

A THOUSAND PLATEAUX

Composition Commentary



Jae-Moon Lee

Robinson College

Faculty of Music

University of Cambridge

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A Thousand Plateaux

Commentary

on Scores submitted for the degree of PhD in Music

Composition Research



University of Cambridge

Jae-Moon Lee

Summary of Composition Portfolio

***Tangram* for piano**

The puzzle known as *tangram* was the inspiration behind this composition. Just as the seven pieces of the tangram create shapes, seven contrasting musical fragments appear as thematic materials from which to draw sonic imagery.

***Sapphic Fragments* for two sopranos**

This composition was constructed from “broken” materials - an analogy for Sappho's dismembered poem. These broken materials were arranged in a pointillistic manner. I drew inspiration from M.C. Escher's works to vary thematic fragments of this work.

***M.O.N.T.A.G.E.* for flute, clarinet, violin and cello**

This work was influenced by the video work, *Wantee*, by artist, Laure Prouvost. The title, *M.O.N.T.A.G.E.*, is an acrostic, using words that show intimate relations with my composition: Multicolour, Oscillation, Numbers, Television, the Artist, Gleam, Etc..

***Once Emerged from the Grey of Night* for flute, clarinet, horn, violin, viola and cello**

This sextet consists of numerous fragments with various colours and textures, forming a musical collage. A picture-poem by Paul Klee offered the starting point for this work.

***Scale-Free Spaces* for flute, guitar, viola and cello**

I drew compositional ideas from the video installation, *Irreversible*, by artist Norimichi Hirakawa. This quartet was composed of brief fragments of dots, lines and movements. Various fragments were structured in forms of both simplicity and complexity. For the latter, ideas were drawn from the study in randomness, ‘Scale-Free Network’.

String Quartet no. 3

This composition consists of four movements. In the first and third movements, the sound of rain drops and images of light through stained glass are explored. The second and fourth movements effect a structural metamorphoses of musical elements. I drew inspiration from Kafka's novella *The Metamorphosis*.

***A Thousand Plateaux* for orchestra**

In this orchestral work, a variety of images of both plateaux and movements were invoked. The work was inspired by both the book, *A Thousand Plateaux* by Gilles Deleuze and Félix Guattari, and the Alhambra palace in Granada, Spain.

CONTENTS

	page
List of figures	5
List of accompanying scores and a recording	9
Introduction	11
Chapter 1: <i>Tangram</i> for piano	14
Chapter 2: <i>Sapphic Fragments</i> for two sopranos	36
Chapter 3: <i>M.O.N.T.A.G.E.</i> for flute, clarinet, violin and cello	52
Chapter 4: <i>Once Emerged from the Grey of Night</i> for flute, clarinet, horn, violin, viola and cello	58
Chapter 5: <i>Scale-Free Spaces</i> for flute, guitar, viola and cello	64
Chapter 6: <i>String Quartet no. 3</i>	71
Chapter 7: <i>A Thousand Plateaux / A Thousand Movements</i> for orchestra	80
Conclusion	97
Bibliography	98
Appendix 1 Seven-tone scales in <i>Tangram</i>	100
Appendix 2 <i>Sappho's Fragments no. 31</i>	106
Appendix 3 Tone material in each section of <i>Sapphic Fragments</i>	107
Appendix 4 <i>Man-Nam</i> for two pianos (partial)	108

LIST OF FIGURES

	page
<i>Tangram</i>	
Figure 1 Images : images of tangram	14
Figure 2 Table : macroscopic structure	15
Figure 3 Score : central pitches	16
Figure 4 <i>Tangram</i> bar 4, 67, 77, 133, 139 and 208 : the fixed note D	17
Figure 5 Score : seven-note scales in centre tones	18
Figure 6 Score : seven-note scale	18
Figure 7 <i>Tangram</i> bar 7 : two scales mixed	19
Figure 8 Score : a combination of two seven-note scales	19
Figure 9 Score : eight-note series	19
Figure 10 <i>Tangram</i> bar 1 to 8 : seven thematic fragments	20
Figure 11 Table : features of seven thematic fragments	21
Figure 12 Table : lengths of seven thematic fragments	21
Figure 13 <i>Tangram</i> bar 7 : fragment VII	22
Figure 14 <i>Tangram</i> bar 1 to 6 : organic structure	23
Figure 15 <i>Tangram</i> bar 15 : organic structure	23
Figure 16 <i>Tangram</i> bar 70 to 71 : organic structure	24
Figure 17 <i>Tangram</i> bar 41 to 44 : vertical structure	24
Figure 18 <i>Tangram</i> bar 46 to 50 : vertical structure	25
Figure 19 <i>Tangram</i> bar 152 to 164 : vertical structure	26
Figure 20 Score : seven rhythmic values	27
Figure 21 <i>Tangram</i> bar 77 to 80 : seven rhythmic values	27
Figure 22 <i>Tangram</i> bar 156 to 162 : seven rhythmic values	28
Figure 23 <i>Tangram</i> bar 169 : added beats	29
Figure 24 <i>Tangram</i> bar 125 : added beats	29
Figure 25 <i>Tangram</i> bar 32 to 33 : dynamics	30
Figure 26 <i>Tangram</i> bar 125 to 126 : melodic contour	30
Figure 27 <i>Tangram</i> bar 51 to 52 : density	30
Figure 28 <i>Tangram</i> bar 160 to 168 : rhythm and density	31

Figure 29 Score : Messiaen's Theme d'accords in <i>Vingt regards sur l'enfant-Jésus</i>	32
Figure 30 Score : harmonic motif	32
Figure 31 <i>Tangram</i> bar 56 to 58 : harmonic motif	33
Figure 32 <i>Tangram</i> bar 63 to 64 : harmonic motif	33
Figure 33 <i>Tangram</i> bar 77 to 81 : harmonic motif	34
Figure 34 <i>Tangram</i> bar 96 to 98 : harmonic motif	34
Figure 35 <i>Tangram</i> bar 66 : harmonic motif	35
Figure 36 <i>Tangram</i> bar 118 to 121 : harmonic motif	35

Sapphic Fragments

Figure 37 Image : an image of <i>Sapphic Fragments</i>	36
Figure 38 <i>Sapphic Fragments</i> bar 1, 31, 32, 39 and 40 : fragmented text from 'phainetai'	37
Figure 39 Table : structures of sections	38
Figure 40 <i>Sapphic Fragments</i> bar 4 to 6 : syllable fragments in sub-section a_1	39
Figure 41 <i>Sapphic Fragments</i> bar 16 and 17: syllable fragments in sub-section a_2	39
Figure 42 <i>Sapphic Fragments</i> bar 37 and 38: syllable fragments in sub-section a_4	40
Figure 43 <i>Sapphic Fragments</i> bar 44 to 47: syllable fragments in sub-section b ...	40
Figure 44 <i>Sapphic Fragments</i> bar 56 to 57 and 70 to 71: syllable fragments in sub-section c, d, e_1 and e_2	41
Figure 45 <i>Sapphic Fragments</i> bar 1 to 9 : thematic fragment I to IV in a pointillistic arrangement	42
Figure 46 Table : distinct features of four thematic fragments	43
Figure 47 Image : M.C. Escher, <i>Metamorphose</i>	44
Figure 48 Image : five phases of structural change in Escher's work	44
Figure 49 <i>Sapphic Fragments</i> bar 1, 4, 6, 7, 8, 10, 12 and 15 : 'fragments I' in phase 1	45
Figure 50 <i>Sapphic Fragments</i> bar 18 to 24 : 'fragments I' in phase 2	46
Figure 51 <i>Sapphic Fragments</i> bar 45 to 51 : 'fragments I' in phase 3	47

Figure 52 <i>Sapphic Fragments</i> bar 52 to 55 : 'fragments I' in phase 4	47
Figure 53 <i>Sapphic Fragments</i> bar 60 and 81 : 'fragments I' in phase 5	48
Figure 54 Score : tone materials in sub-section a_1	48
Figure 55 Score : tone materials in sub-section a_2	49
Figure 56 Score : tone materials in sub-section a_3 and a_4	49
Figure 57 Score : tone materials in sub-section b and c	49
Figure 58 <i>Sapphic Fragments</i> bar 50 and 51: the highest note, 'B', and the golden section	50
Figure 59 Score : tone materials in sub-section d, e_1 and e_2	50
Figure 60 <i>Sapphic Fragments</i> bar 83, 86 and 87 : added notes, 'B' and 'F'	51
Figure 61 <i>Sapphic Fragments</i> bar 61 to 69 : tone sets for fragment I, II and III	51

M.O.N.T.A.G.E.

Figure 62 Notes oscillate between two pitches, at various intervals.....	53
Figure 63 bar 18 - 21.....	54
Figure 64 flute, bar 1 - 5.....	55
Figure 65 bar 85 - 100	56

Once Emerged from the Grey of Night

Figure 66	60
Figure 67 Structural skeleton, bar 1 - 8.....	60
Figure 68 score and structural skeleton, bar 1 - 8.....	61
Figure 69 bar 21 - 28.....	62
Figure 70	63

Scale-Free Spaces

Figure 71 Map of the Internet topology by Hal Burch and Bill Cheswick.....	65
Figure 72	66
Figure 73 Skeletal materials in <i>Scale-Free Spaces</i> bar 1 - 4.....	66
Figure 74	67
Figure 75 bar 1 - 12 consistent gestural elements.....	68
Figure 76	70

String Quartet no. 3

Figure 77	71
Figure 78 Rhythmic patterns.....	72
Figure 79 bar 1 - 9.....	72
Figure 80 Twenty-three notes series.....	73
Figure 81 The series in bar 1 to 4.....	73
Figure 82 bar 52 - 58 frequent variations of series.....	74
Figure 83 varied forms of the series.....	75
Figure 84 Conversion of gestures into different forms	77
Figure 85	78

A Thousand Plateaux / A Thousand Movements for orchestra

Figure 86 Form of the work.....	82
Figure 87	83
Figure 88 varied forms of the numerical series.....	84
Figure 89 bar 19 - 23.....	85
Figure 90 bar 16 - 19.....	86
Figure 91 Contrasting rhythmic materials between sections.....	87
Figure 92 bar 1 - 6.....	88
Figure 93 bar 92 - 100, a fixed form of the ten-note series.....	89
Figure 94 bar 44 - 47, a fluid form of the ten-note series.....	90
Figure 95 Scales.....	91
Figure 96 bar 8 - 11.....	92
Figure 97 Contrasting tone materials between sections.....	93
Figure 98 Formulae of balancing the volume.....	95

LIST OF ACCOMPANYING SCORES AND RECORDINGS

Scores

1. *Tangram for piano* (2014)

Duration: approximately 13 minutes 30 seconds

2. *Sapphic Fragments for two sopranos* (2014)

Duration: approximately 5 minutes 40 seconds

3. *M.O.N.T.A.G.E.* for flute, clarinet, violin and cello (2015)

Duration: approximately 8 minutes 30 seconds

4. *Once Emerged from the Grey of Night* for flute, clarinet, horn, violin, viola and cello (2015)

Duration: approximately 14 minutes

5. *Scale-Free Spaces* for flute, guitar, viola and cello (2016)

Duration: approximately 9 minutes

6. *String Quartet no. 3* (2016-17)

Duration: approximately 17 minutes

7. *A Thousand Plateaux / A Thousand Movements* for orchestra (2017)

Duration: approximately 13 minutes

CD

Track 1	<i>Tangram</i> for piano	13' 29"
Track 2	<i>M.O.N.T.A.G.E.</i> for flute, clarinet, violin and cello	8' 28"
Track 3	<i>Scale-Free Spaces</i> for flute, guitar, viola and cello	9'
Track 4	<i>String Quartet no. 3</i> - Movement I	6' 46"
Track 5	<i>String Quartet no. 3</i> - Movement II	3' 02"
Track 6	<i>String Quartet no. 3</i> - Movement III and IV	7' 15"

Total duration: 47' 30"

1. Nicholas Hodges - piano

King's College Chapel, Cambridge University

8 November 2014

2. Ensemble IPSE

Shapeshifter Lab, New York

5 March 2017

3. Hwaum Chamber Orchestra

Daejeon Museum of Art, Daejeon, South Korea

31 August 2016

4. - 6. Ligeti Quartet

Workshop at the Faculty of Music, Cambridge University

23 May 2017

INTRODUCTION

Nowadays, classical music become diversified into numerous styles. It is perhaps more varied than any time in its history. In this era of diversity, my works have been influenced by a variety of styles such as total serialism, the avant-garde, musique concrète and new simplicity. Apart from music, other areas have also affected my compositions. I have been inspired to compose by the visual arts, literature, philosophy, science and architecture. My doctoral research in composition has been conducted alongside study of those various areas.

During my PhD studies, my compositional style has varied since there have been changes in my views on music. Previous to my PhD studies, I was obsessed with denying certain musical elements: I had negative approaches to creating melodic structures and developmental forms and using simple pitched sounds without any extended playing techniques. Instead of them, repetitive structures and noise-based sounds were favoured. In retrospect, I sought my compositional originality by restricting certain elements, but I now realize that I fell into mannerism at that time. The negative and somewhat obsessive attitude made it difficult for me to compose. It limited domains of available musical elements and excessively narrowed the scope of my compositional style. Through the course of my doctoral studies, I have intended to revive some of these previously restricted elements, and achieve greater compositional freedom. I believe that composers should have free and open attitudes without any limit in order to explore new compositional possibilities.

Various compositional methods have been studied in the submitted works. In *Tangram* and *M.O.N.T.A.G.E.*, numerically based compositional techniques were devised. Melody, rhythm and harmony were often composed numerically. In the orchestral work, *A Thousand Plateaux and A Thousand Movements*, numerical series were used to structure rhythms. I aimed to establish a theoretical and mechanical approach that was as rational as a serialist-type systematic approach.

On the other hand, I often value an organic musical development more highly than elaborate pre-compositional planning. My intuition plays a significant role in deciding

between music written according to a fixed rule and organic structures. Any mechanical system is broken by such an approach.

I have a particular interest in creating fragmentary forms. Many parts of my works were composed of short and unconnected pieces. This idea was derived from a study of geometry, as expressed in art works and nature. The majority of the compositions written in my PhD period contain this structural idea.

As my works are structured in a fragmentary way, passages or phrases are disjointedly composed. A formal device in continuity was used to bind together disconnected structures. It was intended to create a unitary form with a continuity that functions to bind diversified fragments together. Since the use of varied fragments may distract the listener, I have sought formal clarity.

The concept of *dichotomy* is significant in my compositions. In many of my works, dichotomous structures of continuity and movements or complexity and simplicity are, alternately, present. In addition to this, I tried to reconcile two contrary structures and seek a mean between them. This idea has been influenced by literature and philosophy.

Timbre is a staple element in my compositions. In the majority of submitted works, new timbral possibilities are sought with studies of extended instrumental techniques: the scope of tone is expanded into noise-sounds. Luigi Russolo said that “We must break at all cost from this restrictive circle of pure sounds and conquer the infinite variety of noise-sounds.¹⁾”. I believe that noise-sound has latent possibilities for new compositional paths.

“One day we will be able to distinguish among ten, twenty or thirty thousand different noises. We will not have to imitate these noises but

¹⁾ Russolo, Luigi, “Art of Noises (Futurist Manifesto)”, *Great Bear Pamphlet*, Something Else Press, 1967, p. 6.

rather to combine them according to our artistic fantasy.²⁾ ”

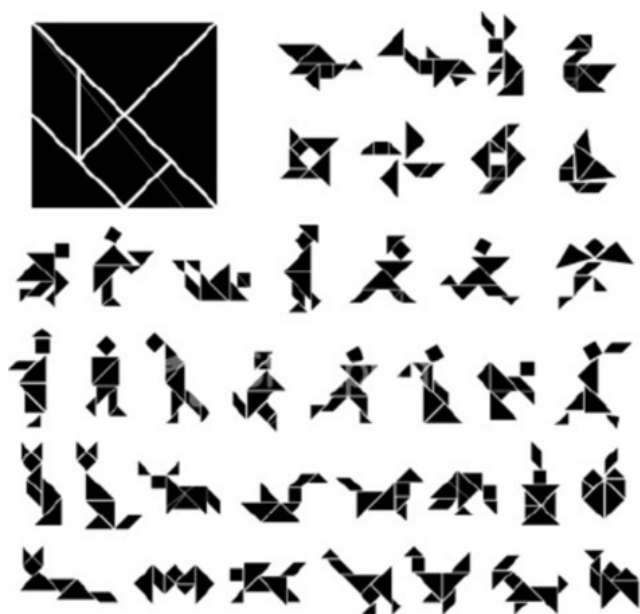
My doctoral research in composition has aimed to explore various compositional styles and seek my own musical path.

²⁾ Ibid. p. 12.

CHAPTER 1

Tangram for piano

Figure 1 Images of tangram³⁾



The tangram is a dissection puzzle consisting of seven flat shapes. A square is divided into seven pieces: a square, a parallelogram and five right-angled triangles including two small, one medium and two large. These seven fragments are put together to form an outline or a silhouette of a specific shape. It is possible to produce a variety of different images, such as people, animals, plants, topographies, buildings and letters.

George Crumb talks in terms of “a system of proportions in the service of spiritual impulse”⁴⁾; and these have proved to be key concepts in my own approach. I advocate his words and mathematical approach. I used a numerical compositional system to depict the puzzle's imagery. Numerical structures were constructed, both macroscopically and microscopically.

³⁾ “Tangram”, Desafios Matemáticos, <<http://www.desafiosmate.blogspot.co.uk>>.

⁴⁾ Gillespie, Donald, “George Crumb: Profile of a Composer”, C. F. Peters Corporation, 1986, p.77.

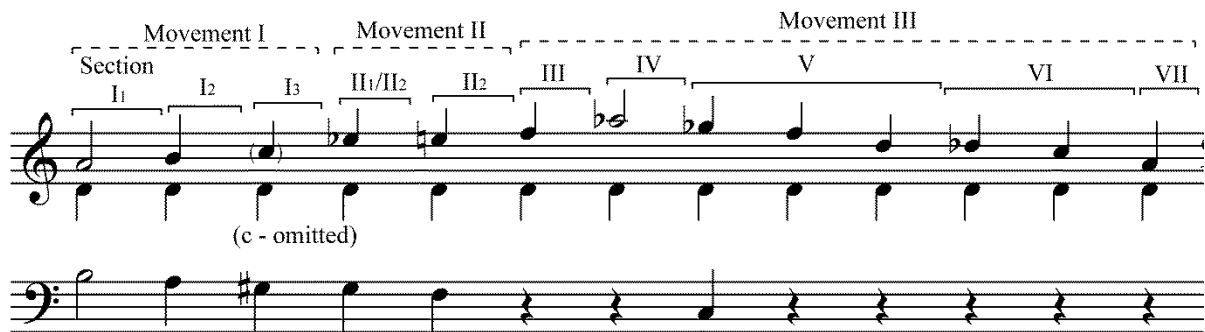
Figure 2 macroscopic structure

		Movement I			Movement II		Movement III				
Section		I ₁	I ₂	I ₃	II ₁	II ₂	III	IV	V	VI	VII
Bar		1 - 38	39-60	61-76	77-89	90	135	156	166	185	218
						-134	-155	-165	-184	-217	-236
Duration (approximately)		1' 55"	50"	45"	47"	1' 40"	1' 30"	25"	55"	1' 35"	1'
		3' 30"			2' 27"		4' 45"				
Central note in common		D									
Central note in each section	Right hand	A	B	(C-omitted)	E ^b	E	F	A ^b	G ^b -F-D	D ^b -C	A
	Left hand	B	A	G [#]	G [#]	F-E-E ^b			C		
Tempo (approximately)		♩ =76 (♩=152)		80 (160)	48 (96)	72 (144)	48 (96) - 52	76 (152)	72 (144) - 108 (216) - 72 (144)	48 - 92 - 108 (216)	

The macroscopic structure of the composition resembles the puzzle: there are three divided movements, separated into seven parts according to their musical characteristics in a way which is comparable to the puzzle's three shapes and seven pieces. A numerical idea of three and seven was also exploited to set tempos. Seven tempos were used (see Figure 2): $J = 76$, $J = 80$, $J = 48$, $J = 72$, $J = 52$, $J = 108$ and $J = 92$. Of these, the three that appear most frequently throughout the work are $J = 76$, $J = 48$ and $J = 72$.

Apart from the central pitch, D, which is common to all the sections, each has its own individual characteristic and atmosphere: duration, central pitch and the number of bars vary between the different sections. Contrasting elements between consecutive sections result in a dramatic flow of music.

Figure 3 central pitches



Each section has a different set of central pitches, but a note, D, appears in every section. Since this note penetrates all the sections, it plays a role in unifying the work:

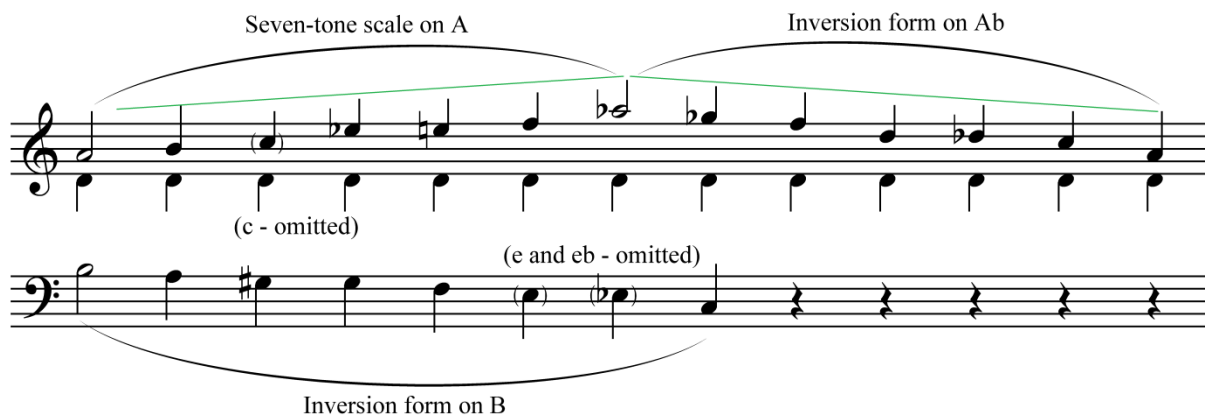
Figure 4 the fixed note D

The figure displays five musical excerpts illustrating the use of a fixed note D. Each excerpt shows the note's placement in the treble and bass staves, its dynamic marking, and any specific performance instructions.

- Excerpt 1 (Measures 4-6):** Treble clef, piano (*pp*). The note D is held across measures 4 and 5. Bass clef has a piano (*p*) chord at the end of measure 6.
- Excerpt 2 (Measures 67-69):** Treble clef, forte (*f*). The note D is repeated in a rhythmic pattern. Bass clef has a sustained note.
- Excerpt 3 (Measures 77-79):** Treble clef, fortissimo (*fff*). The note D is repeated with an accent (>). Bass clef has a fortissimo (*fff*) chord. Includes the instruction "(sost. ped. sempre)".
- Excerpt 4 (Measures 133-135):** Treble clef, forte (*f*). The note D is repeated with fingerings 7 and 6. Bass clef has a sustained note.
- Excerpt 5 (Measures 139-141):** Treble clef, piano (*p*). The note D is repeated with dynamics *pp*, *ff*, and *pp*. Bass clef has a piano (*p*) accompaniment.
- Excerpt 6 (Measures 208-210):** Treble clef, piano (*p*). The note D is repeated with an octave marking (8^{va}). Dynamics include *mf* and *pp*. Bass clef has a piano (*pp*) accompaniment.

The fixed D is repeatedly shown in simple structures that are contrasted with other elaborate structures. Only the duration, octave and dynamic of this note vary between the different sections.

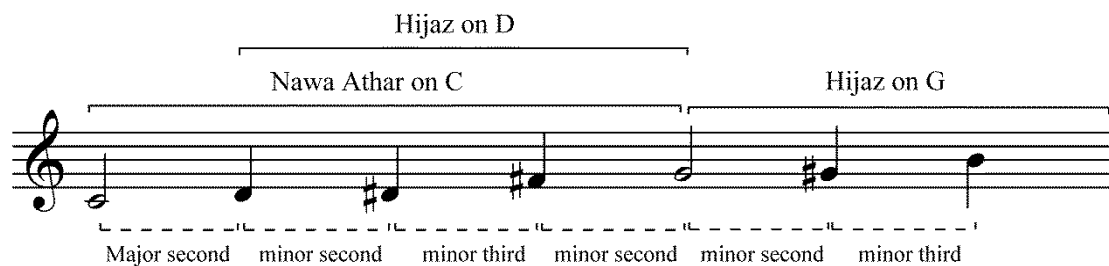
Figure 5 seven-note scales in central pitches



Central pitches, apart from the fixed note D, are completed with three seven-note scales on A^b, A and B. Upper two scales in Figure 5 almost draw an arch shape.

Figure 6 seven-note scale

Arabic scale - Maqam Nawa Athar on C (Nawa Athar on C + Hijaz on G)



The Arabic scale called Maqam Nawa Athar is a seven-note scale in central pitches. This scale is organized by combining two other Arabic scales: Nawa Athar and Hijaz. To vary the form of this seven-note scale, it was transposed continually throughout the work. I used the most varied sets of the scale that were possible, to avoid a monotony of sound. By mixing a scale with a transposed one, the original Arabic scale lost its own cultural characteristic. In this way, I intended to avoid invoking the sound of Arabic music.

Figure 7 *Tangram* bar 7 : two scales mixed

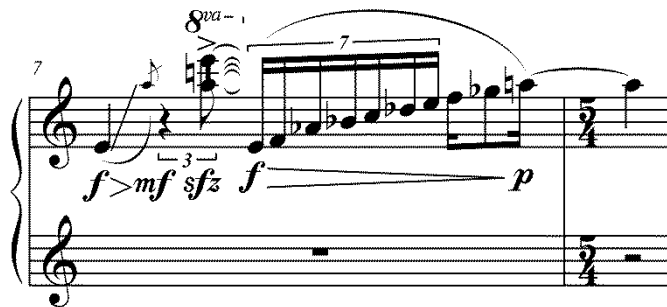


Figure 8 a combination of two seven-tone scales⁵⁾

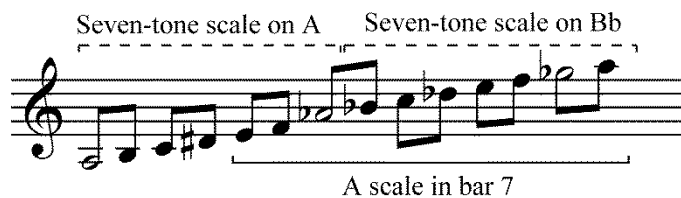
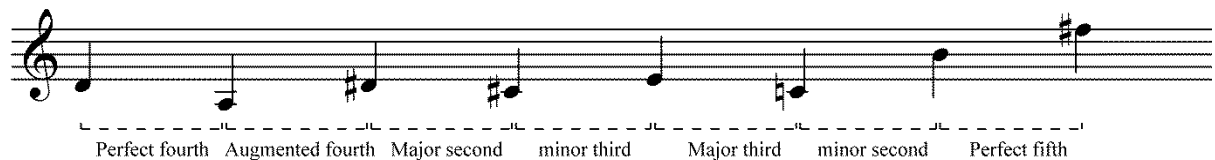


Figure 9 eight-note series



An eight-note series was also created, comprised of seven different intervals, from a minor second to perfect fifth. I set seven notes and seven intervals to make a scale and a series, respectively, to symbolize seven pieces of the puzzle. The series and scales were formed to produce a dissonant pitch language.

As on the macroscopic level, numerical techniques were used microscopically in order for forms, textures, rhythms and harmonies to be created in a sophisticated way.

⁵⁾ A list of transposed scales was attached on appendix 1, with indications which bars they appear.

Figure 10 *Tangram* bar 1 to 8 : seven thematic fragments

I

♩ = ca. 76 (♩ = ca. 152)

Fragment I
Fragment II
Fragment III
Fragment IV
Fragment V
Fragment VI
Fragment VII

※ as fast as possible
sempre

Piano

Just as the seven pieces of the tangram create shapes, seven contrasting fragments in the composition appear as thematic materials from which to draw sonic imagery. Just as with the puzzle, each fragment is developed individually, assembled with others, or even made similar to others through variation in order to illustrate diverse shapes. Each fragment is comprised of individual textures, intervals, harmonies, lengths, rhythms and the number of notes. In Figure 2, each section shows a contrasting characteristic. Likewise, each fragment presents contrasted musical features. Such contrasts lead to a dramatic development.

Figure 11 features of seven thematic fragments

Thematic fragment	The number of note	Dynamic	Structural feature
I	4	mf <	grace notes, intervals: minor second, major second
II	2	mp	semiquaver, intervals: augmented fourth, perfect fourth, minor third, major second
III	8	sfz	cluster (chromatic)
IV	5	mf > p	Repetitive notes, triplet, quarter note
V	1	pp	continuous note, fixed note D
VI	3	p	chromatic chord
VII	10	f > p	scale (glissando)

Figure 12 lengths of seven thematic fragments




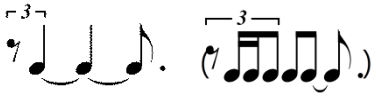



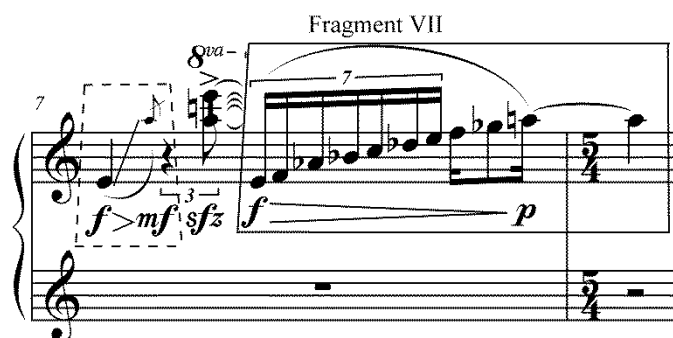
Thematic fragment	Length
I	
II	
III	
IV	
V	
VI	
VII	

Figure 13 *Tangram* bar 7 : fragment VII



In bar 7, a gesture comprised of a glissando is a sort of seed for the following fragment VII. A glissando gesture and fragment VII show similar or common elements in dynamics, notes and contours.

Breaking rules

“Typically, polyphonic music is seen as having developed from a set of fixed rules and almost mechanical practice. This changes how we understand that development precisely because whoever wrote it was breaking those rules.⁶⁾”

I agree with this opinion. I think that fixed rules by composers are inevitably destroyed. On the one hand, I aimed to set a theoretical and mechanical approach that was as rational as a serialist-type systematic approach, but on the other hand, how the rules were broken was also significant. An organic musical development is frequently valued more highly than sophisticated pre-compositional planning. My intuition is a staple factor to decide between music written in accordance with a fixed rule and organic structures. I often break any theoretical system by such an approach. In my opinion, a passage of organic flow releases more natural physical energies than systematized music. The former is more musical and more humane than the latter.

⁶⁾ Varelli, Giovanni, “Earliest known piece of polyphonic music discovered”, News - Research at Cambridge, Cambridge University, <<http://www.cam.ac.uk/research>>.

Organic Development

Figure 14 *Tangram* bar 1 to 6 : organic structure

I

♩ = ca. 76 (♩ = ca. 152)

Piano

mf f mp sfz sfz f mf mp

※ as fast as possible sempre

e.g. 1

e.g. 2

e.g. 3

pp mp mf f sfz

p pp mf

In e.g.1 in Figure 13, as dynamics go down, the velocity of the rhythms declines. e.g. 2 shows that as dynamics diminish, the number of notes decreases.

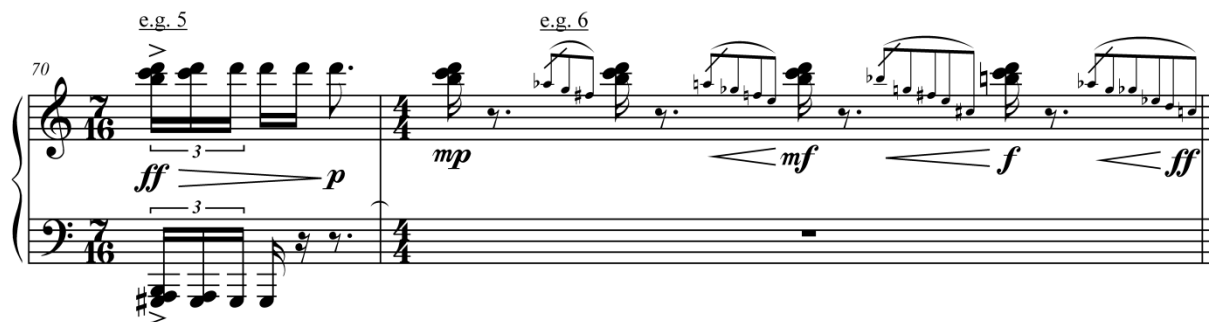
Figure 15 *Tangram* bar 15 : organic structure

15 e.g. 4

f mp f pmf p mp p

e.g. 4

Figure 16 *Tangram* bar 70 to 71 : organic structure

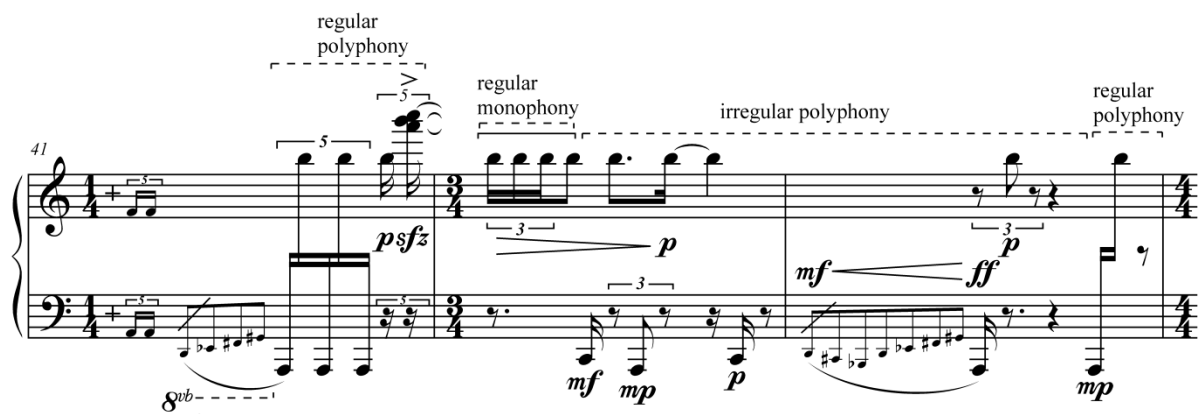


In e.g. 4 in Figure 15 and e.g. 5 in Figure 16, the number of notes is reduced gradually while the dynamics diminish from *f* (*ff*) to *p*. On the other hand, e.g. 6 is the contrary case.

Vertical Structures

I designed three different types of vertical structure: monophony, homophony and polyphony. In addition, another two contrary vertical concepts, regularity and irregularity in rhythm, also appear. These five vertical structures constitute this work, appearing in rotation. The following figures show these ideas.

Figure 17 *Tangram* bar 41 to 44 : vertical structure



irregular homophony

44

mf *f* *ff* *mp* *p*

Figure 18 *Tangram* bar 46 to 50 : vertical structure

polyphony and irregular rhythms

46

homophony monophony

f *p*

f *mp* *p* *mf*

homophony and irregular rhythms

polyphony and irregular rhythms homophony

49

f *p*

p *mf* *p*

Figure 19 *Tangram* bar 152 to 164 : vertical structure

♩ = ca. 52

homophony and regular rhythm polyphony and regular rhythm homophony and regular rhythm polyphony and regular rhythm

152

sfz *mf* *sfz* *f* *mf* *sfz* *mf* *sfz* *f* *mf*

158

homophony polyphony and irregular rhythm

f *mf* *mf* *p*

160

monophony homophony and irregular rhythm

mf *f* *mf* *p*

Seven rhythmic values

A stochastic idea associated with the 'tangram' puzzle was also employed. Seven different proportions were set (for example, 2.5 / 3 / 1 / 1.5 / 2 / 0.5 / 3.5) and expressed in crochets (see Figure 20). This idea was designed for lengths of notes, phrases and passages. Most of the gestures in this work consist of seven different lengths. Likewise, seven thematic fragments were composed in seven different lengths (see Figure 12). Since such seven lengths do not maintain, but vary to different seven ratios, lengths of notes and phrases often seem arbitrarily structured.

Figure 20 seven rhythmic values

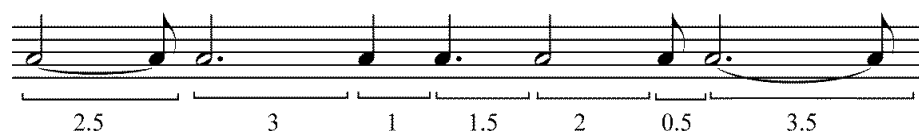


Figure 21 *Tangram* bar 77 to 80 : seven rhythmic values

$\text{♩} = \text{ca. } 48$ ($\text{♩} = \text{ca. } 96$)

8va--
8va--

* without tie

77 *mf* *p* *mf* *p* *mf*

(sost. ped. sempre) >

1 2 3 4 5 6

80 *p*

7

1 2 3 4 5 6 7

Detailed description of Figure 21: This figure shows a piano score for bars 77-80 of 'Tangram'. It features a grand staff with treble and bass clefs. Above the staff, tempo markings are given as quarter notes equal to approximately 48 or 96. Performance instructions include '8va--' (two octaves down), 'mf' (mezzo-forte), 'p' (piano), and 'sost. ped. sempre' (sostenuto, pedal, sempre). A note in bar 77 is marked with a circled 's'. A bracketed section from bar 77 to 80 is numbered 1 through 6. Bar 80 is shown in a separate system with a piano (*p*) dynamic and a bracketed section numbered 7. Below the main score, a single staff shows the rhythmic values 1, 2, 3, 4, 5, 6, and 7, corresponding to the seven thematic fragments mentioned in the text.

Figure 22 *Tangram* bar 156 to 162 : seven rhythmic values

♩ = ca. 76 (♩ = ca. 152)

156 *mf* *sfz* *mp* *mp* *pp*

158 *f* *mf* *mf* *p*

160 *mf* *f* *mf* *p* *p*

162 *p*

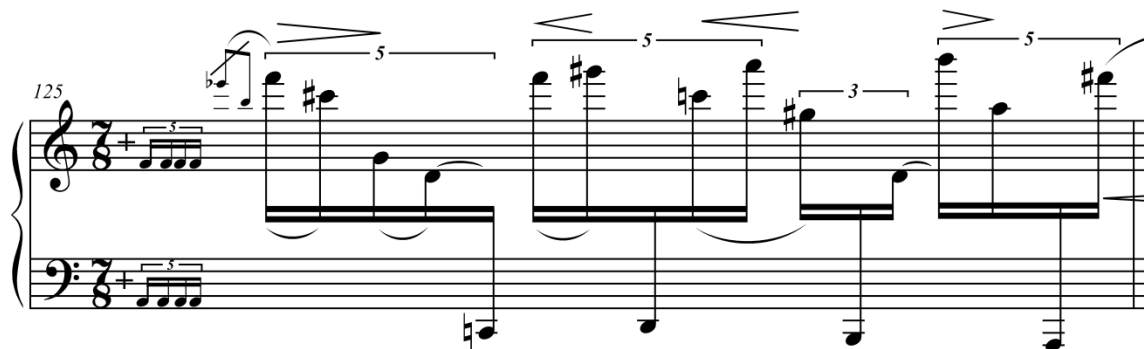
1 2 3 4 5 6 7

In this work, bar lines do not play a traditional role. Traditional dynamic allocations of pulse were not considered. When I began composing, I erased the bar lines; then, I applied a numerical system of seven proportions to divide phrases. I simply drew bar lines to help the pianist to be quickly familiar with my score. A few measures include unusual added beats as I proportionally sketched phrases.

Figure 23 *Tangram* bar 169 : added beats



Figure 24 *Tangram* bar 125 : added beats



In this work, subtle changes of structure frequently appear as a result of organic developments (see Figures 12, 13 and 14). In contrast with such delicate variations, abrupt moments are presented in a variety of aspects, such as loudness, melodic contour, rhythm and density. Conceptions of both subtlety and suddenness were equally taken into account.

Figure 25 *Tangram* bar 32 to 33 : dynamics

Musical score for Figure 25, showing dynamics in bars 32 and 33. The score is in 3/4 time. Bar 32 features a treble clef with an 8va-1 marking and a bass clef. Dynamics include *sfz*, *mp*, *f*, and *mp*. Bar 33 features a treble clef with an 8va-1 marking and a bass clef. Dynamics include *sfz*, *mp*, *f*, and *p*. A *sostenuto pedal* marking is present at the end of bar 33.

Figure 26 *Tangram* bar 125 to 126 : melodic contour

Musical score for Figure 26, showing melodic contour in bars 125 and 126. The score is in 7/8 time. Bar 125 features a treble clef and a bass clef. Bar 126 features a treble clef and a bass clef. Dynamics include *ff*. The score includes various melodic contours and fingerings.

Figure 27 *Tangram* bar 51 to 52 : density

Musical score for Figure 27, showing density in bars 51 and 52. The score is in 18/8 time. Bar 51 features a treble clef and a bass clef. Dynamics include *mf* and *ff*. Bar 52 features a treble clef and a bass clef. Dynamics include *f* and *mp*. The score includes various rhythmic patterns and fingerings.

Figure 28 *Tangram* bar 160 to 168 : rhythm and density

160 *mf* *f* *mf* *p* *p* *Reo.*

162 *p* *mf* *sfz* *p* *Reo.*

contrast

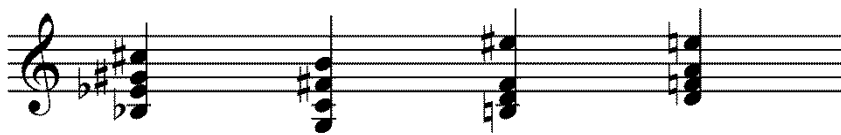
165 *mf* *sfz* *mf* *sfz* *mf* *sfz* *ffz* *f* *ff* *Reo.*

167 *mf* *ff* *mf* *sfz* *ff* *sfz*

Harmony

Seven thematic harmonies, each of which each consists of four notes, were set. In intervals and a developmental method, the harmonies of *Tangram* are comparable with that of Messiaen, shown in his work, *Vingt regards sur l'enfant-Jésus* (1944). Like Messiaen in his Theme d'accords, I intended to avoid a triadic harmony and create non-tonal contexts. However, my harmonies were set in a different way from Messiaen's. In my harmonies, a common note, 'D', appears, different intervals from Messiaen present, and seven harmonies were set (Messiaen set four) (see figure 29 and 30). To systematise my own material, I avoided quoting harmonies directly from his work, but I musically paraphrased his ideas.

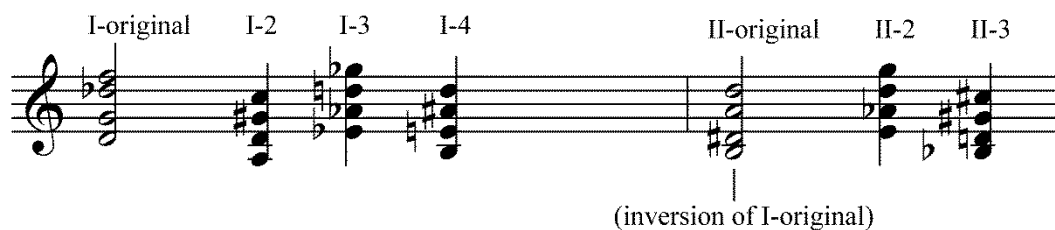
Figure 29 Messiaen's Theme d'accords in *Vingt regards sur l'enfant-Jésus*



intervals : perfect fourth, augmented fourth, minor third, major third, major seventh and perfect fifth

Figure 30 harmonic motifs in *Tangram*

There are two types of harmony: I and II. Type II harmonies are inversion forms of type I. All seven harmonies commonly contain the central note, D.



intervals : perfect fourth, augmented fourth and major third

Figure 31 *Tangram* bar 56 to 58 : harmonic motif

56 *mp* *p* *mf* *sfz* *f* *p* *f*

I - Original II - Original

Figure 32 *Tangram* bar 63 to 64 : harmonic motif

63 *mp* *mf* *mp* *f* *mf* *II - Original*

Major second transposition

Transposed Harmonies

Harmonic motifs vary by transposing notes.

Figure 33 *Tangram* bar 77 to 81 : harmonic motif

II

♩ = ca. 48 (♩ = ca. 96)

* without tie

(sost. ped. sempre)

Figure 34 *Tangram* bar 96 to 98 : harmonic motif

96

97

98

Occasionally, harmonies appear horizontally.

Figure 35 *Tangram* bar 66 : harmonic motif

65

15^{ma}-----

8^{va}-----

sfz *p* *f* *f* *p*

p

II - Original

Figure 36 *Tangram* bar 118 to 121 : harmonic motif

12

118

p *f* *sfz*

8^{va}-----

f *p*

I - 3 6 7 7

I - 3 5

f *mp* *mf*

II - 2

120

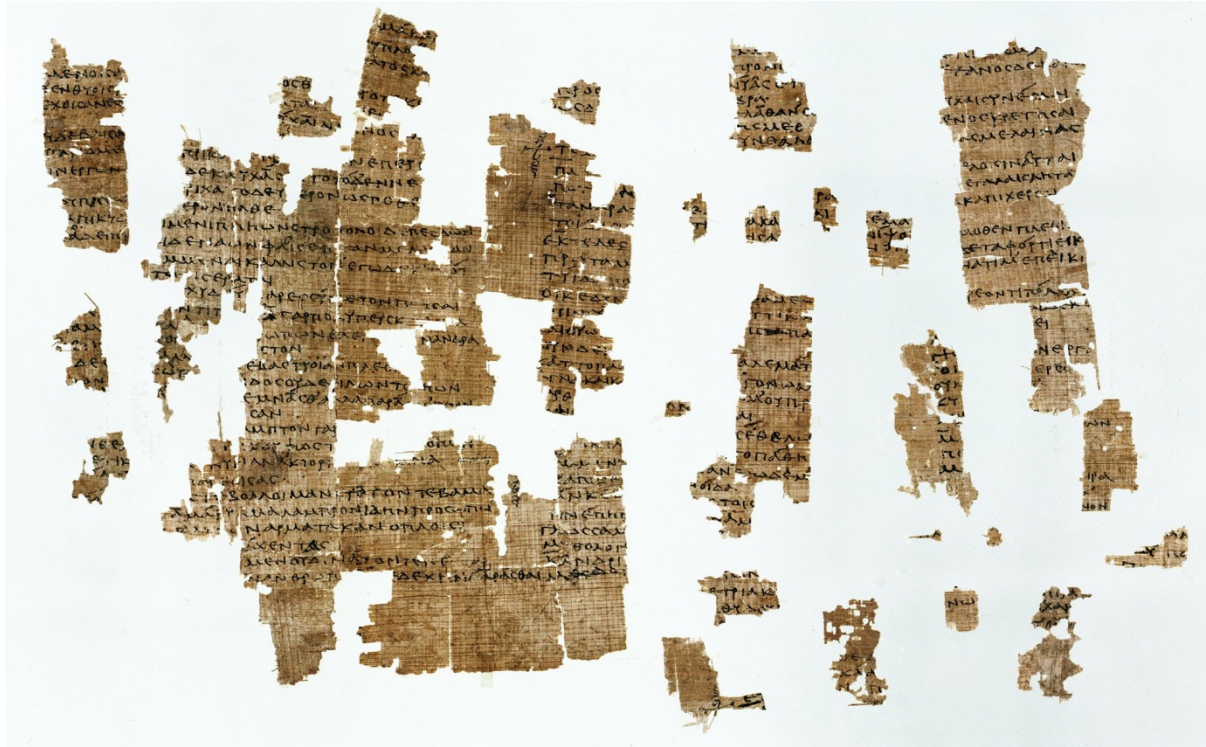
mf *f* *p* *mf* *ff*

Ped. *

CHAPTER 2

Sapphic Fragments for two sopranos

Figure 37 An image of Sapphic Fragments⁷⁾



Sappho was born sometime between 630 and 612 BCE, and died around 570 BCE. The majority of her poetry has been lost, but among the surviving fragments, no. 31, translated into the Latin alphabet, was used for this composition. Fragments of the poem are depicted by means of dismantled structures, texts and tone materials. These ideas were also derived from my interest in stained glasses; and this composition was constructed with several “broken” materials.

⁷⁾ “Sapphic Fragments”, Bodleian Libraries, Oxford University, <<http://www.treasures.bodleian.ox.ac.uk>>.

The first paragraph of *Sapphic Fragments no. 31* in Latin alphabet transliteration⁸⁾ reads:

phainetai moi kênos isos theoisin
 emmen' ônêr ottis enantios toi
 isdanei kai plâsion âdu phôneisâs upakouei

Only the first paragraph of the poem was exploited for this composition. To illustrate an image of Sappho's dismantled poem, the words of this first paragraph were dispersed disjointedly throughout the piece. For example, 'phainetai' was divided into several syllabic subsets, 'pha', 'pha-ne', 'ta-i' and 'i'. These were arranged on the score in a pointillistic "drawing". As words are broken, a function of linguistic communication is also destroyed: any meaning and emotional expression the poem contains are not delivered to audiences. This is to enable audiences to concentrate on merely the voice and its structures.

Figure 38 fragmented text from 'phainetai'

'pha' in bar 1 'pha-ne' in bar 31 'ta-i' in bar 32

'i' in bar 39 and 40

⁸⁾ Full text is attached in appendix 2.

The composition is made up of two sections, separated into four and five sub-sections, respectively. The two sections are contrasted in form, duration, the number of bars, and tempo. In the first section (A), compositional materials are developed continually. Four phases of gradual development are referred to in the four sub-sections (a_1 - a_2 - a_3 - a_4), whereas the second section (B) consists of dramatic changes in contrasting sub-sections (b - c - d - e_1 - e_2).

Figure 39 structures of sections

Section	A	B
Sub-section : Tempo - Bar	a_1 : ♩ = ca. 132 (♩ = ca. 66) - 10 bars a_2 : ♩ = ca. 132 (♩ = ca. 66) - 13 bars a_3 : ♩ = ca. 132 (♩ = ca. 66) - 9 bars a_4 : ♩ = ca. 132 (♩ = ca. 66) - 9 bars	b : ♩ = ca. 52 - 10 bars c : ♩ = ca. 56 - 8 bars d : ♩ = ca. 69 - 9 bars e_1 : ♩ = ca. 69 - 16 bars e_2 (codetta) : ♩ = ca. 52 - 3 bars
Duration	approximately 2' 30"	3' 10"
Total duration	5' 40"	

Different means of structuring the splintered syllable sets were devised for different sections. For example, syllables extracted from the text were listed, omitted, repeated or combined.

Figure 40 syllable fragments in sub-section a₁, bar 4 to 6

In sub-section a₁, syllables are scattered on the score.

- Sets of vowels, “ou” and “ei” are extracted from a word of the text, “upakouei”
- “pha” from “phainetai”
- “la” from “plâsion”
- “up” from “upakouei”
- “sas” form “phôneisâs”
- “mm” (humming) from “emmen”
- “pla” from “plâsion”

Figure 41 syllable fragments in sub-section a₂, bar 16 to 17

In sub-sections a₂ and a₃, the idea from a₁ is also present. However, longer sets of syllables that consist of combined or omitted texts begin to appear as grace notes.

- “a-du-pho-ne” from “âdu” and “phôneisâs”
- “la-si-o” from “plâsion”
- “e-nan-to-o” from “enantios”

Figure 42 syllable fragments in sub-section a₄, bar 37 and 38

37 *f* pha (ou) *p* *mf* ne - da *p* *mf* ei (ou) ei (ou) p - la si (o)

ti (mm) ei (ou) ei ne - da ou ka e (ou)

Sub-section a₄ consists of relatively short words, composed of one to three syllables. Single vowels and humming (mm) are represented more frequently than in other sections.

Figure 43 syllable fragments in sub-section b, bar 44 to 47

44 *p* *mp p* (e) - (ke) (o) *mp* pho-sa-ne *mf* (pha)

pla si on e - (ke) (o) pla on si

46 *p* *mp p* *mp* p-la-si-o *mf* a du *mp* *mf* *mp* (pha) e *mf* *mp* (ke) (o)

pha e - (ke) (o) ke-ne-ste se

In sub-section b, the texts are arranged using the methods similar to those used for previous sections. “ke” and “pha” are set to notes ‘D’ and ‘F’, respectively. Single vowels are employed for fragments of tremolo (written on grace notes).

Figure 44 syllable fragments in sub-section c, d, e₁ and e₂

In sub-section c, d, e₁ and e₂, certain extracted syllables are listed. Listed syllables' order was decided, randomly.

Sub-section c, bar 56 and 57

56 *mp* *pp* *pp₆* *mp* *mp pp*
 la ne be - ke - na - ra e ti be - ne - se - de
mp *mp pp* *mp* *pp₆* *mp*
 e so ne - se - ke - be o - la si - se - ne - be - la o

Sub-section e₁, bar 70 and 71

70 *pp* *p* *mf p* *mf p* *mf* *mf p* *mf pp* *f* *f p* *mp*
 mm du i pho - i be ne se de la i u i i mm be ne la u se de la
p *mf* *pp* *p* *pp p* *f* *mf* *** tie* *pp*
 la be ne se u ne mm sa - mm be la u i mm

In sub-section c, syllables are joined on repeated notes, and in sub-section e₁ and e₂, on ascending scales. Aside from these cases, texts were structured similarly to in prior sections.

Fragmented Thematic Gestures

Similarly, thematic gestures were structured fragmentarily.

Figure 45 thematic fragment I to IV in a pointillistic arrangement

Sapphic Fragments
for two sopranos

Jae-Moon Lee

$\text{♩} = \text{c. } 132$ ($\text{♩} = \text{c. } 66$)

Soprano I
pha ou ei ei gliss. mm ou mm

Soprano II
pha ou ei ei up

S I
pha la ou sas pla pha






S II
pha ei la up ei ou ei pha

S I
la pho ei ou la ka ou

S II
ou la ei mm la ou ei ei

Four thematic gestures were set. Each gesture contain contrasted musical elements.

Figure 46 distinct features of four thematic fragments

Fragment	Note	Text	Structural feature	Dynamic	Length
I	G	pha / la	Octave unison	f	
II	Ab	ou /ei / up		p	
III	C, D	ou / ei / sas / pla / pho / ka / da	Grace note, Continuous notes Intermittently	p	
IV	C#, D	mm	Glissando		

Distinct musical features and texts appear in different thematic fragments (aside from the same dynamic in fragments II and III). Such differences contribute to clearly distinguishing their sounds, by which images of the fragmented poem are more effectively created.

M.C. Escher

I drew inspiration from M.C. Escher's works to vary thematic fragments. In my work, each thematic fragment is transformed into other shapes through an Escher-like structural variation.

Figure 47 M.C. Escher, *Metamorphose*, woodcuts 1939-40, 1967-68⁹⁾

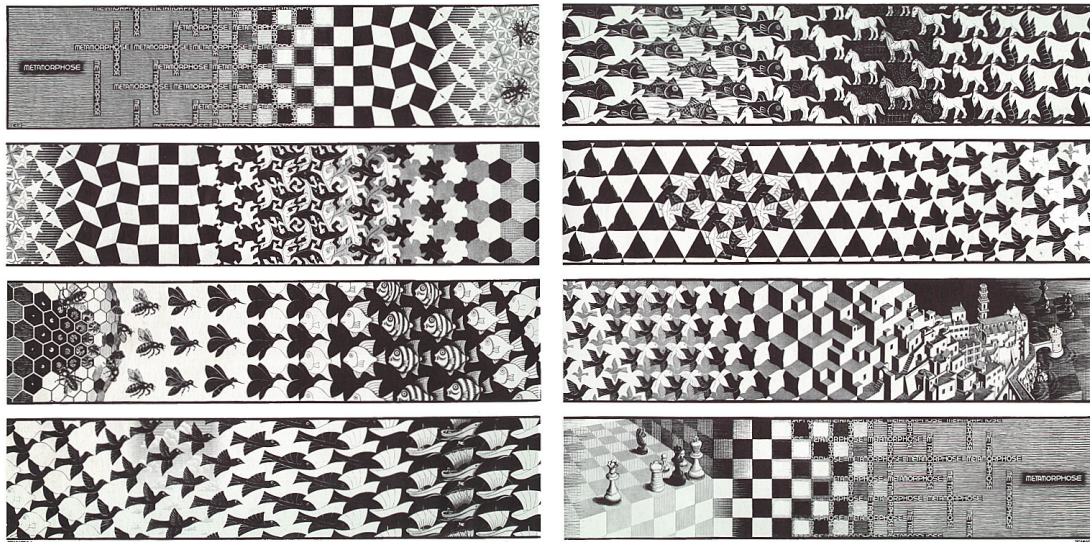
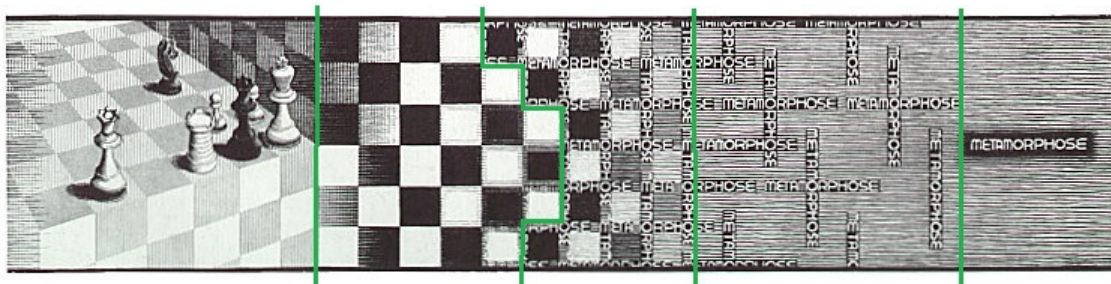


Figure 48 five phases of structural change in Escher's work

phase 1 phase 2 phase 3 phase 4 phase 5



My work was composed using a similar developmental method to Escher's. To demonstrate this, 'thematic fragment I' is extracted from the score in its entirety, and classified into five phases according to musical characteristics. Figures 48 to 52 show how fragments are, gradually, transformed to another shapes.

⁹⁾ "Metamorphose", 1939-40, 1967-68, EIL, <<http://www.escapeintolife.com>>.

Figure 49 'fragment l' in phase 1

bar 1 ... bar 4 ... bar 4...bar 6 ... bar 7... bar 8

bar 10 ... bar 12 ... bar 15

The musical score consists of two staves. The first staff (top) has lyrics 'pha' and 'la'. The second staff (bottom) has lyrics 'pha' and 'la'. Dynamics are indicated above the notes. In the first section (bars 1-8), dynamics include *f* (circled in blue), *mp* < *mf* (boxed in red), *mf* (circled in blue), *mp* < *mf* (boxed in red), *mp* (circled in blue), and *mp* < *mf* (boxed in red). In the second section (bars 10-15), dynamics include *p* < *mf* (boxed in red), *p* (circled in blue), and *p* < *mf* (boxed in red).

Phase 1 - nine fragments: the notes are fixed octave G's. There are two types of dynamics: one which changes subtly, while the other is repeated. Both ideas are expressed, rotating among each other. This is also linked to note-length. Two letter fragments, 'pha' and 'la' are present.

Figure 50 'fragment l' in phase 2

bar 18 and 19

ei ou p-la-si a-du-pho-ne

ka ke da e

bar 20 and 21

o mm mm e-nan-ti ka e o ei

o ei ke no e o e ou

bar 22 to 24

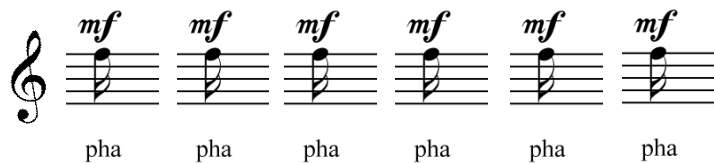
la la mm

p-la ou mm la ne-la ta na

Phase 2 - 27 fragments : the majority of notes are single G's, but this begins to vary with ascending scales. Semiquaver triplets, semiquaver and grace notes are newly presented. The length of cresc. and decresc. also increases. New texts are present.

Figure 51 'fragment l' in phase 3

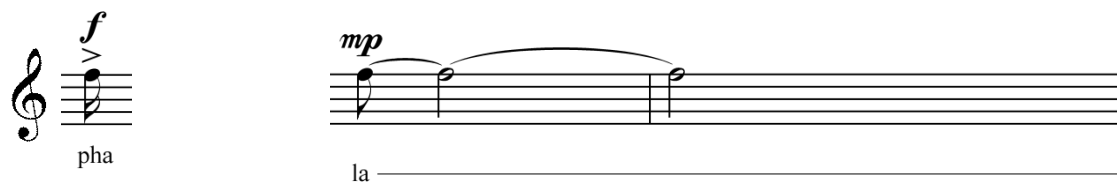
bar 45·bar 46·bar 47·bar 48·bar 50·bar 51



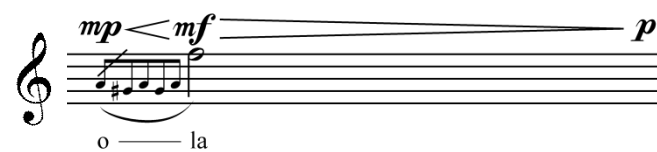
Phase 3 - six fragments : pitch has changed from 'G' to 'F'. Note, rhythm, dynamic and text are repeated.

Figure 52 'fragment l' in phase 4

bar 52 bar 54



bar 55



Phase 4 - three fragments : the fixed note 'F', continuous sounds and text 'la' reappear. Dynamics were structured without a rule.

Figure 53 'fragment I' in phase 5

..... bar 60 bar 81

Phase 5 - two fragments : note, rhythm, dynamic and text return to those of the very beginning.

Fragments II, III and IV are also developed using a manner of variation similar to that of 'fragment I'.

Tone Materials

In different sections, different tone sets were used. Or different approaches to structure tone materials were applied.

Figure 54 tone materials in sub-section a₁

Six-tone

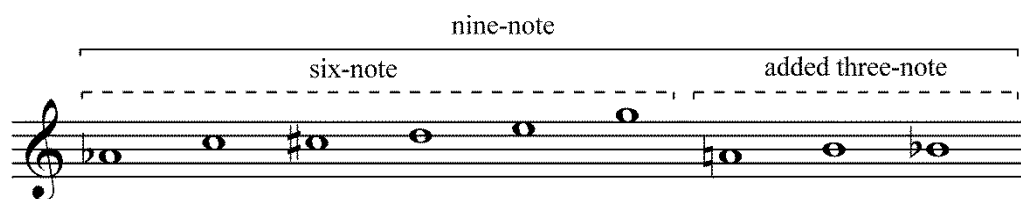
fragment I fragment II fragment III fragment IV

minor second (major seventh) major fourth augmented third perfect fourth / major third (minor sixth)

Centre tone

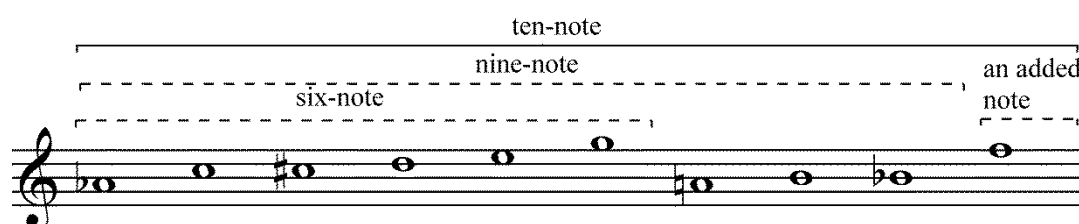
In sub-section a₁, the six-note set was used. Of these, 'Ab' is the central note. Different notes were set for different thematic fragments. Between each note and the central note, different intervals appear.

Figure 55 tone materials in sub-section a₂



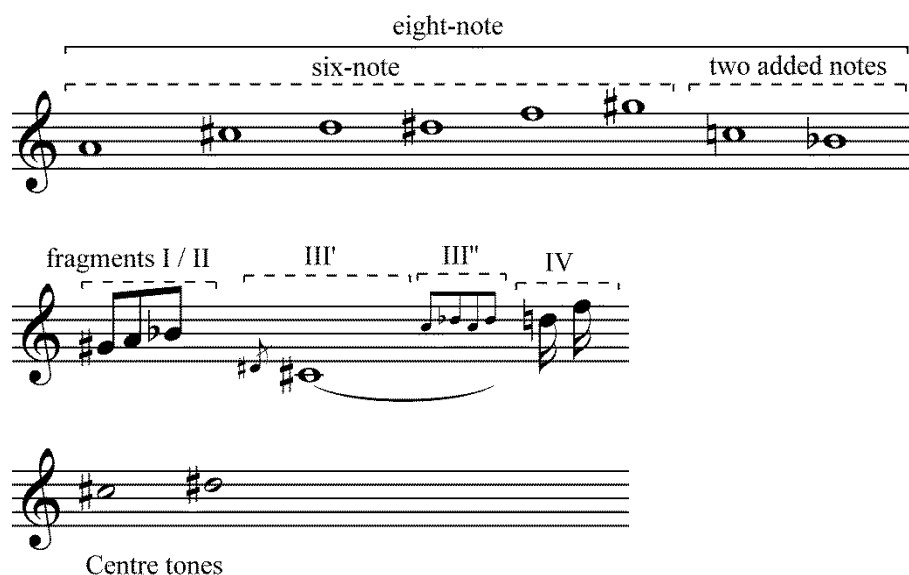
In sub-section a₂, a nine-note set was employed, which consists of section a₁'s six notes and three added notes.

Figure 56 tone materials in sub-section a₃ and a₄



In sub-section a₃ and a₄, 10 notes were exploited. One, 'F', was added to section a₂'s nine-note set.

Figure 57 tone materials in sub-section b and c



In sub-section b and c, an eight-note set was used that is comprised of sub-section a₁'s six notes transposed up a minor second, and two added notes. Thematic fragments were newly structured with this set. In section b and c, there are two centre tones, 'C#' and 'D#', which belong to fragment III.

Figure 58 the highest note, 'B', and the golden section

50

S I

S II

mf mp *mf* *f* *mf*

pha e — ke na — pha ke

la

In bar 50 and 51, the highest note in the work, 'B', appears. This is placed at about 3 minutes 30 seconds, almost the golden section in this work: around 3' 30" (bars 1 to 50) : around 2' 10" (bars 51 to 87) = 1.614 : 1. (1.614 is very close to the golden ratio, 1.618.)

Figure 59 tone materials in sub-sections d, e₁ and e₂

eight-note

six-note two added notes

fragment I II III + +

centre tones

In sub-sections d, e₁ and e₂, the eight-note set is comprised of sub-section a₁'s six-note set plus two added notes, 'B' and 'F'. The six-note set is constituted of fragments I, II and III.

Figure 60 added notes, 'B' and 'F', bar 83, 86 and 87

Notes, 'B' and 'F', were added to upward scales and repeated notes in the finale, respectively.

Figure 61 tone sets for fragment I, II and III, bar 61 to 69

There are three centre tones, 'D', 'G' and 'Ab' that comprise 'fragment I'. 'Fragment II' is made up of notes 'E' and 'fragment III' is 'C' and 'C#' with semiquavers.

In different sections, different central notes were utilized and different notes were set for each fragment. On the other hand, between sections, there are notes in common including the six-tone. These common notes play a role to relate the different sections.¹⁰⁾

¹⁰⁾ Tone materials in entire sections are expressed altogether in appendix 3.

CHAPTER 3

M.O.N.T.A.G.E. for flute, clarinet, violin and cello

This work was commissioned by the Korean ensemble, Hwaum Chamber Orchestra. The terms of the commission specified that my composition should be related to the video work, *Wantee*, by artist, Laure Prouvost. Moreover, the ensemble planned to premiere my composition at a gallery where the video work is installed. The video's unique atmosphere, complex composition and a form of collage¹¹⁾ all influenced my approach. *M.O.N.T.A.G.E.* was premiered by the Hwaum Chamber Orchestra at the Gallery Space C, Seoul on 18 November 2015, as part of the Hwaum Project Festival¹²⁾.

¹¹⁾ “Her unique approach to filmmaking, often situated within atmospheric installations, employs strong story-telling, quick cuts, montage . . . to create surprising and unpredictable work.” “Turner Prize 2013 Artists”, The Tate Gallery Website, <<http://www.tate.org.uk>>.

¹²⁾ During my doctoral studies, it was also performed by the ensemble Kokoro at the Lighthouse, Poole on 18 February 2017, as part of the Bournemouth Symphony Orchestra's Composers Day 2017, and by the ensemble IPSE at the Shapeshifter Lap, New York on 5 March 2017.

The title, *M.O.N.T.A.G.E.*, is an acrostic, using words that show intimate relations with my composition: Multicolour, Oscillation, Numbers, Television, the Artist, Gleam, Etc..

Multicolour - Structures and movements of this work were occasionally decided in view of timbre, in order to compose in ‘multicolour’.

Oscillation - Shapes of ‘oscillation’ were taken into account in structure. In this work, a section is often comprised of two principal pitches, contrasting timbres and passages, and structures that oscillate between the two extremes at certain intervals.

Numbers - Melody, rhythm and harmony were often constructed ‘numerically’. I intended to use ‘numerical’ techniques to arrange certain musical elements.

Television and the Artist - when watching ‘television’ and changing channels quickly, short sonic images appear, and here this idea gives rise to a musical collage. This formal idea was inspired by ‘the artist, Laure Prouvost¹³⁾’ and her video work, *Wantee* that uses very short clips, complexity and collage.

Gleam - I conceived an imagery based on the idea of a ‘gleam’: illuminations, as if from the distance, are alluded to in various musical structures. Such light images are fragmented and intermittently presented across my work.

Etc. - Above this, a variety of sound fragments that imply other contents are present in this work. These diverse ideas congregate and complete the *M.O.N.T.A.G.E.*.

In the following, ‘Oscillation’ will be discussed in greater depth.

Notes oscillate between two pitches, at various intervals.

Figure 62

A - C#(D) - A / A - G - A, flute, bar 1 - 3,



¹³⁾ “She disclosed her choice of video style was inspired partly by her own upbringing, when she was forbidden from watching television. ‘I was never allowed to watch television when I was little so I became obsessed with it.’ she said. ‘Now I’m catching up with more, more, quickly, quickly.’”
Furness, Hannah, “Turner Prize 2013”, *The Telegraph*, 2 December 2013.

E - B - E, clarinet, bar 2 - 5



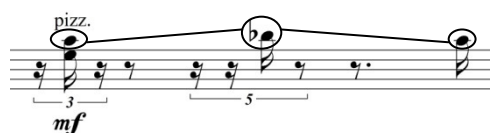
F - B - F, clarinet, bar 6 - 9



A - Ab - G - G# - A / A - F - A / A - Db - A, violin, bar 2 - 5



A - Bb - A, violin, bar 9



Similarly, 'A' and 'D', which are central notes in the first half of the work, are alternately present. They are fragmentarily shown at all instruments.

Figure 63 bar 18 - 21 * Clarinet is transposed in Bb.

The central notes were presented at various dynamics, durations and in various instrumental colours and textures.

Forms of oscillation were also applied to dynamics, timbre and textures.

Figure 64 flute, bar 1 - 5

Dynamics in flute oscillate between *mp* and *f*.

Musical notation for flute, bars 1-5. The notation shows a sequence of notes with dynamic markings: *mp*, *mf*, *mp*, *f*, *mp*, and *mp* < *mf*. Performance techniques 'slap tongue' and 'ord.' are indicated above the notes.

cello, bar 1-5

In cello, two different timbre and textures appear in rotation: pizzicato and arco.

Musical notation for cello, bars 1-5. The notation shows a sequence of notes with dynamic markings: *p*, *mp*, *f*, *p*, *mp*, *p*, *mf*, *mp*, and *p*. Performance techniques 'IV pizz.', 'arco', and 'pizz.' are indicated above the notes.

flute, bar 1-9

in flute, slap tongue and ordinario

Musical notation for flute, bars 1-9. The notation shows a sequence of notes with dynamic markings: *mp*, *mf*, *mp*, *f*, *mp*, *mp*, *mf*, and *mp*. Performance techniques 'slap tongue' and 'ord.' are indicated above the notes.

Two different styles of phrases, contrasting in pitch content, texture, dynamics and density were alternately structured.

Figure 65 score, bar 85 - 100

The musical score for Figure 65, covering bars 85 to 100, is presented in four systems. Each system contains staves for Flute (FL), Bass Clarinet (B. Cl.), Violin (Vln.), and Viola (Vc.).

- System 1 (Bars 85-88):** The Flute part features a melodic line with dynamics ranging from *mf* to *f*. The Bass Clarinet part has a rhythmic accompaniment with dynamics from *p* to *f*. The Violin part includes *arco* and *pizz.* markings. The Viola part has a low-register accompaniment with dynamics from *p* to *f*.
- System 2 (Bars 89-92):** The Flute part continues with dynamics from *ff* to *p*. The Bass Clarinet part has a more active role with dynamics from *mf* to *f*. The Violin part features a complex texture with *ord.* and *sul pont.* markings. The Viola part has a low-register accompaniment with dynamics from *ff* to *pp*.
- System 3 (Bars 93-96):** The Flute part has dynamics from *f* to *mf*. The Bass Clarinet part has dynamics from *f* to *p*. The Violin part includes *sul pont.* and *ord.* markings. The Viola part has a low-register accompaniment with dynamics from *mf* to *p*.
- System 4 (Bars 97-100):** The Flute part has dynamics from *fp* to *f*. The Bass Clarinet part has dynamics from *f* to *p*. The Violin part includes *gliss.* and *ord.* markings. The Viola part has a low-register accompaniment with dynamics from *f* to *pp*.

Phrases with continuities, shown within the boxes, are periodically juxtaposed with various contrasting structures in a rotational pattern.

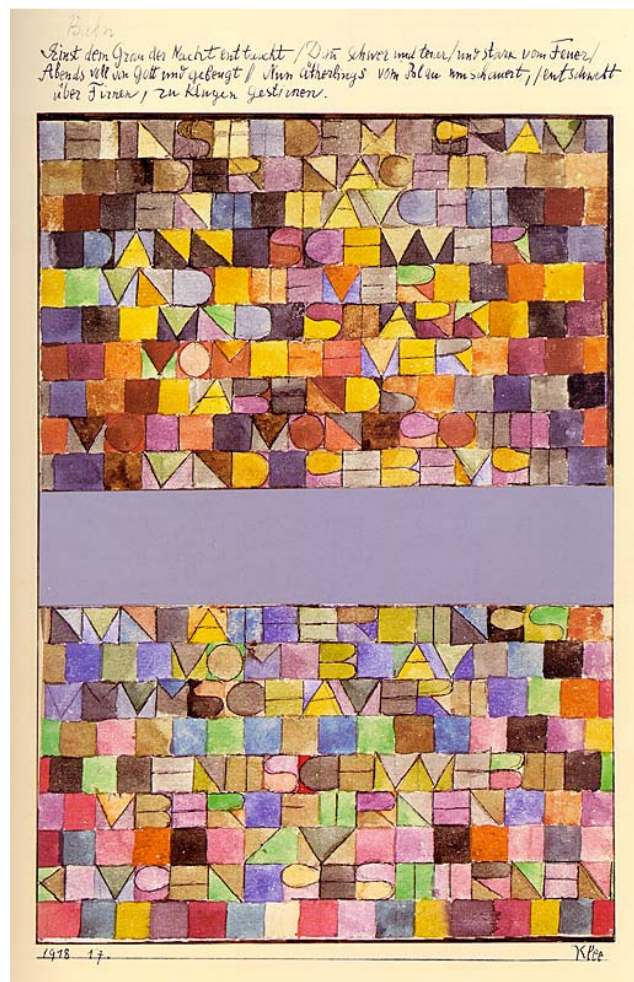
In this way, dichotomous elements and structures were set out, but as the work proceeds, boundaries between them become blurred.

M.O.N.T.A.G.E. was written without pre-compositional plans. Instead, I relied on my musical intuition to create structures that were inspired by the video work, *Wantee*. However, after completing this composition, I wanted to further systematize its compositional ideas in a new work, and planned to develop pre-compositional materials based on it. This is discussed in more detail in the next chapter.

CHAPTER 4

Once Emerged from the Grey of Night for flute, clarinet, horn, violin, viola and cello

The sextet, *Once Emerged from the Grey of Night* further develops musical ideas seen in the quartet, *M.O.N.T.A.G.E.*. The sextet consists of numerous fragments with various colours and textures, forming a musical collage. Moreover, a picture-poem by Paul Klee had a strong influence on this piece. The title of this composition is a direct quote from Klee.



Once Emerged from the Grey of Night, 1918, Paul Klee¹⁴⁾

¹⁴⁾ <www.paulklee.net>.

“Klee's thorough and unusually sensitive understanding of the art of music itself is apparent in a far more fundamental aspect of his theory of art. On this level, the analogy with music is employed, not to liberate his thinking in a purely evocative direction but, rather, to clarify and discipline his pictorial inspirations in a manner similar to that employed by the composer of music¹⁵⁾.”

Klee's works are intimately related to music, and musical elements in his works have long attracted composers. Many composers (including Boulez¹⁶⁾) have acknowledged the artist's strong influence on their works. I have also been affected by the artist, and the picture-poem, *Once Emerged from the Grey of Night*¹⁷⁾, was the inspiration for my sextet.

The picture-poem is divided into three sections, two of which are complex and one simple. The poem is written in the two complex sections, made up of diversely coloured fragments like stones of a mosaic. Between those sections is set a contrasting block of solid colour.

Similarly, my sextet is comprised of a variety of fragments with various colours and textures. A 'simple' section is set in the middle of the work, dividing the two more complex structures which make up the rest of the material.

¹⁵⁾ Verdi, Richard, “Musical Influences on the Art of Paul Klee”, *Chicago Museum Studies*, Vol.3, The Art Institute of Chicago, 1968, p. 81.

¹⁶⁾ French composer, Pierre Boulez wrote the book, *Le pays fertile: Paul Klee*, paying homage to Klee. Boulez wrote in the book that Klee's works and artistic theories substantially benefitted Boulez himself, to introspect about music. Boulez, Pierre, “Le pays fertile: Paul Klee”, Gallimard, 1989, p.87.

¹⁷⁾ Once emerged from the gray of night / Heavier and dearer and stronger / Than the fire of the night / Drunk with God and doubled over. / At present ethereal / Surrounded by blue / Soaring over the glaciers / Toward the wise constellations. created in 1918.

Figure 66

Sections	A ⁰	A ¹	B	C	D		E ⁰	E ¹	F			G (B ¹)	H	I			J
Bars	1	32	63	93	118	123	137	165	182	202	219	227	249	266	275	295	310
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	31	62	92	117	122	136	164	181	201	218	226	248	265	274	294	309	325
Tempi J =	96	104			69	56	80	108	80	96	104	108	69	96	69	92	60
Structure	complexity				simplicity			complexity									
Density	higher				lower			higher									

Pre-compositional materials

In this work, pre-compositional materials were employed to further systematize compositional ideas seen in the quartet, *M.O.N.T.A.G.E.*. A structural skeleton, composed of specific notes and rhythms, was used throughout the work.

Figure 67 Structural skeleton, bar 1 - 8



This is a part of the skeleton from bar 1 to 8.

Figure 68 score and structural skeleton, bar 1 - 8

Score in C

Once Emerged from the Grey of Night

for flute, clarinet, horn, violin, viola and cello

Jae-Moon Lee

$\text{♩} = \text{ca. } 96$

Flute: * t. ram (tongue ram) s. tong. (slap tongue) t. ram s. tong. t. ram
 Clarinet in Bb: ord. (timbral trill)
 Horn in F: pizz. (secco) (secco)
 Violin: IV pizz. (secco) (secco) IV
 Viola: III pizz. IV s.t. arco IV pizz. arco IV pizz.
 Cello: III pizz. I arco pizz. (secco) IV (secco) IV
 Structural Skeleton

* produce the given note with the "s" "hu" / "ch" sound to make a breath only, toneless sound, then key click it.

* Tap mouth piece using the palm of the hand.

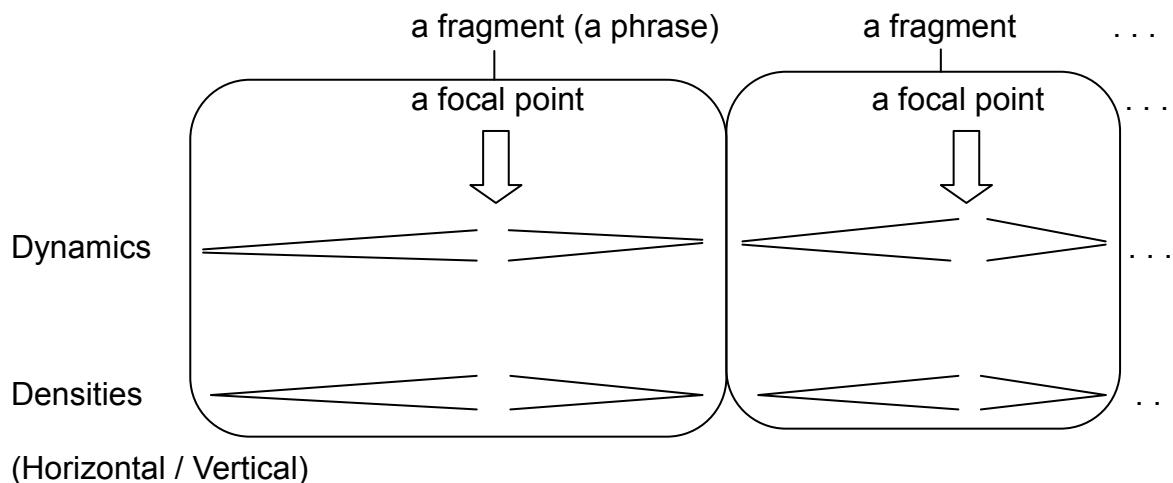
Fl.: t. ram t. ram
 Bb. Cl.: "s" "hu" "ch"
 Hn.: * Tap mouth piece using the palm of the hand.
 Vln.: (secco) snap pizz. IV
 Vla.: ord. arco IV snap pizz. IV arco
 Vc.: (secco) pizz. III arco snap pizz. IV
 Structural Skeleton

Notes in the skeleton were listed in the score in a contrapuntal form. For the sake of convenient analysis, each note of the 'backbone' is numbered. In the figure 69, notes of the bone are enumerated in the score in numerical order.

In addition to this, the work also comprises various alternate forms of the “skeleton” notes: inversion, retrograde and retrograde-inversion.

In figure 68 and 69, the structural skeleton includes the articulations and accents. Each note with an accent denotes the focal point of a phrase. A focal point is located at the highest or lowest point in an “arch” of notes. In the score, these notes are given louder dynamics and higher densities.

Figure 70



A focal point was assigned to each fragment or phrase, with louder dynamics and higher densities than others.

I intended to enable audiences to apprehend a collage of diverse fragments, rather like stones in a mosaic in Klee's work.

CHAPTER 5

Scale-Free Spaces for flute, guitar, viola and cello

Scale-Free Spaces was commissioned by the Hwaum Chamber Orchestra. It was premiered by the ensemble at the Daejeon Museum of Art, Korea on 31 August 2016. I drew compositional ideas from the video installation, *Irreversible*, by artist Norimichi Hirakawa. The video installation was screened alongside the premiere of the composition.

The video installation shows short fragments that consist of moving of dots and lines. A number of fragments are present in a random sequence. Similarly, my work was composed of brief fragments of dots, lines and movements. Various fragments were structured in forms of both simplicity and complexity. For the latter, ideas were drawn from the study in randomness, 'Scale-Free Network'.

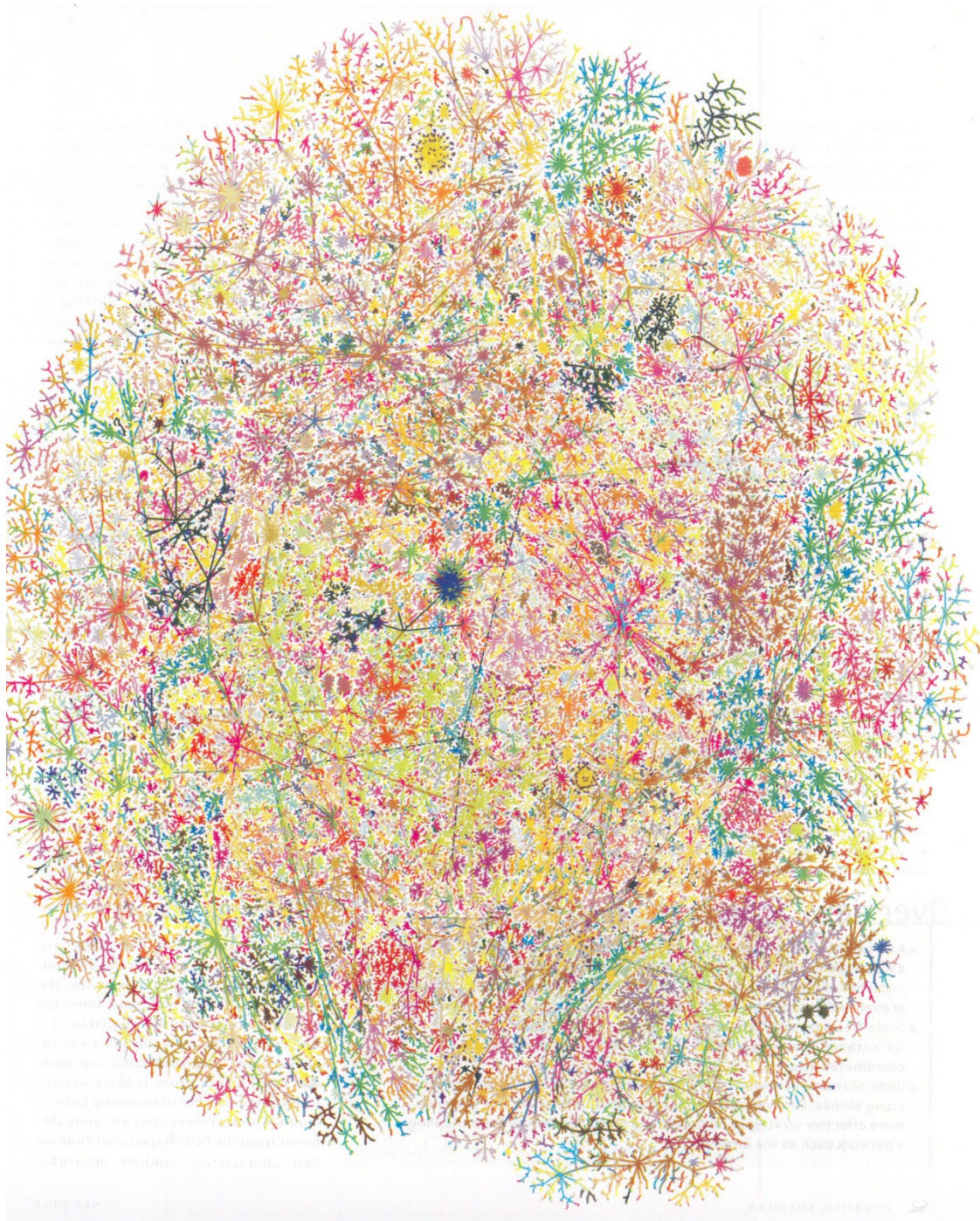
I was interested in creating intricate structures in my work, and this study of randomness attracted my attention:

“Many systems around us display rather complex topologies, that often seem random and unpredictable. In particular, many of these systems form complex networks, whose vertices are the elements of the system and edges represent the interactions between them.¹⁸⁾”

In particular, imagery from the theory was the inspiration for *Scale-Free Spaces*.

¹⁸⁾ Barabási, A.L.; Albert, R.; Jeong, H.W., “Scale-free characteristics of random networks: the topology of the world-wide web”, *Physica A*, Vol. 281, Elsevier, 2000, p. 69.

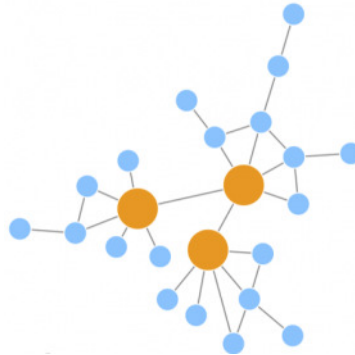
Figure 71 Map of the Internet topology¹⁹⁾ by Hal Burch and Bill Cheswick



Courtesy of Lumeta Corporation

¹⁹⁾ “The Internet is a scale-free network in that some sites (starbursts and detail above) have a seemingly unlimited number of connections to other sites. This map, made on February 6, 2003, traces the shortest routes from a test Web site to about 100,000 others, using like colors for similar Web addresses.” Barabási, Albert-László; Bonabeau, Eric, “Scale-Free Networks”, *Scientific American*, May 2003, p. 50 - 51.

Figure 72



A tiny part of the figure 71 can be enlarged as above. It shows that there are three hubs with other sub-nodes. The network appears to have no scale. This 'scale-free' idea was applied to my work.

Figure 73 Skeletal materials in *Scale-Free Spaces* bar 1 - 4

$\bullet = \text{ca. } 80 \text{ energetico}$

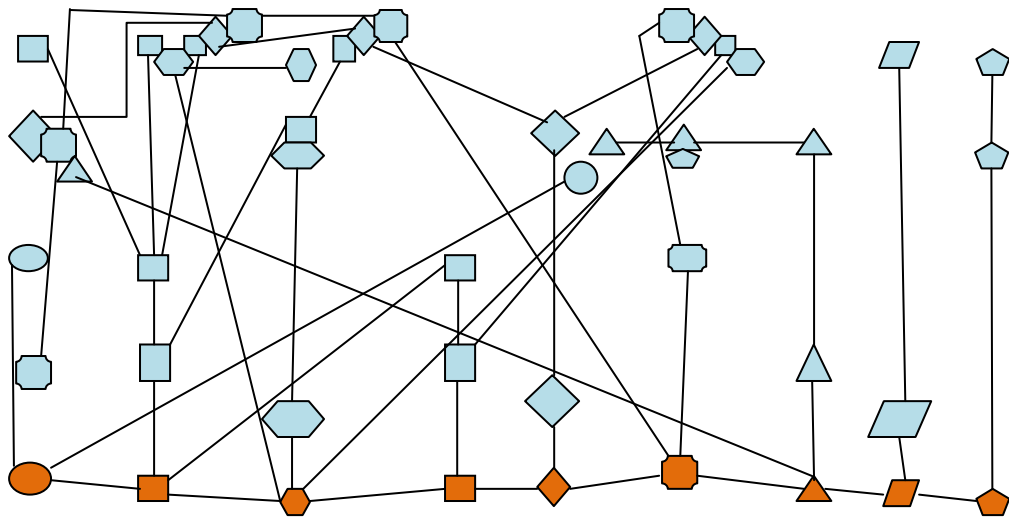
t. ram (tongue ram)

Flute (Piccolo)
Guitar
Viola
Cello
Structural Skeleton

Legend:
G (circle) D (square) G# (hexagon) Eb (diamond) A (rectangle) B (triangle) A# (trapezoid) F (pentagon)

* Different shapes for different pitches

Figure 74



This 'network' illustration is created by linking the occurrences of various pitches as seen in the score.

In the composition, a skeleton of pitch and rhythm was set throughout the work. Skeletal notes play a role as hubs. Those notes are distributed throughout the score in a contrapuntal form. Distributed notes can be understood as sub-nodes in a 'Scale-Free Network': they are connected in complex structures without a scale. Figure 74 shows a similarity to the image of 'Scale-Free Network'. Irregularity in rhythm helps in creating such intricate structures. The more notes used, the more the music comes to resemble the complex theory²⁰⁾.

²⁰⁾ Overview of Scale-Free Networks: "A variety of complex systems share an important property: some nodes have a tremendous number of connections to other nodes, whereas most nodes have just a handful. The popular nodes, called hubs, can have hundreds, thousands or even millions of links. In this sense, the network appears to have no scale." Ibid. p. 52.

Figure 75 bar 1 - 12 consistent gestural elements

The musical score for Figure 75, bars 1-12, is presented in three systems. The instruments are Flute (Piccolo), Guitar, Viola, and Cello. The score includes various performance instructions and dynamic markings.

System 1 (Bars 1-4):

- Flute (Piccolo):** Features a "t. ram (tongue ram)" instruction. Dynamics range from *fz* to *mf*. Gestural elements include slurs and accents.
- Guitar:** Dynamics range from *fz* to *mf*. Includes a triplet of eighth notes.
- Viola:** Dynamics range from *fz* to *p*. Includes fingerings (III, II) and a *pizz.* instruction.
- Cello:** Dynamics range from *fz* to *p*. Includes *pizz.* and *arco* instructions.

System 2 (Bars 5-8):

- Fl.:** Dynamics range from *p* to *mf*. Includes a slur and a triplet.
- Gtr.:** Dynamics range from *mf* to *p*. Includes a triplet and a "tap" instruction: "*** tap h m (high, medium) 3".
- Vla.:** Dynamics range from *mf* to *p*. Includes *pizz.* and *arco* instructions.
- Vc.:** Dynamics range from *mf* to *p*. Includes *pizz.* and *arco* instructions.

System 3 (Bars 9-12):

- Fl.:** Dynamics range from *mf* to *mf*. Includes a "t. ram" instruction.
- Gtr.:** Dynamics range from *mf* to *mf*. Includes a "tap" instruction: "1 (low) tap h m (high, medium) 3".
- Vla.:** Dynamics range from *p* to *fz*. Includes *pizz.* and *arco* instructions.
- Vc.:** Dynamics range from *fz* to *p*. Includes *pizz.* and *arco* instructions.

Additional notes: "*** tap on the sound box." is written below the guitar part in the second system.

Scale-Free Spaces was composed of short fragments with constantly varying forms. In contrast to this, consistent gestural elements are present throughout the work in

the form of tremolos or trills. (see figure 75) In this way, sustained energies are maintained over the span of the entire piece. Moreover, it was intended to create a unitary form with an energetic continuity that functions to bind diversified fragments together.

Extended instrumental techniques were studied to create a variety of colours and textures. In particular, this focused on the guitar: various techniques were employed in bars 6, 75, 83 - 87, 89, 109, 131 and 152. Plenty of guitar works were researched, such as *Sonata* for guitar, Op.47, by Alberto Ginastera, *Salut* for two guitars by Helmut Lachenmann, *Elogio de la Danza* for guitar by Leo Brouwer, *Nocturnal* for guitar by Benjamin Britten and *The Prince's Toys* for guitar by Nikita Koshkin.

Figure 76

Sections	A°		B°	A ¹	B ¹	A ²	B ²	C <A ³ +B ³ >				D		B ⁴	A ⁴	
Sub-sections	i	ii	iii	iv	v	vi	vii	viii	viiii	x	xi	xii	xiii	xiv	xv	<coda>
Bars	1-16	17-28	29-32	33-36	37-38	39	40-41	42-53	54-65	66-74	75-79	80-102	103-138	139-142	143-159	160-165
Tempi J=	80		63	80	63	80	63	80	84	80	52	88		63	88	52
Harmony	notes from skeleton (n.s.)	n.s.	clusters	n.s.	clusters	n.s.	clusters	clusters	clusters	clusters	n.s.	n.s.	clusters	n.s.	n.s.	
Texture	polyphony (p.)	p.	homophony (h.)	p.	h.	p.	h.	h.	h.	h.	p.	p.	h.	p.	p.	

As can be seen from the table above, much use is made of dualism in *Scale-Free Spaces*. This principle applies to many parameters including tempo, musical texture, harmony and form; contrasting elements are alternated.

CHAPTER 6

String Quartet no. 3

This composition consists of four movements:

1. *Rain Drops and Stained Glass I*
2. *Transformation I*
3. *Rain Drops and Stained Glass II*
4. *Transformation II.*

In the first and third movements, the sound of rain drops and images of lights from stained glasses were invoked. When I visited the Stained Glass Museum in Ely Cathedral on a rainy day, these compositional ideas flashed through my mind. In the second and fourth movements, structural metamorphoses of musical elements were explored. Four movements are contrasted with one another in terms of their compositional elements and manners.

In this chapter, the first and fourth movements will be discussed.

The first movement - *Rain Drops and Stained Glass I*

Figure 77

Sections	A ⁰										B	A ¹	C	D		A ²
Sub-sections	a ⁰	a ¹	a ²	b ⁰	a ³	b ¹	a ⁴	b ²	a ⁵	b ³	c	a ⁶	d	e	d ¹	a ⁷
Bars	1	10	18	21	23	26	29	33	34	41	45	52	61	79	88	92
	-9	-17	-20	-22	-25	-28	-32		-40	-44	-51	-60	-78	-87	-91	-101
Tempi (J=)	63			76	63	80	63	76	63	76	40	76	84	52	80	60
												~88				

In comparison to the other movements, the first was constructed with the shortest form: 6 sections (passages), 16 sub-sections (phrases) and numerous minute fragments.

A few thematic fragments were structured in the first page of the work (bar 1 - 9). Those describe images of rain drops and stained glass windows. As the fragments are gradually concretized, dynamics and densities both increase.

Throughout the work, these patterns are deployed in various combinations, and no combination was identically repeated. This is intended to represent the sound of rain drops.

Figure 80 Twenty-three notes series



A single set of twenty-three notes was used to generate all the pitch material for this movement. The series consists of repetitions of notes and leaps with intervals of major second, minor third, major third, perfect fourth and augmented fourth.

Figure 81 The series in bar 1 to 4

The image shows a musical score for the first four bars of a piece, featuring four staves: Violin I, Violin II, Viola, and Cello. The time signature is 2/4, which changes to 3/4 in the final bar. The score is annotated with various performance instructions and dynamic markings.

- Violin I:**
 - Notes 2, 3, 6, 8, 10, 13, 19, 23 are marked with their respective numbers in black boxes.
 - Notes 2 and 3 are marked with fingerings II and III and the instruction "pizz.".
 - Notes 6, 8, and 10 are marked with fingerings II, III, and "simile".
 - Notes 13, 19, and 23 are marked with fingerings II, III.
 - Dynamics: *f* (forte) and *mp* (mezzo-piano).
 - Other markings: "★★ l.v. sempre" and "***".
- Violin II:**
 - Notes 1, 4, 5, 7, 9, 11, 12, 14, 16, 17, 20, 21, 22 are marked with their respective numbers in black boxes.
 - Note 1 is marked with fingering IV and the instruction "★ air b. (air bowing)".
 - Note 4 is marked with fingering II and "pizz.".
 - Notes 5 and 7 are marked with fingerings III and II, III.
 - Note 9 is marked with "simile".
 - Dynamics: *pppp* (pianissimo).
 - Other markings: "3" (triplets) and "3" (triplets).
- Viola:**
 - Notes 1, 4, 5, 7, 9, 11, 12, 14, 16, 17, 20, 21, 22 are marked with their respective numbers in black boxes.
 - Note 1 is marked with fingering IV and "★ air b. (air bowing)".
 - Note 4 is marked with "pizz.".
 - Notes 5 and 7 are marked with fingerings III and II, III.
 - Note 9 is marked with "simile".
 - Dynamics: *f* and *mp*.
 - Other markings: "★★ l.v. sempre" and "3" (triplets).
- Cello:**
 - Notes 15 and 18 are marked with their respective numbers in black boxes.
 - Note 15 is marked with "pizz." and "gliss.".
 - Note 18 is marked with "air b. arco".
 - Dynamics: *pppp* and *mf* (mezzo-forte).
 - Other markings: "3" (triplets).

Var. XI



Var. XII



The fourth movement - *Transformation II*

Gestures originating in the latter half of *M.O.N.T.A.G.E.*²¹⁾ were quoted in the fourth movement. Quoted gestures were, gradually, converted into different forms (from bar 189 to 216). Ideas about structural conversion were drawn from the novel *The Metamorphosis* by Kafka.

Figure 84 Conversion of gestures into different forms.

IV. Transformation II

♩ = ca. 76

bar 189-190

Vln. I

Vln. II

Vla.

Vc.

bar 216-217

Vln. I

Vln. II

Vla.

Vc.

²¹⁾ From bar 83 to 87 in *M.O.N.T.A.G.E.*

Figure 85

Vln. II in bar 216

(Melodic contour retained)

(A)

IV. Transformation II
♩ = ca. 76

Vln. I

Vln. II

Vla.

Vc.

(B) (Similarity in rhythm)

(C) (Similarity in dynamic)

Vn. I in bar 209

Vn. I in bar 207

(A) Ordinary (pitched) sound → unpitched extended string techniques
; melodic contour retained

In (A), ordinary (pitched) sound is converted into unpitched extended string techniques. However, the original gestural structure (melodic contour) is retained. In other words, a conversion of gestures into different colours and textures were the staple aim in this movement. This idea was also applied to (B) and (C).

(B) A single note → double stop / pizz. → arco (sul ponticello)

; similarity in rhythm

(C) Repeated notes → harmonics tremolo

; similarity in dynamic

The climax of this movement is reached by means of such converted gestures and heightened dynamics (bar 216 - 224).

Such techniques are employed extensively to metamorphose musical colours and textures, and this plays a staple role in shaping themes, structures and forms in this movement.

CHAPTER 7

A Thousand Plateaux / A Thousand Movements for orchestra

In this orchestral work, a variety of images of both plateaux and movements were invoked. The work was inspired by both the book, *A Thousand Plateaux*, written by Gilles Deleuze and Félix Guattari, and the Alhambra palace in Granada, Spain.

When I visited the Alhambra in 2015, I was fascinated by the architectural style of the palace. Alhambra's arches, domes and columns, which contain complex and sophisticated ornaments, alongside unadorned, plain walls, inspired me to compose this orchestral work. Just as in the Alhambra, in this work, gestures in minute detail appear juxtaposed with simple and plain ones. Both detailed and plain gestures were developed in a variety of forms, to which literary inspirations were applied.

Deleuze and Guattari's *A Thousand Plateaux* was a further inspiration for this work. In the book, the authors' logic is structuralized based on dichotomous ways of thinking. Furthermore, concretizing their logic, boundaries between dichotomous ideas are abolished, and divided thoughts become connected to one another. The authors' ideas are not only reconciled based on dichotomy, but at the same time, also beyond it. These thinking methods influenced me to compose my orchestral work. In my work, dichotomous structures of continuity and movements or complexity and simplicity are, alternately, present. Boundaries between them become blurred as the work goes by. For me, this recalls the Eastern philosophy of Yin Yang.

“The Yin Yang theory is based on the concept that all sensible phenomena are manifestations of two opposite forces, namely Yin and Yang. The earliest definition of Yin and Yang is found in the I King, and is ‘firm’ and ‘soft’. Other attributes have been (respectively) dark and light, cold and heat, full and empty, expansion and contraction, transformation and conservation. These examples help understand the properties of these two ‘elements’, but the nature of Yin and Yang is much more complex. What differentiates Yin and Yang from other

dualistic philosophies is its fuzziness and the set of laws that rule the interplay between the elements²²⁾.”

Meanwhile, I personally think that the book, *A Thousand Plateaux*, negates a notion of absolute centre in any logic. It asserts that anything can be centre of it. This point of view influenced me to explore different compositional methods from my recent works. Many of my works include central pitches and other central materials like fixed gestures and rhythms. However, I aimed to dissolve central materials in this orchestral work, and seek new ways of proceeding.

²²⁾ Gabrielli, L.; Gabrielli, D., “The Yin Yang Theory in Sound and Music: a First Exploration”, *International Computer Music Conference Proceedings*, 2012, p. 598, Quoted in R. Wilhelm; U. Diederichs, *I-ging*, Europ, Bildungsgemeinschaft, 1956.

Figure 86 Form of the work

Section	A							B		C				D		E		
Sub-section	I (intro)	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv	xvi	xvii	xviii (coda)
Bar	1-15	16- 19	19- 26	27- 35	36- 48	49- 61	62- 69	70- 78	79-92	93- 103	104- 131	132- 143	144- 152	153- 167	168- 184	185- 219	220- 230	231- 237
Tempo ♩ =	52- 96	96						63		84	100			88		72	52	
Duration	0-45	56	1:13	1:35	2:08	2:40	3:00	3:33	4:25	4:54	6:01	6:27	6:48	7:30	8:15	10:10	10:59	11:33
	45"	11"	17"	22"	33"	32"	60"	33"	52"	29"	67"	26"	21"	42"	45"	115"	49"	34"
	3'00"							52'		2'23"				1'27"		3'18"		

The composition consists of five sections and eighteen sub-sections. Each section is contrasted by several compositional elements: tempo, duration, tone material, rhythm, timbre and structure. (Also see figure 91 and 97) This will be further discussed in timbre part in page 92.


This work contains short phrases of introduction (bar 1 - 4) and coda (bar 231 - 237). Both the introduction and coda contain similar materials and structures. In other words, when the music reaches the coda, it recalls the beginning of the work, and thereby, a circular form is generated. I intended to deliver to audiences an obvious formality that traverses the whole piece.

Compositional materials

The orchestral work was composed of a variety of materials that are based on a single pitch set and a single rhythmic pattern. The basic materials in tone and rhythm are a ten-note series and a numerical series, respectively.

Figure 87

Series of ten-note (original form)



Series of numbers (original form)

3 - 2 - 3 - 1 - 2 - 3 - 1 - 3 - 2 - 5 - 1 - 3 - 1 - 5 - 3
- 2 - 1 - 2 - 1 - 3 - 5 - 3 - 5 - 2 - 3 - 2 - 1 - 2 - 3 - 5

First of all, the numerical series will be discussed.

Four different numbers (1, 2, 3 and 5) are arbitrarily arranged in the series, and thirty numbers compose it. I intended to create irregular structures with this arbitrary material.

The original set of the numerical series for rhythms was varied by means of retrograde form and ten different variations. (See figure 88)

Figure 88 varied forms of the numerical series

Original	3	2	3	1	2	3	1	3	2	5	1	3	1	5	3	2	1	2	1	3	5	3	5	2	3	2	1	2	3	5
(structure	A	B	A	C	B	A	C	A	B	D	C	A	C	D	A	B	C	B	C	A	D	A	D	B	A	B	C	B	A	D)
Retrograde	5	3	2	1	2	3	2	5	3	5	3	1	2	1	2	3	5	1	3	1	5	2	3	1	3	2	1	3	2	3
Var. 1	4	3	4	1	3	4	1	4	3	5	1	4	1	5	4	3	1	3	1	4	5	4	5	3	4	3	1	3	4	5
Var. 2	5	4	5	3	4	5	3	5	4	7(1)	3	5	3	7(1)	5	4	3	4	3	5	7(1)	5	7(1)	4	5	4	3	4	5	7(1)
Var. 3	3	5	3	4	5	3	4	3	5	1(7)	4	3	4	1(7)	3	5	4	5	4	3	1(7)	3	1(7)	5	3	5	4	5	3	1(7)
Var. 4	4	5	4	6	5	4	6	4	5	7(1)	6	4	6	7(1)	4	5	6	5	6	4	7(1)	4	7(1)	5	4	5	6	5	4	7(1)
Var. 5	2	1	2	3	1	2	3	2	1	5	3	2	3	5	2	1	3	1	3	2	5	2	5	1	2	1	3	1	2	5
Var. 6	1	3	1	5	3	1	5	1	3	2(4)	5	1	5	2(4)	1	3	5	3	5	1	2(4)	1	2(4)	3	1	3	5	3	1	2(4)
Var. 7	5	1	5	4	1	5	4	5	1	3(6)	4	5	4	3(6)	5	1	4	1	4	5	3(6)	5	3(6)	1	5	1	4	1	5	3(6)
Var. 8	3	4	3	5	4	3	5	3	4	1(7)	5	3	5	1(7)	3	4	5	4	5	3	1(7)	3	1(7)	4	3	4	5	4	3	1(7)
Var. 9	7	5	7	8	5	7	8	7	5	10	8	7	8	10	7	5	8	5	8	7	10	7	10	5	7	5	8	5	7	10
Var. 10	8	7	8	6	7	8	6	8	7	9	6	8	6	9	8	7	6	7	6	8	9	8	9	7	8	7	6	7	8	9

See how the numerical series are used in figure 89 and 90.

Figure 89 bar 19 - 23

The image shows a musical score for five instruments: Fl. 1, Fl. 2, Ob., E. Hrn., and Bsn. The score is annotated with numerical series (1, 2, 3, 5) in boxes, indicating the original form of the series used in the composition. The series are applied to various rhythmic patterns across the staves. The Fl. 1 staff starts with a box containing '19'. The Fl. 2 staff has boxes with '3', '3', '2', and '2'. The Ob. staff has boxes with '3', '3', '3', '5', '3', '5', '2', '2', and '3'. The E. Hrn. staff has boxes with '2', '3', '3', '5', '3', '5', '2', '2', and '3'. The Bsn. staff has boxes with '1', '1', '1', and '1'. The C. Bn. staff has boxes with '1' and '1'. The score includes dynamic markings such as *mf* and *f*.

In the above score, the original form of the series is used:

3 - 2 - 3 - 1 - 2 - 3 - 1 - 3 - 2 - 5 - 1 - 3 - (1 omitted) - 5 - 3 - 2 - 1 - 2 - 1 - 3

It functions to create irregular structures in rhythm.

Figure 90 bar 16 - 19

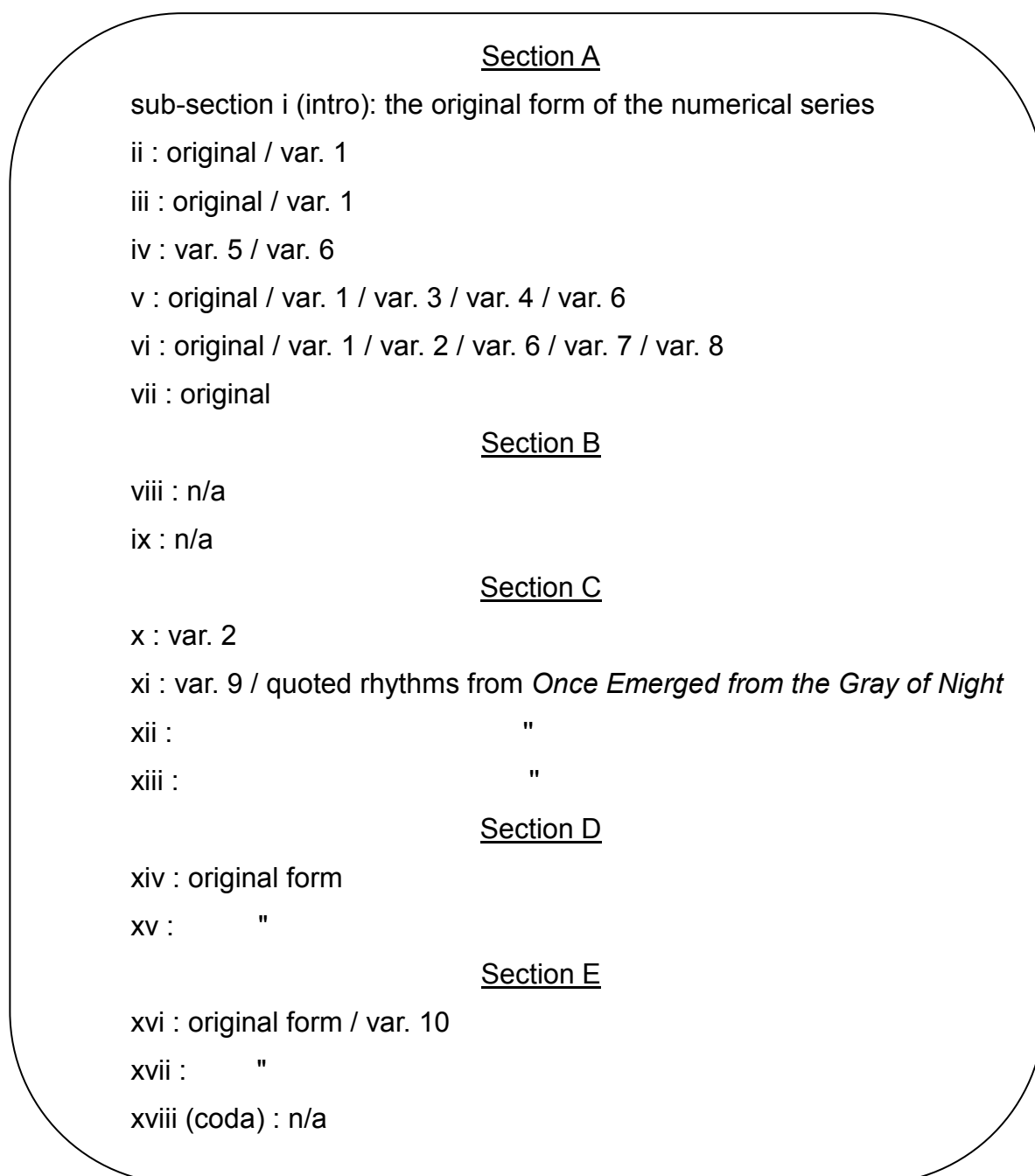
The musical score for Figure 90, bars 16-19, is presented below. The score includes parts for Mrb. (Perc. I), Vib. (Perc. II), Hp., Pno., Vn. I 1-6, Vn. I 7-12, Vn. II 1-5, Vn. II 6-10, Vla. 1-4, Vla. 5-8, Vc. 1-3, Vc. 4-6, D.B. 1-2, and D.B. 3-4. The percussion parts (Mrb., Vib., Hp.) feature rhythmic patterns with numerical annotations (4, 3, 5) and dynamic markings (mp). The string parts (Vn., Vla., Vc., D.B.) feature complex rhythmic patterns with dynamic markings (mp, mf, p) and articulation (pizz., unis.).

'Variation 1' of the numerical series is used in figure 90:

4 - 3 - 4 - 1 - 3 - 4 - 1 - 4 - 3 - 5 - 1 - 4

In each section, different variants of the numerical series were used.

Figure 91 Contrasting rhythmic materials between sections



Ten-note series

Several of my compositions have been written using pitch series. The work, *Man-Nam*²³⁾, attached in appendix 4, was composed using an eight-note series. In the attached work, eight notes are listed in sequence both vertically and horizontally, and the process is repeated throughout the work. Similarly, a set of pitch series was used for the orchestral work. In the example below, they appear listed in sequence.

Figure 92 bar 1 - 6

The musical score for Figure 92, bars 1-6, is written for four instruments: Marimba (Percussion I), Vibraphone (Percussion II), Harp, and Piano. The score is in 4/4 time and features a ten-note series. The series is defined as: 1 (C4), 2 (D4), 3 (E4), 4 (F4), 5 (G4), 6 (A4), 7 (B4), 8 (C5), 9 (D5), 10 (E5). The series is used in various ways throughout the score, including as a melodic line in the Harp and Piano, and as a rhythmic pattern in the Marimba and Vibraphone. The Harp part includes a list of notes: C4, D4, E4, F4, G4, A4, B4, C5, D5, E5. The Piano part includes a list of notes: C4, D4, E4, F4, G4, A4, B4, C5, D5, E5. The score also includes dynamic markings such as *mp*, *p*, and *una corda pedal sempre*.

10-note series diagram:

1 2 3 4 5 6 7 8 9 10

²³⁾ The work, *Man-Nam* for two pianos was commissioned by the theatre group, Sita Calvert-Ennals & David Lane based in Bristol. During my doctoral studies, the work was composed, and it was premiered at the Burdall's Yard in Bath on 23 June 2016, as part of the theatre work, *KOREA*.

Furthermore, individual methods were sought to organize the series and create a variety of forms of it. The pitch series vary their forms through techniques of inversion, retrograde, retrograde inversion and transposition to different pitches.

These various forms were structured in dichotomous ways. I use words 'fixed' and 'fluid' to explain the manners in this chapter.

A fixed form of series is present as follows. The ten notes of the series are listed in sequence, horizontally. Their original order is retained throughout the work. This form is clearly shown in soloistic passages and plays a role of thematic melodic lines.

Figure 93 bar 92 - 100, a fixed form of the ten-note series

The image displays a musical score for bars 92 through 100. The score is arranged in a system with multiple staves. The top staff is for the Oboe (Ob.), followed by the Clarinet in C (C. Tpt.), Gong (Perc. I), Tom Tom (T.B. Perc. II), Flute (Flac.), Violin I & II (Vla. 1-4), Double Bass I & II (D.B. 1-2), and Double Bass III & IV (D.B. 3-4). The music features a ten-note series that is presented in a fixed, horizontal form across the Oboe and Clarinet parts. The series is repeated and varied in dynamics, including *ppp*, *p*, *mp*, and *pp*. The Flute part has a melodic line with dynamics *ppp*, *mp*, and *pp*. The Violin I & II part has a melodic line with dynamics *ppp*, *p*, and *pp*. The Double Bass parts have a melodic line with dynamics *p*, *mp*, and *pp*. The Gong and Tom Tom parts have a melodic line with dynamics *ppp*, *mp*, and *pp*. The Flute part has a melodic line with dynamics *ppp*, *mp*, and *pp*. The Violin I & II part has a melodic line with dynamics *ppp*, *p*, and *pp*. The Double Bass parts have a melodic line with dynamics *p*, *mp*, and *pp*. The score is in 4/4 time and features a variety of rhythmic patterns and dynamics.

In the meantime, a fluid form of the series is present, transforming in a variety of ways. Notes of series are distributed to multiple instruments in a fluid way both vertically and horizontally. Horizontally, this results in ceaseless modified forms of the ten-note series. In some passages, the original form of the series becomes difficult to detect. (See figure 94)

Figure 94 bar 44 - 47, a fluid form of the ten-note series

The image displays a musical score for Figure 94, covering bars 44 to 47. The score is written for a large ensemble, including woodwinds, strings, and percussion. The key signature is one flat (B-flat major or D minor), and the time signature is 4/4. The score is divided into systems, with the first system starting at bar 44. The instruments listed on the left are: B♭ Clarinet (B♭ Cl.), Bass Clarinet (B. Cl.), Bassoon (Bsn.), Horns (Hrn.), Mellophone (Mbn), Saxophone (Sax), Violins (Vln.), Viola (Vla.), Horns (Hrn.), Percussion (Perc.), Trumpets (Trp.), Trombones (Tbn.), and Double Basses (D.B.). The score features a variety of musical notations, including eighth and sixteenth notes, rests, and dynamic markings such as *mp*, *p*, *f*, *mf*, and *ff*. The ten-note series is presented in a fluid form, with notes often beamed together and slurred across measures. The score is marked with a rehearsal sign '44' at the beginning of the first system.

Figure 95 Scales

Scales quoted from my piano piece, *Tangram* were used in this work. These scales comprise ascending and descending gestures.

Musical score for strings in bar 19. It consists of four staves: Vn. I 1-6, Vn. I 7-12, Vn. II 1-5, and Vn. II 6-10. Each staff contains a melodic line with triplets and dynamic markings of *mf* and *f*. The Vn. II 1-5 staff includes the instruction "arco".

bar 19 - strings

Musical score for flutes and clarinet in bar 35. It consists of three staves: Fl. 1, Fl. 2, and B. Cl. Each staff contains a melodic line with dynamic markings of *f*, *p*, *mp*, and *pp*. The Fl. 1 staff includes a fermata and a *p* marking. The Fl. 2 staff includes a *f* marking. The B. Cl. staff includes a *p* marking and a *pp* marking.

bar 35 - flutes and clarinet 1

Scalic gestures were built separately from the other structures. Scales were transposed to various pitches throughout the work.

A ten-note series was used for the majority of the work; the two remaining notes of the total chromatic were also employed to form gestures contrasting with those derived from the series. For example, in bar 8 to 11, flute 1 and clarinet perform continuant sound with the two notes (A# and G#); the others play sound of movements with the original form of the series.

Figure 96 bar 8 - 11

The musical score for bars 8-11 features the following instruments and parts:

- Fl. 1:** Continuant sound with notes A# and G#.
- Fl. 2:** Continuant sound with notes A# and G#.
- Ob.:** Continuant sound with notes A# and G#.
- E. Hn.:** Continuant sound with notes A# and G#.
- B♭ Cl.:** Continuant sound with notes A# and G#.
- B. Cl.:** Continuant sound with notes A# and G#.
- Bsn.:** Continuant sound with notes A# and G#.
- C. Bn.:** Continuant sound with notes A# and G#.
- Hn.:** Continuant sound with notes A# and G#.
- B♭ Tpt.:** Continuant sound with notes A# and G#.
- Mrb. (Perc. I):** Continuant sound with notes A# and G#.
- Vib. (Perc. II):** Continuant sound with notes A# and G#.
- Hp.:** Continuant sound with notes A# and G#.
- Pno.:** Continuant sound with notes A# and G#.

Ten-note series - original form

The original form of the ten-note series is shown on a single staff, consisting of the following notes: A, B, C, D, E, F, G, A#, B, C#.

Figure 97 Contrasting tone materials between sections

Section A

- i (intro): 10-note series - original
- ii : inversion & retrograde of the series / scales
- iii : original, inversion & retrograde of the series / scales
- iv : transposed series to Major second higher
- v : "
- vi : original series
- vii : "

Section B

- viii : two-notes (gong)
- ix : quoted harmony from section A

Section C

- x : original series
- xi : original series / transposed one to Perfect fifth higher & its retrograde
- xii : original series & its retrograde / transposed series to Major third lower / scales
- xiii : transposed series to Major third higher

Section D

- xiv : transposed series to Major third higher & its retrograde
- xv : original series / transposed series to Major second lower

Section E

- xvi : original series / transposed series to minor third lower
- xvii : "
- xviii (coda) : transposed series to Perfect fifth lower

Timbre

Sections are contrasted and divided by contrasting tone materials, rhythms and structures. Likewise, timbre has a function in delineating the formal sections. Contrasting timbres characterise the different sections of the work. For example, pizzicato and arco, sul ponticello are contrasted with ordinary arco, general piano with prepared piano, C trumpet (with water) with Bb trumpet, high notes with low notes, woodwind multiphonics with conventional playing techniques.

Contrasting sections are often bound together with linking phrases or passages. The 'links' are provided by way of structure, timbre or techniques of orchestration. In this way, I intended to create a fluidity of structure, binding together contrasting sections. For instance, in bar 68, trombone and gong are linked by their similar melodic contours, and in bar 93, gong and oboe are also joined by the same method. Between bar 48 to 49, suddenly, low strings halt and low woodwinds appear, but as both groups perform very similar rhythms, they are connected. Besides, similarity in timbre between both low instrumental groups helps its links: timbre in low strings (cellos and double basses) is smoothly linked to that of low woodwinds (bass clarinet, bassoon and bass bassoon).

Tao Te Ching by Lao Tzu

In this work, the gong frequently appears in simple and repeated structures, referring to images of mountains (See bar 68 to 78). Simply repeated passages of gong stand out in stark contrast to other more complex structures.

Similarly, many of my compositions are made up of simple structures in the middle of the works. This compositional idea is influenced by the Tao Te Ching by Lao Tzu.

“Thirty spokes share the wheel's hub;
 It is the centre hole that makes it useful.
 Shape clay into a vessel;
 It is the space within that makes it useful.
 Cut doors and windows for a room;
 It is the holes which make it useful.
 Therefore benefit comes from what is there;
 Usefulness from what is not there.²⁴⁾”

Orchestration

I referred to several classic texts on orchestration. In particular, Rimsky-Korsakov's book, written in the 19th Century, was utilized to set formulae of orchestration used in this composition. Here are a few of his formulas of orchestration that were applied to my work.

Figure 98 Formulae of balancing the volume

f - 1Tpt. = 1Trb. = 1Tb. = 2Hn.

p - 1Tpt. = 1Trb. = 1Tb. = 1Hn. : somewhat similar to each other

(*pp*) (*p*) : more practical volume

f - 1Hn. = 2Fl. = 2Ob. = 2Cl. = 2Bsn.

p - 1Hn. = 1Fl. = 1Ob. = 1Cl. = 1Bsn.

f - Vn.I = 2Fl. = 1Ob.+1Cl.

p - Vn.I = 1Fl.

²⁴⁾ Lao Tzu, Tao Te Ching, Chapter 11

I believe that knowledge of the orchestration of former periods is still valuable and applicable to orchestral music, as classical instruments and their organization have persisted without a very great degree of change.

Various extended instrumental techniques were also researched in my work.

Extended instrumental techniques

To seek and develop a characterful palette of sound, various contemporary instrumental techniques were employed in my work.

Several clarinet multiphonics were used²⁵⁾. Tongue-rams on the flute were employed to achieve a unique timbre and produce notes below the usual range of the instrument. These low notes respond to and interact with other percussive sounds from the orchestra.

Two types of trumpets are used in this work. One is the ordinary Bb trumpet and the other is a C trumpet filled with water which produces a bubbling sound. I learnt this particular technique in a workshop at the International Composers Pyramid held in France in 2011.

In the piano, blue-tack is placed on the strings of the instrument, producing various percussive sounds. In this way, high notes produce a sound similar to that of a wood block, low-medium notes resemble a marimba sound and low notes resemble a gong / tam-tam sound.

²⁵⁾ For which, I studied the book, *New Directions for Clarinet* written by Phillip Rehfeldt. (published by University of California Press) The book includes a variety of examples of multi-phonic sound, showing detailed difficulties to perform, timbre and intonation of keys. I considered to choose multi-phonic examples, which are easy to play.

CONCLUSION

In the course of my PhD studies, seven compositions were written. In each work, my aim was to explore different compositional techniques and aesthetics, with a view to extending my musical language. Various techniques and aesthetics were underpinned by research in numerous areas: the visual arts, literature, philosophy, science, architecture and contemporary music of the 20th and 21st Century. Along with these studies, I also worked on breaking some of my previous compositional habits in the submitted works. The habit of restricting certain musical elements originated, previous to my PhD studies, in the search for my own compositional style. However, it excessively narrowed the scope of my compositional approach and inhibited my research to extend my musical language. For this reason, I consider my PhD studies as a turning point in terms of breaking with earlier mannerisms and broadening my musical approach. I believe that composers should create work free of restrictions, and with unending transformation and relentless challenge in the pursuit of new music.

My PhD studies have been conducted to establish my original sound. In my opinion, my originality is my imagination looking for a thousand paths.

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Appendix 1 Original seven-tone scale and its transposed forms

in the first movement of *Tangram*

Seven-tone scale on C on B

Bar 71 (i) Bar 15 (iv) / 16 / 17

bar 13 to 14 bar 7 (ii)

on Bb

bar 66 (i) / 69 (i)
bar 22, retrogression

bar 68 (ii) D# omitted

on A

bar 65 bar 69 (iii)

bar 71 (ii) bar 66 (ii) 'C' omitted

on G#

bar 7 (i) bar 15 (i)

bar 63

bar 41 bar 69 (iii)

on G

bar 39 bar 43

on F#

bar 68 (i)

bar 47

bar 69 (ii)

on F

on E

bar 15 (ii)

bar 71 (iii)

on Eb

bar 15 (iii)

on D

bar 50

bar 53

on C#

bar 55

on C

bar 71 (iv)

In the second movement of *Tangram*

Seven-tone scale on C on B

Bar 86 / 90 / 93 / 94

on Bb

bar 108

on A

bar 107 / 114
bar 108 (ii)

on G#

on G

on F#

on F on E



In the third movement of *Tangram*

Seven-tone scale on C on B

bar 143 (ii) bar 135 (i) / 143 (i)

bar 216

bar 141 (ii) bar 137

on Bb

bar 228 bar 195

on A

bar 139 bar 141 (i)

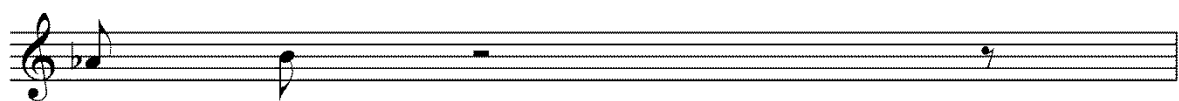
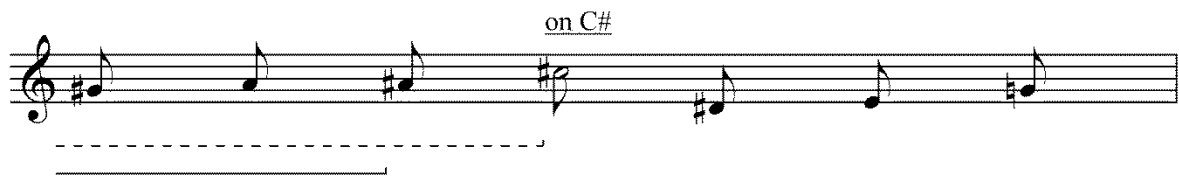
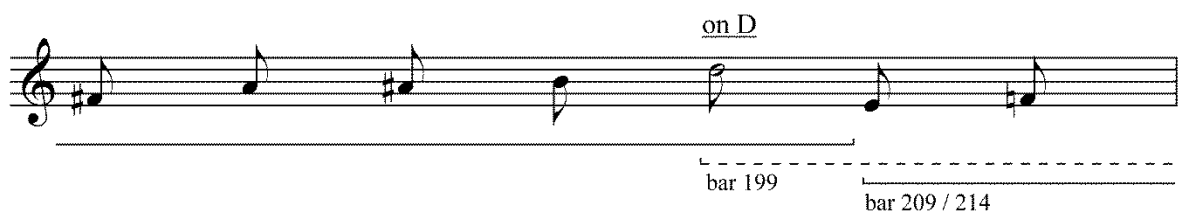
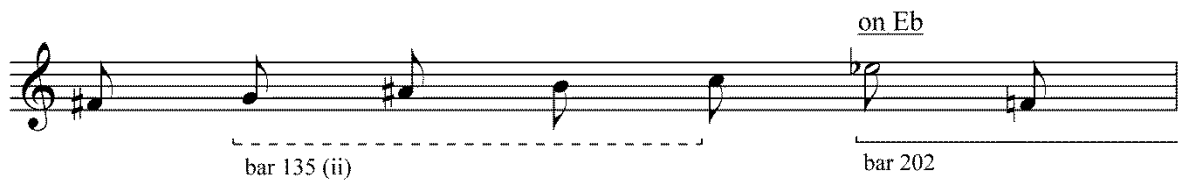
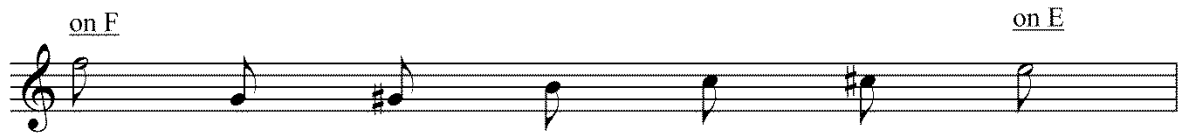
on G#

bar 218 (i) bar 195

on G

bar 144 (i) bar 218 (ii)

on F#



Appendix 2 *Sappho's Fragments no. 31*

Latin alphabet transliteration

phainetai moi kênos isos theoisin
emmen' ônêr ottis enantios toi
isdanei kai plâsion âdu phônei-
sâs upakouei

kai gelaisâs îmeroen to m' ê mân
kardiân en stêthesin eptoaisên.
ôs gar es s' idô brokhe' ôs me phônai-
s' oud' en et' eikei,

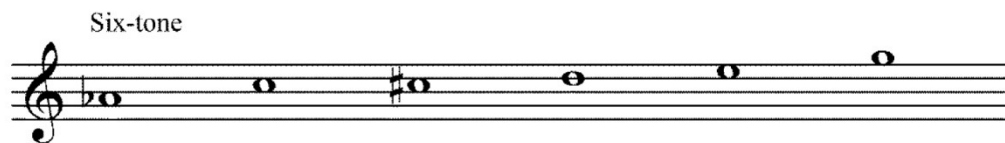
alla kam men glôssa eâge lepton
d' autika khrôi pur upadedromâken
oppatessi d' oud'en orêmm' epirrom-
beisi d' akouai,

kad de m' idrôs kakkheetai tromos de
paisan agrei khlôrotera de poiâs
emmi tethnâkên d' oligô 'pideuês
phainom' em' autâi.

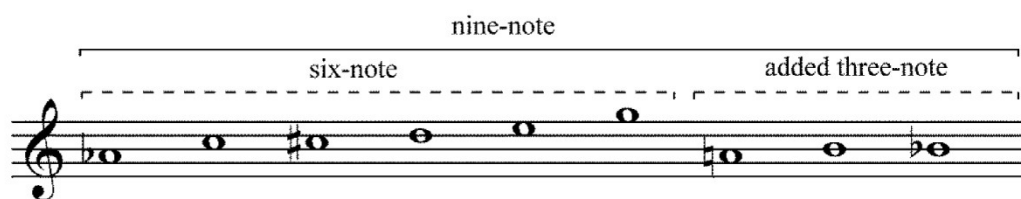
Alla pan tolmaton, epei [kai penêta] ...

Appendix 3 tone material in each section of *Sapphic Fragments*

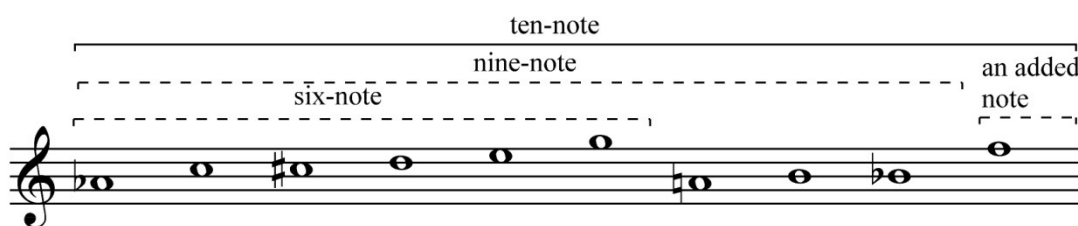
a₁



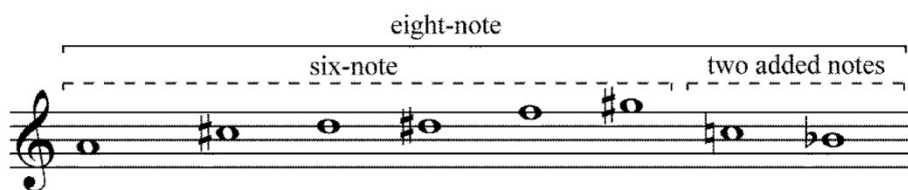
a₂



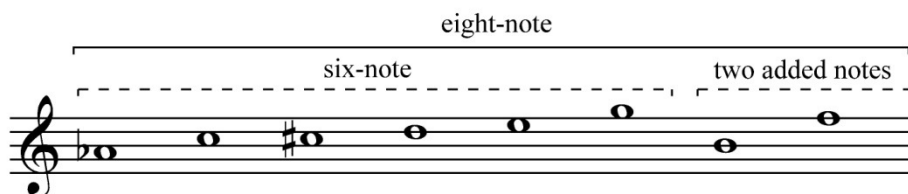
a₃ / a₄



b / c



d / e₁ / e₂



Appendix 4 Man-Nam for two pianos (partial)

Musical score for two pianos, Man-Nam (partial), measures 24-31. The score is written for two pianos, labeled 1 and 2. The key signature is one flat (B-flat major or D minor). The time signature is 4/4. The score is divided into three systems, each with two staves (treble and bass clef).

System 1 (Measures 24-25):

- Measure 24: Piano 1 (P1) has a melodic line starting with a half note G4, followed by a quarter note F4, and a quarter note E4. A slur covers the last two notes, with a '5' above it. Dynamics: *mf*. Piano 2 (P2) has a whole rest.
- Measure 25: P1 has a half note G4, followed by a quarter rest, and a quarter note G4. Dynamics: *mf*. P2 has a whole rest.

System 2 (Measures 26-27):

- Measure 26: P1 has a half note G4, followed by a quarter note F4, and a quarter note E4. A slur covers the last two notes, with a '6' above it. Dynamics: *f*. P2 has a half note G4, followed by a quarter note F4, and a quarter note E4. Dynamics: *mf*.
- Measure 27: P1 has a half note G4, followed by a quarter note F4, and a quarter note E4. A slur covers the last two notes, with a '6' above it. Dynamics: *f*. P2 has a half note G4, followed by a quarter note F4, and a quarter note E4. Dynamics: *mf*.

System 3 (Measures 28-29):

- Measure 28: P1 has a half note G4, followed by a quarter note F4, and a quarter note E4. A slur covers the last two notes, with a '3' above it. Dynamics: *f*. P2 has a half note G4, followed by a quarter note F4, and a quarter note E4. Dynamics: *f*.
- Measure 29: P1 has a half note G4, followed by a quarter note F4, and a quarter note E4. A slur covers the last two notes, with a '5' above it. Dynamics: *f*. P2 has a half note G4, followed by a quarter note F4, and a quarter note E4. Dynamics: *mf*.

System 4 (Measures 30-31):

- Measure 30: P1 has a half note G4, followed by a quarter note F4, and a quarter note E4. A slur covers the last two notes, with a '3' above it. Dynamics: *mf*. P2 has a half note G4, followed by a quarter note F4, and a quarter note E4. Dynamics: *mf*.
- Measure 31: P1 has a half note G4, followed by a quarter note F4, and a quarter note E4. A slur covers the last two notes, with a '3' above it. Dynamics: *mf*. P2 has a half note G4, followed by a quarter note F4, and a quarter note E4. Dynamics: *f*.

4

30

1

f 3 5 3 3

sfz 3

2

f 5 3

32

1

3 3 3

2

3 5 5

34

1

3 3 6 5 6

2

6 6 5 5

sfz