the sound of bells – as reminder of clock time and the idea of the tower (see next paragraph). The overall shape of *ST7*, with its combination of **Static** and **Transforming Time**, is further coloured by this use of repetition - a device rarely found in the *Seven Towers* cycle as a whole.

Referring to the title of the cycle, a tower can have various purposes. It can be built to remind citizens of clock time – the real time as stated by Bergson. A tower incorporating bells may accentuate the height of such buildings - the bells ring usually from the top floor of a tower. As the overall shape of *ST1* represents a simple rise from the bottom to top (remember the *7th space* starts high pitched), so the entire shape of the *Seven Towers* cycle mirrors a similar idea. Regarding these aspects I decided to devote *ST7* to the sound of bells. Furthermore, one of the “Museggtürme” in Lucerne is indeed called Zyturm (a clock-tower whose name literally means ‘Time Tower’), already mentioned in section 1.1.

The reappearance of *Melody 1* at the beginning of *ST7* is situated at a remote distance in time from its first appearance in the *3rd Space* of *ST1* – about 55 minutes. Although *Melody 1* was clearly exposed in *ST1* it might be difficult to recall it when it reappears again in *ST7*. *Melody 1*’s reappearance in *ST7* happens at such a remote distance from its first appearance that it evokes a different aspect of time experience. Remember what Husserl says about primary and secondary memory in section 1.2. We now remember what he has said through secondary memory. Time has passed (presumably) between reading section 1.2 and now. This can directly be compared to the time experience of *Melody 1* in *Seven Towers*. I hope that in this way the musical experience of time in *Seven Towers* might go far beyond anything so far discussed. In this thesis I have tried to explore temporality in a variety of ways, from the immediate now perception to more extended types of temporal perception, extending over a composed musical duration 78 minutes of music.⁵⁵

⁵⁵ The most extreme ideas on extended time can be seen as the *The well Tuned Piano* (1964) by La Monte Young, lasting 5-6 hours, his *Dream House* (1963) in NYC which is playing a composition of his in electronic frequencies lasting many days each; and John Cage’s *ASLSP* (*As Slow as Possible*) for organ (1987), which is playing for a total duration of 639 years in Halberstadt, Germany.

2.6 Linking Elements

As already clarified in the introduction, *Seven Towers 2-7* are each related to the individual spaces of *ST1*. In addition to this factor, the repetition and development of recognisable musical elements established earlier in the cycle plays an important role in generating coherence over time through to its final stages. Some of these linking elements are shown in different appearances and variations across the cycle.

2.6.1 Two Central Tones

Throughout the whole cycle, the pitch-classes c# and g# appear as central tones in any octave, as fundamentals or as intervals of fifths and fourths. They appear in very differentiated musical circumstances, functioning as links between the pieces and creating consistency across the cycle. These central tones are connected to other linking elements such as *Melody 2* (c#) and *Melody 3* (g#) – see subsections 2.6.5 and 2.6.6 below.

2.6.2 Harmonic Spectra

Each of the seven pieces contains harmonic spectra on various fundamentals. *Example 18* illustrates a harmonic spectrum on the fundamental of c, showing its partials up to the 16th overtone. Those partials with micro deviations from equal temperament (e.g. the 5th partial is approx. a twelfth tone lower, the 7th partial a sixth tone lower and the 11th and 13th partial a quarter tone lower) are not differentiated in their notation, both in *Ex. 18* and in all scores of *Seven Towers*. The 5th partial is tuned normally; whilst both the 7th, 11th and 13th partials are approximated to the nearest quarter-tone (as shown by the extending downward arrows on the accidentals concerned). This choice was determined by a personal decision: assuming that the entire cycle had to be rehearsed within a few hours (approx. 2 hours per

piece), there would be insufficient time to tune the harmonic spectra with absolute precision, so a practical compromise had to be found. My harmonic spectra are therefore not pure: rather than embodying scientific precision of intonation, in *Seven Towers* the harmonic spectra contribute to the timbral sound experience as a particular recognisable colour within the wider harmonic and pitch vocabulary deployed in the music. For these purposes, the approximation employed (as illustrated in *Ex. 18*) proved quite aurally sufficient in practice to register the harmonic spectra as such within the wider harmonic contrasts of the music.

Example 18: Harmonic Spectrum



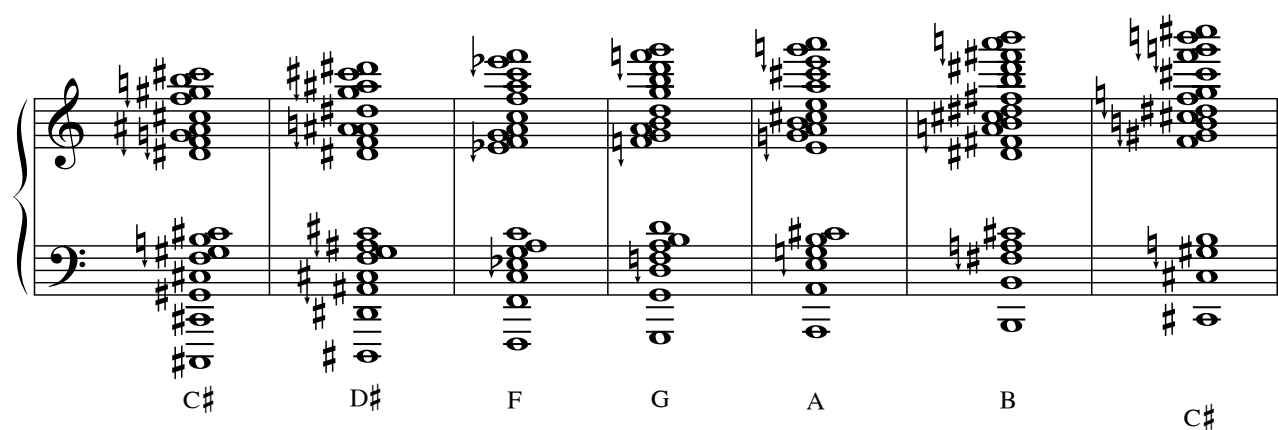
An example can be seen in *ST4*: two harmonic spectra, one based on the fundamental of $c\sharp_1$, and the other of $g\sharp_0$, alternate with each other throughout the whole piece on a regular basis. Both spectra sound in two different versions consisting of different sets of partials played by the strings and the accordion. (See *Ex. 19*)

Example 19: Four Harmonic Spectra in ST4

Further development of harmonic spectra can be seen in *ST6*. Seven spectra are set up with fundamentals from whole tone scale beginning and ending on the fundamentals of c# (see *Ex. 20*). The rising progression was established to generate direction and can be followed in the strings from bar 64-c#, 80-d#, 85-f, 88-g, 97-a, 102-b, 106-c# (these spectra continuously overlap each other). From bar 111 the spectra change on each beat within an acceleration. From bar 123 the speed of spectral change culminates as the spectra change each quaver.

If in future orchestral rehearsal time can be extended significantly beyond the present average of 2 hours per piece, the intonation of harmonic spectra in the cycle may possibly be re-considered in the interests of greater spectral accuracy.

Example 20: ST6, Seven Harmonic Spectra

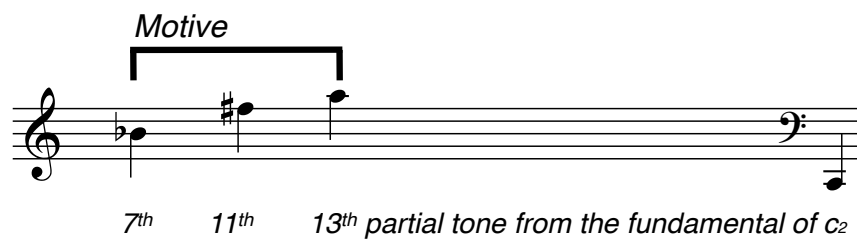


2.6.3 The Motive

A more melodic use of spectra is introduced by a different linking element: the *Motive*. The *Motive* consists of three pitches drawn from the harmonic spectrum, which as just explained, is a major cyclic element throughout *Seven Towers*. The *Motive* extracts the 7th,

11th and 13th partials from the harmonic spectrum – here illustrated as partials of a fundamental C₂. (See *Ex. 21*)

Example 21: Motive



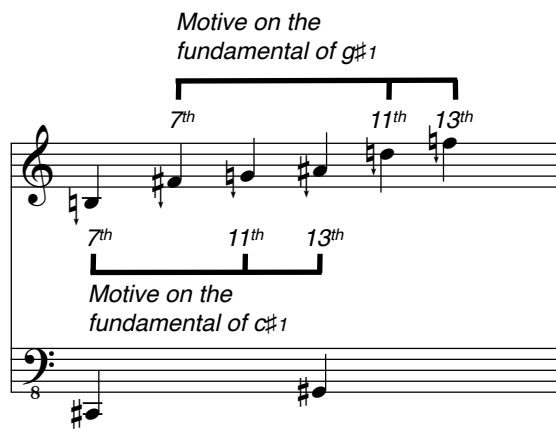
The *Motive* either appears on its fundamentals as part of a spectrum (including harmonic alterations); or else it is detached and independent from the sonority of a harmonic spectrum, being freely exploited and developed by itself. It may appear as linear order or else as a chord. It emerges the first time in *ST1-6th space* bar 264 as partials of sustained harmonic spectra on the fundamentals of f[♯], a and f, each cross-faded. (See *Ex. 22*).

Example 22: ST1, Motive in bar 264-268

The musical score for Example 22, ST1, Motive in bar 264-268, is presented in a system of staves. The staves are labeled as follows: Fl. 1, Fl. 2, Fl. 3, Ob. 1, Ob. 2, Ob. 3, B. Cl. 3, VI. I, VI. II, Vla. div. in 2, and Vc. div. in 2. The score is written in 4/4 time and features a key signature of one sharp (F#). The motive is highlighted with red and blue circles and boxes across various staves. The red circles highlight the first and second notes of the motive in Fl. 1, Fl. 2, Ob. 1, Ob. 2, and B. Cl. 3. The blue circles highlight the third and fourth notes of the motive in Fl. 1, Fl. 3, Ob. 3, and B. Cl. 3. The blue boxes highlight the fifth and sixth notes of the motive in VI. II and Vla. div. in 2. The score includes dynamic markings such as *pp*, *ff*, *f*, *mf*, and *ppp*, as well as performance instructions like *non vibrato* and *div.*.

The *Motive* emerges as linear order at the end of *ST1* from bar 307 (see *Ex.42* below). Further use of the *Motive* can be seen in *ST4*. Both the harp and the piano use a set of six pitches tuned a quarter tone lower. The six tuned pitches consist of the *Motive* based on both the fundamentals $c\sharp_1$ or $g\sharp_1$ (see section above 2.6.1 Two Central Tones), exemplified in *Ex. 23*. This set of six tuned pitches is applied throughout *ST4*. Further use can be observed in *ST5* bar 197-206, *ST6* (only harp) bar 46-54/134-135 and *ST7* bar 487 until the end of the piece.

Example 23: ST4 and ST7, Motive as Six Tuned Pitches



2.6.4 Melody 1

Melody 1 appears the first time in *ST1-3rd space* in the flutes, bar 107-114 and emerges only a second time in its full length in *ST7*. *Melody 1* develops in dyads of perfect fourths and perfect fifths and is structured in two segments. (See *Ex. 24*)

Example 24: Melody 1 in ST1, bar 107-114



The second use of the *Melody 1* is not melodic but rather textural - at the start of *ST1-4th space*. Only the first segment of *Melody 1* appears here – discreetly highlighted dynamically within a glissando texture. (See *Ex. 25*)

Example 25: ST1, from bar 217

The musical score for Example 25, ST1, from bar 217, displays a complex orchestral texture. The staves are arranged in two systems. The first system includes Horns (Hm. F 1, Hm. F 2, Hm. F 3, Hm. F 4), Trumpets (Tpt. 1, Tpt. 2), Trombones (Tbn. 1, Tbn. 2, Tbn.), and Tuba (Tba.). The second system includes Violins (VI. I, VI. I, VI. II, VI. II), Viola (Vla.), Violoncello I (Vc. I), and Violoncello II (Vc. II). The score is marked with dynamic levels (p, mf, pp, f) and includes blue arrows and circles highlighting specific musical motifs and their transpositions across different staves.

The next reappearance of the complete *Melody 1* only occurs at the beginning of *ST7* in the celesta, bar 1-38 – see following subsection.

2.6.4.1 Counterpoint of Melody 1

The *Counterpoint of Melody 1* develops independently from it into *Melody 4*. It first appears in the first section of *ST7* to form an extended texture in **Static Time**. An extended section using this material (bar 1-39) is built up with seven transpositions of both *Melody 1* and its *Counterpoint*. The next figure shows the derivations of the counterpoint from *Melody 1*.

Example 26: ST7, Melody 1 and its Counterpoint

The musical score for Example 26 is presented in two systems. The first system includes 'Melody 1' and 'Counterpoint'. 'Melody 1' is written in the treble clef and contains a complex melodic line with numerous accidentals and intervals marked with '5' and '3'. It is annotated with a '1st transposition' arrow pointing to a section of blue boxes and an 'original' arrow pointing to a section of green boxes. The 'Counterpoint' is written in the bass clef and consists of a series of chords, mostly perfect fourths and fifths, some of which are circled in blue, purple, and orange. The second system continues the melody and counterpoint, with the counterpoint featuring more complex chords and intervals marked with '5' and '3'.

The *Counterpoint* consists of a simple figuration of four successive perfect fourths or perfect fifths. Each figuration formed by four dyads reiterates 3-4 times. An additional dyad (marked by blue triangles) can be seen between the repetitions: it links the figurations. (See Ex. 27)

Example 27: Counterpoint of Melody 1

The original version of *Melody 1*, used in *ST1*, starts on the perfect fourth g-c. As I intended to start *ST7* on the central tones c $\sharp$ - g $\sharp$ (to connect *ST6* with *ST7* smoothly), a first transposition up a semitone onto these pitches was used before the original transposition. The following transpositions fall by minor seconds. The next example shows the first six pitches of *Melody 1* and its seven transpositions used in *ST7*, bar 1-39 (in the score little deviations can be seen of the transpositions, e.g. not octave identical and minor changes of the melodic procedure). (See *Ex. 28*)

Example 28: First six Pitches of Melody 1 and its seven Transpositions used in ST7

2.6.5 Melody 2

Melody 2 is built by four segments and ends on $c\sharp_5$. Segment 1, 2, and 3 are identical and segment 4 introduces three further pitches. $C\sharp$ acts as the central tone in *Melody 2* and this is affirmed by its arrival at the end of the fourth segment. (See *Ex. 29*)

Example 29: Melody 2



Melody 2 appears the first time in *ST1-3rd space* at letter K, bar 128, and remains present throughout the *3rd space*. Here *Melody 2* is a construct of a texture: its pitches are picked out from a dense melodic progression in the strings and clarinets. (See *Ex. 30*)

Example 30: ST1-3rd Space, bar 128-131

Melody 2 develops in *ST2* as it proceeds hocket-like within the winds. In this context it appears without its 3rd segment; it can be observed from bar 115 beginning on b_3 (tbn.2) -

c $\sharp$, (hrn. 3) - g, (tpt.1) - f $\sharp$, etc. *Melody 2* is repeated subsequently five times in diverse transpositions, in each of which the penultimate pitch overlaps with the start of the next transposition. (See *Ex. 31a* and its continuation *31b*)

Example 31a: ST2, bar 115-120

The musical score for Example 31a, ST2, bars 115-120, is presented below. The score includes staves for Bsn. 1, Bsn. 2, Bsn. 3, Hrn. F 1, Hrn. F 2, Hrn. F 3, Hrn. F 4, Tpt. 1, Tpt. 2, Tpt. 3, Tbn. 1, Tbn. 2, and Tbn. 3. The key signature has one sharp (F#) and the time signature is 4/4. The score includes dynamic markings such as pp, mf, and p. Blue arrows and circles highlight a melodic sequence across the woodwind and brass parts, showing how the penultimate pitch of one transposition overlaps with the start of the next. An orange arrow points to a specific note in the Tbn. 2 staff.

Example 31b: ST2, bar 121-128

The musical score for Example 31b, ST2, bars 121-128, shows a complex orchestral texture. The Horns (F1, F2, F3, F4) and Trumpets (1, 2, 3) are prominent, with various dynamics like *f* (forte) and *mf* (mezzo-forte) indicated. The Trombones (1, 2, 3) and Keyboard (Akk.) provide a harmonic foundation. Annotations include yellow boxes highlighting specific notes and orange arrows showing melodic movement between staves. Red circles and arrows highlight a specific melodic fragment in the Trombone 1 staff.

Melody 2 is further explored within *ST3*: as this piece explores **Moment Time**

Melody 2 assists in building some unity among the many fragments of moments. Brass instruments gradually reintroduce *Melody 2* – first in fragments (from bar 5) until its full unfolding in bar 50. (See Ex. 32)

Example 32: ST3, bar 50-57

The musical score for Example 32, ST3, bars 50-57, shows three staves for Trumpets (C1, C2, C3). The score includes markings for 'harmon mute' and 'p' (piano). Arrows indicate melodic movement between staves.

2.6.6 Melody 3

By way of contrast with other linking elements, *Melody 3* is deliberately more elaborate and complex in its make-up. Part of this complexity results from the incorporation within *Melody 3* of several fragments from *Melody 2* as well the whole of the *Motive*, several times in different orders. The *Motive* is either built on the harmonics of fundamentals $c\sharp_2$ or $g\sharp_2$, or without a relation to any fundamentals when it appears in the prime form in retrograde inversion. *Melody 3* also incorporates the central tone $g\sharp_5$. This central tone connects *Melody 2* with the *Motive* as it is placed between them and marks the final pitch of the whole series. The central tone is also connected to the *Motive* as it is related to the fundamental $g\sharp$ - as a fifth from the fundamental of $c\sharp$. (See *Ex. 33*)

Example 33: Melody 3

When *Melody 3* appears arranged in the winds, starting in *ST3* bar 58 (see *Ex. 34*), it suddenly introduces and forms a new sound area: the whole orchestra tunes the pitches a quarter tone lower and continues to do so for a substantial period of time (see section 2.4).

Example 34: ST3-bar 58-69

A further use of *Melody 3* can be seen in *Ex. 39*, see below.

2.6.7 Melody 4

Melody 4 is built by an extended musical development of lyrical character. It is a construct rooted in the harmonic development of the *Counterpoint* in *ST7*, bar 41-84. The *Counterpoint* – appearing here in a slightly distorted version – is sung by the chorus. See the first passage of *Melody 4* in the brass instruments: the colour in the diagram shows how *Melody 4* connects pitch to the *Counterpoint*. (See *Ex.35*)

Example 35: ST7, Extract of Melody 4 deviated from the Counterpoint

The musical score for Example 35 shows an extract of Melody 4 deviated from the counterpoint. The score includes staves for Horns (Hrn. F 1, 2, 3, 4), Trumpets (Tpt. 1, 2, 3), Trombones (Tbn. 1, 3), Tubas (Tub.), Saxophones (S, A, T), Baritone (Bar), and Bass (B). The score is marked with various dynamics (pp, f, p, mf, pp) and features colored circles and arrows indicating specific melodic phrases and their development across different instruments. The phrases are marked in purple, and the arrows show the melodic development across various lengths up to 10 bars played by other brass instruments.

The horn solo (horn 1 in the first two bars, see example above) plays a short phrase of two bars appearing six times (some of them varied) throughout *Melody 4*. After each phrase – each one marked in purple, (see *Ex. 36*) – further melodic development can be seen of various lengths up to 10 bars played by other brass instruments.

Example 36: ST7, whole Melody 4

The musical score for Melody 4 in ST7 is presented across eight staves. The key signature has one sharp (F#) and the time signature is 4/4. The melody is characterized by triplet rhythms and is assigned to various instruments throughout the piece.

- Staff 1:** Rehearsal mark Hrn. 1/bar 41. Instruments: Hrn. 1, Tpt. 2, Tpt. 1, Hrn. 4, Tbn. 1, Hrn. 2.
- Staff 2:** Rehearsal mark Hrn. 1/bar 46. Instruments: Tpt. 2, Tpt. 1, Tpt. 3, Tbn. 2, Tbn. 1.
- Staff 3:** Rehearsal mark Hrn. 1/bar 50. Instruments: Tpt. 3, Tbn. 1, Tpt. 2, Tpt. 1, Tpt. 3, Tpt. 2, Hrn. 1, Tpt. 3.
- Staff 4:** Rehearsal mark Hrn. 1/bar 56. Instruments: Tpt. 2, Tpt. 1, Hrn. 3, Hrn. 2, Tpt. 3, Hrn. 1.
- Staff 5:** Rehearsal mark Hrn. 1/bar 70. Instruments: Tpt. 1, Hrn. 2, Tbn. 1, Tbn. 2, Tbn. 3, Tbn. 1+2.
- Staff 6:** Instruments: Hrn. 3, Hrn. 1, Hrn. 2, Hrn. 4.
- Staff 7:** Instruments: Hrn. 1, Tpt. 1.

Melody 4 reappears again in the final section of ST7 from rehearsal letter W, bar 488 until the end of ST7. Here it can be heard in the sound of the detuned piano and the detuned harp (see The Motive in subsection 2.6.3), both playing *Melody 4*.

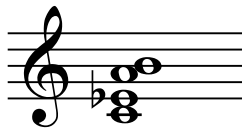
To use *Melody 4* twice in ST7 was based on the fact that ST7 needed unification in its split time structure (**Static Time in Sections**). Furthermore, a reappearing melodic

structure towards the end of the piece assisted to somewhat herald the termination of the entire cycle. The length of *Melody 4* was ideal to compose an extended fade towards the end of *ST7*.

2.6.8 The Tetrachord

The *Tetrachord* consists of a minor third, a tritone and a major second, which can be seen as a reminiscence of the *Motive* in its inversion, but including one more pitch. (See *Ex.37*)

Example 37: Structure of the Tetrachord



The *Tetrachord* appears for the first time in *ST1-5th space*. Most of the chords progressing in the wind instruments from bar 242-257 are structured by the *Tetrachord*. (See *Ex. 38*)

Example 38: ST1-5th Space, the Tetrachord, bar 242-243

242 R

The musical score for Example 38, bars 242-243, is presented for a full orchestra. The score is divided into two systems. The first system contains bars 242 and 243, and the second system contains bars 244 and 245. The key signature is one sharp (F#). The time signature is 4/4. The score includes parts for Flutes 1, 2, and 3; Oboes 1, 2, and 3; Clarinets 1, 2, and 3; Bassoons 2 and 3; Trumpets 1, 2, and 3; and Trombones 1, 2, and 3. The score is marked with various dynamics (p, sfz, ff, mf, pp) and articulations (accents, slurs). Several notes are circled in purple, highlighting specific melodic lines. A box labeled 'R' is placed above the first staff (Fl. 1) at bar 242. The score is divided into two systems, with bar 242 in the first system and bar 243 in the second system.

The *Tetrachord* reappears again in *ST5*, section 2 and 4, split in dyads: whilst one of the pitches doubles *Melody 3* the others are harmonising *Melody 3* within diverse transpositions each adapting a particular pitch of *Melody 3*. (See Ex. 39)

Example 39: ST5, beginning of Harmonisation of Melody 3 by the Tetrachord

2.6.9 The Choral

The *Chorale* – a five voice progression lasting 5 bars – appears in *ST2* and in *ST5*. The *Chorale* emerges repetitively five times throughout *ST2* – the first time in three flutes and two oboes, bar 44-48. The *Chorale* in *ST2* can further be seen from bar 52, 68, 78 and 87 – the last *Chorale* is transposed a perfect fourth lower than all others; see *Chorale* in Ex. 40.

Example 40: ST2, Chorale, split in Four Segments

The repetitions and therefore the memorisation of the *Chorale* is an important factor as it does not reappear again before *ST5*. The chorus appears for the first time in *ST5*, which picks up the *Chorale* from bar 22 onwards. In *ST5* the *Chorale* reappears fragmented in segments which are sometimes varied. The structure of the *Chorale* can be split in four segments (see again *Ex. 40*). For instance, the violins play the first segment of the *Chorale* three times in *ST5* from bar 12 each of which is slightly varied (see *Ex. 41*). The *Chorale* circulates a perfect fifth (B and F sharp, see first and last chord in *Ex. 40*) framing the chromatic content or whole tone scale fragments. The five-tone-chords change harmonies each crotchet: from chromatic clusters (4th chord, bar 1) to whole tone chords (1st chord, bar 3) up to an augmented four-note chord (last chord, bar 5).

Example 41: ST5, Fragments of the Chorale in the Violins, from bar 12

The image shows a musical score for six violins (VI. I to VI. II) starting at bar 12. The score is written in 4/4 time. Three specific segments of the chorale are highlighted with blue boxes and labeled '1st segment' below them. The first segment is in bar 12, the second in bar 13, and the third in bar 14. The score includes dynamic markings such as *mf*, *p*, *f*, and *ppp*. The first segment is a chromatic cluster, the second is a whole tone chord, and the third is an augmented four-note chord.

2.6.10 Adjacent Elements between the Pieces

The seven pieces are sharply contrasting in character. In order to generate coherence and continuity between pieces adjacent elements were employed to generate a sense of ambiguity formally and musically. Each of the adjacent elements is used differently in the following piece. However, their presence acts as a means to transition from the musical

world of one piece to the next. As an example, *ST1* and *ST2* are connected by triplets of repetitive pitches and the use of the *Motive*. The repetitive triplets appear at the end of *ST1* from bar 307 and continue in *ST2* in the strings from bar 3 at a slightly increased pace. The *Motive* appears at the end of *ST1* as linear triads and as repetitive chords from bar 307. In *ST2* the *Motive* emerges from bar 5 when both groups of wind instruments cross-fade through increasing dynamics. Compare the next two excerpts of *ST1* and *ST2*: the *Motive* is marked by squares in colour (each colour emphasises a different transposition). (See Ex. 42a and 42b)

Example 42a: ST1, bar 307-309 (near the End of the Piece)

The musical score for Example 42a, ST1, bars 307-309, is presented for a full orchestra. The score is in 3/4 time and features triplets and dynamic markings like *p* (piano) and *f* (forte). The 'Motive' is marked by colored squares (blue, red, green) across various instruments, emphasizing different transpositions. The score is divided into two systems, each starting at bar 307. The first system includes Flutes (Fl. 1, 2, 3), Oboes (Ob. 1, 2, 3), Clarinets (Cl. 1, 2, 3), and Violins (VI. I, VI. I, VI. II, VI. II). The second system includes Violins (VI. I, VI. I, VI. II, VI. II). The score shows the 'Motive' marked by colored squares (blue, red, green) across various instruments, emphasizing different transpositions. The score is divided into two systems, each starting at bar 307. The first system includes Flutes (Fl. 1, 2, 3), Oboes (Ob. 1, 2, 3), Clarinets (Cl. 1, 2, 3), and Violins (VI. I, VI. I, VI. II, VI. II). The second system includes Violins (VI. I, VI. I, VI. II, VI. II).

Example 42b: ST2, bar 1-5

The musical score for Example 42b: ST2, bar 1-5, is a woodwind and string ensemble. The woodwinds (Flute 1, Flute 2, Flute 3, Oboe 1, Oboe 2, Oboe 3) play a melodic line with dynamics ranging from *ppp* to *f*. The strings (Violin I, Violin II, Violin III, Violin IV) play a rhythmic pattern with dynamics ranging from *pppp* to *f*. A red box highlights a specific chord in the woodwinds, and a blue box highlights a specific chord in the strings. An arrow points from the text "Motive as chord" to the red box.

The adjacent elements assist in linking some of the pieces seamlessly. The listener may not immediately realise when a new piece starts until the new character of the piece has settled, which may take between approximately 10 seconds and a maximum of 2 minutes. At this point the new piece becomes unambiguously apparent to the audience.

2.7 Conclusion

This research started by questioning what musical form could be in my own creative work, and how it could function within it. I had a very vague idea that form is a factor of the listener's imagination – an aural perception as we listen to music in a continuous present. Form per se in the physical sense is the material aspect of a visible structure – the shape

of an object confined in space. Transferred into music I realised that musical form cannot aurally be grasped as a whole in one present moment. Rather it is the product of the listener's memory of a musical work heard.

I begun to reflect on temporal perception and read many composers' ideas on musical form. For example, Wolfgang Rihm: 'Yes, that is what form is for me: the shape of change.'⁵⁶ or, György Ligeti: 'Musical form arises when the process in time can be imagined retrospectively as a virtual space.'⁵⁷ I decided to find my own answers by creating the types of time devised whilst composing *Seven Towers*. The awareness of temporality through these time structures seems to me much closer to our real experience in the now – in the Bergsonian sense *experienced time*.

The seven types of time might be seen as too schematic. Therefore they should be regarded as provisional, even to some extent subjective. Having established the categories of the temporal types and having passed through all the ambiguities of trying to define these types of time musically and verbally, I realise I have gained a much wider view of how music progresses through time. Composing with the time types assisted me in distinguishing the seven pieces from each other clearly; yet it also caused some difficulties.

Before composing the *Seven Towers* cycle I had very little experience in conceptualising a whole work before composing it – the creative process usually

⁵⁶ Häusler, Josef, (2002), "Wolfgang Rihm in conversation with Josef Häusler". In *Jagden und Formen*, [CD-Booklet], Deutsche Grammophon, Hamburg, pp.11-12

⁵⁷ Ligeti, György, (2007), "Form in der neuen Musik", in: Monika Lichtenfeld, (ed.), *György Ligeti Gesammelte Schriften*, Paul Sacher Stiftung, Basel and Schott Music, Mainz, p. 186, article originally published 1965. Original text in German: '[...] musikalische Form entsteht erst, wenn man den Zeitablauf der Musik retrospektiv als "Raum" überblickt.'

developed spontaneously from one moment to the next moment (somewhat like the work of my teacher Dieter Ammann). The time types assisted me in experimenting with an idea of an overall time character whilst leaving an open space for intuitive freedom and spontaneous bar-to-bar creative decisions. Yet I felt creatively restricted in making decisions spontaneously because the intuitive notion of the next musical shape or phase did not always fit into the concept of the time types within which I was working. This caused some of the deviations and ambiguities of category present in the seven pieces. Furthermore, without having had the chance to write a series of orchestral pieces before, it had not been possible to go to such musical extremes in composing long passages in ***Static Time***, or shaping music into ***Time in Sections***.

Without the theory of time types, the pieces would not have been as differentiated from each other as they now are. Experimenting with the seven types of time revealed that transformation – perhaps my greatest interest in composing music – necessitates incorporating a much wider flexibility of time character than I have experienced before. For instance, the contrasting characteristics of the seven temporal types generated increased differentiation in the pace of musical change. It became clear that my personal tendency to transform elements throughout a piece happens habitually on a medium-speed basis. To be more precise, harmonic fields, for instance, are changing generally several times a minute. The time types helped to vary the pace of harmonic changes. *ST4* and *ST7* are the pieces where the pace of change harmonically happens more slowly compared to the other pieces in the cycle. This finally assisted me in achieving musical development of a wider diversity – an essential factor in shaping music vividly if, as in this instance, it is to be heard continuously over a whole concert.

I would like to take this opportunity to briefly mention a personal experience, which impacted on my own perception of time and memory in an extraordinary way. Following a stroke twenty-three years ago I experienced a complete loss of memory (including my own name). The resulting disorientation of physical and mental action affected the sensations of space and time considerably. I experienced time stopping and loss of spatial orientation. My normal sight became restricted (the visual field was limited and distorted into fragmented images); this generated a spatial disorientation and an associated absence of the ability to memorise actions in time linearly. The period of recovery and re-orientation lasted many years leading me through several stages of different time perceptions. Having experienced an extended time of immobility I was interested to find equivalences within the field of musical composition. *ST4* was a first venture of interpreting and transforming the perception of immobility within longer duration. Furthermore, the considerable time distance between the appearance of *Melody 1* (first appearance in *ST1*) and its reappearance in *ST7* (see section 2.6.4 *Melody 1*) perhaps has an analogy of the experience of loss of my memory: losing a memory of something and finding it again within new, unexpected circumstances over a vast extended time-frame. This was the first experiment in transforming such exceptional experiences into my compositions.

The influence of the *Seven Towers* cycle on other music in my output can already be seen. I composed *Thread*, a piece for violin and piano, in December 2014 to February 2015 between composing *ST4* and *ST5*. The influence of the different types of time in *ST1-7* on the duet can be seen in the more elaborate contrast of register, timbre, change of melodic character. In particular, the use of material developing throughout the whole duration of the piece was a factor affected by the orchestral composing I had just done. To

focus on limited material over an extended period of time was a fresh experience for me in composing chamber music. Consciously to follow a particular time type was not a factor in composing the duet. However, I noticed a tendency to give more attention to the time types when I discovered one of the time types in miniature. For instance, the pitch b flat keeps recurring over seven bars (bar 119-125) – a brief but clear and direct influence from the texture of *ST4*.

The experience of this research work may help me to form further cycles of pieces lasting a whole concert – which remains my major interest as a composer. As mentioned in the introduction, the popularity of presenting a single one composer's music in a series of concerts, or juxtaposing pieces of one composer's music in one concert has increased significantly in recent years. I believe that this tendency will grow over the next decades and will lead to new concert-forms within the field of contemporary music. New types of commission are being devised for whole concert events by one composer, e.g. for the Music Festival in Donaueschingen 2013 (see next chapter 3.1). The awareness of and concentration on the diversity of temporal perception remain valuable creative tools for me in considering how to compose the concert experience. Perhaps, too, the listening process might become more playful. People from the audience at the premiere of the *Seven Towers* cycle in Biel related after the concert that whilst listening they had tried to grasp the idea of time categories: they were intrigued to work out when a new piece of the seven had started and enjoyed the musical ambiguity generated by the transitions between pieces. Such a listening process, focused on temporal characterisation, might assist in bridging the gap between new music and the audience – perhaps even assist in communicating contemporary music to a wider audience in new ways. The experience of

ambiguous temporal perception thus becomes an active tool in developing audience awareness whilst listening to new music.

Lastly, reflecting on time structures gave me a deeper understanding of how music unfolds and will surely affect my future projects substantially. One of the next projects I am planning is to convert the seven time types into the visual world. As Cage recognised long ago,⁵⁸ temporality is the common ground between music and dance. I am hoping it may be possible to visualise the seven time types through choreography on stage. This, in turn, might lead to new compositional as well conceptual discoveries. Another upcoming project – a commission for a new piece for woodwind quintet – will be structured in five movements attempting to use the time types in a new way: two types of time are juxtaposed in each movement. Each of the five instruments will be used as a predominant soloist in each movement and each soloist will exhibit a particular time type.

Simultaneously the remaining instruments will play within a different time type in contrast to the solo instrument. It is clear that such simultaneous juxtapositions of time types may well pose different compositional challenges to working with each time type in isolation, as was done in *Seven Towers*. Yet it is only now, having explored each type so thoroughly in succession that it is possible realistically to envisage composing with them in a counterpoint of time types. The future will doubtless see other unexpected uses of the discoveries made throughout the long composing journey which resulted in *Seven Towers*.

⁵⁸ The temporal structure of Cage's early pieces (e.g. *Imaginary Landscape No.1*, 1939, and *First Construction (in Metal)*, 1939) was based on rhythmic phrase-lengths. For instance, the rhythmic structure of his percussion sextet *First Construction (in Metal)* is based on a single number series (4-3-2-3-4) that controls both the lengths of phrases in terms of measures and the lengths of sections in terms of these phrase-group units. Cage called the principle of these rhythmic structures "micro-macroscopic". John Cage and the choreographer Merce Cunningham later introduced the temporal independence of both music and dance from around the 1950s. In many later collaborations, Cage and Cunningham created an independent working process between the disciplines (music, dance, lighting, costumes and set) resulting in productions of merging the disciplines at the moment of performance e.g. *Points in Space*, 1987 or *Beach Birds*, 1991.

3. Appendix

3.1 List of Orchestral Cycles

To look at orchestral cycles or cycles of mixed instrumentation up to orchestral instrumentation, these pieces can be seen as the most well-known ones:

- Friedrich Cerha: Spiegel, cycle of seven individual orchestral pieces, 1960-72, 90'
- James Dillon: Nine Rivers 1-9 for large ensemble, 1982-99, 3h 30'
- Brian Ferneyhough: Carceri d'Invenzione, cycle of seven pieces for solo or ensemble of mixed groups up to orchestral instrumentation, 1981-86, 86'
- Gérard Grisey: Les Espaces Acoustiques, cycle of six pieces of diverse instrumentations up to orchestral pieces, 1974-85, 95'
- Wolfgang Rihm: Tutuguri for large orchestra, five pieces 1981-82, 100'

The Music Festival in Donaueschingen devoted its theme 2013 to large scale format pieces. They premiered six new pieces, three of them of a duration of an evenings concert for large ensemble or orchestra. The three large scale format pieces were:

- Georges Aperghis: Situations, for large ensemble, 2013, 54'
- Bernhard Lang: Monadologie XIII "The Saucy Maid", for orchestra, 2013, 70'
- Enno Poppe: Speicher, for large ensemble, 2008-2013, 71'

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