

The Concept of the Meta-Instrument and its Implementation in Pre-Composition

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I declare that the work submitted is my own, and does not contain any unacknowledged material from other sources.

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Abstract

This portfolio explores and defines the concept of the meta-instrument as a set of conceptual tools for pre-composition. Here pre-composition is examined and regarded as a complex set of activities; the instrumental metaphor serves to illuminate the kinship composition has with building and exploring a conceptual network of ideas and concerns which are then 'played'. The meta-instrument is therefore not seen as a direct sonic model with which to compose but as the result of a critical engagement with three distinct areas of activity before composition takes place. These are identified as: translation, Actor-Network Theory (ANT), and notation. The part of this research concerned with translation examines how ideas derived from linguistics, semiotics, and philosophy can be applied to practice-led research in a creative discipline. Concepts derived from ANT, such as relational materiality and network building, provide a means of examining how the results of translation perform when placed in a network of relationships. Notation, as a part of composition, is then seen here not only as the 'front-end' of these activities of translation and ANT but also as a means of exploring the potentialities and limits of the meta-instrument. Each of the works that make up the portfolio is therefore seen as a part of a continuous development of the meta-instrument, and is described within my methodology as a distinct 'research iteration'.

This portfolio consists of two main sections: a theoretical part followed by commentaries on the compositions that make up my portfolio. The scores themselves have been included in this portfolio and have been placed after the main thesis in the order of their appearance. Each commentary is seen as an attempt to retrace the processes during pre-composition and examine the consequences these thought processes had. Therefore this portfolio represents a documentation of how this approach to pre-composition was formed, outlines ways in which this approach can progress, and also reveals how I have approached the process of composition as research.

Table of Contents

<i>List of Figures</i>	6
<i>Acknowledgements</i>	9
<i>Introduction</i>	10

Part One: Theory

<i>Meta-Instrument</i>	14
<i>Translation</i>	19
<i>Actor Network Theory</i>	26
<i>Notation</i>	31

Part Two: Commentaries

<i>brumaires</i>	46
<i>Works for Piano Solo and Piano with Live Electronics</i>	56
<i>Work for Organ Solo and Organ with Live Electronics</i>	63
<i>foreign languages</i>	73
<i>solo speaking</i>	80
<i>Leiden Translations</i>	82
<i>Spagyria</i>	97
<i>Something Is Other Than It Is</i>	105
<i>Conclusion</i>	112
<i>Bibliography</i>	115

Portfolio of Scores

<i>brumaires</i>
<i>chordwork</i>
<i>inner and outer mind</i>
<i>contrejours</i>
<i>BlowUp</i>
<i>...rain of stars</i>

foreign languages

solo speaking

Leiden Translations

Spagyria

Something Is Other Than It Is

Additional Materials

CD-ROM of MaxMSP patches for:

Inner and Outer Mind

contrejours

...rain of stars

Leiden Translations

Data DVD of Video Recording of Leiden Translations: Film Version

Portfolio CD Of All Works Presented

List of Figures

Figure 1: Translation of recipe number 43 from <i>Leiden Translations</i> for contrabass	23
Figure 2: Simplified network used for <i>foreign languages</i>	29
Figure 3: Bar 166, <i>brumaires</i>	32
Figure 4: Bars 181—183, <i>brumaires</i>	33
Figure 5: Bar 191, <i>brumaires</i>	34
Figure 6: Bars 236—239, <i>brumaires</i>	35
Figure 7: Bars 174—175, <i>brumaires</i>	36
Figure 8: Example from <i>BlowUp</i> (5'55"—6'20"): release of notes in chords graphically notated	36
Figure 9: Page 3 of <i>inner and outer mind</i> (excerpt)	37
Figure 10: Page 3 of <i>inner and outer mind</i>	38
Figure 11: <i>contrejours</i> : Initial solution for notation	39
Figure 12: <i>contrejours</i> : system number 25	40
Figure 13: Table indicating tempos for tempo stave during initial part of <i>foreign languages</i>	41
Figure 14: Excerpt from <i>foreign languages</i>	42
Figure 15: Legend showing lengths of rest in <i>solo speaking</i>	43
Figure 16: Excerpt from score of <i>solo speaking</i>	43
Figure 17: Excerpt from <i>Leiden Translations</i> : Improvisation clef showing a progression from 2nd to 3rd degree	44
Figure 18: Excerpt from <i>Leiden Translations</i> : improvisation stave in combination with sigil drawing actions	45
Figure 19: On-stage set-up of <i>brumaires</i> showing both pianos flanked by both sets of skin percussion	47
Figure 20: Table showing stage-like accelerando progressing from MM72 to MM144 in eleven logarithmically calculated steps	47
Figure 21: Rhythmic organisation bars 1—35	48
Figure 22: Table shows eight divisions of complexity of pitch distribution	49
Figure 23: Table shows eight degrees of the brightness scale	51
Figure 24: Table of bars 158—188, <i>brumaires</i> , show the bar-by-bar changes of six tempi	52
Figure 25: Bars 158—160, <i>brumaires</i> : beginning of second movement	52

Figure 26: Bars 202—205, <i>brumaires</i> : example of the rapid action followed by resonant silence	53
Figure 27: Bars 209—213, <i>brumaires</i> : hocket patterns preceded and followed by resonant silences	54
Figure 28: Bar 236, <i>brumaires</i> : senza misura	55
Figure 29: Opening of <i>chordwork</i>	56
Figure 30: Technique ensuring ametric rhythm	57
Figure 31: Bars 77—79, <i>inner and outer mind</i>	59
Figure 32: All pitch material for <i>contrejours</i>	60
Figure 33: Diagram of electronics in <i>contrejours</i>	61
Figure 34: Table showing appearance and disappearance of chords in <i>BlowUp</i>	63
Figure 35: Chord categories used in <i>BlowUp</i>	64
Figure 36: All pitch material for <i>BlowUp</i>	64
Figure 37: Excerpt showing opening of <i>BlowUp</i>	65
Figure 38: Excerpt showing final chord of <i>BlowUp</i>	66
Figure 39: Screenshot showing MIRA interface operated on an iPad	68
Figure 40: Table showing seven transpositions operated via MIRA interface	69
Figure 41: Screenshot of plates 10—12 of <i>The Great Work Photographed</i> , by alchemist Roger Caro	70
Figure 42: Screenshot of plates 25—28 <i>The Great Work Photographed</i> , by alchemist Roger Caro	71
Figure 43: List of fragments with letter names assigned for <i>Spagyria</i>	74
Figure 44: List of directions of beater across surface for <i>foreign languages</i>	75
Figure 45: Table of weighted probability connecting hand directions, <i>foreign languages</i>	75
Figure 46: Pre-compositional sketch of opening music for hand-drum, <i>foreign languages</i>	76
Figure 47: Excerpt of <i>foreign languages</i> , later passage	76
Figure 48: Final page of <i>foreign languages</i>	78
Figure 49: Diagram showing basic functions of the MaxMSP patch for <i>foreign languages</i>	79
Figure 50: Excerpt of Fred Gettings' <i>Dictionary of Occult, Hermetic, and Alchemical Sigils</i>	84
Figure 51: Sigil formula derived from Leiden Papyrus X, recipe no. 44	85

Figure 52: All sixteen pitches used for contrabass part to compose <i>Leiden Translations</i>	87
Figure 53: Magic square of Jupiter	88
Figure 54: Sigil interpretation derived from recipe no. 5, Leiden Papyrus X	89
Figure 55: Pre-compositional sketch showing data derived from the sigils created from recipe no. 20	90
Figure 56: Image of the author being filmed writing sigil formulae	91
Figure 57: Photograph showing set-up of <i>Leiden Translations</i> installation	92
Figure 58: Table showing all possible pairings used for the film version of <i>Leiden Translations</i>	93
Figure 59: Table showing plan for film version of <i>Leiden Translations</i>	94
Figure 60: All twenty-four pitch sieves used for <i>Spagyria</i>	98
Figure 61: Diagram showing all materials labelled A—G, plus Chord Material	99
Figure 62: Markov tables used to order materials shown in Figure 62	100
Figure 63: First two pages of <i>Spagyria</i>	101
Figure 64: Table showing trajectory of main chord → complex resonance	103
Figure 65: Excerpt: first material of <i>Something Is Other Than It Is</i>	108
Figure 66: Excerpt: second material	108
Figure 67: Excerpt: third material	108
Figure 68: Excerpt: fourth material	108
Figure 69: Excerpt: fifth material	108
Figure 70: Table of the divisions of the four part form of <i>Something Is Other Than It Is</i>	109
Figure 71: Table of five materials. The first three materials are displayed as scales	110

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Introduction

The music that makes up this portfolio is the result of my practice-led research in the area of pre-composition, and theoretical reflection on the relationship of pre-composition with the eventual sounding result of the music. Pre-composition is understood here as a necessary and complex set of processes that prepare, accompany and are changed by actual composition. Each commentary traces these stages critically; every piece is considered as a sequence of practice-led research iterations, where every iteration informs and is influenced by its predecessor. The term 'research iteration' (from Roger Dean's and Hazel Smith's explanation of practice-led research¹) derives from my understanding of practice-led research and refers to all the procedures undertaken for a single work. Once a piece has been composed a further research iteration is undertaken with a following piece; this takes into consideration any new perspectives gained during previous iterations.

Almost all the works presented in this portfolio began by examining non-musical ideas and their application to my creative practice. Such ideas are transferred onto instrumental or technical practices. Focussing on pre-composition involves following the transferral processes from non-musical ideas (drawn from theoretical, historical, or philosophical texts) to the technical solutions directly relevant to musical composition. The various strands of research this yields are brought together to form what I term the meta-instrument, which is understood here as a conceptual means with which to compose.² Two main types, or extremes, of meta-instrument are identified. During the chapters that follow I examine three main activities that comprise and inform the meta-instrument: translation, Actor-Network Theory (ANT), and notation.³ Bearing in mind the instrumental metaphor the notion of the meta-instrument is further clarified, perhaps rather abstractly, when considered as an outside-time conceptual framework that can be played on repeatedly, allowing its subtleties to be 'discovered'. For instance, one can compose with a finite set of related spectromorphologies. Each sonic member of this set is employed to allow and encourage the perception of its belonging to a single and consummate 'acoustic body'. By

¹ R. Dean and H. Smith, eds., *Practice-led Research, Research-led Practice in the Creative Arts* (Edinburgh: Edinburgh University Press, 2011), E. Barrett and B. Bolt, eds., *Practice as Research: Approaches to Creative Arts Enquiry* (London: I.B. Tauris & Co Ltd, 2010)

² Chapter 1: Meta-Instrument, page 20

³ Chapter 2: Translation, page 25; Chapter 3: Actor-Network Theory, page 32; Chapter 4: Notation, page 37

imagining composition as the construction of an instrument, 'learning' and eventually 'playing' on such an instrument yields the music.

Translation is the activity of transferring and applying an idea into a workable compositional concept; this movement is applicable to both purely musical, or sonic ideas, and to extra-musical ideas. The chapter entitled "Translation" examines theoretical work by Hermann,⁴ Jacobsen,⁵ Derrida,⁶ Benjamin,⁷ Bartoloni,⁸ Agamben,⁹ and Bhabha,¹⁰ and concludes by identifying three main translation paradigms, examples of which are made from work in the portfolio. The chapter entitled Actor Network Theory presents a brief introduction to this theory. The description of this theory is drawn from John Law,¹¹ and Rose Capdevila and Stephen Brown.¹² ANT is described by John Law as a set of semiotic tools; the two main concepts employed from this set are network creation and relational materialism.¹³ This chapter gives examples from my work to demonstrate my understanding of these concepts, their application, and the relevance this theory has to the meta-instrument. The examples from my work in the chapter on notation illustrate how the

⁴ Thomas Hermann 'Sonification – A Definition' (2010) at *SONIFICATION.DE: Thomas Hermann's research on Sonification, Data Mining and Ambient Intelligence*, Accessed 10.06.2014, <http://sonification.de/son/definition>

⁵ Roman Jacobsen, "On Linguistic Aspects of Translation" in *The Translation Studies Reader*, ed. Lawrence Venuti (London: Routledge, 2004), 113–118

⁶ Jacques Derrida, "Roundtable on Translation" in *The Ear of the Other: Otobiography, Transference, Translation. Texts and Discussion With Jacques Derrida*, ed. Claude Levesque and Christie McDonald (New York: Schocken Books, 1988), 93–161

⁷ Walter Benjamin, 'The Task of the Translator', in *Illuminations*, trans. by Harry Zohn (New York: Schocken, 1969), 69–82

⁸ Paolo Bartoloni, "Translation Studies and Agamben's Theory of the Potential," *CLCWeb: Comparative Literature and Culture* Volume 5 Issue 1 (2003)

⁹ Giorgio Agamben, 'On Potentiality', in *Potentialities* (Routledge: London, 1994), 177–184

¹⁰ Homi Bhabha, 'How Newness Enters The World', in *The Location of Culture* (Routledge: London, 1994), 212–235

¹¹ John Law "Actor-Network Theory and Material Semiotics" version of 25th April, 2007, available at <http://www.heterogeneities.net/publications/Law2007ANTandMaterialSemiotics.pdf> accessed 13.09.2012

¹² Rose Capdevila and Steven D. Brown: *Perpetuum Mobile: Substance, Force, and the Sociology of Translation* in John Law and John Hassard (editors) 'Actor Network Theory and After' (Oxford: Blackwell1999)

¹³ Law, 2

meta-instrument and its component parts are channeled graphically. Notation is regarded as the 'front end' of the meta-instrument. A movement can be observed progressing from a musical or a non-musical idea, through processes of translation, network creation and relational materiality, all of which in turn inform decisions made about notation itself. These initial five chapters comprise the theoretical part of this portfolio.

In the commentaries the pieces are, with a few exceptions, presented chronologically; at the end of each commentary I have included a list of performances. The commentaries also document the experiences of constructing the specific meta-instruments for each piece. They present how each activity (translation, ANT, and notation) has contributed to each meta-instrument. Throughout these commentaries, this portfolio documents a transition of thinking which explains how my approach to translation has changed and, in turn, informed my practice. The translation chapter itself presents, in stages, both a description of all three main translation paradigms and an account of how this understanding developed during my work.

This is the reason why the longest piece for solo piano, *Spagyria*, is given its own commentary; it is not included in the commentary entitled 'Works for Piano and Piano and Electronics'. A change in my thinking, leading up to writing this piece, is characterised by the increasing employment and consideration of the second and third translation paradigms described towards the end of the Translation chapter. These two paradigms became important not only to assemble meta-instruments but as principles determining both form and detail and potentially character, instrumental functions, and notation.

Throughout the portfolio my work and understanding made a transition that was influenced heavily by my understanding and research on translation. My initial understanding was that translation compares two texts, an original and the text in the target language. The main discourse of translation addresses the fidelity with which a target text that reproduces an original in another language and the difficulties this involves. This conforms to the conventional paradigm of translation. The importance translation has for my creative work is the parallels this has with the movement where an initial musical/non-musical idea progresses towards a workable concept. Subsequent research revealed a perspective that foregrounds the dynamic space between two languages. The results of this latter research can be seen in: *foreign languages*, *Leiden Translations*, *Spagyria*, and *Something Is Other*

Than It Is. This quartet of works both represents the most significant change in this approach and indicates future directions for research.

Part One: Theory

Meta-Instrument

The concept of the meta-instrument was a starting point for this research and was one that I intended to thoroughly investigate throughout my creative practice. This chapter will examine the concept of *meta-instrument* as it applies to my own practice. My interest is in what way the initial stages of a composition can employ an instrumental metaphor as a compositional tool to determine the foundations for both the concept and details of a work. It is not my intention to present this as a finished method but as a set of possible points of departure. By outlining and exploring its two main definitions I present the meta-instrument as a useful construct that can inform pre-composition.

Helmut Lachenmann's statement '[t]o compose is to build an instrument'¹⁴ provides an instrumental metaphor derived from the context of his '*musique concrète instrumentale*' aesthetic. Lachenmann developed the instrumental metaphor from Pierre Schaeffer's work, who wrote that 'more than we know, musical ideas are prisoners of our "instruments"'¹⁵. Lachenmann's discourse examines the responsibility on the part of the composer to constantly seek new, meaningful and sounding relationships, and he offers ways in which this can be achieved. The imagined instrument is presented as a pliable and rich metaphor drawing a parallel between, on the one hand, the gamut of sounds yielded from a single resonant body subject to a peculiar acoustic design and, on the other hand, the resonance or aura obtained by a network of sounds, sonic structures, and other aesthetic choices housed within specifically composed contexts.

Lachenmann illustrates these points by proposing the idea of a whole music work consisting of a continuous striking or tapping action on an imagined instrument. Beginning at one extreme of the instrumental body and, while moving in one direction for the course of the piece, he explores and encounters the morphology of the sound and by implication, the shape and structure of this imagined instrument. While many of the resonances this causes are different from each other the perception is of their stemming from the same instrument or acoustic design. This imagined piece will have ended as soon as this

¹⁴ Helmut Lachenmann, 'Über das Komponieren', in *Musik als Existenzielle Erfahrung* (Wiesbaden: Breitkopf und Härtel, 1996), 77 "komponieren heisst ein Instrument bauen" (my translation)

¹⁵ Pierre Schaeffer, "'Traité des Objets Sonore'" quoted in Newton Armstrong, *An Enactive Approach to Digital Musical Instrument Design*, PhD Thesis, (Princeton University, 2006), 16

opposite end is reached. Later in the same essay Lachenmann writes that ‘to compose is to build an instrument and play on it’¹⁶. and explains this as follows:

This, however, relates specifically to a highly intensive exploration of time- and sound-articulation, so that not only the sound but also the relationships of movement eventually take on an important function of this imaginary ‘instrument’¹⁷

The notion of instrument yields a constellation of signifiers different to those of style. ‘Instrument’, as the governing metaphor, reveals that a sound or an idea derives from a single resonant body—resonant also in the potential field of sounding relationships. Lachenmann was mainly addressing the acoustic composer, though many of his ideas can be transferred to electroacoustic composition. Electroacoustic composition differs fundamentally from acoustic composition in encompassing the many uses of amplified sound either with or without a live performer, the sound being either pre-recorded or manipulated live.

Two Main Definitions of the Meta-Instrument

I would like to propose two main types, or poles, of meta-instrument, between which exists a continuous sliding scale.

Type One

The first type is composition in which the priority is to realise a concept, without room for difference, intervention, or variation. In this case a concept piece in which compositional intervention is avoided provides the model for the type one meta-instrument. The success of such works relies upon the intelligence and subtlety of its conception. Obvious examples of this are James Tenney’s *Koan: Having Never Written A Note For Percussion*, or Alvin Lucier’s *I Am Sitting In A Room*; works in which the brevity of their conception nevertheless determines all of the details of realisation. The artist Sol LeWitt describes the process of realising conceptually watertight art as one that forbids intervention, commentary, or ornament: ‘[t]he artist's will is secondary to the process he initiates from idea to completion’¹⁸ and ‘[o]nce the idea of the piece is established in the artist's mind and

¹⁶ Lachenmann, 79 “komponieren heisst: ein Instrument bauen und darauf spielen” (my translation)

¹⁷ Ibid., “Indessen geht es gerade um eine so intensive Durchdringung von Zeitartikulation und Klangartikulation, daß eben nicht bloß der Klang-, sondern ebenso der Bewegungszusammenhang eine Funktion dieses imaginären ‘Instruments’ ist” (my translation)

¹⁸ Sol LeWitt ‘Sentences on Conceptual Art’, 0-9 (New York: 1969) and *Art Language* (London: 1969), at ALTX Online Network <http://www.altx.com/vizarts/conceptual.html> (25.05.2014)

the final form is decided, the process is carried out blindly.¹⁹ Here the process of realising a concise concept in as pure a form as possible takes precedence over all other factors. The formation of the idea is therefore the artist's responsibility; in the presence of a great concept there is almost no such thing as a 'bad' realisation since, for LeWitt, '[i]t is difficult to bungle a good idea,'²⁰ and similarly "[b]anal ideas cannot be rescued by beautiful execution."²¹

Type Two

The second type of meta-instrument involves creating networks of materials from the initial concept in which their contradictory, or interruptive nature is encouraged. Here, material and structure are recombined and redefined constantly to establish a discursive context. Ferneyhough writes: '[o]ne is constantly in dialogue with one's means[...]'²²; 'means' relates to one's current array of generative musical structures, and construction the interaction between them which is dynamic and self-critical. The main difference between both types of meta-instrument construction is that for the first type 'structure' is a noun, for type two, a verb. It is necessary to clarify these two definitions as connected poles on opposite ends of a scale to establish which model of composition one wishes to either aim at or avoid. In addition it is also possible to move between poles within the same composition. The meta-instrument is essentially a metaphor to help establish and define creative boundaries or resistances necessary for working. However, operating solely within these two extremes might prove limiting; to develop the idea further I have identified three further parts of the meta-instrument that work in combination with each other. These further interlocking building blocks are Translation, Network, and Notation, and they can be seen to either follow on from each other in this order, or inform each other laterally.

Translation

Translation in creative practice refers to how information and meaning in one form is transferred semiotically into another form, the path(s) this takes, and the way this transferal of meaning causes difference between the original and target 'languages'. Translation is included as part of the meta-instrument construct because of my interest in

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid.

²² Lois Fitch, *Brian Ferneyhough* (Bristol: Intellect, 2013), 352.

tracing and examining how and why one set of techniques, pitches, durations, or other dimensions, are chosen over others. To *translate* is to also betray (hence the saying *traductore, traditore*²³): a new set of translated meanings can change the message so drastically and so complexly that fidelity to the original language becomes questionable and equally complex.

Network

The network, understood as a structural tool, refers to how relationships are created between materials. The creation of a network is derived from analytical techniques used by Actor-Network Theorists such as John Law and Rose Capdevila. My reading relates their concept of relational materialism to Lachenmann's idea of uncovering a potentially infinite range of categories—or 'trajectories'—from a single musical material. By forming a network an act of translation takes place in which elements are connected to reveal how they communicate with each other; such elements are mapped onto a network which is a spatial metaphor. Composition is always the composition of relationships; one method of unearthing relationships useful for creating a musical work consists of assembling connections between 'materials'. For Actor Network Theorists everything can be seen as a material, be it a physical object, a social arrangement, a belief, an opinion or a series of pitches. There is no distinction made as to whether a material is human or not: the main task is to examine how, if at all, such materials act, or perform, once placed within a network, and how the performances of these materials affect and influence each other. If a material once placed in a network is found to not make any difference it is discarded. Relational materialism is one of the main semiotic tools Actor Network Theory offers. For composition these stages entail uncovering the often hidden heterogeneity behind seemingly concise and 'innocent' objects such as a cymbal, an accepted notation, or a performance indication.

Notation

Ideally, the notation a composer uses is both the result and expression of all preceding layers: meta-instrument, translation and network. In order to avoid disconnection between pre-composition and the final result, the work undertaken during pre-composition has to align and communicate with the notation used for the piece. A few simple rules for notation might be considered. Cardew writes that 'Rules' and 'Notation' are inextricably

²³ John Law, *Actor Network Theory and After* (Oxford: Blackwell, 1999), 1

intermingled, and it is misleading to separate them. There never was a notation without rules: these describe the relationship between the notation and what is notated.²⁴

In this portfolio my contention is that the many layers one encounters while listening to complex²⁵ music²⁶ can be accessed by integrating translation and relational materiality to pre-compositional practice. Ideally I envisage a clear relations that progress from the vision of the composer, through both these layers onward to the point of notation. Not only is a musical concept seen here as ‘instrumental’, but also with regard to its being informed by translation, relational materiality, and notation.

Each commentary presents the conceptual sequence: idea—meta-instrument—translation—material—notation both as network and context. Notation is both determined by and the graphic expression of these preceding stages. For instance the appearance of digital media in my work caused me to alter my notation. Works involving digital media, such as *foreign languages* and *contrejours*, employ radically different notational strategies from *brumaires*, or *Spagyria*.

The conceptual sequence mentioned above is directed towards fixing the boundaries for a work, with a view to heightening the particular specificity, expressive possibilities, and intended character of the musical work. It follows that each meta-instrument has the potential to be aura- and expression-specific, as to its choice of materials, presentation, set of rules, and boundaries. The aim is to avoid arbitrary decisions or false and uninformed spontaneity and to attain stylistic integrity and focus.

²⁴ Cornelius Cardew, ‘Notation - Interpretation, etc’, in *Cornelius Cardew 1936—1981: A Reader*, ed. by Edwin Prévost (Essex: Copula, 2006), 18

²⁵ This does necessarily not refer to ‘New Complexity’ but to musical work in which the perception of a complex musical experience is apparent

²⁶ My term ‘layeredness’ is discussed briefly on page 114

Translation

This chapter considers what place translation theory has for the conception of the meta-instrument. The main iterative research network I outline in this thesis is: meta-instrument—translation—actor-network theory—notation. The importance of translation for pre-composition refers to the transferral of an idea, a text, or a musical vision onto the meta-instrument. Busoni uses the word transcription to describe the immediate notation of musical ideas as and when a composer thinks them.²⁷ Although he describes some technical obstacles facing a composer, the complexity of the concept of translation is preferred for the potential insights into the creative process. My theoretical understanding is derived from Thomas Herman, Roman Jacobsen, Jacques Derrida, Walter Benjamin, Paolo Bartoloni, and Homi Bhabha. Apart from Herman's writing on sonification, although these theories pertain to literature, and interrogate the problems surrounding linguistic translation, they are useful in elucidating the processes of pre-composition. Conventional translation theory frames its discourse in terms of the opposition between source and target language. More recently an examination of the space between both languages, or indeed both cultures, has offered perspectives which are highly critical of the conventional view. In this portfolio both concepts have been transferred on to an interdisciplinary process ranging from the construction of a non-verbal target language derived from a source text to an examination of the interstitial space, or zone of translation. I shall begin with a brief outline of the most salient theoretical points regarding translation. I shall then give examples from my own work concluding with critical comments as to how these ideas can be further developed.

This short theoretical survey of my understanding of translation begins with sonification. One of the most direct and practical means of translating a text, or natural or physical phenomena, is sonification, which Thomas Hermann defines succinctly as:

the data-dependent generation of sound, if the transformation is systematic, objective and reproducible, so that it can be used as scientific method.²⁸

Hermann describes sonification in purely algorithmic terms. Sonification extracts data either from sound, or from any other continuously active phenomenon. This data is then

²⁷ Ferruccio Busoni "A New Esthetic of Music", in *Three Classics in the Aesthetic of Music*, (New York: Dover Publications, 1989), 85

²⁸ Hermann, 2010

mapped onto sonic media separate from the original source. In order to isolate precise aspects of the chosen phenomenon the preferred practice avoids creative intervention. By avoiding creative changes to the result one would be in a position to trace the sounding results back to the original data. For me this area of research places emphasis on the character a 'target' sonification has in relation to the original it has been mapped on to. The algorithmic nature of sonification (for example: a process runs its course, and can be repeated exactly) stresses the proximity both origin and target have. As a paradigm sonification conforms to a conventional perspective of translation that views the target language as subservient to the original. I will examine how the concept of translation has been interrogated to reveal more complex usages and understanding.

The Russian structural linguist, Roman Jakobson, distinguishes three types of translation:

1. Intralingual translation or *rewording* is an interpretation of verbal signs by means of other signs of the same language,
2. Interlingual translation or *translation proper* is an interpretation of verbal signs by means of some other language,
3. Inter-semiotic translation or *transmutation* is an interpretation of verbal signs by means of nonverbal sign systems.²⁹

From this list, the third most clearly describes interdisciplinary translation. In addition to the word 'translation' Jacobsen describes the creation of a work of art (as derived from a piece of verbal text) as a transmutation via interpretation. As a result non-verbal art forms (music, dance, cinema, painting) must attach themselves to concepts within an original text and replace them with a system of signs.

In his discussion of Jacobsen, Derrida points to the presence of many voices, or linguistic systems in a single language.³⁰ Derrida uses the term 'pluri-vocalities'—a term normally used to discuss narrative in literature.

[T]here are, in one linguistic system, perhaps several languages or tongues. There is impurity in every language. This fact would in some way have to threaten every linguistic system's integrity, which is presumed by each of Jacobsen's concepts [...]if the unity of the linguistic system is not a sure thing, all of this conceptualisation around translation[...]is threatened.³¹

²⁹ Jakobson, 114

³⁰ Derrida, 100

³¹ Derrida, 100

Given the impure character of any language, spoken or otherwise, Derrida describes the complex process of interdisciplinary translation as involving a ‘semiotic of de-centered transformations’³² rather than a simple process of one-dimensionally re-encoding any given text. For Derrida, writing is considered as a ‘constantly transformed and transformative activity.’³³ My understanding of the phrase: de-centered semiotics, relates to the translator’s understanding and usage of the source language itself. If, for Derrida, language contains impurities, or foreign elements, they have the potential to create dynamic and liminal spaces of meaning. This situation is a given for any translator regarding their working grasp and apprehension of both source and target languages.

Derrida traces the origins of this linguistic plurivocality in the biblical story of the Tower of Babel, regarded by Derrida as the first translation. Derrida derives his compound term, *disscheminisation*, to describe the reason for the unbridgeable gaps between two languages in more differentiated terms. Read in the original ancient Hebrew, the word *Shem*, the name of the tribe that decided to erect the tower, ‘already means “name”: Shem equals name’.³⁴ The intention of the Shem people is to build a monument to make a name for themselves and to further establish universal power via the singularity of their language. This is divinely punished and in Derrida’s narrative, God condemns mankind to a baffling multiplicity of languages which confounds their speech, alienates the people, and scatters mankind from the tower. The word *Babel* itself becomes untranslatable as it can be taken both as a noun and as a proper name; this lack of clarity allows it to both be understood as, and signify, confusion. Disschemination is applied to explain how the distances and differences arise between an original text and its translation. Derrida explains four possible meanings of this word:

1. As being against the Shem (de-Shemitising) as a proper name—against the act of ‘naming’ itself
2. Dissemination
3. De-schematisation: against making plans
4. De-routing, or diverting from a path: *chemin* (French) means road or path.³⁵

³² Derrida, 96

³³ Ibid., 98

³⁴ Ibid.

³⁵ Ibid., 103

Walter Benjamin posits that a translation not only represents an extension of the life of a text but also facilitates renewal and maturation of both languages as a direct consequence:

Translation is so far removed from being the sterile equation of two dead languages that of all literary forms it is the one charged with the special mission of watching over the maturing process of the original language and the birth pangs of its own.³⁶

This reciprocal change to original and target languages suggests that the space dividing both languages is itself potentially transformative. This space, otherwise known as “the interstitial zone of translation”,³⁷ has been discussed and developed by theorists like Paolo Bartoloni and Homi Bhabha both of whom are critical of the conventional (and for Bhabha, as a post-colonial thinker, imperialist) conception of translation. To allow this interstitial zone of translation to emerge the necessity of a goal oriented movement progressing from one state to another would need eradicating. Once the teleology inherent in translation is removed then the idea of something becoming something different, of erasing itself continuously in order to arrive at a fixed target, is bypassed. This revised concept of movement peculiar to the interstitial zone of translation is ‘predicated upon a movement that does not go anywhere outside but that keeps on moving within the inherently dynamic borders of the interstices.’³⁸ As a process of bringing two cultures together the interstitial zone is a moment of cultural hybridity predicated upon a dynamic of becoming. Bartoloni includes Homi Bhabha’s concept of the ‘Third Space’³⁹ into this discussion which Bhabha defines as the interstitial space and time of cultural hybridisation.

Translation is the performative nature of cultural communication.[...]The ‘time’ of translation consists of that *movement* of meaning, the principle and practice of communication that in the words of de Man “puts the original in motion to decanonise it, giving it the movement of fragmentation, a wandering of errancy, a kind of permanent exile”⁴⁰

I will now present three translation paradigms and give examples of where these are to be found in this portfolio.

³⁶ Benjamin, 73

³⁷ Bartoloni, 5

³⁸ Ibid., 4

³⁹ Bhabha, 38

⁴⁰ Ibid., 228

Original and Target Languages

*BlowUp*⁴¹ for solo organ is an example of a process where the execution of an algorithm designed to expand the durations of a diminishing set of chords became the content and form of the whole piece. Here there is very little intervention; the piece proceeds by combining increasing durations with a chordal sequence and a set of attack and release patterns.

Of all the pieces presented in this portfolio *Leiden Translations* could possibly be described as a sonification. Data was derived from the shapes of the alchemical sigils and was fed into a complex algorithm. This algorithm reinterpreted the data to determine playing technique, pitch, dynamic, degree of improvisation, and density of notes for the contrabass part. Once I had decided on a 60" duration for each miniature the results of the algorithm were placed within a 3x3 grid which acted as the score (Figure 1).⁴²

The image shows a handwritten musical score for a contrabass piece titled "No. 43 Testing of Gold". The score is organized into a 3x3 grid. The top row contains a single system of music with dynamic markings such as *f*, *pp*, *ff*, and *pp*. The middle row contains two systems of music; the second system includes markings for *arco sp* and *open string ad lib*. The bottom row contains a single long system of music with dynamic markings including *ppp*, *mf*, *ff*, *sfz*, and *pppp*. The grid layout is designed to resemble a magic square.

Figure 1: translation of recipe number 43 from *Leiden Translations* for contrabass. The score shows the 3X3 grid layout resembling a magic square.

⁴¹ Discussed on page 63

⁴² Described on page 82

Further decisions were made as to how this minute-long duration should be shaped, if there should be rests, held notes, and generally how the action should be placed in time. This second set of decisions related to the structure were creative interventions and had little to do with data collection and parametric mapping.

Interstitial Space

My work for organ and live electronics, “...*rain of stars*”⁴³, presents an organ part made up entirely of quoted material and an electronics part comprised of long, and spectrally rich sound-files. The duo situation represents the changing relationships between images of an alchemical process in combination with their captions. The intention is to create ambiguity between which part is commenting on what. I envisaged this piece as highlighting how the space between both parts becomes foregrounded as well as how it may alter each part. My understanding of both Derrida’s de-centring semiotic and the interstitial zone is at the heart of *foreign languages*.⁴⁴ In two parts the piece presents two different performance paradigms. Essentially my understanding is each both paradigm presents a differently encoded musical and performative languages. The music for hand-drums is organised using rhythmically cellular combinations and recombinations. The second part for amplified cymbal and live electronics dispenses with the combinatorial rhythmic language and instead presents an interactive feedback model of performance while the percussionist performs from a graphic score.

For the work for bass clarinet *Something Is Other Than It Is*,⁴⁵ I created five related interstitial spaces, or categories. The meta-instrument arranges these five categories into a range of different scales. Every point on each scale represents a movement towards either pole of each scale.

Cultural Hybridity

Both installation and the film version of *Leiden Translations* present the enactment of three different languages, one of which is musical. The hybridity reveals itself in how a set of modern languages (framed writing as a visual language for itself, British Sign Language, a visual language and presentation rooted historically in structural film, my own musical

⁴³ Discussed on page 66

⁴⁴ Discussed on page 73

⁴⁵ Discussed on page 105

language) are used to translate and as a close reading of the Ancient Greek alchemical text.

With *Spagyria*⁴⁶ for solo piano the hybridity is located in presenting multiple interpretations of the same text derived from my knowledge of the alchemic/spagyric method as described by Paracelsus,⁴⁷ Manfred Junius,⁴⁸ and Rubaphilos Salfluëre.⁴⁹ Here the 'foreign' culture is the hermetic culture of alchemy itself.

⁴⁶ Discussed on page 97

⁴⁷ Philippus Aureolus Theophrastus Bombastus von Hohenheim (alias Paracelsus), *Das Buch Paragranum* (Berlin: Edition Holzinger, 2013)

⁴⁸ Manfred M. Junius *The Practical Handbook of Plant Alchemy* (Inner Traditions Bear and Company: Rochester, Vermont, 1993)

⁴⁹ Rubaphilos Salfluëre *The Hermes Paradigm, Book One: First Principles* (Salamander and Sons: Muang, Chiang Mai, Thailand, 2009)

Actor Network Theory

This chapter outlines how I have employed theories taken from Actor Network Theory, (ANT) and how these theories have been integrated with the meta-instrument concept. According to one of the main founders, John Law, ANT is less a theory and more ‘a disparate family of material-semiotic tools’;⁵⁰ another founder, Bruno Latour, argues that ANT is multi-disciplinary by definition. In a typical ANT analysis, social phenomena are interpreted as a heterogenous network, where the nodes and the relational points of connection can be either human or non-human agents. In this sense creating a network is an act of translation, for a network reveals the structure (as well as the politics) of objects. When discussing translation ANT theorists invoke the aphorism ‘*traduttore, traditore*’ (translator, traitor). A translation is more understandable and idiomatically correct, one must obey rules specific to the target language which are different to those of the original language.

The two main concepts are relational materiality and performativity. ANT analyses customarily treat both human and non-human elements as equal. Law writes that every thing, object, and person does not exist independently but is supported by an invisible, complex, heterogenous and patterned assemblage of media, boundaries, rules, technology, concerns, habits, behaviours, buildings, and social structures.⁵¹ All of these elements are active, or perform to different degrees. The most important elements are chosen to function as nodes in a related network. A network is a means of translating social phenomena; ‘performativity’ refers to the degree to which these nodes contribute. From this perspective Capdevila and Brown write that ‘networks are assemblages of forces’⁵².

Where a network exists communication is involved. The simplest network can be imagined between two conversant people connected over a distance via a telephone cable. Instead of this simple bi-nodal network relational nodes can be connected to both human and non-human materials. As previously mentioned ANT does not differentiate between human or non-human materials and for ANT all phenomena are regarded as material, whether it be a

⁵⁰ Law (1992), 2

⁵¹ Ibid., 13

⁵² Rose Capdevila and Steven D. Brown, 38

musical idea or an object. For my practice-led research ANT is useful because it addresses material relationship. Law insists that ‘the performative character of relations’⁵³ may uncover how these relationships ‘act’. Regardless of how this appears ANT theorists argue that networks, however invisible, exist behind every object; ‘the cause of every event, object and person is[...]generated by a network of heterogenous, interacting materials.’⁵⁴

Lachenmann describes the gradual process of uncovering relationships in musical material.⁵⁵ Arguing, perhaps somewhat abstractly, that while composing discrete events (or what, for Stockhausen, might be called Moments) every sound, sound object, transformation, connection, or movement chosen, while maintaining their complexity, can be represented as a single point through which a potentially infinite number of lines (either representing parameters, complex and infinite lines of tendency, or “lines of force”⁵⁶) can be drawn. He writes, “[t]o compose means: to recognise the trajectories passing through the points that lie upon them from which their primal sense and perceivable qualities are derived.”⁵⁷ Once such lines have been abstracted, further points (continuing to represent musical events or moments) can be imagined as resting along such lines. The advantage of this is that any given starting point can be categorised in an infinite number of ways which, in turn, illuminate older and newer relationships. The different trajectories and vectors upon which further points are plotted, imagined, and written out, delineate the purely musical network of the piece at hand but must be capable of passing through a chosen starting point. Lachenmann writes that the search for trajectories and, in consequence, the reshaping of initial musical material is the primary activity of the composer. Interrogating the conditions that yield musical material becomes a substantial and lengthy part of the pre-compositional process. Despite this, it offers a method of reassessing learned working patterns. Relational materialism provides an important set of considerations if one is concerned with instrument and language building.

⁵³ John Law, (1999), 7

⁵⁴ Law, (1992), 383

⁵⁵ Lachenmann, 73—82

⁵⁶ Brian Ferneyhough, “Form - Figure - Style: an Intermediate Assessment,” *Perspective of New Music*, Vol. 31, No. 1 (Winter, 1993), 32—40, <http://www.jstor.org/stable/833034>

⁵⁷ Lachenmann, 76 “Komponieren heißt: von welchem Punkt auch immer die Geraden erkennen, auf denen er liegt, vonden er seine Vorab-Bedeutung und Wahrnehmungsqualität hat.” (my translation)

Something Is Other Than It Is has already been mentioned in the previous chapter but also provides an initial example. A network of materials was constructed as a set of trajectories that pass through and are related to the technique and idea of the flutter tongue.⁵⁸ A more comprehensive example can be taken from *foreign languages* for solo percussion that consists solely of two hand-drums and an amplified cymbal. The interest in creating a potentially rich network of relationships while choosing instruments that stand in opposition to each other was the main aspect of the meta-instrument for this piece. My starting point was to make a network of the cymbal. My initial result included categories, or nodes, such as: noise/harmonics, speed of decay, characters of sound (i.e. its saturation, or ‘splashiness’), beater (hard/soft), character of attack and of sound, position of beater on cymbal, filter effects (using vessels, and via electronics), spoken language, relation to Stockhausen’s *Mikrophonie*.

With this cymbal network I focussed on the character of the cymbal sound itself. Even though the nodes here—representing categories, descriptions, and connections between each node—could be attached in any way, I became interested in using cups or other vessels as resonators similar to those used on the tam-tam in Stockhausen’s *Mikrophonie I* (1964-65) as a method of imitating speech sounds, or to create wah-wah effects similar to vowel sounds⁵⁹. The performative relations intended between the materials of the instruments are revealed in the nature of the musical material as well as the two situations the performer finds themselves in. Due to their dimensions, the way their sound is propagated, and their main mode of playing, both instruments ‘speak’ in idiomatically different ways. The interest in the difference and divergence of their material ‘languages’, and what these languages end up looking like, provides a continuous relationship between them.

The problems were that this initial cymbal network resembles more a mind-map of ideas and relationships than an analytical network as intended by ANT thinkers. More importantly: since each of those nodes can be attached to each other in any way desired, a heterogenous and complicated mind-map is less useful as a meta-instrument than a

⁵⁸ These material trajectories are illustrated in page 110

⁵⁹ “By resonator is meant a hollow container (a glass, mug, plastic flower pot, etc.) which one moves over the vibrating tam-tam surface—very close to it[...].in this way the timbre of the sound[...]is changed continuously from bright to dark (like the colouring of vowels [**iu**]” Karlheinz Stockhausen *Mikrophonie I: General Introduction* (London: Universal Edition Ltd., 1964), 14

more concise model. The model presented in Figure 2 is far simpler and general and can be applied to both the amplified cymbal and the hand-drums. Here each category serves as placeholders for the more detailed categories listed previously. Material refers directly to both the physical materials of the cymbal and hand-drums, as well as the different musical ideas for both. 'Language' stands for both the act of speaking as well language building. 'Media' refers to how the instrument is played (hard and soft beaters, or with hand, fingers, nails) and to how the sound is propagated (acoustic, amplified, or via manual or computer filtering).

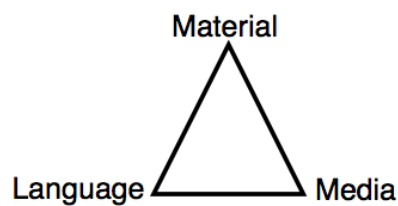


Figure 2: Simplified network used for *foreign languages*.

I will be discussing this line of thinking in the work commentaries, and especially how ANT has been engaged with in *brumaires*, *contrejours*, *foreign languages*, and *Leiden Translations*. These four pieces show how relational materialism is applied. Building a meta-instrument can be compared to creating a language, a vernacular with which a composer can become fluent. Umberto Eco writes of the birth of a language as a 'human event, a *branch system*, in which several factors have intervened to produce a state of order and to establish precise connections'⁶⁰. Eco's statement describes the meta-instrument paradigm as I am presenting it here. To conclude, the use of ANT offers the potential to deepen the activity of composition as the composition of relationship and not just as an act of translation. A relationship can be described using the communicative metaphor of a network. Performative relationships are derived from observations on how these elements, once networked, communicate and talk to each other. I consider the parts of the meta-instrument, translation and ANT, as mutually influential and beneficial. Musical material and structures can be derived from the ideas and paradigms set out in the translation chapter and these can be networked to uncover their relationships. Similarly network(s) of materials can be placed within interstitial spaces offered by translation, and thereby increase the potentiality for a work. So far in the discussion of the construction of the meta-instrument emphasis has been placed upon the pre-compositional aspects

⁶⁰ Umberto Eco *The Open Work*, trans. by Anna Cancogni (Cambridge, Massachusetts: Harvard University Press, 1989), 50

relating to material and its relationality. The area of research I want to focus on is how the structural approach described until now influences, is changed, or is resisted by notation. To what extent does a chosen notation—seen here as the final station in the composition process—force one to rethink the layers and combinations of material relationship, translation, and meta-instrument one may have been previously occupied with? Is it possible for a meta-instrument to be determined by notation from the very start and bypass everything else?

Notation

This chapter examines the notational issues arising from my work. Notational decisions vary widely in the pieces of my portfolio. I shall concentrate on the pieces whose notation provides examples that differ from standard classical notation, these being *BlowUp*, *Leiden Translations*, *foreign languages*, *solo speaking*, *contrejours*, the second movement of *brumaires*, and passages in *inner and outer mind*. Notation, for my purposes, can be divided up into either ‘action-notation’ or ‘real notation’; the mixture of action and intended sound (or ‘real’) notation in my scores (as opposed to solely action, real, or graphic notation) outlines the actions the performer has to execute with indications of the intended sound(s). My notation is informed by a synthesis of experiences gained from my own learned written practice, from experimentation with instruments, electronics (where applicable), and with other performers in rehearsal. However, in developing a language drawn from relating materials, playing techniques and performance situations can be questioned.

brumaires

As a way of creating a relativisation of temporal direction in the second movement of *brumaires*⁶¹ I created a set of situations that present an interrogation of temporal structure as a process throughout this movement. By the phrase ‘relativisation of temporal direction’ my intention is primarily to negate the *accelerando* heard in the first movement. Secondly, establishing a structure characterised by a constant switching of speeds creates the perception of there being no main tempo to refer to, similar to the way pitch is relativised in atonal music. Figures 3, 4, 5, and 6 reveal some of the notations used. At the beginning of the movement there are several styles of notation in operation. Figure 3 shows the notation of local level *accellerandi*, and *ritardandi* in the instrumental parts.

⁶¹ See page 46

The image shows a handwritten musical score for Figure 3, consisting of five systems of staves. The first system is marked with a tempo of $\text{♩} = 108$ and a 4/4 time signature. It features a grand staff with a piano (p) part and a vocal line. The piano part has a dynamic marking of *mp* and a slur over a series of notes. The vocal line has a dynamic marking of *ppp* and a slur over a series of notes. The second system continues the piano and vocal parts, with dynamics of *ppp* and *mp*. The third system shows a more complex piano part with multiple voices and a dynamic marking of *ppp*. The fourth system is marked 'better:' and shows a piano part with a dynamic marking of *mp*. The fifth system shows a piano part with a dynamic marking of *mp* and a slur over a series of notes.

Figure 3: *brumaires* (bar 166)

Figure 4 presents a mixture of real and action notation: pitches are played at any time within a narrow time bracket, represented as a box. The performer decides when these pitches are played. Here the 6/4 bar is divided unequally: a box is drawn for each division, and within each box the instruments are given either two or three pitches. These pitches have to be played within the positions these boxes start and finish; since there are no durations notated the players are free to play these pitches at any point without overstepping where each box starts and ends.

Handwritten musical score for 'brumaires' (bars 181-183). The score is divided into four systems. The first system (bars 181-183) has a tempo marking of quarter note = 96. The second system (bars 184-186) has a tempo marking of quarter note = 84. The score includes piano, violin, and cello parts with various dynamics (ppp, pp, mf, f, ff) and performance instructions like 'edge', 'l.v.', 'Tutu-Tutu', and 'ching'. There are also handwritten annotations like '8va', '15ve', and '15'.

Figure 4: *brumaires* (bars 181 – 183)

Figure 5 is an extract from later in the second movement: the instruments play at different speeds, achieved through conventional notation with a small addition to the tempo marking indicated to the right of each tuplet.

Figure 5: *brumaires* (bar 191)

The final stage of this process presents a hocket, involving the full quartet, played as fast as possible (Figure 6). There is no metre (*senza misura*); each hocket pattern is represented by equally spaced semi-quavers. The crossed-through semi-quaver beam is placed above the whole system; every semi-quaver written is played by one of the four instruments. The repeat structure is written out so that every repeat-bar iteration—of which there are five in the example shown—begins at (potentially) different points. The intention is to represent the ensemble as a single instrument playing: an enactment of the ensemble as meta-instrument. I classify this as action notation as the passage gives no indication of exactly how fast it should be played, neither is there an ‘ideal tempo’ for the ensemble to work towards. All these factors would have to be discovered and refined by the ensemble during rehearsal and over time.

Figure 6: *brumaires* (bars 236—239)

BlowUp

The notation of *BlowUp* presents an example of ‘real’ notation, where time = space. The performer is presented with the ideal image of the sound, and must employ strategies to realise this accurately. The pitches are presented as a note-heads; thick horizontal lines proceed immediately to the left indicating the beginnings and endings of the pitches in relation to time and the other notes. Time is represented in seconds above the organ staff. Since the whole piece charts a single, exponential, slowing down of a set of chordal iterations, more space is allocated to shorter degrees of time at the beginning than at the end. In comparison to the second movement of *brumaires* where, in bars 174 and 175 (Figure 7), the rhythm of the notes on their release has been notated (to produce notated *rallentandi*). The notation employed for *BlowUp* indicates such temporal relationships graphically without recourse to the possible clutter of conventional notation. In *BlowUp* the performer understands quickly how the rhythmic gesture operates (Figure 8).

Handwritten musical score for Figure 7, showing four staves with notes, rests, and dynamic markings. The score includes a tempo marking of quarter note = 60, a 'Rit' (ritardando) instruction with an arrow pointing to a final tempo of quarter note = 90, and various dynamic markings like ppp, mp, and fff. There are also handwritten annotations such as 'on bell' and 'Hang Jara Gongs eb&gb on stand right of table.'

Figure 7: Example from *brumaires* (bars 174–175): release of notes in chords, duration of each note is precisely measured

Handwritten musical score for Figure 8, showing two staves with notes and rests. Above the staves, time points are marked in minutes and seconds: 6:00, 6:05, 6:10, 6:15, and 6:20. The notes are connected by horizontal lines, indicating their duration over time.

Figure 8: Example from *BlowUp* (5'55"–6'20"): release of notes in chords graphically notated

I am not advocating that time = space notation supplants conventional notation. However, with these two examples, my experience was the opposite of what was expected: the notation in *brumaires* was easier to realise as the performers coordinated their part by following the conductor. With *BlowUp* the task of understanding which notes to release—especially those notated on ledger lines—became challenging and contributed to slowing down the learning process. The performer Lauren Redhead said that in order to perform this piece correctly large passages of the piece have to be committed to memory. During those passages the notation mostly functioned to provide brief reminders during performance of what the next set of chord shapes will be.

inner and outer mind

In contrast to *contrejours*, or *BlowUp*, and similarly to *brumaires*, there are several different notational strategies present in *inner and outer mind*. The open form notation in page 5 of the score (bars 12–32) presents a set of ‘navigational’ rules for the pianist to follow rather like those found in Boulez’s *Third Piano Sonata* (1955–57) or Stockhausen’s *Klavierstück XI* (1957). On this page the music is laid out in three columns of four bars (Figure 10). A single reading comprises selecting and playing three bars in total: a bar is selected from each column and performed in the given order left to right. The whole page is read seven times before the performer progresses to page 6. The first bar of this page is uppermost in the far left-hand column. Once played the performer chooses any of the four bars in the column immediately to the right. Just above and to the right of every bar are numerical instructions indicating the number of times that bar can appear and on which readings. Figure 9 presents an example taken from the middle column:



Figure 9: Example from *inner and outer mind* (from page 5). The numerical instructions indicate that the fragment be played either twice or less than twice and that, if played at all, it can only be played between the 3rd and 7th readings, inclusively.

Although this notation may imply that this process happens live, in practice the performer prepared their route choosing which bars should be played on every reading. I found myself very interested both in the decisions made and in the collaborative process this notation offers.

Bars: 12-32:

Figure 10: *inner and outer mind* (page 5)

contrejours

In this piece the pianist executes stopped harmonics throughout either singularly or in groups of two or three. Although these sounds are spectrally rich, the notation shows the performer the fundamental and the main target harmonic only; there is no indication as to which partial number the target harmonic should be. What is indicated (placed either above or below the accidental marking) is the difference in cents to the tempered pitch. The situation aimed for in this piece for the performer is both immersive and interactive. There is little rhythmic detail notated, the pitches merely have to be executed within the time brackets of each bar length.

The sounds in the electronics are indicated as singular pitches in a shorthand form; these indicate the main pitches which the pianist may or may not hear⁶². Aside from the pitch-based aspects a more obvious point about the notation for *contrejours* is the absence of rhythmic detail. Before deciding on the final notation I experimented with different kinds of notation; one solution led me to write out precise rhythms. In practice this notation proved to be flawed due to the relationship between the physical demands of stopped harmonics, the time needed in preparing them, and in the care needed on the part of the pianist to allow them to sound properly. A later solution presents a ‘map’ (Figure 11) where the pianist chooses which path of harmonics to play. After they have played either the first or second bar (indicated by the circled numbers) they follow an arrow leading them to a following bar. The process repeats itself and the pianist is free to choose other routes or repeat the same route.

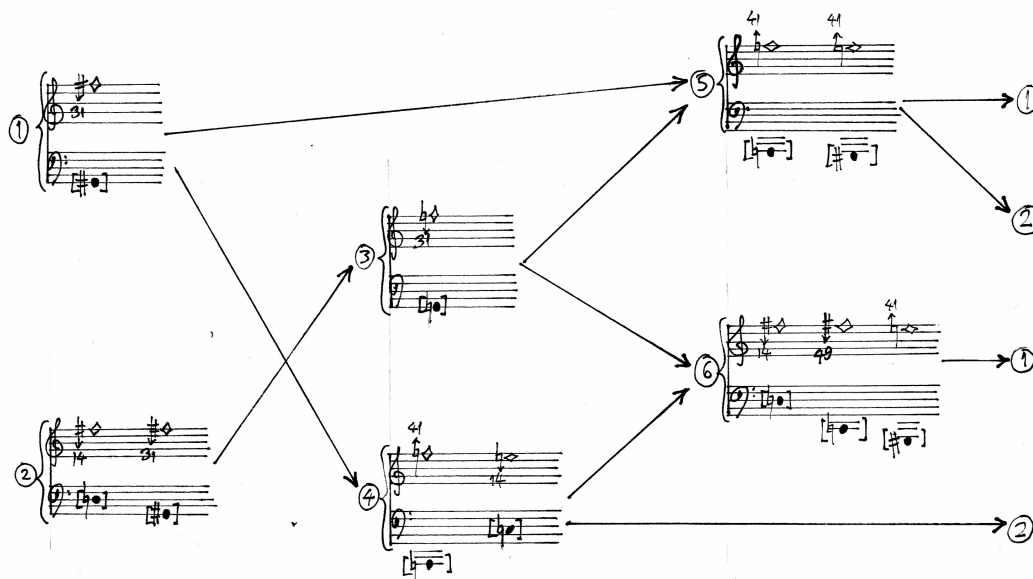


Figure 11: *contrejours*: Initial solution for notation

This notation allows the pianist to learn the harmonics quickly, which path(s) to take from the notation, and—in the absence of any rhythmic indication— how rapid they should be. This arrangement helps the performer listen and respond from within the piano and electronics mix.

⁶² This is explained in the chapter entitled ‘Work for Piano Solo and Piano and Live Electronics’, the section devoted to *contrejours* is on page 56.

This non-obtrusive notation certainly has merits, as the focus is on local level decision making and listening. I made many such 'maps' choosing arrays of different stopped harmonics and recorded these with the electronics. This was because the notation takes into account the practical difficulties involved thus allowing for any sonic and expressive discoveries while interacting with the electronics. My only reservations were that this notation could not include the electronics without cluttering and, importantly, the amount of space each map requires. A more standard notation where all necessary information is compacted inside the bar may have less to do with performer agency and responsibility than a notation that invites a player to find pathways. Despite the initial success of the map-score method my final decision was for a more standard looking notation (Figure 12). Letting go of this map notation limited the types of interactivity for the pianist already explained, however the notation I decided on allowed the concentration on the playing technique to be heightened and placed a greater focus on listening.

The image shows a musical score for two instruments: Electronics and Piano. The Electronics part is written on a single staff with a treble clef. It consists of three measures, each with a duration in seconds indicated above the staff: 3.5'', 5'', and 4''. The notes are grouped as quavers with stems pointing to the right. The Piano part is written on a grand staff (treble and bass clefs). It consists of three measures corresponding to the Electronics part. The notes are grouped as quavers with stems pointing to the right. Fingerings are indicated above the notes: 31, 41, 31, 14, 31. The notes are grouped as quavers with stems pointing to the right.

Figure 12: *contrejours*: system number 25

In the final score each bar is given a length in seconds, and has between one and three pitches to play which are placed next to each other allowing the pianist to decide on their rhythm. Bar lengths are indicated in seconds and pitches are grouped together as a group of quavers. This grouping indicates phrasing, the position of the group indicates roughly where the notes appear in the bar (the *implication* being a space = time notation). Crochets are separated from the quaver groups to indicate that the pitches are considered separate from each other. Essentially, and despite the implication of a time = space notation, the pianist is free to decide where the notes are played within each time-bracket according to how he or she responds to the electronics.

foreign languages

In the opening two-drum passage of *foreign languages* for solo percussion there are three staves: the two lower staves represent both hand-drums and the uppermost staff represents tempo. The extra tempo staff contains the standard five lines to indicate individual steps on a tempo scale (Figure 13)

Position on Tempo Clef	Tempo
Ledger line above staff	90
Fifth line	80
Fourth line	71
Third line	64
Second line	57
First line	51
Ledger line below staff	45

Figure 13: Tempos indicated on tempo staff for initial part of *foreign languages*

Tempo is represented by a thick black line to represent rapid or gradual change (Figure 14), and this is notated either gradually or in steps. For the hand-drum, notation for both upward and downward stems represent left and right hands respectively. The most prominent absence in this notation is of dynamics. I wanted a score where the percussionist chose their own dynamics derived from their own intimacy with the score. The rhythm was composed of combined and recombined rhythmic cells: the task for the percussionist is to choose different dynamics whenever the same combination of rhythmic cells returns. The similarity here is that they must not be allowed to ‘tell the same joke’ twice.

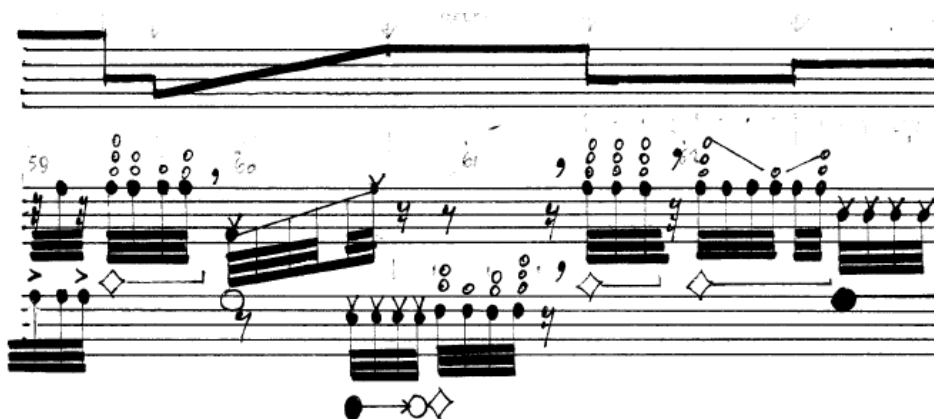


Figure 14: excerpt from *foreign languages*

This practice is a response to Cornelius Cardew's observations of scores that allow the performer responsibility for the dynamics:

“Dynamics are free” does not mean that there are to be no dynamics, or one constant dynamic, but invites the player to ask himself ‘what dynamic(s) for this sound?’, thus bringing him into the situation of having to take care of the sound, putting it in his charge, making him responsible.⁶³

The approach to the notation in this piece also derives from Christopher Fox's idea that by “enriching or impoverishing” some of the levels of the notation potentiates the interpreter's engagement allowing access to “[...]the heart of the music”.⁶⁴ Given this situation, a performer becomes challenged into making decisions that fill in the gaps in order to interpret a work.

solo speaking

The notation of the whole score is written as text (Figure 15) with four different lengths of pause that should be determined by the performer as part of the theatre of performance:

⁶³ Cardew, 18

⁶⁴ Christopher Fox, 'Opening Offer Or Contractual Obligation? On The Prescriptive Function Of Notation In Music Today', *Tempo*, Volume 68, no. 269, (Cambridge: Cambridge University Press, July 2014), 9

Notation	Duration
,	shortest
;	mid-short
:	mid-long
.	longest

Figure 15: legend showing lengths of rest in *solo speaking*

```

un; frame fl, tu
fter: and, be frame, as;
frozen, un: fro, zen:
frame facto; ry back;
ground fluss, a:fter
now fro: zen frame,
framed backgr; round, as aft-:
-er and before in: ferred.

```

Figure 16: *solo speaking*: excerpt

The fact that each line is considered as a phrase, combined with the use of rests as described above, means that words and lines can be interrupted midway (Figure 16). This creates a challenge for the performer who has to perform these phrases as if uninterrupted. The same is true of the words and produces a kind of ‘freezing’ effect in performance. The performance indications explain how the narrative surrounding the central half-word ‘fluctu’ should be used by the performer to determine the tempo of speaking without recourse to rubato, as conventionally understood.

Leiden Translations

The contrabass parts for *Leiden Translations* are visually laid out like a 3X3 magic square; the contrabassist reads the score starting from the top left square, reading from left-to-right, and ending with the bottom rightmost square. Since each miniature lasts one minute, each row lasts twenty seconds. The bass part was written for improviser Adam Linson. Bearing this in mind I was interested in the opportunity to create a practical notation that included an improvisatory element and to explore the possibility to varying degrees. One part of the translation algorithm derives a degree—from one to four—of improvisation

required, notated on the upper stave (Figure 17). The performer reads the bass part in relation to the degree of improvisation indicated. There are only four degrees possible:

1. No improvisation: no alteration of the music in the bass part.
2. Some improvisation: the bass part can be altered (by adding ornamentation, rhythmic changes, gestural changes) but the changes must not depart from the original so as to make it unrecognisable.
3. More improvisation: Make greater changes, some of the original must be audible but the bassist can be far freer in their interpretation.
4. Improvisation: regardless whether this indication is placed above a written out passage or not the bassist is free to either disregard the written out part or not and interpret freely.

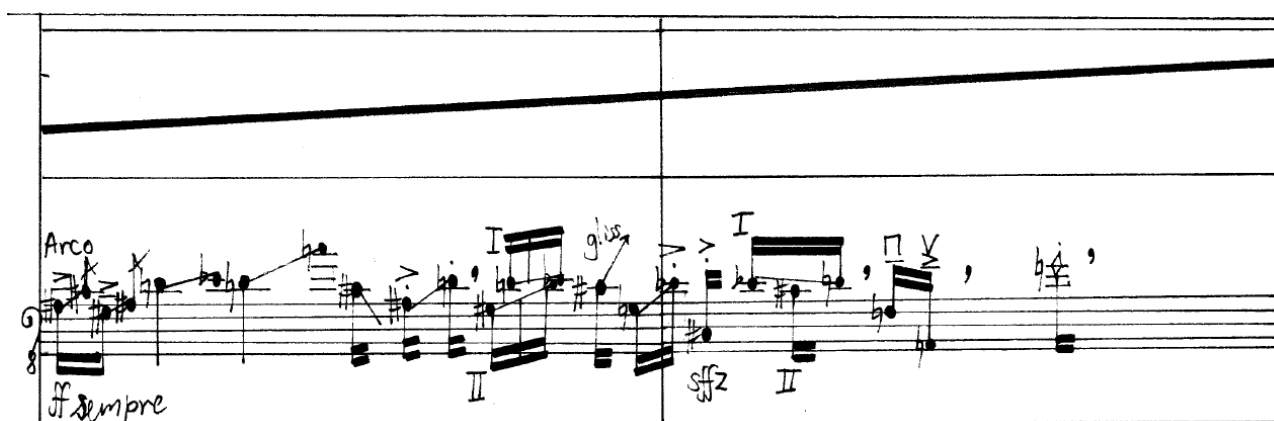


Figure 17: *Leiden Translations*: Improvisation clef showing a progression from 2nd to 3rd degree during the above passage.

There is also a differentiation between playing styles: the translation algorithm determines whether the bassist plays either a composed out passage, similar to the one shown in Figure 17, or it decides that the bassist draw the sigil directly. Figure 18 shows a combination of notations, the lower system representing bow actions. The vertical line on the furthest right indicates how high/low the bow should be placed in relation to the fingerboard. The roman numerals indicate the string; the circle with the cross placed in the centre (at the beginning of the passage) indicates that the left-hand dampen the strings, the dotted line extending from this sign shows the simultaneous movement of the left-hand. A contradiction arises from the way space and time are represented. In the improvisation stave space corresponds to time: time progresses proportionally from left to right. In the lower stave the bassist has to read actions that represent the direction of the bow played as if drawing the alchemical sigils with the bow. For example, moving upwards, downwards, to the right but also to the left. Hence the performer has to understand that

two 'reading styles' co-exist in this notation. The notation for this piece represents the clearest example of action notation in this portfolio; the difficulties I envisaged for the performer regarding the difference of reading styles proved unfounded in realisation.

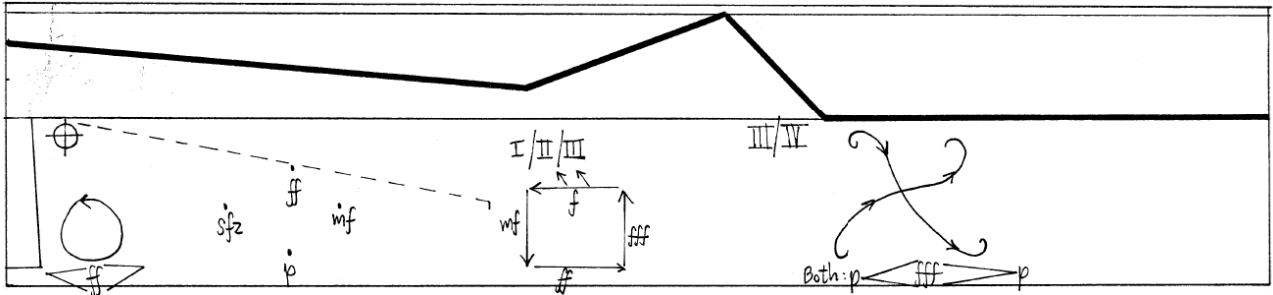


Figure 18: *Leiden Translations*: improvisation stave in combination with sigil drawing actions

Part Two: Commentaries

brumaires

brumaires was completed in February 2010 and is a piece in two movements scored for two pianos and two percussionists. I intended to create a two-part form, each part standing in a critical relationship to the other. The first movement is governed by an architectural, teleologic form; I envisaged performative tensions between the many different formulations of time and the overriding and continuous *accelerandi* progressing throughout the movement (this represents directionality, or the “arrow-of-time”). The second movement is a shorter, interactive, and discontinuous piece, the form of which focuses more on moment-to-moment micro-dramaturgy.⁶⁵

The ensemble is considered as an extended piano or meta-piano. This concerns how the percussion and pianos relate to each other and how the ensemble becomes ‘reconstructed’ during both movements. In *brumaires*, the two different families of percussion are metals and skins. The metals are positioned on and around a table directly behind both pianos and include tuned, non-specifically tuned, and noisy instruments. The skins are placed to the left and right of both pianos; each percussionist has their own set (Figure 19). The assemblage of the percussion ‘rebuilds’ the piano duet in several ways. Due to the fact that no two pianos that are exactly alike, and that no two performers can ever perform exactly the same way, both percussion set-ups include some of the same instruments as well as some similar instruments. This is demonstrated by the skin instruments: player one has three timbales and player two has three octobans. A further reason for the inclusion of the two skin groups was their general imitation of a taut surface stretched across a resonating chamber, rather like the mass of strings across the inside of a piano, struck by ‘mallets’ or beaters. The metal instruments also offer a scale between pitch and noise.

⁶⁵ Micro-dramaturgy, as a compositional tool, describes how short-scale moments, lasting between three and eight seconds, are formed in terms of cause and effect. Moment by moment changes occurring at this level happen either because of or in spite of something directly previous. Situations can be set up where a given pattern may be interrupted giving rise either to an altered or a different pattern via one or several points of climax. As a composer one can create sequences of these short-scale moments that teleologically plot a path moving from one situation, or texture, to another, for example making a transition from a texture of points of sound to a texture of lines. If such a path resembles an excited fever curve, then a higher and detailed level of dramaturgy has taken place, if such a path merely resembles a straight, horizontal line then perhaps the dramaturgy can be said to be subservient to other musical concerns.

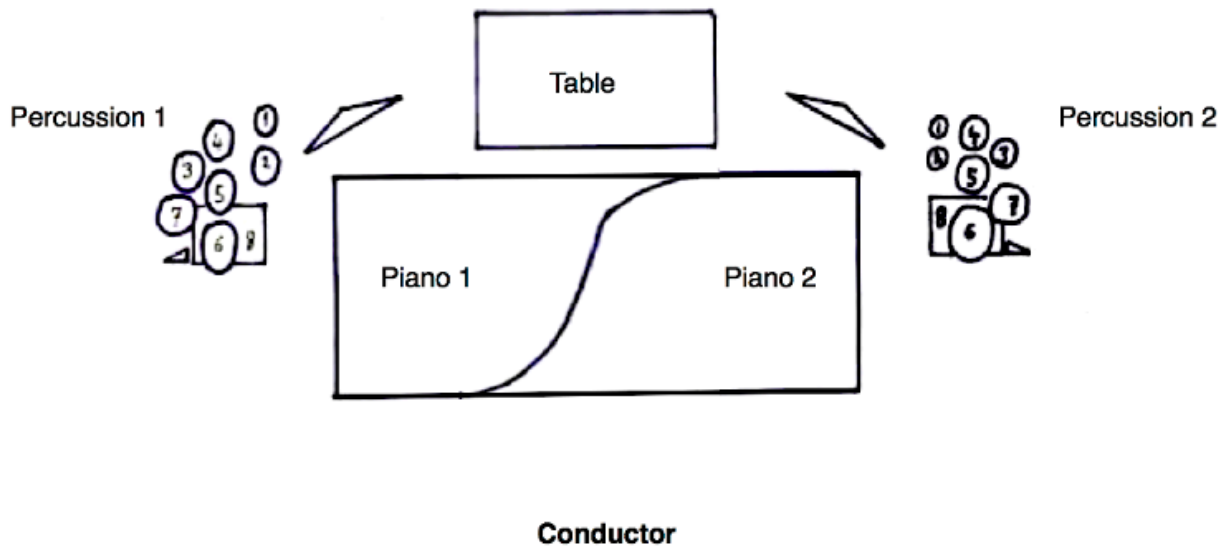


Figure 19: on-stage set-up of *brumaires* showing both pianos flanked by both sets of skin percussion; on the table are placed the array of metal instruments shared by both percussionists

The title *brumaires* refers to Karl Marx's historical text *18th Brumaire of Louis Bonaparte*⁶⁶; the word 'Brumaire' itself referred to the second month of the original French Republican Calendar and is named after the French word *brume*, meaning 'fog' which occurs frequently in France around mid-November.

First Movement

The first movement has a clear, stage-like teleology regarding musical time and timbre. It consists of one singular accelerando arranged in eleven logarithmically calculated steps (Figure 20) from $\text{crochet}=72$ to $\text{crochet}=144$. By the end the tempo returns back to the original.

Bar	1	8 (2nd time)	21	33	54	68	81	96	110	140	144
Tempo	72	76	81	86	96	102	108	114	120	136	144

Figure 20: stage-like accelerando progressing from MM72 to MM144 in eleven logarithmically calculated steps

The rhythm was composed according to a basic understanding of Markovian technique to determine rhythmic structure (Figure 21).

⁶⁶ Karl Marx, 'The Eighteenth Brumaire of Louis Bonaparte', *Marxists Internet Archive*, 1852 <https://www.marxists.org/archive/marx/works/1852/18th-brumaire/> (3.09.2014)

Bars 1—8

bars 1-4: first number = semiquaver, second number = rest duration.

	1+2	1+3	1+4	1+5
1+2	0.5	0.5	0.5	0
1+3	0	0.5	0	0.5
1+4	0.5	0	0	0.5
1+5	0	0	0.5	0

Bars 5—9

Each successive crochet becomes divided into either 3, 4 or 5 beats:

3-4-5-4-5-3-5-3-4-5-4-3-4-3-etc

	1	1+1	1+2	1+3
1	0.33	0.33	0.33	0
1+1	0.5	0	0	0.5
1+2	0	0	0.5	0.5
1+3	1.0	0	0	0

Bars 10+11

Repeat bar (played 3 times in total). Each crochet divided into 4, 5 or 6 beats:

4-5-6-5-6-5-4-etc

	1+1	1+2	1+3	1+4	1+5
1+1	0.33	0	0.33	0.33	0
1+2	0	0	0.5	0	0
1+3	0.33	0.33	0	0	0.33
1+4	0.5	0	0.5	0	0
1+5	0	0	0.5	0.5	0

Bars 23-26:

	3+1	5+1	6+1
3+1	0.5	0	0.5
5+1	0	0.5	0.5
*6+1	0.5	0.5	0

*after second appearance, proceed to 5+3 on next table

Bars 26.2 -28.2

	3+4	5+3	6+1
3+4	0.5	0	0.5
5+3	0.5	0.5	0
*6+1	0	0	0

*on first appearance, proceed to 7+1 on next table

Bars 28.2 - 32

	3+2	4+3	6+2	7+1
3+2	0	0	0.5	0.5
4+3	0.5	0	0	0.5
*6+2	0	0	0	0
7+1	0.33	0.33	0	0.33

*on first appearance of 6+2, proceed to 8+1 on next table

Bars 33 - 35

	5+2	7+2	8+1
5+2	0.5	0	0.5
*7+2	0	0	0
8+1	0.5	0.5	0

*after first appearance proceed, etc

Figure 21: rhythmic organisation bars 1—35. 1+1 = one played note, lasting a semiquaver, followed by one semiquaver rest. In the case of 5+2 (bottom left); this refers to five semiquavers followed by 2 semiquavers (or one quaver) rest.

The pitch material is built from 20 cells consisting of either two or three intervals, which are never larger than an augmented fourth. The small cluster-like chords this produces form short-lived ‘clouds’ of sound when played in unison.

Second Movement

This avoids the formal teleology of the first movement in favour of an arrangement of material combining three parameters: complexity of pitch distribution, harmonicicity, and brightness. Since each parameter has an eight-degree division the meta-instrument in this movement can be described as an 8 X 8 X 8 three-dimensional space. The identity of the material is determined by the coordinates—taken from the meta-instrument—I chose to connect. Pre-composition, then, consisted of ‘scripting’ these connections against a sequence of durations, all of which received their own tempo.

Complexity of pitch distribution: The complexity of pitch distribution relates to the articulation of notes played before and after a central chord. In Figure 22 x = number of staggered notes before chord, y = number of notes in chord (played in unison), z = number of staggered notes after the unison chord.





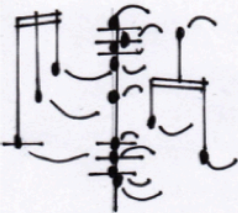

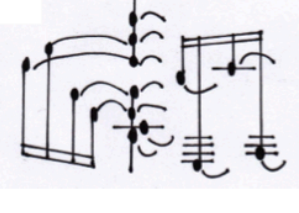

<p>1. Almost imperceptible attack, 4 soft beaters, (for metals: play on middle, or nipple, of instrument)</p> 	<p>2. Half of all notes present have different dynamic</p> 	<p>3. All pitches are assigned a different dynamic</p> 	<p>4. Staggered entries before chord written as grace notes, where more notes are performed as a chord than not</p> 
<p>5. $x + y < z$ (3 different dynamics)</p> 	<p>6. $x + y = z$ (4 different dynamics)</p> 	<p>7. $x + y > z$ (5 – 7 different dynamics)</p> 	<p>8. consists of $\{ x, y \}$ only, hence $z = 0$</p> 

Figure 22: table shows eight divisions of complexity of pitch distribution parameter as graphic notation. Boxes 2 and 3 are also a unison chord, the only differences being in the dynamics

Harmonicity as used here derives from the Pythagorean concept of consonance: the more consonant the simpler the ratio of both frequencies.⁶⁷ The consequence of applying this idea to the meta-instrument at work in *brumaires* was that clearly pitched percussion instruments are to be found at the beginning of the scale, and clearly inharmonic percussion instruments appear amongst the higher degrees. The scale has eight main degrees, some with sub degrees, as follows:

1. Same, or unison, pitch for piano and percussion, no skin instruments, pitched percussion only
2. Octaves. All pitch classes are the same as each other, pitched metals only
3.
 - a) One third (or an approximate fraction) of all notes $(x+y+z)$ = same notes,
 - b) one third = octaves and perfect fifths,
 - c) one third = different notes.Percussion = pitched metals and one brake drum
4.
 - a) One sixth (or approximate) = same note,
 - b) one sixth = octave above bass note,
 - c) one sixth = octave+fifth above bass note,
 - d) one sixth = octave+seventh (minor or major) above bass note,
 - e) one third = notes not related in the same way within this degree.Percussion = pitched metals and all three brake drums
5. Chords consist of six intervals
 - a) one sixth = one octave above bass note
 - b) one sixth = octave+fifth above bass note
 - c) one sixth = octave+seventh above bass note
 - d) one half = non related notesPercussion = metals
6. Chords consist of eight intervals
 - a) one fifth = octave+fifth above bass note
 - b) one fifth = octave+seventh above bass note
 - c) three fifths = non related notesPercussion = pitched metals and skins
7. Chords consist of 10 intervals, notes can result from all-interval chords, few pitch repetitions are allowed.

⁶⁷ Trevor Wishart, 'The Nature Of Sonic Space, in *On Sonic Art*, ed. by Simon Emmerson (Edinburgh: Harwood, 1996), 71—74

Percussion = all untuned metals and skin instruments

8. All-interval chords, all different pitches where possible, clusters can tend towards bass register, cluster regions occur in different ranges on each piano

Percussion = cymbals, ching, tam-tam, skin instruments

Scale of Brightness: this determines both the choice of beater and kind of articulation for both piano and percussion, as shown in Figure 23.

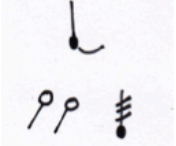
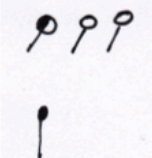
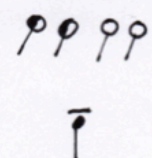
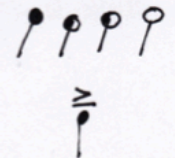


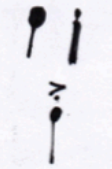

<p>1. Almost imperceptible attack, 4 soft beaters, (for metals: play on middle, or nipple, of instrument)</p> 	<p>2. Neutral attack, 2 soft + 1 mid-hard marimba beater (play next to middle)</p> 	<p>3. Tenuto, 2 soft marimba beater, 2 mid-hard beaters (play between edge and middle)</p> 	<p>4. Tenuto accent, 1 hard beater (hard plastic), 2 mid-hard marimba beaters, 1 soft beater (play between edge and middle)</p> 
<p>5. Accented attack, 2 hard beaters, 2 mid-hard beaters (play near edge)</p> 	<p>6. Staccato, Snare-drum stick, 2 hard beaters, 1 mid-hard beater (play near edge)</p> 	<p>7. Accented staccato, drum sticks and hard beaters (play at edge of instrument)</p> 	<p>8. Accented, marcato, staccato. Hard beaters and drum sticks (play at edge of instrument)</p> 

Figure 23: shows the eight degrees of the scale of brightness. Brightness here applies chiefly to the beater for the percussion and the articulations for all instruments

To illustrate the underlying temporal plan here is a short outline of the course of events during the whole second movement:

Beginning of Second movement (Bar 158 - 188): 'Relativisation' of tempo direction.

Each bar is performed at one of six different tempi chosen either to create step-wise ritardandi or a zig-zag pattern between bars. Each bar also contains a tempo modulation played by one or more instruments (Figures 24 and 25).

	158	160			165			170			175			180			185		
120			X			X		X			X			X					X
108		X			X												X	X	
96			X		X	X	X				X	X		X					
84	X			X								X		X	X				
72			X					X	X				X						X
60	X				X					X	X								X

Figure 24: Bar 158—188 show the bar-by-bar changes of the six tempi. Tempi are listed on the Y axis, bar numbers are shown on the X axis.

The image shows a handwritten musical score for the beginning of a second movement, covering bars 158 to 160. It consists of four staves. The notation is dense and includes various musical symbols such as notes, rests, and dynamic markings (ppp, p, f). There are also performance instructions written in the margins and between staves, such as "Hang CHING on stand right of table during fermata" and "Hang SMALL TAN-TAN on stand left of table during fermata". The score is marked with a tempo of 1=60 and 1=84. There are also some handwritten annotations like "3.", "5.", "3.", and "4." above the staves.

Figure 25 (bars 158—160): beginning of second movement. Each bar shows differences of parameter combination from the meta-instrument.

Bar 189 – 208 : Reduction to one performance pattern (Figure 26). There is rapid action, followed by a resonant or a silent bar. Notes are held by the 3rd pedal, and are mostly changed before playing again. Speeds used are neighbour tempi (tempi lying near to each other, like clusters of simultaneous tempi), until the final bar where all performers play at the same speed.

The image shows a handwritten musical score for Figure 26, spanning bars 202 to 205. It consists of four systems of staves. The first system has two staves with complex rhythmic patterns, including triplets and sixteenth notes, with dynamic markings like *pp*, *mp*, *f*, and *mf*. The second system also has two staves with similar complexity. The third system has two staves with simpler rhythmic patterns, including a *7-6F* marking. The fourth system has two staves with further simplified patterns. The score includes various articulation symbols such as 'Ped' (pedal) and '5|' (fingerings or accents). The overall texture is dense and rhythmic, illustrating the concept of rapid action followed by resonant silence.

Figure 26 (bars 202–205): example of the rapid action (each instrument playing neighbour tempi) followed by resonant silence. The final bar shows the end of the process where each instrument plays in unison rhythm.

Bar 209-232 : Interlocking hocket patterns (Figure 27), all tempi are derived from the initial bar. 9 semiquavers = MM 60, therefore 6 semiquavers = MM 90, 5 semiquavers = MM 108. A resonance bar follows every hocket pattern.

Handwritten musical score for Figure 27, showing four staves of music. The score includes tempo markings: "ideal tempo: ♩.♩. = 60", "Stesso Tempo", and "♩. = 77". Performance instructions include "9ff", "X3", "2''", "6ff (♩. = 90)", and "7ff". Pedal markings "Ped" and fingering "III" are present. The music features hocket patterns and resonant silences.

Figure 27 (bars 209–213): hocket patterns preceded and followed by resonant silences.

Bar 234 till end: Since these short and rapid hockets involve a tight sense of ensemble togetherness and interaction, the passage that follows consists of *senza misura*, quasi hocket, coordinative actions that are played as fast as possible (Figure 28). The exact speed and regularity between pulses depends on how fast each player can respond to the player scheduled to play before him and the speed at which he or she can execute the actions themselves. The end result can only be arrived at via a strong acquaintance and knowledge of the score.

The image shows a handwritten musical score for bar 236. It consists of five staves. The top staff is a piano part with a treble clef and a key signature of two flats. It features a complex repeat pattern with markings '1.3.', '2.5.', and '4.' above the staff, and a circled 'X5' above the first repeat. The second and third staves are piano parts with bass clefs and a key signature of two flats. The fourth staff is a percussion part with a snare drum and a bass drum, featuring dynamic markings: 1. ff, 2. mf, 3. p, 4. ppp, 5. ff, 1. ppp, 2. p, 3. mf, 4. f. The fifth staff is a piano part with a bass clef and a key signature of two flats. The score includes various performance instructions such as 'G.P.', 'Share on!', and 'III'.

Figure 28 (bar 236): senza misura passage to be played as fast as the ensemble is capable. The complex repeat pattern here gives indications as to where to begin on each repeat as well as (as in the first percussion) how the dynamics change.

Primarily the intention of the second movement is to negate and relativise the teleologic and driving character of the first movement. The idea of creating a meta-instrument, a timbral synthesis of piano and percussion, is taken further in the second movement than in the first. The piece is successful in presenting two different kinds of time: a teleologic and a directionless time. My perception of the character of the music is one where there is no definite beginning, no identifiable middle and no real ending; it could carry on indefinitely. Each unfolding situation seeks to redefine the ensemble and the expressive/performative energy present at the local level. The ensemble is constructed as a singular instrument; there is no polyphony as such, but, a meta-instrument in the process of breaking up into many separate parts.

Performances

1. 17.03.2012, Fabrikhalle, Festival UsineSonore, Maleray-Bevilard, Switzerland
2. 20.04.2013, Leeds New Music Festival, Clothworker's Centenary Concert Hall, Leeds University
3. 27.04.2014, Great Hall, Goldsmiths University of London, New Cross, London

Works for Piano Solo and Piano with Live Electronics

chordwork

chordwork is a 2-minute miniature for solo piano. The material is almost entirely made from chords articulated by a single rhythm. The meta-instrument was established by setting up compositional rules rather than working within a three-dimensional space (as in the second movement of *brumaires*, for example). My interest was in examining the distribution of weight and control in the fingers when playing these chords. The pitches of the chords are often given different dynamics to create specific voicing. My understanding of atonality refers to the emancipatory syntactic characteristics of musical material which also applies in pieces where the main parameter is not pitch. In this piece every pitch should be heard for itself, because it is impossible for them to be understood or perceived as part of a hierarchical tonal system. Atonal chords, unlike tonal chords, can exist in different inversions in which it is not possible to perceive main and subsidiary pitches. The conclusion here is that when inverting an atonal chord one creates further atonal chords, which cannot be necessarily perceived as a variation of the original.

In order to create a context for voice-leading between the chords I chose a limited set of intervals using two to six notes to encourage a higher probability of repeated pitches and created sequences of mono-rhythms to set these chords in phrases (Figure 29). The mono-rhythm was constructed by using two, three, or four elements. The opening shows an ametric rhythm made of four elements: semi-quaver, quaver, semi-quaver rest, and quaver rest where the only disallowed combination is where a quaver and a semi-quaver rest follow each other.



Figure 29: opening of *chordwork*.

The ametricism was created by looking at each successive duration and projecting the rhythm to check whether further impulses appear at the beginning of three or four successive bars of the same type. If a bar can be seen to repeat more than three times

when using this close-reading then rhythm is changed slightly on that fourth instance. In the example (Figure 30) below: underneath every rhythmic articulation three rows showing three types of bar are used to filter out the sense of a repeated metre. In the fourth instance of the 3/16 bar a new semi-quaver is added. In addition this semi-quaver is beamed with the quaver that follows. The notation here suggests that an accent could be placed on the semi-quaver (rather than on the quaver) thus placing a strong beat on a weak beat. In the second example (the fourth instance of the 5/16 bar)—where a row of four beamed quavers are notated—the metric weight of a repeated 5/16 bar is disabled. The piece alternates what I term ‘passage work’ with ‘stations’. Passage work denotes moments in the score where the chords and rhythms are differentiated, where there are no obvious repeats with ‘stations’ that consist of passages of a more repetitive nature.

ht pedal $\text{♩} = 120$

p

\gg

$\frac{3}{16}$	1	x	1	2	3	x	1	2	3	4	x	1	2	x	1	2	3	x
$\frac{4}{16}$	1	x			1		2	x		1	2		x					
$\frac{5}{16}$	1		2	x	1		x	1		2	3		4		x			

Figure 30: technique ensuring ametric rhythm. Every first instance of the three bar types is indicated by a red ‘1’ directly underneath the sixteenth/quaver where it appears. Every further instance is indicated by black number in the same manner.

This piece was an experiment in employing a constructivist method to define the meta-instrument. The creation of rule-based systems allowed me to explore an ametric/atonal space with a rigorous discipline. Not all works, or their meta-instruments, must be composed according to a strictly imposed algorithm, and with this piece there are moments where creative intervention contradicts the rules.

Performances

1. 10.06.2011, Noriko Kawai, Deptford Town Hall, New Cross, London
2. 8.11.2012, Jonathan Powell, Janacek Academy of Music and Performing Arts (JAMU), Brno, Czech Republic
3. 7.10.2014, Alfonso Gomez, BKA Theater, Berlin, Germany


inner and outer mind


This piece, for solo piano and live electronics, is an initial attempt to engage with the challenges in use of interactive live electronics. My initial questions examined what kinds of interactive function could be accessed by the use of electronics. The larger context for the meta-instrument in this piece was my interest in creating a holistic performative model involving a soloist and live electronics, as opposed to one in which both have nothing or little in common. This piece was followed by a further piece for piano and live electronics entitled *contrejours*; the research and composition undertaken for *inner and outer mind* served as a precursor for the later work.


inner and outer mind is an interactive duo between a solo pianist and a musician operating a Max/MSP patch at the mixing desk. The score gives cues that trigger one of a set of three sound files, randomly selected by the computer. This set of three forms one quarter of a 'scene' changed regularly during the piece; there are 59 different scenes. The electronic sounds comprise recordings of singular bars taken from the score, shorter extracts of these bars, chords microtonally tuned, convolved harmonic piano resonances, and sound-files of stopped harmonics, some of which are also convolved. There are several passages in this piece that allow the pianist their own decision-making. In the initial two pages the pianist plays the music as written and in turn specific signals from the electronics give cues to the performer. An example of this can be found on page 5 as previously discussed.⁶⁸ A open-format approach is used between pages 24 and 28 (Figure 31). The passage begins with the pianist selecting one bar from the list entitled 'Return' (bar 77). Directly after this the first stave on the following page is played in alternation with one of the five options listed on page 24 (bar 77) entitled 'Return'. The 'X3' indicated at the end of bar 78 indicates that the pianist returns to bar 77, to select any of the five bars and continue. Bar 78 is performed a total of three times before progressing onto bar 79 via the 'Return' bar. The time signature of 13/4 (and 10/4 from bar 82) is only there to indicate the fact that these bars last 13 seconds. Within that time bracket the notation is understood as space = time.


⁶⁸ See page 38

Return

A 

B 

C 

D 


E 



Figure 31: bars 77–79. Passage shows the Return bar and the two bars that follow.

Performances

1. 26.11.2010, Rei Nakamura, ZKM, Karlsruhe, Germany
2. 4.11.2011, Hochschule für Künste, Bremen, Germany
3. 25.04.2012, University College Falmouth
4. 28.04.2012, Clothworkers Centenary Hall, Leeds University
5. 10.11.2012, Great Hall, Goldsmiths, University of London

contrejours

Completed in 2012 *contrejours* is the second piece for solo piano and live electronics. This piece continued my thinking that began with *inner and outer mind*. This piece explores the wide range of playing techniques and interactive situations offered by different styles of open-form notation. I decided to limit the range of playing techniques to stopped harmonics and to work solely from the range of possibilities this constraint provided.

The main function of the patch (written in Max/MSP) was to track frequencies from the stopped harmonics played by the pianist. The pianist plays 16 stopped harmonics in total

(Figure 32), the fundamentals are held, using a weight on the third pedal, throughout the duration of the piece.



Figure 32: all pitch material for pianist in contrejours with approximate frequency ranges (highest and lowest number)

The Max/MSP patch is programmed (using the object fiddle~⁶⁹) to listen to the speed of iteration and the frequencies played on the piano. In the patch itself there are 36 settings, or ‘scenes’ that run in order throughout the course of the piece. Each scene contains information on the frequencies the patch should track and which sound files to trigger where there are always only 1—3 frequencies the patch tracks at any one moment. The speed of sound-file iteration randomly distributed to four loudspeakers is inversely proportional to the speed of performer iteration the Max/MSP patch detects. Each tracked frequency is coupled with a maximum of three different pre-recorded sound-files, a further process decides if these sound-files are transposed or not (Figure 33). The pianist changes scene at the end of each staff by pressing the key on the midi-keyboard, placed inside the piano.

⁶⁹ Miller Puckette, ‘fiddle~ object for PureData and Max/MSP’, 1997—1999 Max Objects Database, http://www.maxobjects.com/?v=objects&id_objet=977&requested=fiddle~&operateur=AND&id_plateforme=0&id_format=0&PHPSESSID=236751aaef4c6d12a68515eb57f19a8c (7.09.2014)

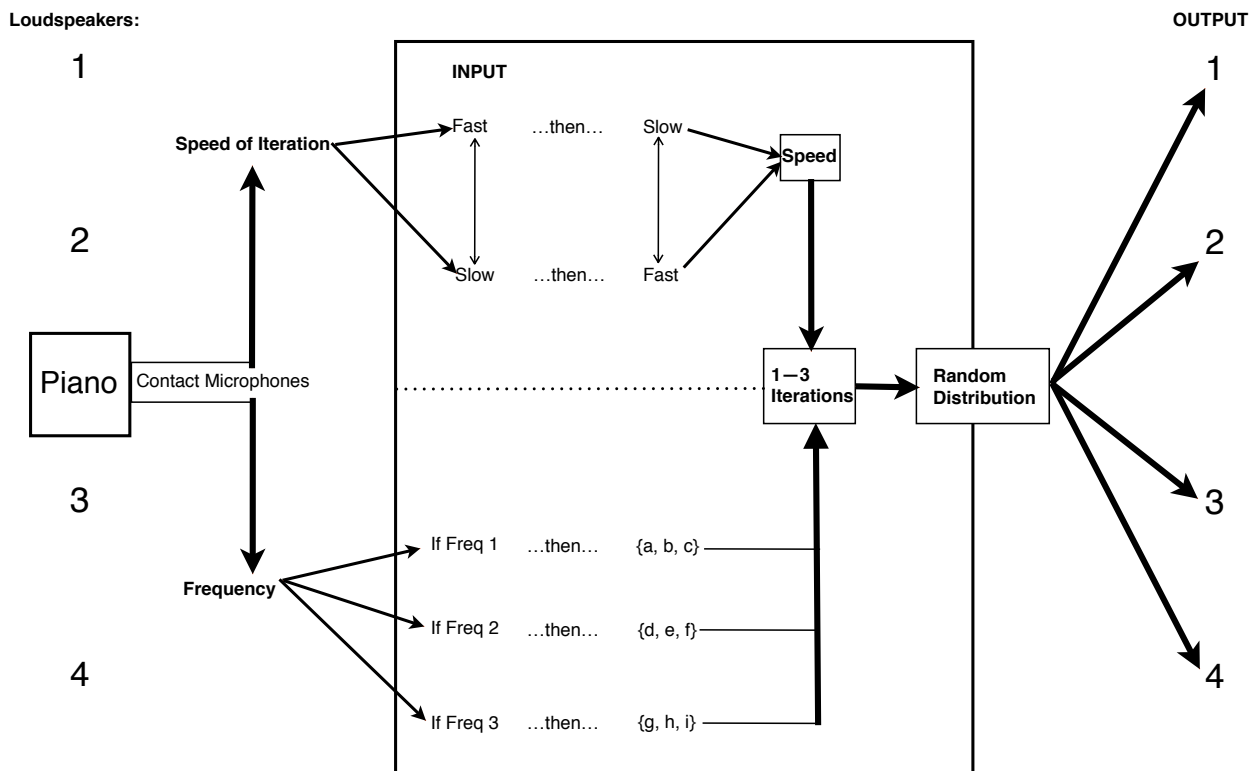


Figure 33: Diagram of electronics in *contrejours*

In the score the degree of rhythmic precision is relaxed. This allows the pianist to decide how the piece should flow. In comparison to *inner and outer mind* the sound-files in *contrejours* are morphologically closer to the sounds played by the performer. These were plotted on a scale ranging from same to similar to different. The sound-files were created by convolving the stopped harmonics with each other or by using a large room resonance as the impulse response.⁷⁰ Taking these convolved sounds I then set about removing or amplifying certain frequencies in AudioSculpt to create a list of different categories of samples before transposition stored in the Max patch.

Although one could still argue that this piece still falls under a procedural liveness according to Croft's definition, this piece represents the closest attempt at creating a performative and perceivable meta-instrument for the two reasons: the limitation of the repertoire of sounds employed and the kind of listening the harmonic alterations invite. This intended to allow the perception of a single, continuous work. The meta-instrument

⁷⁰ Recorded in a derelict building in Grimsby dockyards with an H4Zoom recorder, 23.10.2011

proceeded from the decision to impose a strict limitation of playing technique and as a direct result of the decisions made while programming the MaxMSP⁷¹ patch.

Performances

1. 24.03.2012, Alistair Zaldua, Sonorities Festival, Sonic Arts Research Centre, Queens University, Belfast
2. 13.06.2012, PureGold Festival, Great Hall, Goldsmiths, University of London
3. 28.06.2012, Interface2012, Recital Hall, Birmingham Conservatoire
4. 3.07.2012, CePRA Study Day, Leeds University
5. 24.10.2014, Mireia Vendrell, Ensemble CrossingLines, Sala 3 Tete Montoliu, Barcelona
6. 22.11.2014, Mireia Vendrell, Ensemble CrossingLines, Phipps Hall, Huddersfield University, Huddersfield Contemporary Music Festival

⁷¹ Miller Puckette, David Zicarelli 'Max/MSP 6.1' (San Francisco: Cycling '74 2013)

Work for Organ Solo and Organ with Live Electronics

BlowUp

BlowUp was commissioned by the organist and composer Lauren Redhead. The title is derived from the film by Michelangelo Antonioni in which an outside park scene is captured innocently on camera, and upon which, after progressive magnification during development, a murder scene is revealed.⁷² This idea of progressive distillation fed into the formal conception of my piece: there is both a singular rallentando spanning the whole piece and a reduction in the reservoir of pitches (represented as chords that ‘come and go’). The title also refers to the pneumatic technology of the organ and to the fact that the architecture of the space every organ is situated in is fundamental to the sound and identity of each instrument.

The notation allows the performer to follow the singular exponential function comprising the piece.⁷³ The piece consists entirely of vertical chords that enter and release; this was systemised by using the permutations of combinations available between two types of appearance and disappearance (Figure 34):

Appearance	Disappearance
sudden chordal entry	sudden release of all notes
gradual, note by note entry	gradual release

Figure 34: appearance and disappearance of chords.

Once the chords had been given an appearance/disappearance shape the silence between each chord is determined. This structure, consisting of chord, appearance/disappearance, degree of silence or rest before the next chord, is termed ‘envelope’. The rallentando applies to the beginnings and endings of each envelope. Naturally, as the effect of the rallentando becomes audible, the perception of these envelopes changes from an array of rapid, cluster chords across the whole range, to the foregrounding of the way each chord is progressively built up and broken down. Only three manuals are used: great, swell, and pedals. The timbre was also reduced to one singular and unchanged

⁷² Michelangelo Antonioni, “*Blow Up*,” (Beverly Hills, California: Metro-Goldwin-Mayer 1966)


⁷³ The notation for *BlowUp* is described and discussed between pages 35–36

registration decided by the performer, specific to the instrument. The score instructs the player to choose a similar stop setting for each manual: the sound should be fairly bright (including reed stops), allowing each note-appearance a clarity of attack. The 22 chords, immediately following the cluster chords at the beginning, using 8 chromatic notes (a, a#, b, c, c#, d, d#, e, f), were constructed according to the eight categories listed in Figure 35.

Category Number	Description	Chords
1	2 or 3 notes per manual, containing same notes and different notes	1, 2, 10, 15, 21
2	Non repetition of pitch-classes	6, 9, 13, 17
3	Octaves of the same pitch-class	4
4	One singular pitch passed for each manual. Exact pitch decided during composition (i.e. not always 'd' as shown below—as in 1'17"-1'20", or 3'17"-3'24", for example)	20
5	Repetition of notes in all three manuals	5, 20
6	Symmetrically laid out intervals	18
7	Quasi clusters	5, 8, 16, 17
8	Real cluster chords (not represented in diagram below)	-

Figure 35: chord categories, and their indexes; index numbers refer to chords shown in Figure 36

All Pitches: BlowUp
for solo organ



0 - 1"	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21		
1" - 2"			3	4	5	6		8	9			12	13		15			18	19	20	21	
2" - 3"					5	6			9			12	13		15				19	20		
3" - 5"					5				9				13		15					20		
5" - 8"																				20		22
8" - 13"																						22

Figure 36: upper: chords derived from pitch class set. Lower: chords chosen for every successive change in duration bracket throughout.

Figure 36 shows the decreasing repertoire of chords chosen for every progressive duration bracket, but not the exact chord sequence chosen for each bracket. During this process each envelope lengthens from 0.125 to just under twenty seconds, over a scale of 61 exponentially calculated durations. The organist begins this piece with an array of clusters (Figure 37) followed by chords detailed in Figure 36 represented by 0" - 1". All chords in the entire piece are played during this initial bracket. All duration brackets: [1" - 2"], [2" - 3"], [3" - 5"], [5" - 8"], [8" - 13"], indicate how the gamut of chords changes as the general envelope duration lengthens. For the final bracket [8" - 13"] the envelopes consist entirely of chord 22 where, on every appearance, notes are exchanged amongst the manuals. The longest envelope is just under twenty seconds (Figure 38). The fact that the final chord is longer than the thirteen seconds indicated at the bottom of Figure 38 is a small creative intervention.



Figure 37: opening of *BlowUp* showing exponential extension of durations proceeding from 0.125" onwards. Time is represented above in seconds

As indicated in the performance instructions there are three ways to perform this piece:

1. Duration as notated: 7' 30"
2. Realistic duration (bearing in mind how the sound behaves in the space, and the resonance of the chords themselves): 12'
3. Extended duration: 70'—73'

In the extended version the performer executes each 'second' of notated time 8-10 seconds yielding a total duration exceeding 70 minutes. This extended version heightens the perception of the distention of time, as well as focus on how the pitches unfold, and allows the differentiation of the timbres to be more audible.

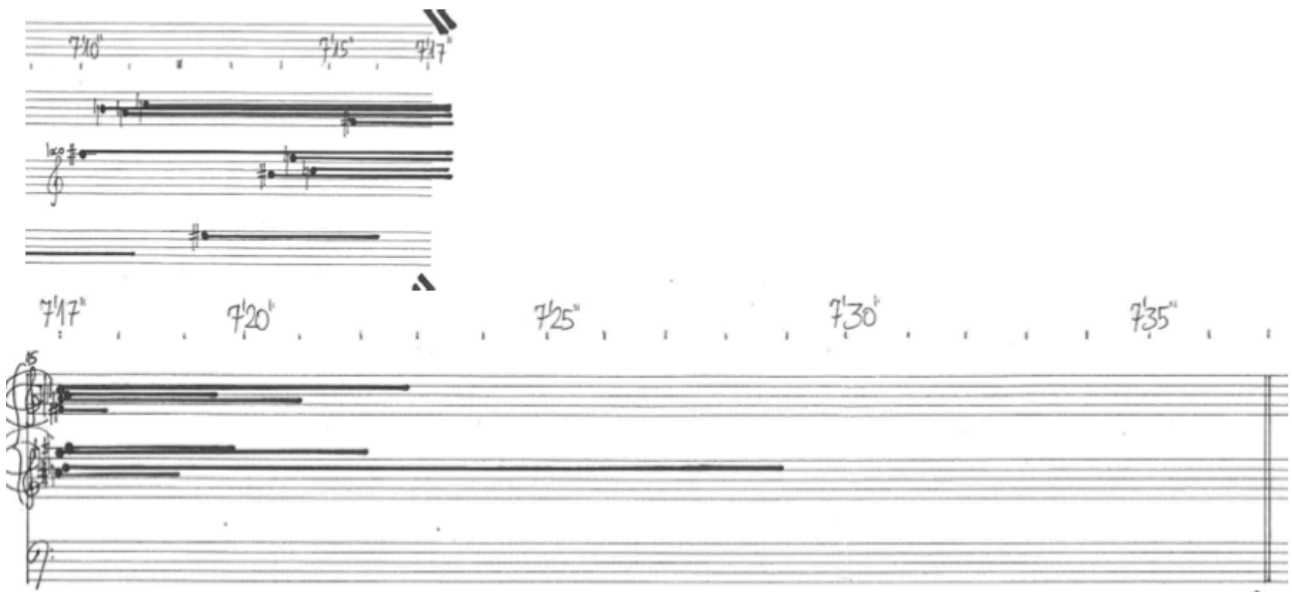


Figure 38: final chord of *BlowUp*. The final duration is represented as the beginning and ending of the whole chord followed by silence: this structure I termed 'envelope' for this piece

Performances

1. 28.01.2012, Lauren Redhead, University of Bangor, Wales
2. 20.06.2012, St Margaret's Cathedral, Leicester
3. 2.11.2013, St James the Great Church, Sonic Arts Forum, Colchester
4. 7.02.2014, St Giles' Cathedral, Edinburgh
5. 10.05.2014, St James' Church, Barrow in Furness

'...rain of stars'

Written in 2013 for a Sound and Music tour, '*...rain of stars*' is scored for organ and live electronics and lasts between five and six minutes. This piece was gradually assembled and composed during the tour; the open and experimental character allowed empirically drawn conclusions to feed into the final work. The initial score consists of a set of instructions for responses to the electronics, controlled by a Max/MSP patch operated by a MIRA⁷⁴ interface. These instructions comprised long held singular tones, gradual attack and release of cluster chords spread across registers and octaves, and clouds of staccato pitches played across octaves and registers. The organist was free to alter the timbre via the organ stops, and could also choose the pitches and how they were spread across the registers. These experiences cumulatively facilitated a greater degree of precision in the organ part.

⁷⁴ Sam Tarakajian, David Zicarelli, and Joshua Kit Clayton, 'MIRA,' (San Francisco: Cycling '74 2013)

The version included in this portfolio comprises quoted material, both altered and unaltered, derived from Arnold Schoenberg's *Herzgewächse* Op. 20 (1912) for soprano, celeste, harmonium, and harp. The pitches from the soprano part became the pitch classes for the chords. All of the instrumental parts of *Herzgewächse* are mined using a random number generator to select fragmented readings that create new melodic and chordal material. The overall effect is of a discontinuously archaic, harmonic sound world. Schoenberg's atonal writing is triadic and employs major, minor, and (especially) augmented triads in the instrumental parts. Different 'tonalities' are presented simultaneously in the harmonium, harp, and celeste parts throughout the piece. Pitches move chromatically suggesting voice leading. The material used is seldom presented in its original form since both the pitches and rhythm underwent conventional serial processes (retrograde, inversion, and retrograde inversion).

The repertoire of sound files were derived from chord samples taken from the performance of *BlowUp* in St. Giles Cathedral, Edinburgh, on 7.02.2014. The chords chosen were then convolved in SoundHack⁷⁵ with the same Grimsby dockyard impulse response used for the sound files in *contrejours* employing Hamming, Ramp, Sinc, and Kaiser analysis windows. I then constructed a MIRA patch (Figure 39) for live operation on an iPad. Figure 40 shows the MIRA patch and its main functions:

⁷⁵ Tom Erbe, 'SoundHack' (La Jolla, California: 1998—2002) available from: <http://www.soundhack.com/freeware/> (10.08.2007)

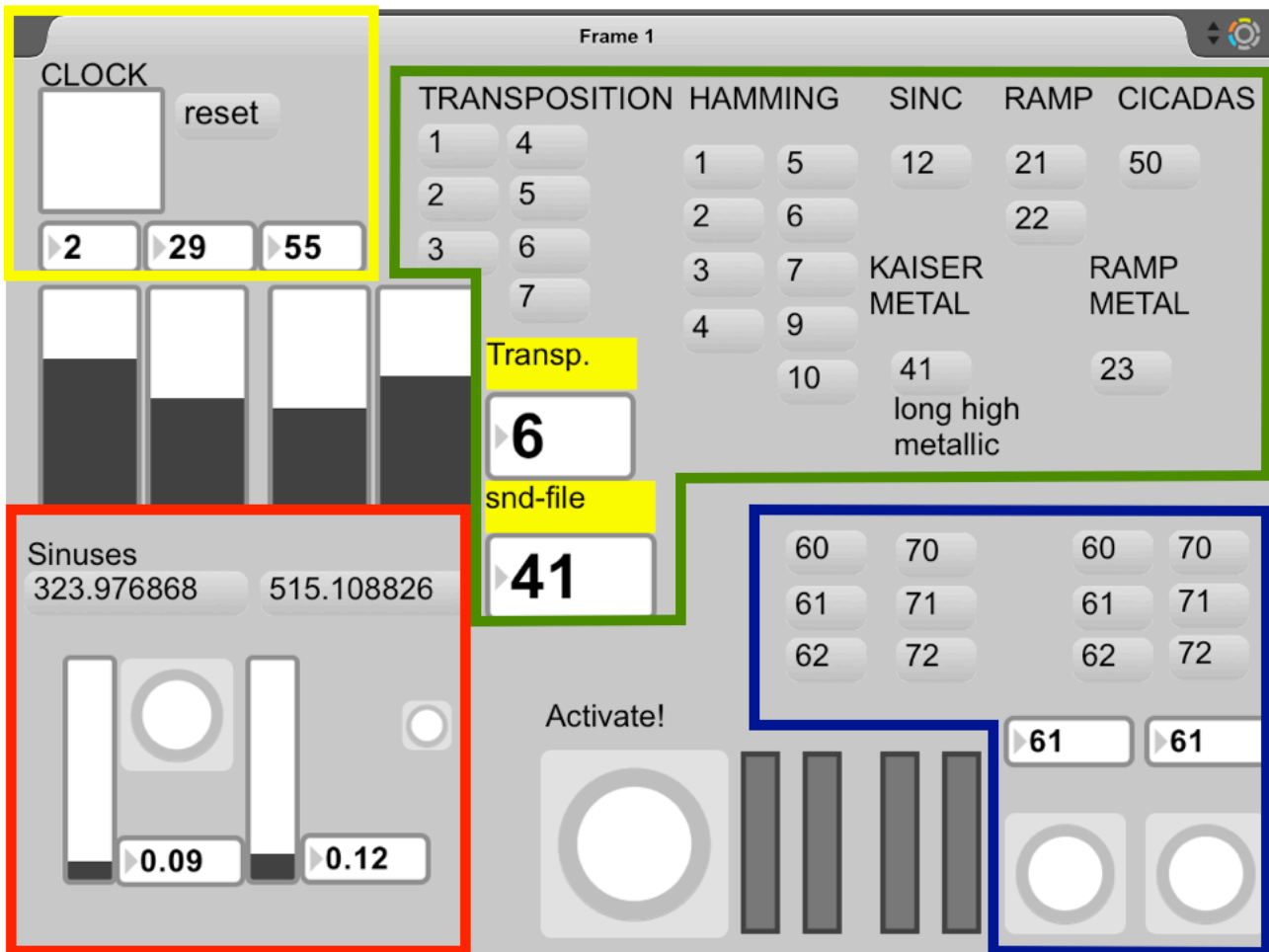


Figure 39: screenshot of the MIRA interface operated on an iPad

Legend for Figure 39

1. The yellow box highlights where clock-time begins in co-ordination with both the organist and the live electronics.
2. The green area contains functions that trigger sound files and determine transposition. Both transpositions and sound files are activated via a series of grey 'buttons'. Figure 40 lists the transposition indexes. Apart from where '1' is chosen (no transposition) once both numbers are selected (referring to degree of transposition and sound file index) the patch adds a further amount (measured in cents) to this interval, randomly chosen from one to forty cents. The sound files are named according to their index number and are categorised according to their analysis window (Hamming, Kaiser, Ramp, and Sinc). Once both transposition and sound file index have been selected the performer presses the square button marked 'Activate'.

Transposition Index	Interval
1	no transposition
2	semitone higher
3	semitone below
4	whole tone below
5	minor third below
6	major third below
7	fourth below

Figure 40: the seven transpositions relate to the numbers displayed under the 'Transposition' heading in the green box of the MIRA interface shown in Figure 39

3. While the sound files are being heard from the loudspeakers they are simultaneously fed into a frequency tracker (fiddle~). This tracks both the second and the third strongest upper partials. These frequencies—both of which change constantly and rapidly—appear in both number boxes respectively seen at the top of the red box. By pressing the large square button the frequency shown for that split-second is sent out either the first or second loudspeakers as a sine tone. The small button activates a chord made up of 2-4 sine tones that capture the upper (right-hand) partials. Each sine tone is given a random duration lasting between 7—10 seconds.
4. The blue box accesses the granular sound files played towards the end (three short organ sound files, labelled 60—62, and three 'sand' sounds, labelled 70—72). Again these are activated by the square buttons.

The title of the work is taken from one of Roger Caro's descriptions of a fleeting moment during a purported alchemic transmutation as documented in *The Great Work Photographed*⁷⁶. The forty images were assembled by A.J. D'Ossa who added captions derived from sentences recorded during Caro's lectures. Figure 41 is a screenshot of plates 10, 11, and 12; the title can be seen at the end of the twelfth plate.

⁷⁶ Roger Caro (a twentieth century French alchemist, 1911—1992) and A. J. D'Ossa (editor) "The Complete Great Work Photographed" *RexResearch*, 1968, <http://www.rexresearch.com/caro/caro.htm> (27.08.2014)

Number 10 ~ If, instead of the citrine color (sometimes verging on dark chestnut) one obtains "suddenly" the appearance of Number 10 (orange liquid), all should be redone. The flowers (of Sulfur) would be burned, as Synesius says. However, so that we be well understood, we specify that the color citrine (Number 9) is the starting color; after a few brief moments the color darkens very rapidly, which is a good sign.



Number 11 ~ After cooling, the "newly married" matter tends to settle down. It darkens chiefly at the end of the 1st "Philosophic Month" (which, for convenience, will henceforth be designated by "P.M." (*4)



Number 12 ~ During the course of the 2nd P.M., it resembles a leopard skin (not that of a tiger or panther). Put it back on the fire in the 3rd P.M, the body continues to darken and presents a dazzling appearance. One would say a rain of stars, or fireworks.



Figure 41: screenshot of plates 10—12 of *The Great Work Photographed*, by Roger Caro⁷⁷

The guiding idea for alchemists is that, in actively evolving a given natural material, like a metal for instance,⁷⁸ one is deliberately developing it faster than it would if left undisturbed underground. The belief is that one can understand the inner life of any material.⁷⁹ There has been much dispute as to the accuracy of Caro's work and how the images were assembled. I was interested in the relationship between the images and their captions. The hermetic language of the captions and their accompanying images can be understood as two separate 'stories', the relation between which is sometimes clear, at other times complex. Figure 42 gives an example of this where the description for plates 25 and 26

⁷⁷ Ibid.

⁷⁸ "Alchemy itself is the art and science of evolution. To take a gross substance, work on it spagyrically, and produce a quintessence from it[...]is[...]an act of evolution. So the alchemist in his lab is doing to a plant or mineral[...]what 100s or 1000s of years of natural evolution would normally do. He is accelerating evolution[...]" Rubaphilos Salfluère to hermetic-alchemy Yahoo Group, August 27, 2014, <https://uk.groups.yahoo.com/neo/groups/hermetic-alchemy/conversations/messages>

⁷⁹ "...it was the experimental discovery of the living Substance...the conception of a complex and dramatic Life of Matter which constitutes the originality of alchemy's opposed to classical Greek science" Mircea Eliade, 'The Forge and the Crucible', (Chicago: University of Chicago Press, 1978), 148

can be understood (perhaps with exception as to the 'transmutational value'). However plates 27 and 28 refer to the Seal of Hermes as well as the age, nourishment, and diet of the 'Stone'.

Number 25 ~ As can be seen with the 7th bath, the 15th P.M., the color white is obtained --- a beautiful lunar white.



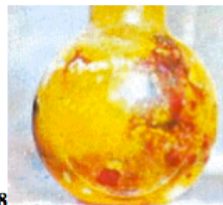
Number 26 ~ This shows a portion of the White Stone unmultiplied but fixed; that is, dry, and therefore without any transmutational value. We are at the end of the 15th P.M.



Numbers 27 & 28 ~ With these photographs we tackle the first imbibitions with the Seal of Hermes. The Stone is adult and its milky nourishment is stopped in order to give it a bloody, meat diet. (*5)



27



28

Figure 42: screenshot of plates 25—28⁸⁰

Whilst reading particularly hermetic passages I found myself 'in-between' text and image; my impression was of two separate narratives to be read for themselves where neither the text nor the image need take precedence. This was the translational relationship I wanted to aim at in my piece: I used altered and original materials derived from Schoenberg's short piece, convolved sound files, sine tones and granular sounds. I envisaged both organ and electronic parts as simultaneous performers, where the space between them encompasses response, commentary, or mere coexistence. The intention is to establish a deliberate ambiguity between the part representing image and that representing commentary. In this regard the results are successful and raise further questions as to the possible future functionality of the electronics especially in improvised and fixed contexts.

⁸⁰ Caro and D'Ossa

Despite the strong similarities of spectromorphological characteristics of both electronic and organ parts the category of liveness remains procedural as opposed to aesthetic. However, since the piece is partly improvised, the aim of performing this piece during a tour enabled empirical decision making to help arrive at a finished version over time. For me this project differentiates itself—from researching aesthetic liveness involving electronics—by prioritising gradual changes from knowledge gained empirically.

Performances

1. 15. 03.2014, Lauren Redhead, St Laurence Church, Catford, London
2. 3.04.2014, University of Sussex, Brighton
3. 5.04.2014, Salford Sonic Fusion Festival, Manchester
4. 4.05.2014, Sounds New Festival, Canterbury
5. 22.09.2014, Huw Morgan, St Laurence Church, Catford

foreign languages

foreign languages, for solo percussion, was written in 2013/14 in direct response to my reading and research in translation. This piece draws on Jacques Derrida's comments on Maurice Blanchot's short novel *Death Sentence*⁸¹ and applies some of the theories and observations made by John Law on and about ANT onto the pre-composition for this piece. In Blanchot's work, a two-part récit⁸² is related in the first person by a narrator (the gender of whom is not revealed) who encounters two women: the first is terminally ill, the other a translator, whom they encounter motionless and in shock following a bomb explosion. During the second part an intimate relationship is formed between the narrator and the translator whose mother tongue is described as a Slavic language. The narrator describes an experience where uttering random words in this Slavic language leads them to feel a loss of responsibility for what they are actually saying. In both situations within the text it is not clear if the narrator is the same person; the ambiguity of the relation between both parts lies in their narration of communication, interpretation, and intimacy.

In my piece there are two parts: a part for two hand-drums and a part for amplified cymbal (2 loudspeakers). With *brumaires* the two-part 'dialectical' form presented a critical relationship; with *foreign languages* the relationship between both parts is more complex. *foreign languages* presents two different ways of 'speaking'; these two parts both touch and do not touch and for me this is a similar situation as that presented by Derrida in his work *Living On/Borderlines*⁸³ comprising two simultaneous texts: a main text, and one constant footnote consisting of diary entries and commentary resembling a 'shipboard journal'⁸⁴.

The two hand-drums (low and high, which the percussionist chooses freely) are played acoustically and one amplified cymbal (using either one or two loudspeakers) with a microphone feeding directly into a Max/MSP patch. The music for hand-drums is built out

⁸¹ Maurice Blanchot, *Death Sentence* (New York, Station Hill, 1998)

⁸² "a récit is an event, it is an account, each turning uninterruptedly into the other, together ceaselessly interrupting their relation and giving either an event no story ever tells", Ann Smock, 'Conversation', in *Maurice Blanchot: The Demand Of Writing*, ed. by Carolyn Bailey (London: Routledge, 1996), 134

⁸³ Jacques Derrida 'Living On: Borderlines', in *Deconstruction and Criticism*, ed. by Geoffrey Hartman (New York: Continuum, 1979), 75—176

⁸⁴ Ibid. 82

of a large vocabulary of tiny fragments (see Figure 43), some as small as a demi-semi-quaver (for instance letter F) and some a little longer.



Figure 43: example of fragments with letter names assigned

This vocabulary of cells was derived from a reservoir of hand movements across the drum itself. Figures 44 and 45 reveal how decisions regarding the changes in harmonics and hand position were arrived at (Figure 44 shows a list of directions, Figure 45 a table of weighted probabilities illustrating how the direction changes are linked up).

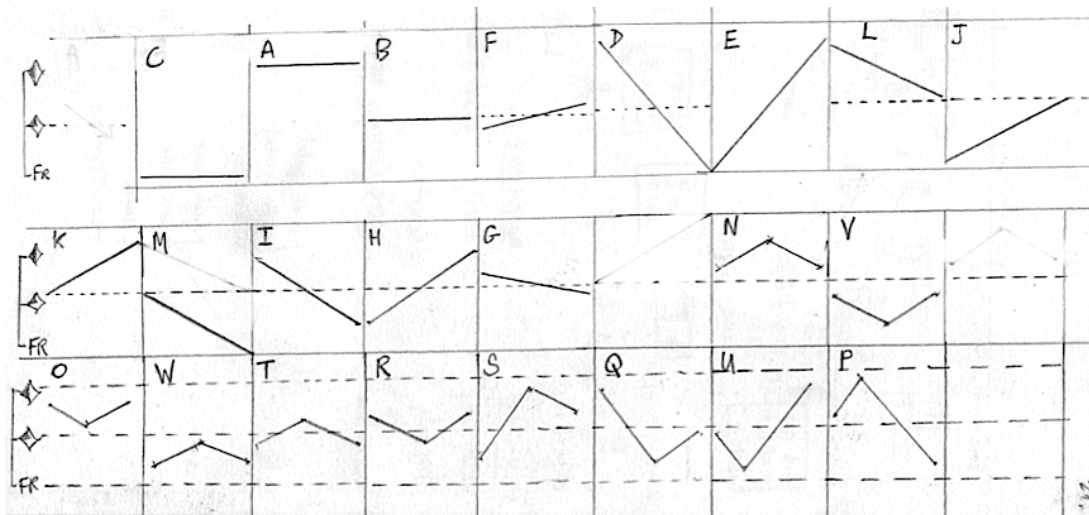


Figure 44: list of directions of beater across surface

	A	B	C	D	E	Q	U	P
A				0.5		0.5		
B							0.5	0.5
C	0.5				0.5			
D			0.5			0.5		
E		0.5						0.5
Q		0.5			0.5			
U	0.5			0.5				
P			0.5				0.5	

Figure 45: Table of weighted probability connecting hand directions

Figure 46 shows a pre-compositional sketch for the opening of the hand-drum music. The high hand-drum is struck repeatedly with one finger, the other hand controls the direction of the harmonics with the outer side of the palm; each rhythmic cell is placed in sequences yielding sentential structures. This arrangement of cells and the differentiation of hand-drum technique owes its genesis to my analysis of Georges Aperghis's *Le Corps à Corps*⁸⁵ for solo percussionist, where a percussionist both performs on a zarb and speaks rhythmically.

⁸⁵ Georges Aperghis 'Le Corps à Corps', ©Georges Aperghis (1978), at Le Site de Georges Aperghis <http://www.aperghis.com/selfservice.html> (18.02.2013)

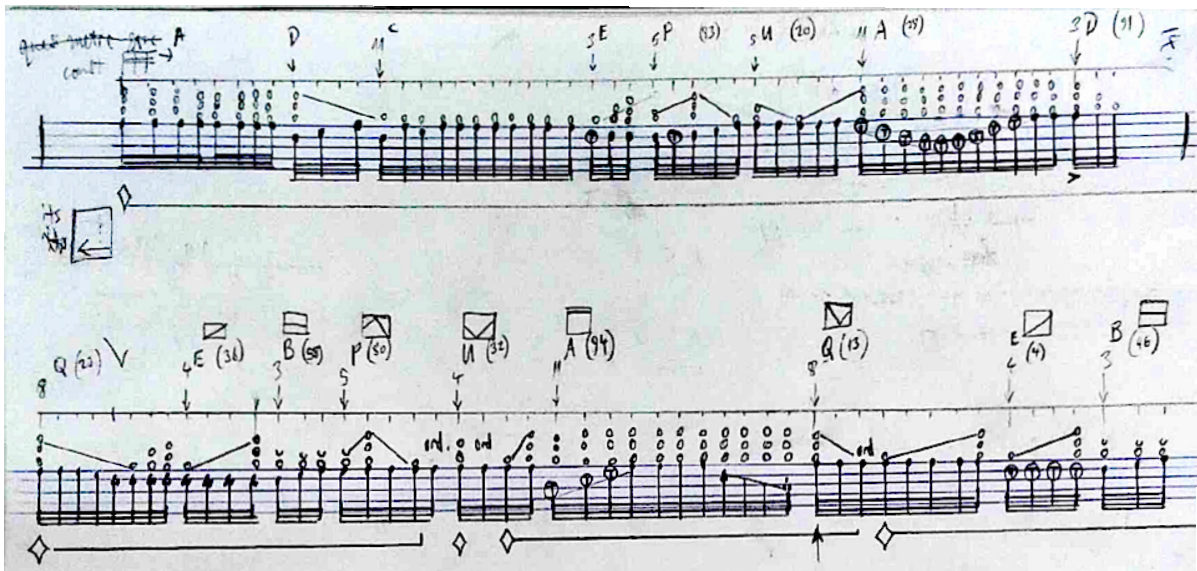


Figure 46: pre-compositional sketch of opening music for hand-drum

Some sentences resemble each other, others are different (Figure 47), and, as previously mentioned⁸⁶, dynamics for the hand-drum music have been mostly left out.

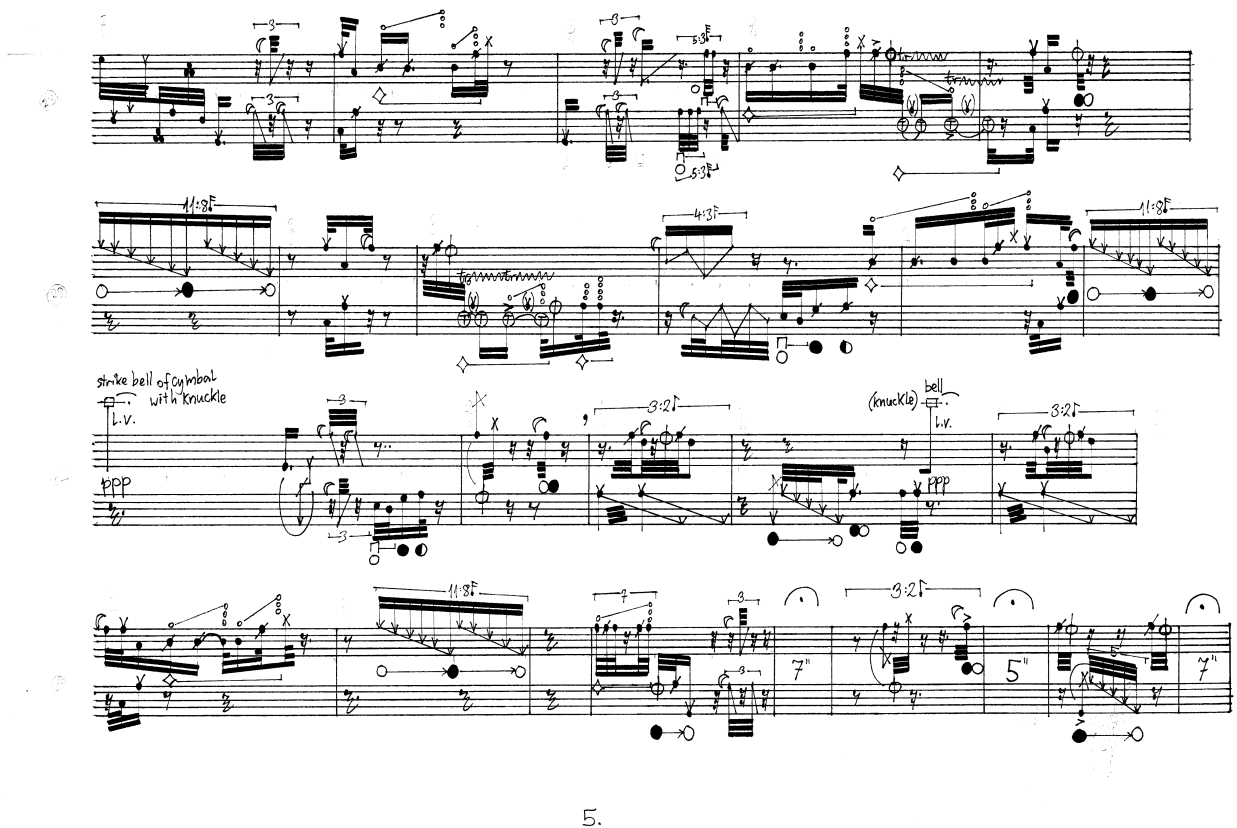


Figure 47: Later Passage

⁸⁶ See pages 41 – 42 where this is discussed

The second part of the piece requires the percussionist to read sentences internally and play using their own speech rhythm on the cymbal. The inclusion of the personal speech rhythm derives from Anne Karpf's book *The Human Voice*.⁸⁷ She describes how easily recognisable a person's voice-timbre is; I speculated that speech rhythm could also provide a central part of a person's individual communicative fingerprint.⁸⁸ Beyond the most obvious two-part form of both *Death Sentence* and my piece, my decision preferred foregrounding the relationship between the instruments to focus my listening on comparing both performative 'languages' resulting from the natures of the instruments.

My approach to the cymbal sound is derived by freely attaching the nodes of my initial cymbal network.⁸⁹ After some experimentation the fine tuning of the cymbal passage revealed that it depended greatly on the kind of microphone used, on where it was placed, and on the dimensions of the cymbal. The notation of the second part of the piece—where the cymbal is the only instrument played—is notated on a single page and consists of a large circle; the bell is represented by a dotted inner circle. Across this diagram are a set of seventeen arrowed lines indicating directions for the beater on the cymbal (Figure 48).

⁸⁷ 'the belief that the individual's voice is as distinctive as their fingerprint has become so unshakeable that voice verification has been both welcomed by both commerce and government, offering the promise of security', Anne Karpf, *The Human Voice*, (New York: Bloomsbury, 2006-2007), 255

⁸⁸ The German composite word *Menschenklangfarbe* (translated literally as: 'human timbre') refers to the notion of an idiosyncratic and personal timbre everyone has when executing the same action. This is strongly related to the ideas discussed in *brumaires* (see page 38), of the impossibility for two performers to produce an identical result.

⁸⁹ See Figure 2 on page 29

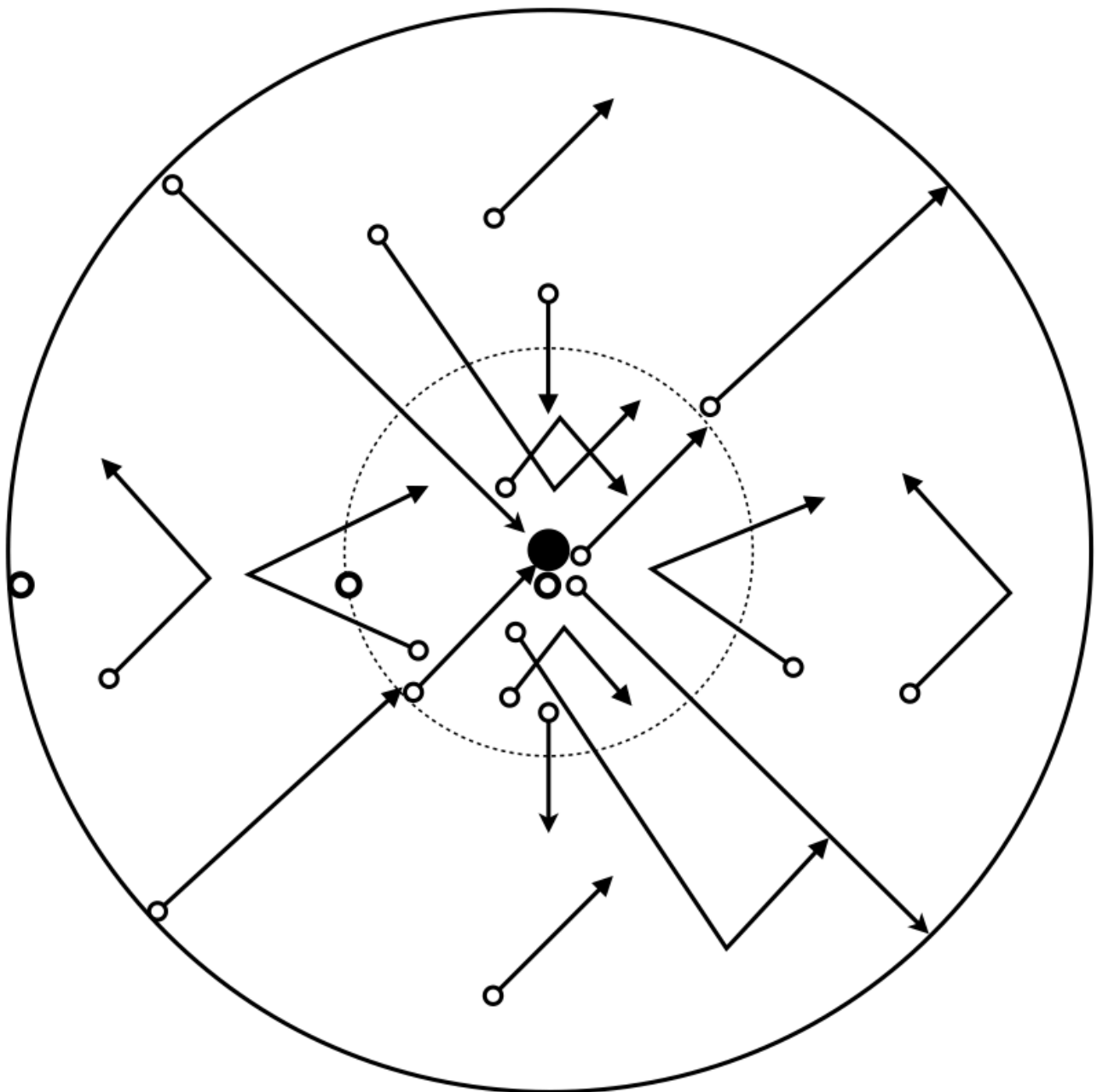


Figure 48: final page of *foreign languages*. The whole diagram represents the cymbal itself, the arrowed lines show the direction of the beater, the small circles at the beginnings indicates the starting points.

On the right-hand side of the page is a legend of English and French sentences taken from the original Blanchot text. The rule for the sentence order is written to avoid the sentence order given in the score. Taking a sentence, in either French or English, the percussionist chooses a direction and follows this. The percussionist has two beaters, mid-hard (marimba beater) and a hard beater (glockenspiel, xylophone beater) and chooses which beater to use (changing every 1–3 sentences); the dynamic range remains between ppp –p throughout. There are three positions indicated by small circles that are not attached to a line: in the middle, at the edge of the bell (mid-left), and at the very edge of the cymbal (on utmost left).

A feedback model is established in the electronics (Figure 49). The Max patch responds to the cymbal sound by analysing the speed and loudness, and by tracking pitches/partial. The cymbal sound is fed into a series of four filters programmed to detect and gradually amplify specific frequencies. The sound fed to the loudspeakers becomes heavily filtered over time focussing on a small number of strong frequencies. In turn the percussionist is free to respond to these frequencies either by changing the beater, position, speed, or rhythm of movement and vessel position as part of their performance. The four filter banks are changed by the percussionist by playing regular pulses either in the middle of the cymbal or at the very edge with a specific beater. These pulses have to be maintained for over three seconds in order for the filter bank to change according to the mixture of the type of beater and the position on the cymbal.

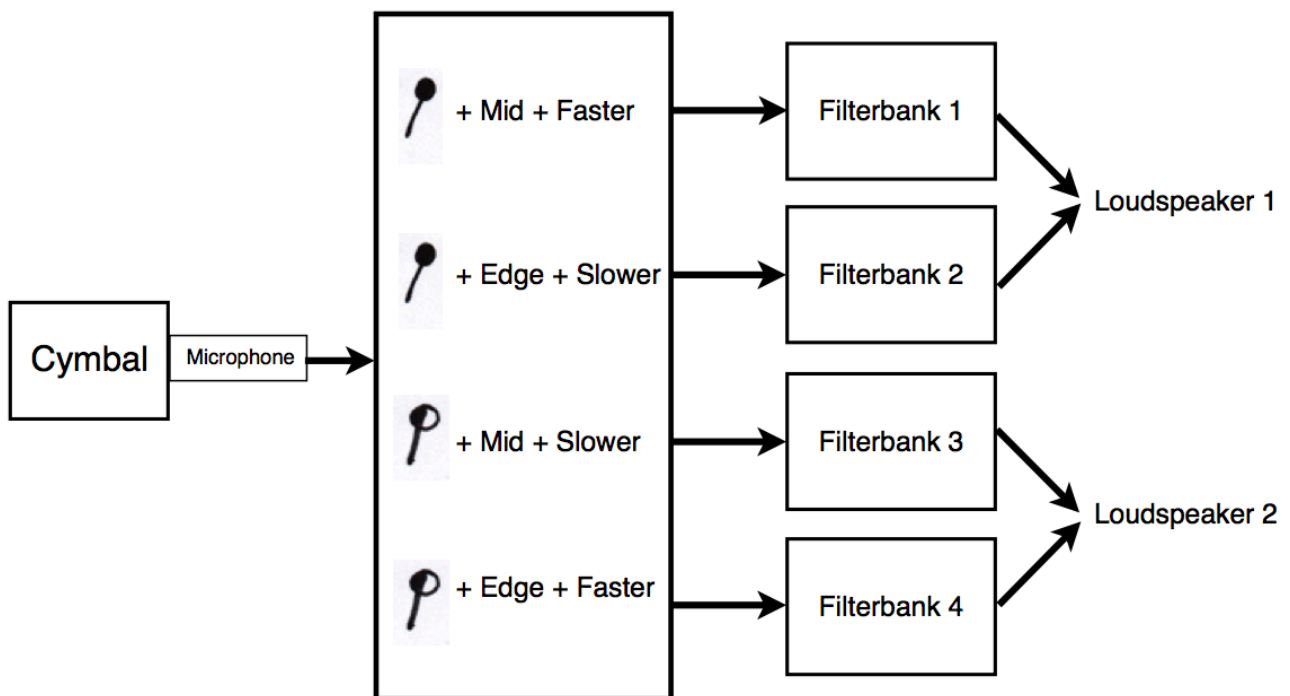


Figure 49: basic functions of the MaxMSP patch for *foreign languages*

solo speaking

The initial impulse for *solo speaking* came from examining generative techniques derived from OULIPO.⁹⁰ I wanted to create a piece that consisted of spoken text only, the sound of the words having primary importance. Forerunners to this species of composition are Kurt Schwitters' *Ursonate* (1922–32) which uses invented words for their sound and for their dramatic and performative character, and the poetic/spoken work of Gerhard Rühm. The expressive concentration of Gerhard Rühm's *Hörspiel* and spoken pieces (for example: *Ophelia and the Words*, 1969) derives from the often radical reduction of words that undergo processes of permutation, addition, subtraction and letter/accent misplacement. Rühm's intention is to create the perception that the words are freed from associated meaning and are heard for themselves. Whilst Schwitter's work is more of a stimulus than a model, this aesthetic provides the main context for my piece.

The actual composition underwent several stages. I started by selecting the final word at the end of each sentence from a randomly chosen page of Phillip K. Dick's novel *Ubik*.⁹¹ Initial blocks of text were created by making sequences with the pools of words this process produced. A further technique was to list words that are similar in sound and spelling to this. This yielded several reservoirs of text each with their own character and implied rhythm.

The cumulative and performative effects of interruption were examined by placing interrupting rests both inside and in between words. Reducing the number of words in use at any moment created a productive contradiction between the seeming nonsense of the text and the dramatically tense energy caused by the articulation of silences. These silences can be perceived both as relief (or 'breath') or as interruptions that resist the flow of the spoken part. During performance I noticed that the gaps between fragments of text, became as relevant to the piece as the word combinations and inventions themselves and how such combinations created unexpected linguistic connections within a discontinuous structure.

⁹⁰ The OULIPO was an experimental literary movement initiated by French authors such as Georges Perec, and Raymond Queneau. The acronym stands for: *Ouvroir de littérature potentielle*, or: 'workshop of potential literature'.

⁹¹ Philip K. Dick, *Ubik*, (London: Harper Collins, 1998)

Performances

1. 3.08.2013, Lauren Redhead, Matthew's Yard, Croydon
2. 4.10.2013, Leeds Late Night, Clothworkers Centenary Concert Hall, Leeds University
3. 30.01.2014, Free Range Concert Series, The Veg Box, Canterbury
4. 1.02.2014, Café Oto, Dalston, London

Leiden Translations

Leiden Translations exists in two forms: as an installation to be displayed in a gallery space, and as a thirteen minute film. This project began with a commission for two related works: a twenty-minute piano piece (which became *Spagyria*) and the other an installation.⁹² Since the theme of the Borealis Festival was alchemy, my initial research focused on reading classical alchemical literature by authors such as Hermes Trismegistus, Zosimos of Panopolis, Avicenna, Jabir Ibn Hayyan, and Nicholas Flamel. I gradually came to the conclusion that, while ill equipped to decipher these deeply encoded texts, I was confronted by a highly complex and ancient culture: any response on my part should seek to avoid a reductive, or representational engagement. *Leiden Translations* is the first conscious application of theories of translation derived from Jacobsen, Derrida, Law et al.

This installation uses the clearest (i.e. the least hermetic) text I could find, the Leiden Papyrus X. This document was discovered by chance hidden inside a sarcophagus in Thebes, Egypt in 1829. It dates from around the 3rd century AD and its author is unknown. This papyrus now resides in Leiden and consists of 111 recipes exclusively concerned with the physical and technical processes required to produce an object or substance, or to improve, and master, nature by means of artifice. The direct and uncomplicated style of these recipes represent the practical or ‘exoteric’⁹³ (as opposed to ‘esoteric’) side of alchemical writing relating directly to ‘lab-alchemy’. The original language of the text is Ancient Greek and some passages make use of Ancient Greek alchemical symbols, or sigils. These alchemical sigils were considered as a means of writing hermetic code (written by alchemical experts either for experts or their students) to provide instruction about how to set free and transmute the “frozen life” within all material (i.e. plants, liquids, metals, etc).

Taking the English translation of the Leiden Papyrus I encoded the recipes into Ancient Greek sigil formulae. For this I used Fred Getting’s *Dictionary of Occult, Hermetic, and*

⁹² The commission was for the Borealis Festival, Bergen, Norway, in March, 2014

⁹³ Stanton J. Linden ‘Introduction: Anonymous (late third century AD) From Leyden Papyrus X and the Stockholm Papyrus’, in *The Alchemy Reader: From Hermes Trismegistus to Isaac Newton*, ed. Stanton J. Linden (Cambridge: Cambridge University Press, 2003), 46

Alchemical Sigils.⁹⁴ This book contains over nine thousand sigils with explanations of their origin. Gettings prefers the term ‘sigil’ over sign, symbol, or glyph as for him ‘sign’ has too wide an application, and ‘glyph’ is used more readily for architecture and sculpture. Sigil derives from the late Latin ‘sigillum’ and also appears in mediaeval magical contexts. Gettings writes: “the word in the eighteenth century did carry the specialised meaning of a small image.”⁹⁵ Here a sigil is amuletic, or “charged with power—and many are ‘small images’ of cosmic processes, and in almost every case linked with the occult”⁹⁶ (Figure 50). Reading Gettings’ Dictionary one is presented with a multitude of images; the temptation for my purposes was to choose the sigils arbitrarily. Instead I decided to choose sigils that came specifically from the era when the Leiden Papyrus was written. With every sigil Gettings provides the—sometimes many—variations a graphic form has taken historically. With each variation a reference is provided that allows one to locate when the sigil was invented. While describing the history of the discovery of Leiden Papyrus X Hunt⁹⁷ describes how Marcellin Berthelot and Charles Rouelle, both academics translating ancient Greek alchemical texts, were given the text to examine and translate. Berthelot, famous for his 3 volume *Collection des Anciens Alchimistes Grecs*,⁹⁸ is often referenced by Gettings in his Dictionary. My preference was in choosing the Ancient Greek alchemical sigils recorded by Berthelot.

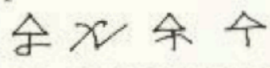
⁹⁴ Fred Gettings, ‘Dictionary of Occult, Hermetic, and Alchemical Sigils’, (London: Routledge and Kegan Paul, 1981)

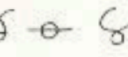


⁹⁵ Ibid., 9



⁹⁶ Ibid.











⁹⁷ L. B. Hunt, ‘The Oldest Metallurgical Handbook: Recipes of a 4th Century Goldsmith’ *Gold Bulletin Journal*, Volume 9, Issue 1 (1976): 24—31 <http://link.springer.com/article/10.1007%2F03215403> (16.4.2014)











⁹⁸ Marcellin Berthelot, ‘*Collection des Anciens Alchimistes Grecs*’, (Paris: Georges Steinheil, 1887—88)



SULPHUR Alc. Very many sigils exist, of which those given below are merely the most common. CARBONELLI 1925 reproduces four of the most frequently used in post-mediaeval documents: 











BERTHELOT 1885 gives a few sigils from the Greek alchemical tradition for ordinary sulphur  for unburned sulphur  and natural sulphur: 


THESAURUS 14C  ONOMASTICUM 1574 











ALCHYMIA 1563      VALENTINE 1671     


ALCHEMICAL 17C      ALCHEMY 1650     

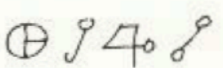
SHELTON 17C  

SOMMERHOFF 1701          

DALTON 1808 

GESSMANN 1906          

SHEPHERD 1971 

SOMMERHOFF 1701 gives the sigils  for sulphur verum.

See also BRINSTONE.

Figure 50: Fred Gettings entry for Sulphur reveals over seventy alchemical sigils invented by many different alchemists through the ages⁹⁹

To describe this initial stage of the translation process, as well as some of the difficulties I encountered, I refer to recipe number 44 entitled *Testing of Silver* to provide an example.

The English translation of the text reads:

Heat the silver or melt it, as with gold; and if it remains white (and) brilliant, it is pure and not false; if it appears black, it contains some lead; if it appears hard and yellow; it contains some copper¹⁰⁰.

⁹⁹ Gettings, 255

¹⁰⁰ William B. Jensen, ed., *The Leyden and Stockholm Papyri: Greco-Egyptian Chemical Documents From the Early 4th Century AD* Translator: Earle Radcliffe Caley (Cincinnati, Ohio: University of Cincinnati Press, 2008): 29. Accessed April 16, 2014, <http://www.che.uc.edu/jensen/W.%20B.%20Jensen/Books/Leyden%20&%20Stockholm%20Papyri.pdf>

Using Gettings' Dictionary I derived the following formula:

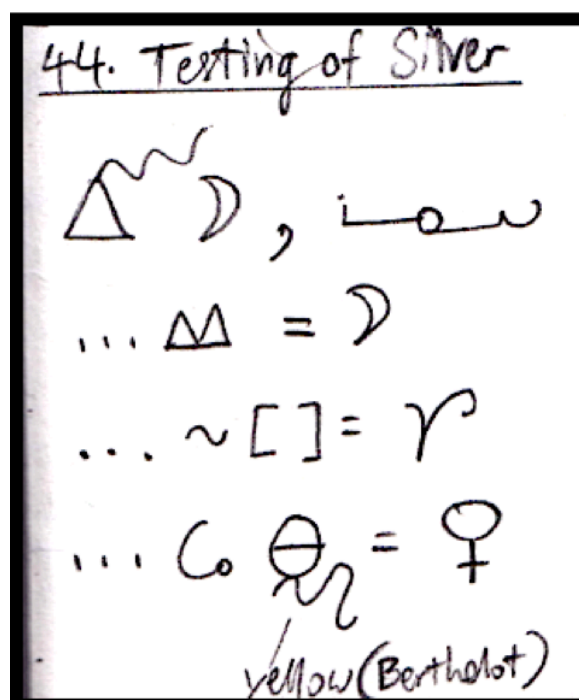


Figure 51: sigil formula for Leiden Papyrus X recipe no. 44

This interpretation consists of four lines and is to be read from left to right. On the first line the simple triangle with the wavy line ('Heat'¹⁰¹) is placed alongside a moon crest (a typical sign for 'Silver' recorded by Berthelot.¹⁰²). To the right of this is the sigil chosen that means 'to melt like a fluid'. Although there is no mention of a melting something to become 'as a fluid' one reads the instruction 'to melt' in over a third of the Leiden recipes. There was an obvious need to use a sign representing this process as closely as possible. The remaining 3 lines are an attempt to follow an if/then structure.

Once all the recipes had been written out I derived data from each sigil formulae that could be used to compose the contrabass music. I chose eight fundamental characteristics to analyse the sigils:

1. Number of vertical lines
2. Number of horizontal lines
3. Number of cross-over points
4. Number of diagonal lines
5. Number of circles

¹⁰¹ Gettings, 133

¹⁰² Gettings, 239

6. Number of triangles
7. Number of points (or dots)
8. Are there ornaments? (Including: shorter lines, curls, wavy lines, etc)

This yields (as in the case of recipe number 20) three columns of eight bits of information:

2	0	0
2	0	0
0	0	0
1	0	0
2	0	0
0	1	1
4	0	0
6	1	1

I decided on using this information to provide seven sub-material categories before I could write a contrabass miniature. These were:

1. Playing technique: arco, pizzicato, col legno
2. Drawing (with the bow) or composed out
3. Dynamics
4. Pitch (according to a scale of 16 notes; each pitch acts as a polar centre)
5. Degree of improvisation
6. Density of notes per time frame
7. Freely invented or automatic material

I used slightly different techniques to fulfill each category:

Playing Technique: The fourth, fifth, and sixth numbers in the column are added to determine the playing technique. Using modulo 3, then 1 = arco, 2 = pizzicato, 3 = col legno.

Drawing (with the bow) or Composed Out: I decided on two main compositional techniques: the answer provided by the data allows either a 'drawing' interpretation or a 'composed out' one. For the first option the score is then written out graphically to show the bassist how he should draw the shape of the sigil on the strings. The second option is less straight forward and entails that the translation of the sigil is composed according to the instructions yielded by this data. The method was to add up all the numbers in the column; if the number is an odd number then a drawing action is written, even numbers are composed out. If the bassist has to draw using the bow, this overrules the playing

technique determined in the first point if the result of the first point was pizzicato. Further decisions as to dynamics and degree of improvisation are maintained where possible.

Dynamics: Two operations determine the dynamics: the top two numbers are added to determine one of four dynamic regions, modulo 4 is used to determine which number:

1. ff
2. mf
3. p
4. ppp

For the second operation modulo 5 is used to determine dynamic shape:

1. No dynamic change
2. Crescendo
3. Decrescendo
4. Crescendo followed by decrescendo
5. Decrescendo followed by crescendo

Pitch: This is decided by adding the largest number to the second largest number in the column then parsing result via modulo 4. The number of pitches in brackets shows the number of tempered pitches available (Figure 52 displays all sixteen pitches):

1. Central pitch +1 semitone above and 1 semitone below (3 pitches in total)
2. Central pitch +1 semitone above and 2 semitones below (4 pitches)
3. Central pitch +2 semitones above and 2 semitones below (5 pitches)
4. Central pitch +3 semitone above and 3 semitones below (7 pitches)

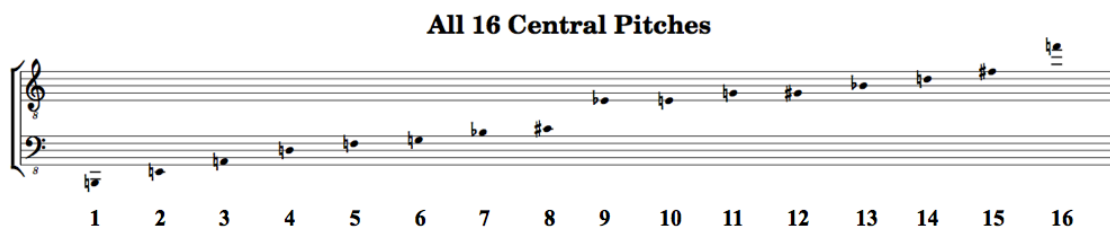


Figure 52: all sixteen pitches that serve as central pitches for the contrabass part

For every sigil the central pitch is determined by reading the magic square that contains all pitches. The following magic square helped determine every following central pitch for each sigil:

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

Figure 53: magic square, also known as the magic square of Jupiter¹⁰³

Degree of improvisation: The four degrees that determine the amount of improvisation derive from whether the sigil contains or consists of a circle. In the notated score there are four degrees determining the amount of improvisation applied:

- Large circle = full improvisation (4)
- Small circle = more improvisation (3)
- Is the sigil circular = less improvisation (2)
- No circle = No improvisation (1)

Density of notes per time frame: The density for every following column was derived by comparing the final three numbers in an initial column with the final three numbers in the adjacent column; each result affected the latter column according to the following rules:

1. If all numbers are the same, the following sigil translation decreases in density in relation to its predecessor, for example:

1	1
1	1
1	1

2. If two numbers are the same, and one different, the density either increases or decreases:

1	1
0	2
2	2

¹⁰³ Linden, 87

3. If one number is the same, and two different, a more radical change of density occurs (either more or less density).
 4. If all three numbers are different there is no change and the density remains the same.
- In all cases the actual amount of density change was chosen freely.

Freely Invented Material/Automatic Material: If the sigil was prefaced by an amount then freely invented material was composed with little or no relation to the automatic procedures described above. For example, recipe number five: ‘Tin, 12 drachmas; mercury, 4 drachmas; earth of Chios, 2 drachmas’¹⁰⁴; Figure 54 provides an example of this:

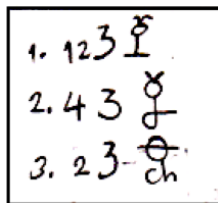


Figure 54: graphic, or sigil interpretation of the opening of recipe no. 5 showing different amounts

The option to freely invent material either erases or includes data already yielded for this sigil. If no amounts are given then the composed translation follows the automatic procedures given above. In total fifteen recipes were translated for contrabass using the methods described above. Figure 55 shows the pre-compositional sketch where data is derived for all eight processes.

¹⁰⁴ Jensen, 19

20. Another Formula			
2.	15 = Draw	2 = Compose	2 Compose
1. pl. 5:8 } 2:3 c 0 e 2 d 1 f 0 g 4 h 6 → pizz: glass:	$\frac{3:2}{c 0 e 0}$ d 0 f 1 g 0 h 1 c.l.: Const.	$\frac{3:2}{c 0 e 0}$ d 0 f 1 g 0 h 1 c.l.: Const.	
3. Dynamics 4 → 1:2 5 ↗ diff: (M)	$\frac{3:1}{0}$ 1 } no chg: (F)	$\frac{3:1}{0}$ 1 } no chg: (S)	
4. pts no mod 4 = 2 -2 pt +1	$\frac{1}{-1 pt +1}$	$\frac{1}{-1 pt +1}$	
5. $\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	
7. <i>Swing</i> 2 0 0 1 4 0	no chg	dens chg - (little chg)	
8. no no no			

Figure 55: pre-compositional sketch showing data derived from the sigils created from recipe no. 20

Fifteen recipes were translated into British Sign Language and filmed, and fifteen recipes were filmed being written out by hand. The recipes were not always the same ones; those chosen were those that could be signed and written inside one minute. Each portrait represents a different phase of a close-up: in every contrabass film the whole musician can be seen, in the sign language films the camera focuses in on the subject, for the writing the camera frames the small and direct space of the pencil drawing. The writing was filmed and executed upside-down (Figure 56); the camera (placed in front of the writer) to capture the writing the 'right-way up'. The three portraits are presented: of improviser Adam Linson, of British Language interpreter Lauren Redhead, and of the author writing the formulae.



Figure 56: the author writing the sigil formulae; from the writer's perspective each formula had to be written upside down for the image to be captured correctly

For the installation a large backlit screen is assembled and a projector displays both images from behind the screen. Figure 57 shows how the room at Galerie 8 (Bergen, Norway) was arranged.



Figure 57: documentation of *Leiden Translations*, the backlight screen allowed for both computer and projector to be behind the screen. Two loudspeakers were placed on either side

There is always a coupling of two separate films presented as non-touching images. Each film lasts one minute long, so each pair of one-minute films begin and end at the same time. Figure 58 shows a table of all fourteen possible film pairings.

Pairing Number	Right Screen	Left Screen
1	Sign Language	Blank
2	Contrabass	Blank
3	Writing	Blank
4	Blank	Sign Language
5	Blank	Contrabass
6	Blank	Writing
7	Sign Language	Contrabass
8	Sign Language	Writing
9	Contrabass	Writing
10	Contrabass	Sign Language
11	Writing	Sign Language
12	Writing	Contrabass
13	Writing	Writing
14	Sign Language	Sign Language

Figure 58: all possible pairings disregarding the content of each category of film

The only pairings not allowed are two blank screens or when two contrabass films are shown simultaneously. A further rule allows a contrabass sound file to be chosen at random even in the absence of a contrabass film. When a contrabass film is projected the patch decides randomly whether its sound file is played or not, but only the correct sound file can be chosen. Therefore, in the short interim before each film pairing appears the MaxMSP/Jitter patch makes three main decisions:

1. Which pairing (chosen randomly from the fourteen options listed above)
2. Which film(s) exactly (chosen randomly from each specific reservoir of films)
3. Whether the sound-file is heard or not.

Allowing the MaxMSP/Jitter patch to decide randomly if a sound-file is played was intended to present sound as independent an element as the visual imagery. This notion was further pursued in the thirteen minute film version of this piece.

Performances

1. 19—24.03.2014, Galerie Rom 8, Borealis Festival, Bergen, Norway

Leiden Translations: Film Version

In the film version I determined which pairings would be shown and when. My concern was to find a means by which categories of situation similar to those composed for the installation would take place, and, using the filmic language presented, aim at a perceivable logic. Figure 59 shows the running order of the film. Although the same rules applying to the installation apply to the film during the ninth minute two black screens are seen (implying ‘visual silence’) accompanied by a contrabass sound-file.

	1	2	3	4	5	6	7	8	9	10	11	12	13
W	88	31	X	30	96	X	63	X	X	21	88	44	43
S	X	75	34	X	55	63	X	33	X	X	X	87	43
B	X	X	61	91	X	X	45	42	X	20	X	X	X
Snd	45	X	61	X	X	42	45	X	91	20	X	111	X

Figure 59: plan for film of *Leiden Translations*. In the first column the film categories listed are: W (writing), S (signing), and B (contrabass). Snd (sound) lists which sound-files are being heard. The numbers written in the rows for W, S, B, and Snd, refer to the exact Leiden Papyrus X recipe numbers. As in the installation there is never a situation where a sound-file is heard which is different to that which the contrabassist is seen playing.

The choice of recipes for each category was not done randomly and the film is not a 13-minute recording of the running installation. All the instances were chosen for the qualities found while analysing and comparing the films. Since I wanted the film to lay bare the processes and relationships of the composition of the films I decided on a hierarchy of category appearance: writing appears most frequently (nine times; one recipe—no. 88—is repeated), signing is second most frequent (seven appearances), and the contrabass films being the least frequent (five appearances). Seven different contrabass sound files are heard, two contrabass appearances are heard together with their respective sound files, and during four instances contrabass sound files are heard without their respective contrabass films. During the fourth minute the music played by the contrabass is not heard until the ninth minute. Apart from the final four minutes there is no element that appears consecutively more than twice. Almost all elements appear during the twelfth minute where the sound file has both not been heard before, and this is the only sound file featuring one continuous playing technique, arco. For me the twelfth minute emerges as a cumulative climax in bringing together all elements presented until then.

The only time where two films represent a translation of the same recipe is at the very end, with writing and signing (number 43), however because of the differences of each language, and because of the context this narrative of de-coupling establishes, it becomes difficult to perceive. This 'vertical repetition' echoes how films of musicians are usually perceived: image with sound file. One writing film appears twice, during the first and eleventh minutes. In contrast there are no signing films that repeat.

As mentioned, the films were chosen for their characteristics. The writing films are differentiated in several ways, for instance: complexity (96 is complex in contrast to 63), the deliberation of the writing (21), similarity (44, and 43), and the choreography of the pencil movement, as if the pencil were 'thinking' (88, and 31). Almost all the films chosen for the signing contain long pauses at beginning and end. The bass sound files chosen for the film were deliberately not the loudest or dramatic; the contrabass films range from those filled with pauses, to those containing many different playing techniques (as with number 45), to the 'arco only' film (number 111).

The film version aims that sound is perceived as a parameter separate from, or independent of, the imagery. By allowing two films, or two languages, to be seen simultaneously my intention is their potential intercommunication. My intention was that a palpable relationship exist between the three categories of translation progressing from the symbolic (writing and sign language) towards the enacted (sign language and improvisation).

Alchemical knowledge is traditionally disclosed by a master to his disciple via initiation. One of the typical techniques used for initiation is a practice known as visualisation, the purpose of which is to fuse, or 'marry' both conscious and 'dream' parts of the psyche, otherwise known as a 'Chymical Wedding'. My intention is to present these film categories in pairs, allowing comparison of languages, and to represent a 'marriage of opposites' between the symbolic and the enacted, and to offer these translations as a visualisation of musical processes.

The meta-instrument here proceeds from thought processes rooted in a traditional notion of translation where the target text re-produces and serves every detail contained in the original. Despite this my perception of the complex results of this piece derive from the

non-exclusive relation they have to the three translation paradigms listed in the Translation chapter. These were identified as:

1. Original and Target Languages
2. Interstitial Space
3. Cultural Hybridity

My belief is that *Leiden Translations* relates to all these paradigms, but that this outcome was not planned. These relationships can be drawn both on conceptual and on practical levels. The installation delivers enactments of language as finished products: similar to where original and translated texts are printed on opposite pages, and the work behind each translation is mostly hidden. By implementing an inter-semiotic translation I contend that the realisation interrogates the first, traditional, paradigm of translation that yielded it and establishes a set of differentiated and subtle relationships with paradigms two and three listed above. This happens, I believe, because of the consequences of the randomness, the character of each non-verbal language, the context of presenting three different degrees of close-up, and the twoness of each presentation. Between these languages, and between both screens, complex moments of cross-over are apparent at levels beyond merely importing meaning from an original text.

Performances

1. 19.03.2014, Borealis Festival, Bergen, Norway
2. 29.03.2014, The Creative Zone, University of Sussex, Brighton
3. 1.06.2014, Canterbury Christ Church University, Canterbury

Spagyria

Spagyria, for solo piano, was completed in January 2014 and was also premiered at the Borealis festival. The piece derives mainly from my continuing research into alchemical texts¹⁰⁵ with the intention of further developing the approaches to translation pursued in *Leiden Translations*. The ‘translations’ in the installation were really a set of mapping procedures where the one-way movement traversing from an original to a target ‘language’ was the given situation. The open format of the installation allowed all the parts to be constructed in isolation from each other without needing to consider when they occur or in which combination. I term the hierarchical relation between the original and target text as ‘vertical’; conventional translation theory considers the original text as higher, or more important than the target language. Despite the fact that each language has difference encoded into it, each target language strives to serve the original language as faithfully as possible. The questions *Leiden Translations* presents led me to envisage a piece that could encompass translation from one initial constellation to a final one, where the discontinuities and continuities in the music, repetitions, or even reversals belonging to translation provide the central aspect of this piece. By doing this the central problem of translation (including its three paradigms) becomes the focus for the musical material trajectories Lachenmann describes. Placing more emphasis on the construction of these trajectories was a means of developing the translational concept as a central part of the meta-instrument for both *Spagyria* and my thinking in general.

In the writings attributed to Paracelsus (a twelfth century alchemist concerned with radically alternative medicines) there is ample reference to the word ‘spagyria’, a word he introduced as a central alchemical concept:

In the word spagyria two Greek words are hidden: span, to draw out, to divide; and ageiro, to gather, to bind, to join. These two concepts form the foundation of every genuine alchemical work, hence the often-quoted phrase "Solve et coagula, et habebis magisterium" (Dissolve and bind, and you will have the magistry).¹⁰⁶

¹⁰⁵ Junius, 1993, and Salfuère, 2009

¹⁰⁶ Junius, 3

Salfluëre condenses this formula into three main processes : “to separate, to purify, and recombine.”¹⁰⁷ My response was to employ categories of process such as: deconstruction, filtering, and re-construction, thus allowing a larger range of trajectories to be constructed. I decided on one singular transformation determining the form. Beginning with a music made of sentences and patterns of pianistic lines, points and chords, the piece progresses toward foregrounded resonances, punctuated by small and chaotic ‘islands’ of pointillist material. I decided against creating an algorithm that could automatically map and convert an extra-musical text, and chose to create an ‘assemblage’ of fragments arranged to perceptually support and resist the main transformational structure.

I created twenty-four pitch sieves, each of which fix specific pitches (as opposed to pitch classes) and are plotted out for the whole piece (Figure 60). These sieves supply the pitches for the seven short materials labelled A—G (Figure 61). These seven micro-materials that begin the piece are placed into a sequence using a looping Markov chain (five generations, see Figure 62). Before the Markov chain is executed a random number chooses the first letter, indicated by table no. 1 in Figure 62, bottom right (*not* the table framed by a blue square). Once the first letter has been chosen further letters are selected according to the Markov pattern. After the fifth generation the process is repeated. The list of letters this yields is displayed in the blue box to the bottom of Figure 62. Figure 63 shows the first two pages of the score.



Figure 60: twenty-four pitch sieves used for *Spagyria*

¹⁰⁷ Salfluëre, 111

The image displays musical notation for the opening of a piece, organized into sections A through G, plus 'Chord Material'. The notation is presented in two rows. The top row contains sections A, B, C, and D. The bottom row contains sections E, F, G, and Chord Material. Section A features a 3:2 ratio in the upper voice and 5:4 ratios in the lower voices. Section B has a 3:2 ratio. Section C is a simple melodic line. Section D is a complex chordal texture. Section E includes a large 13:12 interval and a forte (f) dynamic. Section F shows a 6:5 interval and dynamics from fortissimo (ff) to piano (p). Section G has a 3:2 ratio. The Chord Material section shows two chords with a 7/4G time signature and a pianissimo (ppp) dynamic.

Figure 61: all materials for the opening labelled A—G, plus ‘Chord Material’

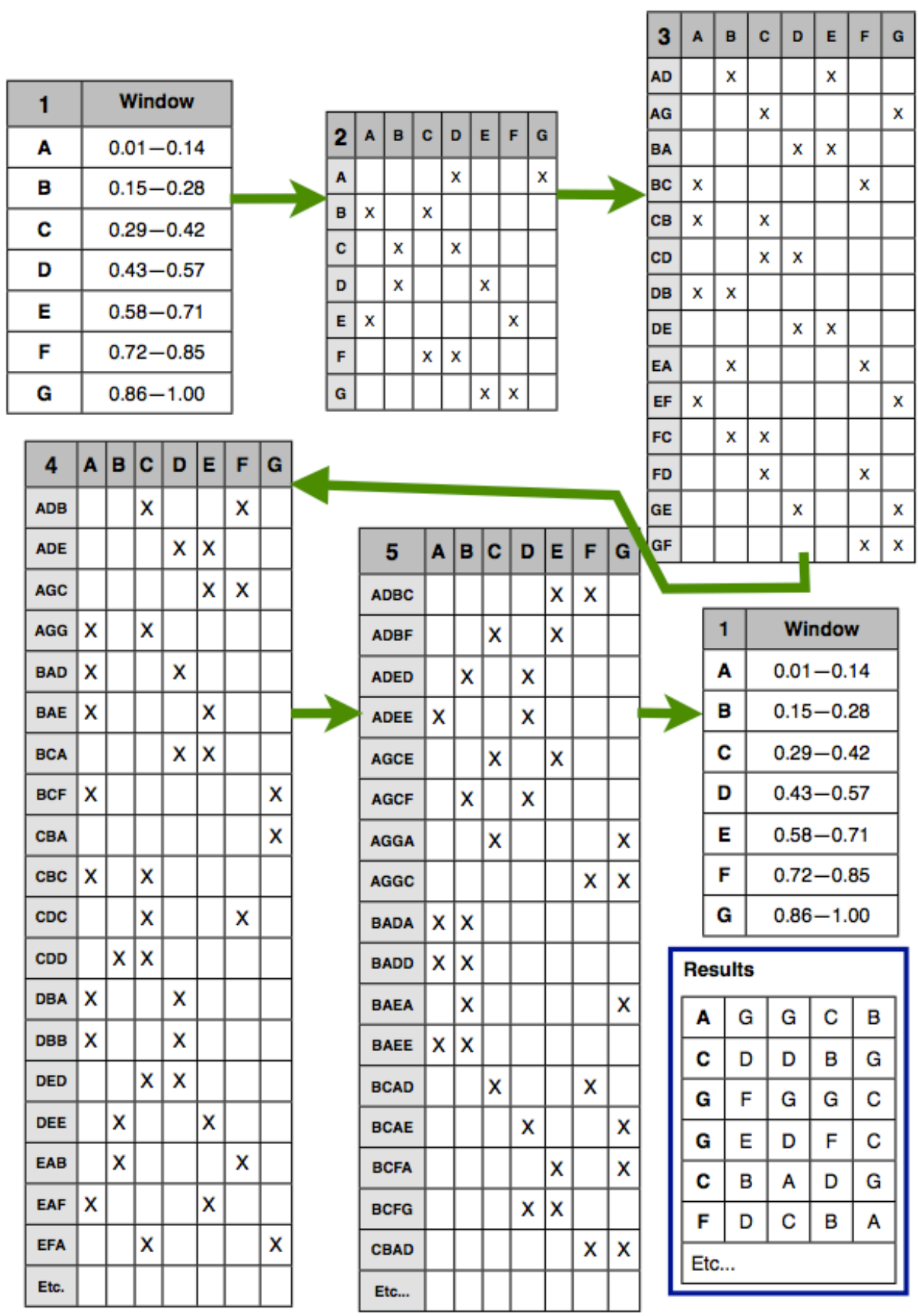


Figure 62: Markov tables show how materials (represented as capital letters) are presented and combined across the first two pages. The Markov pattern is not entirely strictly followed; some letters are missed out (indicated by square brackets). The quasi-repeated chordal material (bars 4–11) offsets the Markov sequence ordering.

The image displays three systems of musical notation for the piece 'Spagyria'. Each system includes a treble and bass staff with various musical notations such as notes, rests, and dynamic markings.

- Sieve 8:** Located at the top, it features a tempo marking of $\text{♩} = 60$. Chord labels in red include A, G, G, and C. Rhythmic markings like 3:2 and 5:4 are present.
- Sieve 6:** Located in the middle, it features a tempo marking of $\text{♩} = 140$. Chord labels in red include B, G, G, F, G, and C. A section is labeled 'Repeated Chord+Silence (8 bars)'. Dynamic markings include *pp*, *mp*, and *ppp*.
- Sieve 9:** Located at the bottom, it features a tempo marking of $\text{♩} = 60$. Chord labels in red include G, E, D, F, and C. Dynamic markings include *f*, *ppp*, *ff*, and *p*.

Figure 63: first two pages of *Spagyria*, the letters in red correspond to the sequence of letters in the blue box at the bottom of Figure 85. Letters in square brackets were ignored (*continues on following page*)

[C]

The musical score is divided into four systems, each with three staves (treble, bass, and a lower bass staff).
 System 1 (Measures 13-14): Labeled 'loco' and 'Sieve 10' and 'Sieve 8'. Dynamics include *pp*, *mf*, *f*, and *ff*. Material labels B, A, D, and Gi are present. Rhythmic values like 5:4, 3:2, and 9:8 are indicated.
 System 2 (Measures 14-15): Labeled 'molto staccato' and 'Sieve 7' and 'Sieve 8'. Dynamics include *mf*, *p*, and *ff*. Material label F is present. Rhythmic values like 6:5 and 7:6 are indicated.
 System 3 (Measures 15-16): Labeled 'Sieve 6' and 'Sieve 8'. Dynamics include *ff*, *pp*, and *ppp*. Material labels C, B, A, C, D, and D are present. Rhythmic values like 3:2, 7:4, and 5:4 are indicated. A 'Ped' (pedal) marking is at the end.
 System 4 (Measures 16-17): Labeled 'Sieve 6' and 'Sieve 7'. Dynamics include *p*, *ppp*, and *pppp*. Material labels B, A, [F]C, B, D, A, and F are present. Rhythmic values like 3:2, 7:4, 5:4, and 7:5 are indicated. A 'ped' marking is at the beginning.

(Figure 63 continued)

Although the miniature excerpts listed in Figure 61 are named as materials they were considered less as repeating motives and more as micro-ideas governed by structural principles. For example A consists of three impulses, the first of which is a chord where all three impulses are separated by slightly different durations; B consists of two notes only; C is a dyad separated by rests. While the looping Markov chains create quasi repeating sequences from these materials, the chances of a sequence of five repeating letters is

extremely low, the materials themselves are also rhythmically either altered slightly, or are given a different pitch sieve.

The trajectories running through this piece vary, combine, and reconfigure materials A—G. As an example of one of the main trajectories, Figure 65 shows how the single chord idea progresses outwards from the Markov sequences towards a complex haze of mid- and background piano resonances.

Bars	Description
End of bar 1	C material, singular dyad between two rests
4—11	Repeated chords of uneven duration and uneven rests
24—26	Short repeated chord, pedal action ‘captures’ resonances
33—44	Repeated chords, one to three pitches are given one of three different dynamics
56—63	Repeated chords that precede broken chord-like action ending in an accented held chord
131—133	Linear chordal passages
149	Repeated chords without variation
223—228	Broken chords with held down main (first) pedal
232—237	Broken chord actions followed by specific third pedal resonances
266—290	Interaction between singular chords, ‘captured’ pitch resonances, and third pedal resonances
291—319	Large linear shapes coupled with third pedal resonances and held pitches

Figure 64: trajectory showing: main chord → complex resonance

The categories described here relate to their first-time appearance only: the moments where they reappear or where they are combined with the more pointillist or linear material are not included. This is an example of how the trajectory of the single chord arrives at the complex resonant regions of the piece. This also demonstrates an example of how translation (understood both as a non-reductive response to the alchemic theme and as formal metaphor) receives a synthesis via a mode of organisation suggested by Lachenmann’s trajectories and the way these musical materials are networked together.

Performances

1. 19.03.2014, Ian Pace, Borealis Festival, Bergen, Norway
2. 30.05.2014, City University, London
3. 16.05.2014, PureGold Festival, Deptford Town Hall, Goldsmiths, London

Something Is Other Than It Is

The final piece in my portfolio is for solo bass clarinet and was commissioned by Ingólfur Vilhjálmsón. This piece represents a summation of the techniques developed and described in the chapter on *Spagyria* and is a further attempt at applying an extended understanding of theories of translation. The title derives from a seemingly non-sensical sentence towards the end of Giorgio Agamben's essay *Philosophy and Linguistics*¹⁰⁸ in relation to his discourse on potentiality¹⁰⁹. Agamben discusses the ontology of potentiality, in his essay *On Potentiality*, as outlined by Aristotle (derived from Book Three of *De Anima*) and identifies two forms, or 'modes of being': generic and existing potentiality. Generic potentiality describes the ability for a child to know or become someone, like a successful architect or the head of State. Existing potentiality—fundamentally different to the generic type—applies to a quality innate to an ability, or knowledge. One speaks of the musician's potential to perform, or the thinker's potential to write books. Crucially Agamben argues that in the moment potentiality exists then, by default, its opposite, or 'Non-Being', exists. Potentiality, therefore, suggests the 'presence of an absence'¹¹⁰:

Potentiality maintains itself in relation to its own privation, its own *sterēsis*, its own non-Being. This relation constitutes the essence of potentiality. To be potential means to be one's own lack, *to be in relation to one's own incapacity*¹¹¹.

The moment before something is realised can be regarded as the site of contingency existing within the boundary separating actuality from non-actuality. Agamben speculates whether this very boundary 'attests to the very *existence* of potentiality' and 'the actuality of contingency'.¹¹² If this is the case, one might then be able to utter a usually non-sensical, or impossible statement such that: 'something *is* otherwise than it is'.¹¹³ Such a statement can only be said within what Paolo Bartoloni describes as the interstitial space between

¹⁰⁸ Agamben, 62—76

¹⁰⁹ *Ibid.*, 177—184

¹¹⁰ *Ibid.*, 179

¹¹¹ *Ibid.*, 182

¹¹² *Ibid.*, 76

¹¹³ *Ibid.*, 76

actuality and inactuality, or being and non-being: this space is where ‘translation is naturally located.’¹¹⁴ This interstitial and liminal space was what I imagined for *Something Is Other Than It Is* at the level of the meta-instrument, or pre-compositional structure, rather than as something that occurs during performance as in, for instance, an improvisational, or indeterminate context.

Bartoloni remarks that, although Agamben does not address translation directly, his discourse on the ontology of potentiality goes beyond conventional translation theory.¹¹⁵ Bartoloni argues that the traditional juxtaposition of the original and the translation ‘appears increasingly inadequate to explain current phenomena of cross-cultural encounters and exchange.’¹¹⁶ Bartoloni's intention is to encourage a revision of the static methodological and theoretical framework such considerations are rooted in, all of which revolve around the idea of the original and the target as unchangeable and finite entities. Bartoloni's critique became increasingly relevant to my thinking especially after the experience of writing *Spagyria*. I avoided creating a translational algorithm—as with *Leiden Translations*—in favour of aiming at a work where each moment foregrounds the present as opposed to being subsumed to a deterministic teleology.

Referring to Bhabha's quote¹¹⁷ made in the Translation chapter, the prime vision of this piece was derived from the “*movement of fragmentation, a wandering of errancy*” (my italics)¹¹⁸ that I saw as providing both the template for the general character of the music itself, and the direction to take when considering the structure of the piece. Fragmentation suggests incompleteness, and a complex relationship to anything that could be recognised as forward motion. The wandering, or errancy implies that directional structures (i.e. becoming louder, less, or more filled with pitches) can be composed but not planned, as if part of a causal chain. When one wanders, one retraces steps, traverses the same and unfamiliar ground: one makes ‘mistakes’, and the present is more important than either start or finish.

¹¹⁴ Bartoloni, 3

¹¹⁵ Bartoloni (2003)

¹¹⁶ Bartoloni, 2

¹¹⁷ This quote can be read on page 22 of this thesis

¹¹⁸ Bhabha, 228

These concerns inform the meta-instrument for *Something Is Other Than It Is*.

Lachenmann's image of trajectories of material passing through a single sonic idea served here as a focus for pre-composition and as a technical means of interpreting the interstitial zone of translation as described by Bartoloni. Put simply, the sonic idea chosen for the bass clarinet sound was the fluttertongue; not even on a specific pitch, just the idea itself. These points constitute the meta-instrument for this piece, itself characterised by a narrative of 'fragmentation', 'movement', 'wandering', 'erring', and discontinuity. Taking the flutter tongue as a central locus I set up five broad trajectories. These trajectories made use of material seen as redefinitions of the flutter tongue technique, technically known as the voiceless alveolar trill. I created a network of freely connectable nodes drawn from the characteristics of this technique and set them out as a list:

1. Friction, or resistance, of continuous breath
2. Alternation
3. An almost regular sound wave is created
4. Two frequencies are produced via flutter-tongue technique
5. One of these frequencies is stable the other is less so
6. Despite the previous point the perception selects to hear a single frequency
7. One hears a single sound phenomena that comprising a frequency and a disturbance
8. An unvoiced Alveolar trill by itself creates a frequency ranging between 23—28Hz¹¹⁹
9. Exact speed and behavior of the flutter tongue is person specific
10. One can describe the behaviour of the speed changes during an alveolar trill as chaotic
11. The frequency the Alveolar trill creates is too low to be properly perceived as a separate frequency

Four main categories were used to generate the music: they freely used, combined, and 'reinterpreted' the points on the list above. These categories were:

1. Alternation of all kinds (regular/irregular, slow/rapid, etc)
2. Disturbance (different types of flutter tongue, combinations of playing techniques)
3. Discontinuity (especially regarding rhythm, juxtaposition of materials, use of silence)
4. Similarity/non-similarity

¹¹⁹ This frequency comes from reading wave forms taken from voiceless alveolar trill recordings made privately by the author

The names of the five trajectories also describe the musical materials (Figures 65–69):

Figure 65 first material: Irregularly patterned rhythm using microtonal pitches

Figure 66 second material: held notes, trill like material

Figure 67 third material: rapid pitches and isolated gestures

Figure 68 fourth material: alternation

Figure 69 fifth material: broken melody

The four-part form (Figure 70)—each part longer than its predecessor—was arranged to avoid the perception of a single, teleologic process.

	1				2				3				4													
Held note	B		B	D		E	G		C				H				A									
Rapid and gestural		E			F					C		B					D	E								A
Rocking alternation											C				B	G	A			E		D	F			
Irregular rhythm								B					A													
Broken line																										A

Figure 70: the divisions of the four part arrangement present the many different versions of each material represented as capital letters (Figure 71)

Using these different categories of materials I created scales to plot transitions between two defined extremes (Figure 71). After the very beginning there are no repetitions, the larger frequency of appearances of the ‘rocking alternation’ material (a composed slowed down flutter-tongue) in the fourth part provides a focus for the final part of the work. The progression each material makes broadly follows zigzag patterns. This was to avoid the perception of a linear progression for each material. The materials are presented as complex parallel narratives aiming to focus listening on the present. This relates to my formal concerns (wandering, erring, discontinuity) intended as an enactment of the translation metaphors discussed above.

Held note							Rapid and gestural
A 90–93	B 1–4	C 36–40	D 13–21	E 24–25	F 26–27	G 28–31	H 64–71
Rapid and gestural							Non-continuous
A 135–137	B 49	C 41–44	D 94–99	E 100–101	F 7–9	G 21–23	
Rocking alternation							Alternation with figures before and after main notes
A 86–89	B 73–76	C 45–48	D 122–126	E 102–115	F 127–134	G 77–85	
Irregularly patterned rhythm using microtonal pitches							
A 50–63				B 31–35			
Broken line							
A 116–121							

Figure 71: this table shows the five material categories displayed as scales (particularly the first three categories). Each letter comes with the bar numbers of their appearance.

The most favourable aspects of this work is in its continuing interrogation of and transformation of the notion of translation. This was enabled by transferring the notion of the interstitial zone of translation onto the pre-composition for this piece. A network was established by setting up trajectories of material and by composing situations informed by the metaphor of wandering, erring, movement and discontinuity. I see this approach to composition and specifically towards conceiving the meta-instrument as one which I was able to uncover from the vantage point of weighing up conclusions and perceptions gained from the work immediately previous to this. In this respect I see this as having been a starting point to derive further theory from which further creative work can be yielded.

Performances

1. 7.10.2014, Ingólfur Vilhjálmsson, AckerStadt Palast, Berlin

Conclusion

This thesis began with a close reading of Lachenmann's statement that posits instrumentality as a potentially useful metaphor and mode for composition. From this the notion of the meta-instrument was developed as an outside-time conceptual apparatus, itself constructed from three related activities: translation, ANT, and notation. This concept serves as a means of composing relationships and is the opposite of immediate or spontaneous procedures. To a great extent the meta-instrument described and discussed in the theoretical chapters pertains to Lachenmann's main sentence that was the impetus for this research project.¹²⁰ The research itself is concerned with pre-composition, which is that preparatory stage before both actual composition and before the final local decisions of detail in a piece are made. I have formalised this preparatory stage under the heading of the meta-instrument, which comprises the three main activities. The instrumental metaphor used implies that composition takes place within conceptual boundaries, and I have investigated how this can be likened to the interstitial zone of translation as described by Bartoloni and Bhabha. By implication this space is also the potential space as discussed by Agamben. The space the meta-instrument creates allows an infinite number of possible variations of the same musical idea; the type of meta-instrument determines the focus and resolution these possible variations of thinking have.

The challenge the meta-instrument may pose is to uncover and explore technical and aesthetic solutions which are, initially, new for the composer. Building and playing on an instrument implies acquiring skills to enable its player to produce layered results. However, towards the end of his essay, Lachenmann warns against believing that everything can be known, as if composition could occur a priori, and as if this could produce some comfortable distance for the composer. This would create a false sense of security between the composer and the work. Lachenmann writes:

I distrust the composer who knows exactly what he knows and what he wants, because his work will end up being exactly that, what he knows: this is insufficient.¹²¹

As a whole, this portfolio presents the development of the meta-instrument concept.

¹²⁰ This sentence can be read on page 14 of this thesis

¹²¹ Lachenmann, 81 "Ich mißtraue dem Komponisten, der genau weiß, was er will, denn er will meist das, was er weiß: also zu wenig." (my translation)

This development has been undertaken by gradually refining each of the component activities for each piece and by revising my understanding of these activities. It reveals how my understanding of translation has deepened, and how this knowledge and experience has yielded unexpected perspectives for the meta-instrument concept on a practical level. In having studied Agamben's concept of 'potentiality', the strong relationship between the main concept of the meta-instrument and the space of potentiality as described by Agamben has been uncovered.

The main answers to research questions this thesis has offered are: the identity of the meta-instrument, the usefulness of the meta-instrument as a metaphor, and the way that the constituent parts of the meta-instrument combine in every work. The meta-instrument as described here does not set out to establish a strict system of composition, but is offered as a useful set of conceptual tools which are either combined or not. It is presented as a transferable means of thinking through a composition before it is eventually written.

During this thesis, translation has been used to address the space between the vision of the composer and the technical means chosen. Increasingly the pieces presented develop techniques that foreground the problem of translation where the transmutation of one thing into something else becomes both the theme and, hence, the main function of the meta-instrument. ANT in this context has represented the creation of a network—while already an act of translation—as a method of interrogating the relationships the materials (whether physical or musical) have to each other as well as the background or even politics of such materials. In the future, I plan to develop this particular strand of research, specifically with respect to the interstitial zone of translation and cultural hybridity, with a further focus on the political implications that this strand of research has.

The meta-instrument, together with its attendant areas of research: translation, ANT, and notation are outside time structures. The outside-time structure, as discussed by Iannis Xenakis, addresses pre-composition directly. Xenakis' project *Formalised Music*¹²² was the application of mathematics to music, a project that demonstrates how each composition produces theory for further research. After having written *solo speaking* it became clear that by fragmenting the text suggested areas of research regarding categories of the unsaid, or of the latently expressed. This would imply an examination of a level of

¹²² Iannis Xenakis, *Formalised Music* (New York: Pendragon Press, 1992)

composition that, if harnessed, may contribute to a perceivable experience of 'layeredness' in the final result. As a desired outcome, layeredness is addressed by Lachenmann's notion of trajectories and Dean and Smith's Rhizomatic diagram that demonstrates how a cyclic or iterative process continuously improves the quality and relevance of one's research to one's practice. During the perception of a rich artwork the perception of its indicating multiple meanings, of its operating on several layers simultaneously might be taken for granted but in the process of composition is as much a part of the construction as any other part in a musical work. The phenomenon that a work can be pluri-vocal in this way for many pieces is my understanding of this term layeredness. The whole notion of the meta-instrument was developed from these beginnings with the interest, whether explicit or not, of aiming at layeredness as a real experience. This experience can only be hoped for and is not necessarily guaranteed by having assembled a particularly complex meta-instrument. Layeredness may arise by consciously evaluating and interrogating one's results during composition. This self-reflection is one method of refining the train and network of thought instigated by the meta-instrument.

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