

Sound of Poetry, Poetry of Sound
An Analysis of *Circle Map* for orchestra and electronics by Kaija Saariaho
AND
Night Landed for solo flauto d'amore and electronics

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Abstract

The music theory part of my dissertation is an analysis of Kaija Saariaho's *Circle Map* for orchestra and electronics. *Circle Map* is a six-movement work based on six quatrains by Jalal ad-Din Muhammad Rumi. In my analysis, I focus on the relationship between these quatrains and music. The main material of the piece is generated from Arshia Cont's voice reciting the quatrains in Persian. Saariaho has analyzed and used the sound of Cont's voice to compose both the electronic and orchestral parts. In addition, she has utilized various strategies, such as word-painting, to reflect the poetic and conceptual qualities of the quatrains. I examine *Circle Map*'s harmonic, melodic, rhythmic, timbral, and textural aspects to understand the structure of the individual movements and their overarching similarities. Along with my personal observations, I use the Expression Parameter system, developed by the Russian musicologist Valentina Kholopova, to examine the relationship between the orchestra and electronics and their impact on the form of the piece.

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“Sound of Poetry, Poetry of Sound”

An Analysis of *Circle Map* for orchestra and electronics by Kaija Saariaho

Introduction

Kaija Saariaho’s *Circle Map* for orchestra and electronics was commissioned jointly by the Royal Concertgebouw Orchestra, the Boston Symphony Orchestra, the Gothenburg Symphony Orchestra, the Orchestre National de France, the Royal Scottish National Orchestra, and the Stavanger Symphony Orchestra, premiered by the Royal Concertgebouw Orchestra. Based on six quatrains (*ruba’is*: pl.; *ruba’i*: sing.) from *Divan-e Shams-e Tabrizi* by Rumi, *Circle Map* was premiered under the baton of Susanna Mälkki in 2012. According to Saariaho, the six quatrains inspired and became part of the musical material for the work.¹

One of my main incentives for analyzing *Circle Map* has been its direct relationship with poetry. Language and poetry often shape my compositional choices on various levels and forms. From organizing musical structures around the timbral and rhythmic qualities of speech, to developing works with more implicit and poetic relations with its literary source material, I continue to explore more possibilities for creating an organic relationship between my music and text.

According to Saariaho, who has read various translations of Rumi’s poetry for a long time, the essence and imagery of Rumi’s quatrains became the immediate inspiration for the piece.² As a native Persian speaker, I was curious about Saariaho’s approach to the recited version of an extremely rich and multi-layered poetic work whose language she does not speak

¹ “Kaija Saariaho, *Circle Map* (2012),” Wise Music Classical, accessed April 25, 2019, <http://www.musicsalesclassical.com/composer/work/1350/47338>.

² Wise Music Classical, “Kaija Saariaho, *Circle Map* (2012).”

or understand. During my research, I was astonished by Saariaho's deep appreciation of the poetic, and philosophical aspects of *Circle Map*'s quatrains. This understanding has manifested itself as subtle and effective musical ideas that complement the analytical choices of the composer. *Circle Map* is the culmination of cerebral and visceral processes that reflect her deep logical and emotional relation with the quatrains. In the next chapters, I will discuss this topic at length.

Before composing *Circle Map*, Saariaho approached IRCAM's former Director of Musical research, Arshia Cont to hear the sound of the quatrains recited in Persian by him. According to the work's program notes: "Indeed, so connected is the work to Rumi's verse that the very musical material for the orchestra is based on the recorded Persian readings.³" In my conversation with Saariaho, she mentioned that the abstract rhythm and music of the words contributed greatly to the process of writing the orchestral part.⁴ Most of the electronic part was generated from Cont's sound of voice by Jean-Baptiste Barrière. In live performances, the electronic sounds are diffused across twelve loudspeakers surrounding the audience.⁵

In separate email correspondences with the composer, Jean-Baptiste Barrière, and Pirkko Moisala, the author of the book *Kaija Saariaho*,⁶ have all individually confirmed the absence of any analytical work on *Circle Map*. In my analysis, I mainly rely on my personal observations of the score and recording of the piece, because as Moisala puts it: "Saariaho aims at writing music that is best perceived by the ear, utterly unlike what she calls 'paper music'... she values musical

³ Wise Music Classical, "Kaija Saariaho, Circle Map (2012)."

⁴ Kaija Saariaho, Email to author, April 14, 2019.

⁵ Wise Music Classical, "Kaija Saariaho, Circle Map (2012)."

⁶ Pirkko Moisala, *Kaija Saariaho*, (Urbana: University of Illinois Press, 2009).

structures that can be perceived just by hearing...⁷” Moisala borrows the term ‘paper music’ from “Out of the Shadows,” an article by Andrew Clements, journalist and critique of the Guardian, published in August 25, 1995. The original article is not available on the Guardian’s official website. The recording of my choice is by Oslo Philharmonic Orchestra, conducted by Clément Mao-Takacs and published in 2019.

Writing the very first paper on a musical work is a daunting task, and I hope that my findings will shed more light on *Circle Map* and pave the way for more academic research on this piece. Certainly, there are several unique aspects of it that should be explored and documented in the future.

Part of my analysis is devoted to the Expression Parameter (EP) system developed by the Russian musicologist, Dr. Valentina Kholopova in the 1990s. Although this system is a powerful device for the analysis of contemporary music, it has been rarely used in the English-speaking world of music theory and analysis. My main reason for using the EP system in this paper is its emphasis on the perception of musical parameters and their role in shaping the structure of a piece. This system is especially aligned with Saariaho’s approach to music, as its primary focus is on listening and the auditory perception. I will lay out the fundamentals of the EP system in the next chapter. By modeling the EP system on Saariaho’s music, I try to show the adaptability and flexibility of the system, and hopefully, contribute to the slowly increasing number of analytical works that utilize this system.

In this paper, I aim to analyze *Circle Map* from different perspectives. After providing a brief introduction of Saariaho and Rumi, I focus on the relationship between the text and music,

⁷ Andrew Clements, “Out of the Shadows,” *The Guardian*, August 25, 1995, in Moisala, *Kaija Saariaho*, 75.

and discuss how each movement captures and reflects the poetic quality of its respective quatrain. In my view, examining the connection between the text and music of *Circle Map* is a step towards understanding Saariaho's preoccupation with the auditory effect of music. Although analysis of the voice and text is one of the pillars of *Circle Map*, the work certainly goes beyond 'paper music' and presents rich structures with sonic qualities and transformations that are immediately experienced by the ear. In other words, *Circle Map*, like several other works by Saariaho, is mostly about perception and I believe that my analysis should serve this perspective.

After analyzing the relationship between the text and music, I examine the transformation of the speech part, its different levels of clarity, and its effect on the harmonic, rhythmic, and timbral aspects of the orchestral part which leads to the formal analysis of the individual movements. In the next step, I examine these parameters in the framework of the Expression Parameter system. Finally, I focus on the structure and trajectory of *Circle Map* in its entirety. I found that the text has informed the music in a poetic manner, meaning that Saariaho organizes the harmony, timbre, orchestration, and structure of *Circle Map* based on the poetic symbols and connotations of the text. In some cases, she creates musical ideas that capture or imitate the literal meaning of the words, also known as word-painting. I investigate such moments from a rather subjective and poetic point of view in hopes of reflecting the depth of Saariaho's insight into the text and her creative choices for the musical representations of the subject matter.

As part of my research, I interviewed Saariaho in Paris in June 2019. The transcript of this interview is provided in the appendix of this paper. I will also refer to it in my discussion on different aspects of *Circle Map* when necessary.

Chapter 1: Pillars

1.1: Life, Education, Influences

Born in Helsinki in 1952, Kaija Saariaho was educated by Paavo Heininen at the Sibelius Academy. Heininen was one of the pioneers of modernism in Finland and influenced Saariaho and her peers, Magnus Lindberg and Esa-Pekka Salonen who are some of the most prominent figures of the contemporary music scene of our time. Together with Lindberg and Salonen, Saariaho established a group called *Korvat auki* which is the Finnish term for ‘Ears Open.’ *Korvat auki* was a dynamic and progressive collective advocating for the introduction of new music in Finland through performances and discussions.⁸ After graduating from the Sibelius Academy, Saariaho travelled to Freiburg to study with Brian Ferneyhough and Klaus Huber, at the Darmstadt summer courses. Later, she moved in Freiburg and became Ferneyhough’s student for two years. Both in Helsinki and Freiburg, Saariaho was trained according to the post-serialist school of composition which was far from her aesthetic preferences. She states: “... This was not what I wanted. These guys were drawing these unbelievable diagrams on the blackboard, system, and interaction, and all of that — and what did you hear of it in the music? All of that complexity, for what aural result? It [her two years in Freiburg] was kind of a crash course to get me out of that whole thing.”⁹

In 1982, Saariaho moved to Paris to study computer music at IRCAM, where she met her future husband Jean-Baptiste Barrière. Ever since, she has been based in Paris. Prior to her time at IRCAM, Saariaho had been introduced to the French spectralist composers, Gérard Grisey and

⁸ “Biography,” Kaija Saariaho, accessed July 15, 2021, <https://saariaho.org/biography/>.

⁹ Tom Service, “Meet The Composer: Kaija Saariaho in Conversation with Tom Service,” in *Kaija Saariaho: Visions, Narratives, Dialogues*, ed. Tim Howell (New York: Routledge, 2011), 9.

Tristan Murail. She describes her first encounter with their music as “fantastic” and explains: “I will never forget the effect it had on me... It sounded so fresh, it was just unbelievable. We had this post-serial education, where octaves were forbidden even in an orchestral context, and Grisey’s and Murail’s music just sounded so good. Gérard had already articulated certain things in writing about his approach to the overtone series, which helped me a lot.¹⁰” The analytical approach of spectralists towards sound helped Saariaho develop her personal method for devising harmonic structures, microtonality, notation. She became interested in studying the quality and effect of sound from pure pitch to noise and was also able to further systematize her approach to timbre and its relationship with harmony and form. In *Timbre and Harmony: Interpolations of Timbral Structures* which is an outcome of her studies and research at IRCAM, Saariaho defines timbre as a multifaceted parameter. According to her, any given timbre can be described based on its purity (noisy vs. pure) or its texture (grainy vs. smooth,) etc.¹¹

Using tools, such as sonograms, composers and researchers like Pierre Schaeffer and Denis Smalley have tried to create a set of terms to describe timbre systematically and objectively, e.g. harmonic versus inharmonic.¹² They use methods such as spectromorphology, which analyzes the attributes, behavior, and transformation of sound in time. Saariaho, on the other hand, prefers subjective and descriptive terms (smooth, bright, etc.) that have little to do with the psychoacoustic terminology.¹³

¹⁰ Service, “Meet The Composer: Kaija Saariaho in Conversation with Tom Service,” 8.

¹¹ Kaija Saariaho, “Timbre and Harmony: Interpolations of timbral structures,” *Contemporary Music Review*, 2:1 (1987): 93. <https://doi.org/10.1080/07494468708567055>.

¹² Dennis Smalley, “Spectromorphology: Explaining Sound-Shapes,” *Organised Sound*, 2: 2 (1997): 120. <http://www.yorku.ca/vannort/smalley-spectromorphology.pdf>.

¹³ Smalley, “Spectromorphology: Explaining Sound-Shapes,” 93.

She was able to expand her knowledge and proficiency in working with timbre as a form-bearing element. The polarity between the dynamism and stasis of timbre is an influential element in *Circle Map*. Frequent timbral transformations in the orchestral and electronic parts determine the trajectory of each movement and the overall form of the piece. Saariaho claims that she has always avoided using predetermined structures, and has organized the form of her works according to the musical material and its potentials.¹⁴

Part of my analysis, on both micro and macro levels, investigates these timbral transformations, their function, and impact on our perception of the music and speech. These timbral transformations are often paired with melodic, harmonic, rhythmic, and textural ones to create rich and multi-layered musical processes. In several cases, the conceptual and sonic aspects of the text are the main sources of the musical ideas and structure of each movement. Therefore, it is important to investigate the timbral features and transformations of *Circle Map* in parallel with harmony, rhythm, register, etc. and while taking the quatrains and Cont's voice into account.

The quatrains contain several words that invoke color, brightness, shape, and movement, and Saariaho still seems to prefer descriptive adjectives to express her views on the timbral qualities in her works. Hence, I have decided to follow the same path and use similar descriptive and subjective terms to analyze the timbre of *Circle Map*. My analysis of timbre will be in relation to the other musical parameters and in the context of the quatrains, their meaning, form, and imagery.

¹⁴ Smalley, "Spectromorphology: Explaining Sound-Shapes," 93.

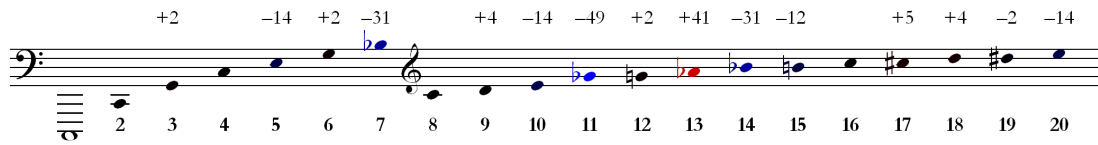
At IRCAM, along with gaining experience proficiency in acoustic composition, Saariaho acquired the techniques of computer-assisted composition and gained the skills to work with tape and live electronics. This shaped her views on writing for orchestra and led her to concentrate on creating dense masses of sound that transform at a glacial rate. She developed multiple pieces based on computer-based analyses and processes. *Vers le Blanc* (1982) and *Stilleben* (1987-8) are two of her works from that period that follow the spectral analysis and sound synthesis methodically. Ever since, she has written numerous electroacoustic pieces with live sound processing. When I asked her about the influence of *Vers Le Blanc* and *Stilleben* on *Circle Map* as well as her choice of fixed media over live electronics, she expressed that her approach to electronics has changed in time, and she always goes with the most effective practical solutions for creating and executing the electronic part.¹⁵

Saariaho's affiliation with IRCAM, where the tools and ideas of spectralism were developed, have had a long-lasting impact on her thinking and practice. She is sometimes referred to as a post-spectral composer. Developed by a group of French composers, most widely represented by Gérard Grisey and Tristan Murail, the spectral school focuses on the digital analysis of different sounds, including their overtone series and timbral specifications, and using them as the core material for developing a musical work. Any sound contains an overtone series, whose frequency, timbre, and amplitude contribute to their unique profile. Although there is an order and proportion to the frequency of the overtone series, natural sounds often deviate from these mathematical calculations. This phenomenon, called inharmonicity, is the main reason behind the versatility of sounds in our world.

¹⁵ Kaija Saariaho, "Interview With Kaija Saariaho," interview by Aida Shirazi, June 25, 2019, audio.

Theoretically, the overtone series of a synthetically generated C1 may seem as follows:

Example 1



In this example, C1, is the fundamental or the first partial. Starting from C2, the overtone or partial series of C1 begin and can, theoretically, continue infinitely. The image above does not provide any information on the amplitude of the partials. The numbers 1-20 at the bottom of the staff demonstrate the order of the harmonics in the series. The values on top of some of the pitches, such as the third, fifth, seventh, ninth, tenth, etc. demonstrate the difference in the intonation of those pitches in comparison with the equal temperament system. These numbers are in cents. Given that each half step consists of a hundred cents in the equal temperament system, the third partial of C1, G2 is two cents higher than the equally-tempered G2, and E3, the fifth partial of C1, is fourteen cents lower than the equally-tempered E3. Worth noting is that the frequency of a C1 produced by an acoustic instrument, human voice, or any object can be slightly or dramatically different from a “perfect” or “ideal” C1 synthesized by a computer. As a result, the frequency and amplitude of the overtones of that instrument, voice, or non-musical object will vary as well.

The amplitude and frequency of sounds and their partials are not audible or measurable by the human ear, therefore, spectralists use tools such as spectrograph to conduct a microscopic analysis of any given sound. They develop musical structures that are informed by one or more

of the properties of the analyzed sound(s.) by using electronic music techniques such as frequency, amplitude, and ring modulation. Essentially, spectralists are curious about the evolution of sound in time and space. For this reason, the music of early spectralists often unfolded at a glacial pace with slight changes. These composers were interested in creating a space where music can be experienced and perceived viscerally.

The spectralist movement was a reaction to serialism and integral serialism that had dominated the European classical music scene since the 1920s. According to the initiators and proponents of spectralism, integral serialism had turned music into a set of abstract calculations whose sonic representation was impossible to be perceived by the human ear and brain. Spectralism advocated for a return to the sound as a source of musical creation. With a strong focus on psychoacoustics and auditory perception, the movement approached sound as a basic material with an extraordinary potential for the creation of music that is cerebrally and viscerally appealing. Although rejected by Grisey and Murail, the term 'spectralism' was coined by the French composer and philosopher, Hugues Dufourt. The roots of spectralism go back to as early as the 20th century and can be found in the music of Claude Debussy, Edgar Varèse, and Olivier Messiaen. Because of their special attention to sound and its characteristics such as the timbre, these composers are sometimes referred to as protospectralists.

Since the initiation of the spectral movement, the computer-assisted sound synthesis was a popular technique among the composers. At the same time, spectral composers were interested in the instrumental sound synthesis. In this technique, the composer takes any analyzed sound as a model, studies its various aspects, approximates its overtone series, and orchestrates it for any given acoustic instruments. When the combination of instruments play the overtones of any

specific sound, they produce a new timbral quality called “timbre-chord,” which is a term used by Grisey.¹⁶ He believed that instrumental synthesis “creates a hybrid entity for our perception, a sound that, without yet being a timbre, is no longer really a chord, a kind of mutant of contemporary music, derived from intersections between new instrumental techniques and additive synthesis realized with the help of computers.¹⁷”

Gérard Grisey’s *Partiels* is often considered the first emblematic spectral piece written. The work is for 18 musicians in 1975 and is based on the spectral analysis of the note E2 on the trombone. After analyzing the sound, Grisey has reconstructed some of it in the acoustic instruments and composed the entire *Partiels* based on it. The contracted harmonic series of E2 on trombone is as follows:

Example 2



Another emblematic example of spectral compositions is Jonathan Harvey’s *Mortuos Plango, Vivos Voco* (1980) for eight-channel tape produced at IRCAM. For this piece, Harvey has recorded, analyzed and manipulated his son’s singing voice and the sound of the largest bell at Winchester Cathedral. He has used the same Latin text written on the very bell which reads as: “HORAS AVOLANTES NUMERO, MORTUOS PLANGO, VIVOS AD PRECES VOCO (I

¹⁶ “Instrumental Synthesis,” Actor Project, accessed June 30, 2021, https://www.actorproject.org/tor/timbre-lingo/2020/6/14/instrumental-synthesis-timbre-lingo-11#_ftn2.

¹⁷ “Instrumental Synthesis,” Actor Project.

count the feeling hours, I lament the dead, I call the living to prayer).¹⁸” The piece comprises of eight sections, and each section is based on one of lowest overtones of the bell. To build the chords, Harvey has used thirty three partials from the bell sound, and utilized glissandi to modulate to different parts of the spectrum.¹⁹ Based on the sound of the bell and voice, Harvey has incorporated a hybrid of pre-recorded and synthesized sounds that are close enough to their original sources. The pitch material and harmonies of *Mortuos Plango* are based on the partials of Harvey’s choice. Below is the harmonic spectrum of the Winchester Cathedral:

Example 3



The frequency deviation of the overtones of the Cathedral bell is evident at the first sight and through its comparison with the mathematically generated overtone series.

The voice part of *Mortuos Plango* is created with a program called CHANT, developed by Gerald Bennett and Xavier Rodet.²⁰ The program was designed as an interactive, expandable instrument that consists of the analysis and composition components.²¹ One can both configure the values of preexisting parameters or define their own parameters to design the

¹⁸ “Sketches for *Mortuos Plango*, *Vivos Voco* (1980) Jonathan Harvey,” *Cut And Splice* 2005, BBC Radio 3, BBC, 2004, accessed July 10, 2021. <https://www.bbc.co.uk/radio3/cutandsplice/mortuos.shtml>.

¹⁹ Peter Manning, *Electronic and Computer Music*, (Oxford: Oxford University Press, 2004), 201.

²⁰ Jonathan Harvey, “*Mortuos Plango*, *Vivos Voco*: A Realization at IRCAM,” *Computer Music Journal* 5, no. 4 (Winter 1981): 24, <https://doi.org/10.2307/3679502>.

²¹ Xavier Rodet, Yves Potard, and Jean-Baptiste Barrière, “The CHANT Project: From the Synthesis of the Singing Voice to Synthesis in General,” *Computer Music Journal* 8, no. 3 (Autumn 1984): 15, <https://doi.org/10.2307/3679810>.

sound of their choice, and in that regard, CHANT is an exceptionally malleable and diverse synthesizer.²²

While analyzing his son's voice, Harvey has mostly focused on the formant analysis which is of the interest of many other spectral composers as well. Formants are frequency peaks in the spectra of the voice. In each formant, the frequency of certain partials are stronger than others. These frequencies give a unique timbral character to each sound. Normally, vowels are more prominent than consonants. By analyzing the formants of the consonants and vowels of the text, Harvey was able to synthesize similar sounds to blend and complement the voice and bell sounds effectively. This process demonstrates the complexity of certain sounds, such as the voice, which is the subject of interest of many spectralists. Moreover, it demonstrates the depth and extent of spectral analysis that surpasses generating musical materials from the mere overtone series. In *Mortuos Plango, Vivos Voco*, Harvey takes the complex phenomenon of human voice to reflect the profoundness and expressivity of the subject matter of the piece. In his notes about the piece he writes: "The bell counts time (each section has a differently pitched bell stroke at its beginning): it is itself a 'dead' sound for all its richness of sonority: the boy represents the living element. The bell surrounds the audience; they are, as it were, inside it: the boy 'flies' around like a free spirit."²³

Although Jonathan Harvey and Kaija Saariaho's approaches to the text, human voice, analysis, and synthesis have led to entirely different results, their musical intentions bare considerable similarities in the creation of *Mortuos Plango, Vivos Voco* and *Circle Map*. First of

²² Rodet, Potard, and Barrière, "The CHANT Project: From the Synthesis of the Singing Voice to Synthesis in General," 25.

²³ BBC, "Sketches for *Mortuos Plango, Vivos Voco* (1980) Jonathan Harvey."

all, like Harvey, Saariaho has used CHANT in *Circle Map* to homogenize sounds of various natures. Both composers have used the human voice and its elaborate spectral characteristics to create highly expressive musical structures that serve the text and highlight its meaning and atmosphere. Finally, in both works, the harmonic, timbral and textural blend of the two parts (bell and voice in Harvey and orchestra and voice in Saariaho's case) are central concepts, and both composers use spectral methods to achieve this goal.

Decades after the initiation of the spectral movement, timbre is still a principal element in contemporary music. While it might not always function as a form-bearing parameter of every composition, timbre can be as present and influential as other musical parameters such as rhythm, melody, harmony, etc. By using what is often called "extended instrumental and vocal techniques" and methods of computer-assisted composition, composers keep pushing the boundaries of timbre in the acoustic, electroacoustic, and electronic music. In the twenty-first century music, approaches to timbre range from objective and analytical to more subjective and personal ones. In all cases, composers experiment with timbre to create musical structures with various degrees of expressivity, complexity, and sophistication.

During her years at IRCAM, Saariaho immersed herself in the world of spectralism and spent the next years perfecting its techniques. Her fascination with timbre and texture continued to grow and led to further explorations and discovery of new and personal realms of music composition. On a few occasions, Saariaho collaborated with Stephen McAdams, Canadian composer, psychoacoustician, and founder of IRCAM's first Music Perception and Cognition Team, to work on areas such as the musical timbre and its function. Saariaho and McAdams co-authored an article entitled as *Qualities and Functions of Musical timbre* which "describes both a

musical and psychological search for form-bearing elements in music.²⁴ They studied the function of timbre in poetic speech to understand “its implications for underlying psychological structures that allow this art form to have such a high degree of sophistication.²⁵” Saariaho and McAdams have succeeded to construct a digitally synthesized musical language with new musical elements.²⁶ The impact of this research is still evident in many of Saariaho’s vocal works with slow timbral transformations and textures that comprise of homogeneous acoustic and synthesized sounds.

IRCAM’s voice synthesis program, CHANT, has been one of the most frequently used programs by Saariaho.²⁷ She has been able to add various types of timbres, harmonies, and noises to her pre-existing pool of electronic and acoustic sounds.²⁸ In addition, using CHANT, she has created resonant filters to modify the harmony and timbre of different sounds. *Lonh* for soprano and electronics (1996) is one of the widely known works with the extensive usage of CHANT. In this work, Saariaho uses resonant filters to process and modify the singer’s voice.

Back in Finland and as a student of Paavo Heininen, Saariaho received a rigorous training in serial music. Although not a serialist, her music manifests some of the influences of serialism. In several of her pieces, including *Circle Map*, she normally uses a limited amount of musical material —often a melodic gesture, a sonority, or rhythmic pattern— in a focused manner and

²⁴ Stephen McAdams, Kaija Saariaho “Qualities and Functions of Musical Timbre,” *ICMC Proceedings 85* (1985): 367, <https://quod.lib.umich.edu/cgi/p/pod/dod-idx/qualities-and-functions-of-musical-timbre.pdf?c=icmc;idno=bbp2372.1985.058;format=pdf>.

²⁵ McAdams, Saariaho, “Qualities and Functions of Musical Timbre,” 367.

²⁶ McAdams, Saariaho, “Qualities and Functions of Musical Timbre,” 367.

²⁷ Service, “Meet The Composer: Kaija Saariaho in Conversation with Tom Service,” 10.

²⁸ Kaija Saariaho, “Using the Computer in a Sear for New Aspects of Timbre Organization and Composition,” *International Computer Music Association*, Rochester, New York, (October 1983): 270. <http://hdl.handle.net/2027/spo.bbp2372.1983.021>.

develops it throughout the work. Obviously, her methods of development are not based on the techniques of serial music, because the sound itself and its behavior in time and space are her main concerns for organizing the structure of her words. Essentially, Saariaho's selective approach to spectralism and electronic music applies to serialism as well. She regards its techniques as a tool that help her achieve her creative and expressive goals in her desired way. Anssi Karttunen, cellist and Saariaho's friend and collaborator of several years, believes that her influence from the prominent figures of serialist and expressionist music, Arnold Schoenberg, Alban Berg, and Anton Webern is most evident in trying and succeeding to develop her own distinctive musical language. According to him: "They come from a strong romantic tradition, but they develop very personal languages. Their emotional world is so strong that nothing can hinder it from getting into their music, whatever musical language they use. This is an important parallel with Kaija's music."²⁹

Saariaho's hybrid style and techniques of composition influenced by different methods is similar to that of Jonathan Harvey. In his early years as a composer, Harvey studied with Hans Keller and Erwin Stein who were students of Schoenberg.³⁰ Harvey was also a scholar of Karlheinz Stockhausen's music and wrote a book about him entitled "The Music of Stockhausen: An Introduction." His early training, interest in Stockhausen's music, and studies with Milton Babbitt at Princeton University in 1969 contributed to Harvey's affinity with both serialist and electronic music.³¹ In 1980s, he was invited to IRCAM by Pierre Boulez to develop some of his

²⁹ Moisala, *Kaija Saariaho*, 77.

³⁰ "Jonathan Harvey," Faber Music, accessed July 11, 2021. <https://www.fabermusic.com/we-represent/jonathan-harvey>.

³¹ Jonathan Harvey, "Jonathan Harvey on the record," interview by Bob Shingleton, *An Overgrown Path*, May 20, 2014. <https://www.overgrownpath.com/2014/05/jonathan-harvey-on-record.html>.

electronic compositions.³² During his residency at and thereafter, Harvey created several spectral and electronic works such as *Mortuos Plango, Vivos Voco* (1980,) *Advaya* for cello and electronics (1994,) and *Speakings* for orchestra and electronics (2008.) He continued to amalgamate techniques and methods of spectral, serial, and electronic composition and share characteristics of all three of them.

As mentioned previously, Saariaho always aims to make music that is perceived and appreciated by ear, and this fact helps us contextualize her fascination with spectralism and psychoacoustics. Worth noting is that Saariaho does not consider herself a spectralist. She does not entirely rely on the methods and techniques of spectral analysis in all of her pieces, and when she does it, she often treats the result of her analysis with a great degree of liberty. She describes Grisey's approach as "very systematic" and elaborates: "He had a very systematic way of analysing his sonograms; his orchestration was mathematical, and my work was not at all systematic or mathematical. It comes back to what I learnt from the technology at IRCAM and elsewhere. The technology... only gives you what you put into it, what you ask it... The machine cannot compose for you, cannot make you better... I didn't have any ambition to create a program that would do something complex and wonderful, because I want to do the complex and wonderful myself.³³"

When I asked her about the role of analysis in developing the harmony of *Circle Map*, she responded: "I'm completely free even when I deal with analysis and computers. I just used them to inspire myself, but I don't feel attached to them.³⁴" Basically, Saariaho has absorbed and

³² Harvey, interview.

³³ Service, "Meet The Composer: Kaija Saariaho in Conversation with Tom Service," 13.

³⁴ Saariaho, interview.

adopted some of the principles of the spectral school, but her artistic choices always come before any analysis. Therefore, she is often considered as a post-spectral composer.

Nature is another factor with a profound influence on Saariaho's world and her thinking about music. According to Saariaho, being a native of Finland and spending extended periods of time in the vast and constantly-changing landscape of the country have shaped her music in various ways. On several occasions, she has discussed the manifestation of natural processes and elements in her music. In an interview at NJORD Festival in Denmark, she explains that she lived close to Nature as a child, and spent her time in large forests during and after the rain. She names lakes, sweet and salty water, different degrees of coldness and their impact on the snow and acoustics of the environment as some of the influential images and sounds of Nature. Dramatic changes of the light during the year is another phenomenon of high importance in her work. Finally, she asserts that spending the early years of her life in a different environment, such as Paris where she has lived for a long time now, would have affected her music differently.³⁵

In another interview, conducted and published by the Carnegie Hall, Saariaho describes the relationship between Nature and her music as "complex."³⁶ She continues that her inspiration from natural elements is rarely expressed as a direct description of them and more about creating processes that transform musical ideas. She names *Nymphéa* for string quartet and electronics as an example, where natural elements such as wind and water or living organisms such as flower are the starting points of the composition. In this work, the water lily is represented by a symmetrical idea which is broken by rhythmic and melodic transformations and repetitions

³⁵ Kaija Saariaho, "Composer Kaija Saariaho about Nature..." Facebook Video, January 29, 2016, <https://fb.watch/v/2RIIaQusk/>.

³⁶ Kaija Saariaho, "Kaija Saariaho on The Role of Nature in Her Work," Carnegie Hall, February 17, 2012, 1:24, <https://www.youtube.com/watch?v=pEmSVqegTi4>.

symbolizing the wind and water that move and deform the flower.³⁷ In other words, Nature is an important tool for transforming musical materials in Saariaho's music. Other works such as *Neige*, *Sept Papillons*, and *Petals* are written based on natural elements and phenomena as well.

Although Nature is not central to *Circle Map*'s creation, elements such as wind, birdsong, the Moon and its rotation, and day and night are represented as musical ideas and processes in it. The recurrence of some of these ideas and processes, especially the wind and birdsong, confirm their significance for the composer. Moreover, they function as unifying elements among the movements. The role of Nature in *Circle Map* will be discussed in detail in the next chapter.

As stated before, spectralism focuses on analyzing sound and its properties for the purpose of developing musical structures based on them. Sound is the vibration of matter against the molecules of air, a physical and natural phenomenon with measurable and describable properties. The preoccupation of spectralists with the sound and, consequently, its overtone series, inherent rhythmic patterns, timbre, behavior in time and space, and effect on our perception should be interpreted as a form of fascination with Nature. Under the influence of spectralism, Saariaho's special attention to timbre, its natural transformation in time and space, and its impact on the human perception further confirm her fascination with Nature. Ultimately, it is crucial to understand that Saariaho uses musical ideas and processes to symbolize Nature and create a profound poetic representation of Rumi's poetry. Sounds of Nature are transformed and they transform musical ideas to picture and idealize the sound and imagery of *Circle Map*'s quatrains.

³⁷ "Nymphéa," Kaija Saariaho, accessed June 21, 2021, <https://saariaho.org/works/nymphea/>.

1.2: The Role of Text in Saariaho's Music

As previously stated, a large portion of Saariaho's oeuvre contains works set on or influenced by poetry. While using text has been historically common among composers, not all of them start their training and career as vocal music composers. Saariaho, however, seems to have stepped into the world of composition by writing her own songs on the guitar. Asked by Tom Service about her urge to express herself musically at an early age, she responded:

“I wouldn't have dared to show my composition to anyone at that age. But the first things I tried when I was nine or ten, I played on the piano in our living room... So I learnt the guitar when I was 13, because I could play it on my own in my room. And I started to compose a piece called 'Yellow and Nervous.'
It's interesting: that title was two things, the character — because I'm always looking for some character in my music — and this colour perception I have always had. I don't know where it is now, but that was a piece I tried to write down. And as time went on, I began to express myself by setting poems and writing songs.³⁸”

Saariaho's continued writing songs and setting music to text until she was temporarily prohibited from it by her composition teacher, Paavo Heininen at the Sibelius Academy. In the same interview with Tom Service she states: “One turning point was when Paavo told me not to write any more vocal pieces — ‘it's too easy for you— now you'll concentrate on instrumental music.’ And it was very difficult, like telling an alcoholic not to drink any more. Even when I read the telephone book, I started to hear music!³⁹”

Saariaho carried her passion for vocal music and music inspired by text through the years. From her operas, *L'amour de loin* (2000,) *Adriana Mater* (2005,) and *Émilie* (2008) with librettos by Amin Malouf, and *Only the Sound Remains* (2015) based on translations of two Japanese Nôh theater plays by Ezra Pound and Ernest Fenollosa, to *Grammar of Dreams* for two

³⁸ Service, “Meet The Composer: Kaija Saariaho in Conversation with Tom Service,” 5.

³⁹ Service, “Meet The Composer: Kaija Saariaho in Conversation with Tom Service,” 9.

sopranos, based on the book *The Bell Jar* and poem *Paralytic* by Sylvia Plath, and *Circle Map*, she has experimented with different genres and languages. She has created numerous works that not only reflect her sensitivity and inventiveness in combining text and music, but also have pushed the boundaries of text-based contemporary music.

Saariaho has used texts in French, English, and German, and so far, *Circle Map* is her only work in Persian which she does not speak.

1.3: On Rumi

Originally from Balkh, located in today's Afghanistan, Jalal ad-Din Muhammad Balkhi, also known as Jalal ad-Din Muhammad Rumi, Mowlavi (Mevlevi,) and Mowlana (Mevlana) was a poet and theologian of the thirteenth century. He was born in 1206, and as a young man, fled from the Mongolian invasion to Konya, currently part of the territory of Turkey. From a young age, Rumi was familiar with Sufism, mystical love, and the techniques and rules of Persian and Arabic poetry.⁴⁰ Upon his encounter with the wandering dervish, Shams-e Tabrizi, Rumi's life changed forever. "The men read and recited spiritual poetry and became almost inseparable for at least two years."⁴¹ As Nilgün Anadolu-Okur states in her article *The Enduring Allure of Rumi and Sufism in American Literature*: "Reynold A. Nicholson, a Rumi translator and author, asserts that Rumi 'found in the stranger that perfect image of the Divine Beloved which he had long been seeking'.⁴²"

⁴⁰ Annemarie Schimmel, *Rumi*, (New Delhi: Oxford University Press, 2014), 2-3.

⁴¹ Nilgün Anadolu-Okur, "The Enduring Allure of Rumi and Sufism in American Literature" in *Muslims and American Popular Culture*, eds. Iraj Omidvar and Anne Richards (New York: Praeger, 2014,) 249.

⁴² Anadolu-Okur, "The Enduring Allure of Rumi and Sufism in American Literature," 249.

After a while, Shams disappeared unexpectedly, and his sudden absence had such a great effect on Rumi, that he started dancing in whirls to the sound of music and reciting poetry.⁴³ Rumi's major poetic works include *Masnavi-ye-Ma'navi*, consisting of six books of poem on Sufism, as well as *Divan-e Shams-e Tabrizi*. Based on Badi-uz-Zaman Foruzanfar's edition of *Divan-e Shams*, which is the result of his work on the oldest manuscripts available, the book contains 44,282 lines of poetry, including 1283 quatrains.⁴⁴

The Mevlevi Order, whose followers are also referred to as the whirling *darvishes* (plural; singular: *darvish*) have continued Rumi's path to this day and are known as one of the most important *sufi* orders of the world. They are based in Konya.

1.4: On the Translation of Quatrains

Saariaho has used the book, *Unseen Rain: Quatrains of Rumi* by John Moyne and Coleman Barks who have published one of the most popular translations and interpretations of Rumi's poetry in the United States. Barks started translating Rumi's poetry in 1976. According to Anadolu-Okur: "Since then, he has published several volumes of Rumi's poetry, some of which appear in the seventeenth edition of the Norton Anthology of World Masterpieces."⁴⁵

Saariaho has read different translations of Rumi for several years and added the following in her interview: "I don't understand Persian at all and I had never worked with a language that I didn't know, so this was a very different kind of experience. I have the poems in many translations, especially I like one of the translations that I found on one of my trips to New York.

⁴³ Annemarie Schimmel, *Rumi*, 4.

⁴⁴ Badiozzaman Foruzanfar, *Kulliyat-e Shams*, (Tehran: Amir Kabir Press, 1957), 66.

⁴⁵ Anadolu-Okur, "The Enduring Allure of Rumi and Sufism in American Literature," 251.

But of course, like translating any poetry, these translations are very free. They absolutely don't have and don't even try to have the rhythm of the original text.⁴⁶

To facilitate a comprehensive understanding of the quatrains of *Circle Map*, I have provided three versions of them: the transliterated version of the original quatrains in Persian; Coleman Barks' interpretation; the word-by-word translation done by myself. My purpose for including the word-by-word translation of the quatrains is to reflect the most immediate and direct meaning of the words. This is important for two reasons: Firstly, Barks' translations are far removed from the original quatrains. Often, he takes liberties with Rumi's works and the ultimate result is a personal reading of Rumi, rather than an actual literary translation of his poetry. Secondly, Although inspired by Barks' interpretations, several passages of *Circle Map* indicate that Saariaho has gone beyond Barks' interpretations and relied on her particularly deep and insightful knowledge of the quatrains that may have been gathered from other translations. Throughout the *Circle Map*, I have spotted some word-painting instances whose representative words and phrases are missing from Bark's version, but are present in the original quatrains. To bring more context and clarity to my analysis, I have found it crucial to include the word-by-word translation of the quatrains.

1. 5: The Expression Parameter System

Looking for an adequate system for analyzing Saariaho's music, I came across the Russian musicologist, Valentina Kholopova's "Expression Parameter" system which was originally devised for the analysis of Sofia Gubaidulina's music. This system focuses on the most

⁴⁶ Saariaho, interview.

expressive and immediate musical parameters, including articulation, texture, timbre, and melody to analyze Gubaidulina's music. Historically, these parameters have been overlooked as the ones with structural function, but according to Kholopova, the EP system is an adequate tool for analyzing most of the musical works written in the 20th and 21st centuries that are organized around timbre, texture, articulation and other similar parameters. In his article, *The Parameter Complex in the Music of Sofia Gubaidulina*, Philip Ewell quotes Kholopova who asserts:

“The “Expression Parameter” is so named because its elements are very immediate in emphasis and directly convey a musical-emotional expression.

Despite its name, it belongs not to the category of musical character but, rather, to that of musical composition, standing in an array of such concepts as harmony, rhythm, and texture...

At the basis of the EP lie those elements of music that are not yet recognized as structural in the history of composition: the devices of articulation and the methods of sound production, which in the past have pertained to the performer and not the composer.

Several elements of melody, rhythm, and texture—organized in a specific fashion—are associated with these devices of articulation. That it has a clear functional organization, similar to how classical harmony is organized by “T, S, D” functions, serves as an indicator and guarantee of the EP's existence.⁴⁷”

Kholopova believes that the existence of the expression parameter is due to the dynamic and developing language of the contemporary music and the rising importance parameters other

⁴⁷ Valentina Kholopova, “Parametr ekspressii v muzykal'nom iazyke Sofii Gubaïdulinoï” (The expression parameter in the music of Sofia Gubaidulina), in *Proceedings of International Conference of Moscow Forum*, vol. 25, (Moscow, 1999): 153-4. In Philip A. Ewell, “The Parameter Complex in the Music of Sofia Gubaidulina”, *a Journal of the Society for Music Theory* 20, no. 3 (September 2013): 2-3, <https://mtosmt.org/issues/mto.14.20.3/mto.14.20.3.ewell.php>.

than harmony.⁴⁸ She continues that in Europe, the EP system first appeared in the music of Anton Webern and is present in the music of many.⁴⁹

For large scale analysis of *Concordanza*'s structure, Kholopova borrows a method proposed by the Russian musicologist, Viktor Bobrovsky. His method was based on the large-scale themes in the music of the twentieth century. These themes were called 'super-themes,' 'macrothemes,' or 'dramaturgical themes,' and span a whole movement or an entire composition, even though they go through some interruptions.⁵⁰ Such themes have distinct timbral, textural, or articulative characteristics along with their rhythmic, melodic, and harmonic traits. After designating the consonant and dissonant quality of the parameter complex, Kholopova connects them to a super-theme and analyzes a composition's macro structure by investigating the relationship between the consonant and dissonant macrothemes.⁵¹

Music theorist, Aleksandra Drozzina has translated parts of this article for her Ph.D. dissertation, *Schnittke, Gubaidulina, And Pärt: Religion and Spirituality During the Late Thaw and Early Perestroika*. According to her: "This analytical approach is most fruitful in the analysis

⁴⁸ Kholopova, "Parametr ekspressii v muzykal'nom iazyke Sofii Gubaïdulinoï" (The expression parameter in the music of Sofia Gubaidulina), 159-160. In Ewell, "The Parameter Complex in the Music of Sofia Gubaidulina," 6.

⁴⁹ Kholopova, "Parametr ekspressii v muzykal'nom iazyke Sofii Gubaïdulinoï" (The expression parameter in the music of Sofia Gubaidulina), 159-160. In Ewell, "The Parameter Complex in the Music of Sofia Gubaidulina," 6.

⁵⁰ Valentina Kholopova, *Sofia Gubaïdulina: Monografiia* (Sofia Gubaidulina: A monograph), (Moscow: Kompozitor, 2011), 123. In Ewell, "The Parameter Complex in the Music of Sofia Gubaidulina," 2.

⁵¹ Ewell, "Parametr ekspressii v muzykal'nom iazyke Sofii Gubaïdulinoï" (The expression parameter in the music of Sofia Gubaidulina), 2.

of so-called “sonoristic” works, since it allows for visual tracing of musical “actions” and “counter-actions” that together carry the primary dramaturgical meaning.⁵²”

Based on their contrasting qualities, parameters such as articulation, dynamics, register, melodic line, and texture are divided into to categories of consonant and dissonant. In her article, Kholopova has analyzed Gubaidulina’s *Concordanza* for chamber ensemble (1971.)

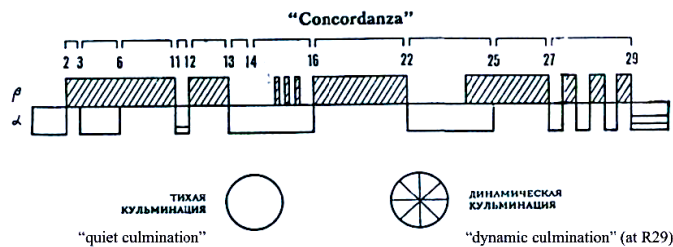
Below is Kholopova’s parameter complex for *Concordanza*:

Table 1: *Concordanza* Expression Parameters by Valentina Kholopova⁵³

	Action (consonant)	Counter-Action (dissonant)
Articulation	Legato	Staccato
Dynamics	Pianissimo	Fortissimo
Register	High	Low
Harmonic coloring	Consonant	Dissonant
Melodic Line	Stepwise	Skips
Texture	Continuous	Discontinuous

The diagram below shows Kholopova’s analysis of *Concordanza*, which is done according to her expression parameter analysis combined with Bobrovsky’s macrotheme method.

Example 4⁵⁴



⁵² Aleksandra Drozzina, “Schnittke, Gubaidulina, And Pärt: Religion and Spirituality During the Late Thaw and Early Perestroika” (PhD diss., Louisiana State University, 2020), 67.

⁵³ Drozzina, “Schnittke, Gubaidulina, And Pärt: Religion and Spirituality During the Late Thaw and Early Perestroika,” 67.

⁵⁴ Drozzina, “Schnittke, Gubaidulina, And Pärt: Religion and Spirituality During the Late Thaw and Early Perestroika,” 68.

According to Drozzina, these are only a few parameters to consider while working with the EP system. The list of parameters is expandable with regard to the music that the EP system is used to analyze. In addition, one is free to switch ‘action’ and ‘counter-action’ and assign them to the other end of the spectrum.⁵⁵ For instance, in a given piece of music, legato can be categorized as counter-action and staccato as action.

Timbre and texture are form-bearing parameters in Saariaho’s music, therefore, the EP system seems to be not only an appropriate, but also a powerful tool for understanding her music. The EP system is based on the binary of consonant-dissonant. In *Timbre and Harmony: Interpolations of timbral structures*, Saariaho presents her ideas on the relationship between timbre, harmony, and form. As Saariaho states:

“For some years now I have a tendency in my music to relate the control of timbre with the control of harmony. Initially I began to use the sound/noise axis to develop both musical phrases and larger forms, and thus to create inner tensions in the music. In an abstract and atonal sense the sound/noise axis may be substituted for the notion of consonance/dissonance. A rough, noisy texture would thus be parallel to dissonance, whilst a smooth, clear texture would correspond to consonance. It is true that noise in the purely physical sense is a form of dissonance pushed to the extreme. At the level of auditory experience, we can compare on the one hand the perception of a tension which is related by the tonic (or by a consonance if the context is not tonal) and, on the other a noisy texture which, while magnifying itself, transforms into pure sounds: one finds a certain analogy here. The "noise" in itself can actually manifest itself in different ways — soft, harsh etc. In a general way, the concept of “noise” signifies to me utterances such as breathing, the sound of a flute in a low register or a string instrument playing "sul ponticello." By contrast, a pure sound would be more akin to the ringing of a bell or a human voice singing in the Western tradition.⁵⁶”

When I asked Saariaho about the role of the sound (tone)/noise axis in her current practice, she responded: “It is present in my music because it is very present in my imagination. I think it's very much the way I think about music. But on the other hand, it's not so structured. I just start writing the score so my only criteria is that when I write a specific passage, is it

⁵⁵ Drozzina, “Schnittke, Gubaidulina, And Pärt: Religion and Spirituality During the Late Thaw and Early Perestroika,” 68.

⁵⁶ Kaija Saariaho, “Timbre and Harmony: Interpolations of timbral structures,” 94.

satisfying to me or not.⁵⁷ Saariaho also added that consonant and dissonant are interchangeable in her work, and sometimes, a bright color functions as dissonant whose resolution could be a noisy sound with a complex spectrum.⁵⁸ The connection between Saariaho's sound/noise axis and Kholopova's action/counter-action binary is particularly evident. Although I came across the EP system several months after choosing to analyze *Circle Map*, seeing the piece through the lens of this system seemed only reasonable if not necessary.

Since speech and electronics are the two central and interconnected elements of *Circle Map*, I decided to organize my EP analysis based on them. In my work, any vague and distorted utterance of the text in the electronic part is dissonant/counteraction. On the contrary, I consider a clear and comprehensible delivery of the text by Cont as consonant/action. In the orchestral part, any harmonic, melodic, gestural, rhythmic, and timbral idea that audibly reflects the same properties of the text and voice (namely, chords and colors based on the spectral analysis and filtering of Arshia Cont, gestures emulating the rhythmic patterns of the text, melodies that follow the contour of the voice while narrating the quatrains, etc...) represents consonant. Finally, any section of the orchestral part that lacks a perceptible connection with the text and voice is considered dissonant.

In the table below, I have listed these parameters of *Circle Map* and their quality:

⁵⁷ Saariaho, interview.

⁵⁸ Saariaho, interview.

Table 2

	Action (Consonant)	Counter-Action (Dissonant)
Electronics	clear and comprehensible sound of the voice reciting the text	Distorted and saturated sound of the voice reciting the text
Orchestra	rhythmic, melodic, harmonic, or timbral representation of the text	No audible relationship with the text



Consonant (orchestra): harmonic, rhythmic, or timbral material based on on the speech/voice



Dissonant (orchestra): harmonic, rhythmic, or timbral material not related to the speech/voice



Consonant (electronics): clear, intelligible utterance of the text



Dissonant (electronics): vague, distorted utterance of the text



Consonant and dissonant hybrid (electronics)

Chapter 2: Analysis

I. Morning Wind

Transliteration:

sobh ast o sabâ moshk feshân migozarad
daryâb ke az kooye folân migozarad
barkhiz – ché khosbi? ke jahân migozarad
booyi besetân ke kârevân migozarad

Word by word translation:

morning . it is . and . the morning wind . exuding the scent . Is passing
seize it . that . from . any alley . Is passing
get up – why are you sleeping? the world . is passing
scent . take . that . the convoy . is passing

Literary translation/interpretation by John Moyne and Coleman Barks:

The morning wind spreads its fresh smell.
We must get up and take that in,
that wind that lets us live.
Breathe, before it's gone.⁵⁹

The opening movement contains two harmonic fields. The first one consists of clusters that become denser through a gradual addition of notes to the pitch collection of the movement. The second field is comprised of chords that echo the harmonic and timbral quality of Arshia Cont's voice and coincide with the utterance of the quatrain by him. These chords appear in measures 36-39 and 76-81. The following reduction illustrates the harmonic outline of *Morning Wind*:

⁵⁹ John Moyne and Coleman Barks, *Unseen Rain*, (Putney: Threshold Books, 1986), 39.

Example 5

mm. 1-3

mm. 4-8

mm. 10-22

from m. 14 onward in fl.

mm. 23-7

mm. 28-35

appearing very late in bsn. and hp.

mm. 36-9

mm. 40-75

mm. 76-81

mm. 82-105

mm. 106-11

m. 112

At first glance, the structure and distribution of the chord among the octaves in mm. 36-39 resemble the harmonic series, although some of the pitches show considerable deviation from the standard harmonic series. Saariaho has taken liberty in treating the result of her most thorough and detailed analysis of Cont's voice. During our interview she also stated that she moves freely between the octaves "to create strange sonorities⁶⁰" meaning that adjusting chords for the purpose of improving their sonority occurs frequently in her music. As mentioned earlier, in natural sounds, the exact frequencies of overtones tend to deviate from the theoretical calculations of the harmonic series. Based on these two points, G-sharp 2 is doubled an octave higher and represents the second partial in mm. 36-39. D can be considered G sharp's lowered third partial, and C5 would be fifth partial. Finally, F5 can be seen as the lowered seventh partial of G-sharp. C-quarter-sharp is close to the eleventh partial of G-sharp, and A-quarter-flat falls between the sixteenth and seventeenth partials.

In an email correspondence with Jean-Baptiste Barrière, who has created the electronic part of *Circle Map* alongside Saariaho, I asked about the specific techniques and tools that were utilized in the process. According to Barrière, several filters and with various models of resonance were utilized to create different harmonic textures and colors alongside Arshia Cont's voice.⁶¹ In electronic music, a filter cuts off certain frequencies and allows others to pass. Depending on which frequencies they strain, filters can be categorized as high-pass, low-pass, band-pass, band-stop, etc. For instance, a high-pass filter allows frequencies higher than a threshold frequency to be heard, and anything lower than a given frequency will be attenuated.

⁶⁰ Saariaho, interview.

⁶¹ Jean-Baptiste Barrière, Email to author, April 16, 2019.

The function of a low-pass filter is the opposite of a high-pass one. The frequency that sets a threshold for a filter is called the cutoff frequency. In any filter, resonance creates an emphasis peak around the cutoff frequency. As a result, frequencies at that peak become louder than others in the frequency domain. These filter banks are especially effective in blending the electronic and acoustic sounds and creating unified harmonic, textural, and timbral masses. I believe that the C-quarter-sharp and A-quarter-flat in the chord in mm. 36-39 are the result of these filters with specific resonance models that amplify the C-quarter-sharp and A-quarter-flat frequencies in Arshia Cont's voice. In mm. 76-81, another chord with semi-spectral structure and voicing aligns with Cont's recitation of the entire quatrain. It contains two other quarter-tones (E 1/4 sharp 5 and D 1/4 sharp 6.) This chord spans across a wider range and blends well with the voice.

One of the most striking aspects of *Morning Wind*'s speech part is the great amount of white noise in its electronic part. The electronics consist of two separate, yet timbrally consistent layers, labeled as 'noise'—the sound of the narrator's voice, filtered, heavily distorted, and granular— and 'wind' which seems to be the field recording of the wind at the shore. In his email, Barrière stated that AudioSculpt, a software for analyzing, controlling, and manipulating different properties of sound, such as its harmony, noise, length, etc. has been used in creating the electronics of the piece.⁶² AudioSculpt makes it possible to isolate noise from pitch, and to process and amplify them separately. As the title of the first movement suggests, wind is the main element of the quatrain and this movement. In Persian language, 'sabâ' is the name of the breeze that blows from the east. Taking advantage of AudioSculpt's possibility for generating and manipulating the noise material, Saariaho has enhanced the noise component of Cont's voice

⁶² Jean-Baptiste Barrière, Email to author, April 16, 2019.

to amplify the sound of the wind. She has not only unified the wind and noise layers, but also created a deep and poetic relationship between the electronics and the quatrain.

Although not reflected in the English translation of the quatrain, the last word of each hemistich, ‘migozarad’ means ‘it passes/it is passing.’ The electronic sounds travel across the twelve loudspeakers of the hall and elicit the concepts of movement and transience, another two main concepts of the quatrain. In the orchestral part, movement is captured by the instrumental gestures that flow and whirl into each other. Simultaneously, the orchestration reinforces this type of motion in the following instances: mm. 24-7 (strings), mm. 29-34 (woodwinds), mm. 31-9 and mm. 56-71 (strings), mm. 64-70 (woodwinds), mm 72-5 (strings), mm. 98-104 (woodwinds), mm. 102-6 and mm. 110-6 (strings). In these measures, groups of instruments share a single melodic line and play it one after another to create larger waves of sound. Some of these gestures are demonstrated below:

Example 6 (mm. 24-27)⁶³

The image shows a musical score for Example 6, measures 24-27. The score is written for Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vlc.), Double Bass (D.B.), and Electronics (El.). The notation includes various musical symbols such as notes, rests, and dynamic markings like 'p' (piano). Above the staves, there are annotations: 'S.T.' (Sustained Tone) and 'N.' (Noise) with arrows indicating the duration of these sounds. For example, in measure 24, Vln. I has an S.T. from the start to the end of the measure, while Vln. II has an S.T. from the start to the end of the measure. In measure 25, Vln. I has an S.T. from the start to the end of the measure, while Vln. II has an S.T. from the start to the end of the measure. In measure 26, Vln. I has an S.T. from the start to the end of the measure, while Vln. II has an S.T. from the start to the end of the measure. In measure 27, Vln. I has an S.T. from the start to the end of the measure, while Vln. II has an S.T. from the start to the end of the measure. The Electronics part (El.) is shown as a horizontal line with a vertical bar at the end of each measure, indicating the presence of electronic sounds.

⁶³ Kaija Saariaho, “Morning Wind,” *Circle Map* for orchestra and electronics, (London: Chester Music Limited, 2012), 4.

Example 7 (mm. 99-104)⁶⁴

The image shows a musical score for Example 7 (mm. 99-104) from Saariaho's *Circle Map*. The score is divided into two systems. The first system (mm. 99-104) is marked "Subito molto energico" and features a complex, swirling texture in the strings and woodwinds. The second system (mm. 101-104) is marked "vibr. ond." and shows a more rhythmic, pulsating texture. The score includes staves for Fl. Pic., Ob., Cl., B.Cl., Bsn. 1,2, and Bsn. 1,3.

The whirling and circular motion in the strings, woodwinds (occasionally), and electronics result in a texture that moves and breathes constantly.

In the field recording of the wind at the shore, one can hear birdsong in the background. Although there is no mention of birds in the quatrain, I argue that Saariaho associates birdsong with the beginning of the day and incorporates it in *Morning Wind*, the opening movement of the work. As though, the movement that starts the journey of *Circle Map* is the beginning of a new day that is complemented with the breeze, birdsong, and a call to wake, move, and begin life.

Saariaho, has amplified birdsong in some orchestral passages with gestures in the woodwinds that imitate it. These relatively agile gestures move in different ranges of the instruments and consist of only a few pitches that are repeated in a, more or less, similar manner. A few examples of such passages are as follows:

⁶⁴ Saariaho, *Circle Map*, 14-15.

Example 8 (mm. 1-8)⁶⁵

Dolce ♩ = c. 92 poco rit. A tempo poco rit.

1 Flute 2, Piccolo

3 Flute 3, Piccolo

Example 9 (mm. 17-23)⁶⁶

17 Fl. Picc.

3 Ob.

1 Cl.

2 Cl.

1 Molto calmo ♩ = c. 46

Gestures that resemble birdsong will recur later in the piece, which I consider as a unifying element across the movements and will discuss them as they appear.

I interpret the initial distortion of the speech and its gradual progress towards clarity and eloquence as a process influenced by the wind. As it blows, the morning wind takes the morning fog away and brings about light and brightness.

Morning Wind gradually becomes faster and more energetic, as it strives to “breathe, before it’s gone.” It exemplifies music that transcends beyond the immediate imagery of the text

⁶⁵ Saariaho, *Circle Map*, 1

⁶⁶ Saariaho, *Circle Map*, 3.

and brings forth musical elements that subtly represent the text and become more apparent by a deeper look into the text and music.

Expression Parameter Analysis

Example 10



As the diagram shows, the orchestral part of movement I is overwhelmingly dissonant, as there is little to no audible harmonic, rhythmic, and timbral relationship between the two forces. In the brief sections that coincide with the recitation of the text, the harmonic field shifts to capture and amplify the sonority of the voice.

In mm. 36-40, the voice is highly distorted and the text is not perceptible. In the next iterations of the quatrain, Saariaho has brought more clarity to the text and increased the contrast between the textures of the electronic part and the chord that accompanies it in the orchestra. As the diagram demonstrates, the first movement is generally dissonant.

II. Walls Closing

Transliteration:

déltangamo didaré to darmâne manast
bi range rokhat, zamâné zendâne manast
bar hich déli mabâd o bar hich tani
ânche az ghame héjrâne to bar jâne manast

Word by word translation:

I miss you and . seeing . you . remedy of . mine is
without . the color of . your face . time . prison of . mine is
on . no . heart . may it be . and . on no body
that . from . sorrow of . separation . from you . on . soul of . mine is

Literary translation/interpretation by John Moyne and Coleman Barks:

Seeing you heals me.
Not seeing you, I feel the walls closing.
I would not wish for anyone else
such absence.⁶⁷

The rhythmic activity of *Morning Wind* is countered by the rather slow and heavy pace of *Walls Closing*. The metronome marking of *Morning Wind* is 92 BPM. Some moments of recess (46 BPM) happen in mm. 23-27, mm. 76-81, and mm. 114-116 and align with the recitation of the text. With the exception of these instances, *Morning Wind* becomes progressively more dynamic and spirited. *Walls Closing* starts at 76 BPM which is considerably slower than 92 BPM. The gap between the tempi of the two movements and the harmonic, timbral, and textural contrast between them is balanced by the slow ending of *Morning Wind*. In m. 110, a ritardando leads to 46 BPM in mm. 114-116. In effect, these final measures of *Morning Wind* function as a smooth transition to *Walls Closing*. This smooth transition also happens in the melodic organization of both movements. The last pitch of *Morning Wind* is F, and *Walls Closing* begins

⁶⁷ Moyne and Barks, *Unseen Rain*, 22.

with F-sharp on the alto flute, clarinet, trumpet 1, and marimba. F-sharp is followed by G and A as part of a melody on the alto flute and trumpet 1.

In her interview, Saariaho mentioned that *Walls Closing* is strictly based on the analysis of Cont's voice. Her adherence to the analysis is evident in the rhythm, melodic contour, harmony, and form of the movement.

In order to understand the logic behind the phrase structure of this movement, one needs to revisit the structure of its corresponding quatrain. A classical Persian quatrain consists of four hemstitches with equal lengths, coherent rhyme, and perfect balance in the pattern of short and long syllables.

The structure of short and long syllables in *Walls Closing* is as follows:

--...--...--...--
--...-.-.-...--...--
--...-.-.-...--...--
--...--...--...--

Long syllables: _

Extra long syllables: —

short syllables: .

As the diagram demonstrates, the first, second, and fourth hemstitches consist of the total of thirteen syllables. The first and last hemstitches are identical, and with the exception of its sixth and seventh syllables, the second hemstitch follows the same pattern of long and short syllables as the first and last ones. The third hemstitch consists of eleven syllables, two of which are extra long. The length of these syllables (two and nine) maintains the metric balance of the quatrain and make for its consistent structure and rhythmic pattern.

Inspired by the form and balance of the quatrain, Saariaho has created sections that consist of four phrases. The length of these phrases corresponds with the length of their recitation by Cont. The entire movement consists of four iterations of this pattern, which creates an even stronger connection with the quatrain on the macro level (four hemstitches, four large sections.)

The structural outline of *Walls Closing* is as follows:

- 1) mm. 1-24 (24 measures): A
- 2) mm. 25-48 (24 measures): A'
- 3) mm. 49-72 (24 measures): A''
- 4) mm. 73-97 (24+1 measures): A'''

The melodic content of *Walls Closing* remains fairly consistent in all the four sections. The same melodic pattern, with minor pitch and rhythmic modifications, is repeated on four different combinations of instruments that appear as soloists or small ensembles. The first round, mm. 1-24, is played by the first trumpet. In the second round, mm. 25-48, the piano takes over and plays the melody. The cello section plays the third round of the melody mm. 49-72, and in mm. 73-97, the double basses and the piano render the final iteration while the bassoons play a variation of the melody. I find this repetitive structure similar to a recurring circular pattern that retains its overall shape but goes through minor variations.

Of all the four rounds, only the final one is accompanied by the electronics. Therefore, the relationship between the text and music remains obscure for a relatively long time before the two parts align and overlap. The overall homogeneity of rhythms, melodies and form of all sections is countered by a stark contrast in the timbre and texture of A'''. There is a subtle

balance between familiarity and freshness. It would be fair to say that *Walls Closing* is a short theme and variations, where A', A'', and A''' are the variations to the theme A.

Below is the main melody of *Walls Closing* in all its four iterations. The most striking change in the melody occurs in the third iteration (mm. 49-72,) where it is transposed down a minor third and starts from D-sharp instead of F-sharp. Apart from this transposition, the rhythmic patterns and melodic lines remain mostly consistent.

Example 11

The musical score for Example 11 consists of eight systems of music, each representing a different iteration of the main melody. The instruments are Trumpet in C, Tpt., Pno., and Vc. The score is divided into measures 1-8, 9-16, 17-24, 25-32, 33-40, 41-48, 49-56, 57-64, and 65-72. The melody is primarily in the treble clef, with some systems using the bass clef for the Vc. The key signature is one sharp (F#), and the time signature is 3/4. The melody is characterized by a series of eighth and sixteenth notes, often grouped in threes or fives. The third iteration (mm. 49-72) is transposed down a minor third and starts on D# instead of F#.

73

Bsn. 1

Bsn. 2

Pno.

Db.

Db.

deltangamo didare to darmanemanast bi range rokhat zamane

81

Bsn. 1

Bsn. 2

Pno.

Db.

Db.

zendane manast bar hoch deli mabad o bar hoch tani

89

Bsn. 1

Bsn. 2

Pno.

Db.

Db.

anche az ghome hejrane to bar jane manast

In my layout of the syllables of this quatrain, I demonstrated that the four hemstitches are of equal length. The musical phrases, shown with dotted slurs, vary in meter and length. The approximate duration of the first two phrases is nine seconds, and Cont takes about twelve seconds to recite the third and fourth phrases. These changes reflect Saariaho's dedication to his delivery of the quatrain instead of their exact length on paper. Saariaho has taken the same approach towards the pitch organization and melodic contour of *Walls Closing*. Most intervals are seconds and thirds which are close to the contour of Cont's voice while reciting the quatrain. Larger leaps of sixth and seventh coincide with more dramatic changes in his voice and match its fluctuations perfectly. There are some ascending and descending glissandi at the end of each phrase that mimic the slight, natural glide of the voice.

In mm. 1-24, the melody is played at a higher register than Cont's voice on the first trumpet. In mm. 25-48, the piano reaches C3. The cellos in mm. 49-72 enter the lower octave and play as low as B-flat2. Eventually, the double basses echo Cont's voice in the first octave and provide the richest and most resonant duplication of his voice in the orchestra. This gradual change of the register and its expansion creates a linear process that complements the circular form of the movement. The gradual transition of this movement to a denser texture and darker timbre evokes the narrowing of the space suggested by the title *Walls Closing*.

The rhythmic patterns are not strictly based on the text, but as the last iteration of the quatrain arrives in mm. 73-96, their close connection to the words becomes more perceptible. The rhythm of movement two is the stylized version of the rhythm of the text.

To reinforce the relation between the speech and orchestra, Saariaho has chosen to introduce each segment of the orchestral part with a short delay after each fragment of the text.

In other words, the orchestra echos the text slightly after the electronics. By doing so, she has created a more effective and convincing connection between the two parts to intensify the effect of the text.

Compared to the first movement, the recitation of the text in the electronics is clear and comprehensible in the second movement. No distortion, repetition, or deconstruction of the text occurs in the electronics. The transparency in the electronics empowers the relationship between the text and orchestral part and increases their intelligibility.

EP Analysis

Example 12



For the entirety of *Walls Closing*, both the orchestral and electronic parts remain consonant. In the electronics, the text of the quatrain is easy to follow and comprehend throughout the movement. In the orchestral part, the length, number, and structure of rhythmic patterns of the phrases duplicate the same properties of the quatrain. Moreover, the contour and predominantly low register of the melodic lines match Cont's voice and his style of recitation of the quatrain.

According to my EP analysis, the overwhelmingly dissonant quality of *Morning Wind* is in stark contrast with *Walls Closing*'s entirely consonant character. With this strategy, Saariaho has created a balance between action and counter-action in the first two movements and prepared the ground for a fresh start in the third movement, *Circles*.

III. Circles

Transliteration:

*dar . noh . ghadami . ke . cheshmé . heyvânast
migarad . cho . charkh . tâ . mahat . gardânast
jânist . to . ra . bégard . hazrat gardân
in . jân . gardân . ze . gardéshé . ân . jânast*

Word by word translation:

**in . nine . steps . that . the spring of . the living is
circle around . like . a wheel . until . your moon . circles
a soul . you have . spin . majesty.
This . soul . circles . from . the circling of . that . soul**

Literary translation by John Moyne and Coleman Barks:

Walk to the well.

**Turn as the earth and the moon turn,
circling what they love.**

Whatever circles comes from the center.⁶⁸

Of the six quatrains of *Circle Map*, *Circles* has the most explicit connection with the concept of circle, movement, and whirling. In the original quatrain, ‘ghadam’ means ‘step’ and ‘charkh’ can be translated to ‘wheel’ and also ‘sky.’ The translation of ‘mah’ is ‘moon,’ ‘gardân’ is ‘circling, whirling.’ Saariaho has used various musical elements in this movement to evoke the concept of circle and circular motion.

Circles consists of two contrasting characters that gradually merge and create a dense and dynamic texture. The first character is a perpetual gesture of repetitive eighth notes on the percussion, and later, cellos and double basses. According to Saariaho, this gesture mimics walking as stated in the opening hemstitch of the quatrain (walk to the well.) In mm. 1-7, mm. 9-13, mm. 16-19, and mm. 21-30, one can hear the walking gesture.

⁶⁸ Moyne and Barks, *Unseen Rain*, 20.

The second character consists of rapid and fluid melodies that dominate the medium and high registers. This character first appears in m. 8 on the harp and celesta, and continues to return several times throughout the movement.

Example 15 (m. 40)⁷¹

The musical score for Example 15 (m. 40) is presented in three systems: Harp, Piano, and Celesta. Each system consists of a grand staff (treble and bass clefs). The Harp part begins with a *mp* dynamic and features a rapid, fluid melody in the upper register, culminating in a glissando. The Piano and Celesta parts provide accompaniment with similar rhythmic patterns. The score includes a list of notes: Eb, F#, Gb, A#, D#, C#, B#.

Compared to the first character, the rhythmic gestures of the second character are more active and changing. From the very beginning, the melodies dominate the middle and high registers of the orchestra. To emphasize on the lyrical quality of these melodies, Saariaho has used the term “dolce.” When appearing on the flutes, oboes, and clarinets, the melodies reminisce the quasi-birdsong gestures in the first movement. Their lightness and agility, repetitive and imitative quality, limited range, and register are the common points between these melodies in *Morning Wind* and *Circles*. Below, two instances of these quasi-birdsong melodies in the woodwinds are demonstrated:

⁷¹ Saariaho, *Circle Map*, 35.

Example 16 (mm. 17-22)⁷²

Musical score for Example 16 (mm. 17-22). The score is for a woodwind ensemble and includes parts for Flute (Fl.), Piccolo (Picc.), Oboe (Ob.), Clarinet (Cl.), Bass Clarinet (B.Cl.), and Bassoon (Bsn.). The tempo is marked "Dolce". The music features a multi-layered texture with various dynamics such as *mp* and *f*. A measure number "5" is indicated at the end of the score.

Example 17 (mm. 40-44)⁷³

Musical score for Example 17 (mm. 40-44). The score is for a woodwind ensemble and includes parts for Flute (Fl.), Piccolo (Picc.), Oboe (Ob.), Clarinet (Cl.), Bass Clarinet (B.Cl.), and Bassoon (Bsn.). The tempo is marked "Dolce" and "Poco più energico". The music features a multi-layered texture with various dynamics such as *mp*, *mf*, and *f*. A measure number "17" is indicated at the beginning of the score.

Although at the beginning of *Circles*, the two contrasting characters are isolated from each other, they do not always remain so. In mm. 40-43, both characters appear simultaneously and create a multi-layered texture that functions as a universe and encompasses the entire quatrain.

⁷² Saariaho, *Circle Map*, 32.

⁷³ Saariaho, *Circle Map*, 35.

In these measures, the slit drum plays the walking gesture, and the woodwinds exchange the short, lyrical melodic fragment that exhibits traits of character two. Another instance of this combination is in mm. 49 with the walking gesture on the harp and its variations on the crotales (C-sharp6 triplets) and on the violins D6 sixteenth notes.

Example 19 (mm. 47-51)⁷⁵

The image displays a page of a musical score for Example 19, covering measures 47 to 51. The score is arranged in a standard orchestral format with multiple staves. The woodwind section includes Flute (Fl. Pic.), Oboe (Ob.), Clarinet (Cl.), Bass Clarinet (Bass Cl.), Bassoon (Bsn.), and Horn (Hr.). The string section includes Violin I (Vln. I), Violin II (Vln. II), Viola (Vla.), Violoncello (Vcl.), and Double Bass (D.B.). The percussion section includes Snare Drum (Sn. Dr.), Hi-hat (Hp.), and Cymbal (Cym.). The score features dynamic markings such as *pp*, *p*, *mp*, and *ppp*, and includes performance instructions like "Leggiero" and "Più energico ma sempre grazioso". A tempo marking of $\text{♩} = 80$ is present. The score is divided into two systems, with the second system starting at measure 49. The bottom of the page contains the instruction "Johannes Brahms: Concerto for Piano and Orchestra, Op. 83, 3rd Movement, measures 47-51.".

⁷⁵ Saariaho, *Circle Map*, 36.

The duality created by the two contrasting characters of *Circles* is based on the quatrain. Although not existent in the original quatrain, the interpretation mentions the earth and moon as two concepts in the second hemstitch; a planet and its satellite that moves and revolves around it. In the last two hemstitches, Rumi talks about two coexisting beings (souls) that revolve together. In simple terms, he says: “You have a soul; circle, oh, the most excellent being. This soul (mine) is circling because that soul (yours) circles.” In this hemstitch, the concept of two revolving characters, and their strong connection and inevitable unity are depicted clearly. This information on the quatrain explains Saariaho’s purpose for creating the two seemingly different characters and working towards their unification.

Initially, the texture is relatively transparent, and it becomes denser gradually. There is a considerable increase of tempo and energy in the course of the movement. The metronome markings span from 48 BPM to 120 BMP across mm. 1-91 and the tempo remains as fast through the end of the movement. Along with this increase, the expression markings vary as well and include “calmo,” “dolce,” “poco piu energico,” “piu passionato,” “agitato,” “molto energico tumultuoso,” “sempre intenso,” and “molto feroce.”

Many of the melodic ideas on the harp and celesta emulate the concept of circle. They consist of a few pitches that continue perpetually and create a circular quality.

Example 20 (m. 8)⁷⁶

The image shows a musical score for Example 20, measure 8. It consists of two staves: the top staff is for the Harp and the bottom staff is for the Celesta. Both staves are in 3/4 time and have a treble clef. The Harp part features a melodic line with a slur over the first four notes, a dynamic marking of *mp*, and a *gliss.* marking at the end. The Celesta part features a melodic line with a slur over the first four notes, a dynamic marking of *mp*, and a *ca.* marking at the end.

⁷⁶ Saariaho, *Circle Map*, 30.

In some cases, the number of pitches and their range broadens but the repetition and tempo remain constant. Such figures are similar to the form of a spiral.

Example 21 (m. 49)⁷⁷



The harp and piano play melodies that move in opposite directions in mm. 114-134. The melody on the piano ascends and the one on the harp descends.

Example 22 (m. 114-115)⁷⁸



The two melodies complement each other and when put together, can be considered as two semicircles that create a perfect circle together.

Finally, the circulation of melodies is prominently audible within the members of the woodwinds and brass. In mm. 136-140, the woodwinds play the footstep figure and by rotating it, they circulate the gesture in space. In mm. 67-74, the brass follow the same model and play a combination of the footstep figure and flowing melody simultaneously.

⁷⁷ Saariaho, *Circle Map*, 36.

⁷⁸ Saariaho, *Circle Map*, 44.

Example 23 (mm. 136-140)⁷⁹

Example 24 (mm. 67-74)⁸⁰

Parallel to the orchestra, the electronics travel across the twelve channels constantly and whirl around the hall to help the audience experience the circular motion.

Circle is a significant symbol in mysticism, and especially in the Mevlevi Order. In their gatherings, also known as *samâ* followers of the order, who are called *darvishes* (plural; singular form: *darvish*) or *sufis* (plural, singular form: *sufi*,) whirl in circle for extended periods of time.

As the whirling intensifies gradually, sufis enter a hypnotic state and reach ecstasy. The spinning

⁷⁹ Saariaho, *Circle Map*, 47.

⁸⁰ Saariaho, *Circle Map*, 39.

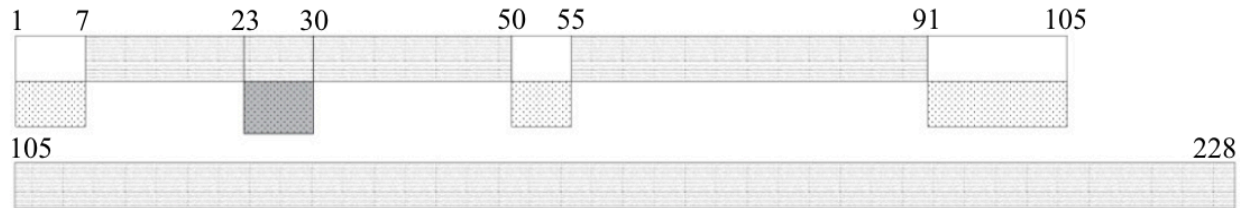
melodies in the celesta and harp, the division and rotation of the pizzicato motifs among the strings as in mm. 32-40, their imitation in the brass (legato) in mm. 136-140, and the whirling of the electronics in the space are the musical representations of *samâ* and play a crucial role in connecting the music to the title of the movement, *Circle*. In the electronics, the incomprehensibility of the words elicits the sense of trance caused by continuous whirling in *samâ*.

Saariaho has applied varying levels of distortion to Cont's voice through filtering and adding noise to it. Some layers of the text have been stretched and others are in the original speed. The first and second hemstitches are moderately distorted, which makes the words relatively easier to perceive and follow. The level of distortion is considerably higher in the third and fourth hemstitches. This strategy leads to the increase of harmonic, timbral, and textural contrast between the electronics and orchestra. In addition, a lack of clarity in the text echoes the otherworldly sense of ecstasy caused by the *samâ* dance.

The noisy and percussive quality of the electronics adds an extra layer of timbral variety to *Circles*. The electronics function as a fourth percussion section with grainy and coarse sounds that, in some cases, are echoed by scraping the body of the guiro in m. 1 or sizzling the cymbal in m. 50.

EP Analysis

Example 25



The orchestral chords in mm. 1-7, mm. 23-30, mm. 50-55, and mm. 91-105, which accompany the electronics, duplicate the harmonies of Arshia Cont's voice and are marked as consonant. The resonant filters homogenize the chords of the electronic and orchestral parts. In the purely orchestral sections, the harmonies are varied and function independently from the voice. These sections are marked as dissonant. Saariaho has organized the timbre and texture similarly. The orchestra sounds brighter and fuller when it does not accompany Cont's voice. The timbre is especially murky in sections that align with the first, second, and fourth hemstitches. The texture is considerably thinner and less active in these instances.

In mm. mm. 23-30, which coincides with the second hemstitches of the quatrain, the text is relatively more perceptible compared to mm. 1-7, mm. 50-55, and mm. 91-105. Therefore, mm. 23-30 should be considered as a combination of consonant and dissonant. In the other three sections, 1-7, mm. 50-55, and mm. 91-105, Saariaho has distorted the voice more heavily and the text becomes much harder to comprehend. In these sections, the electronic part should be marked as dissonant.

IV. Days Are Sieves

Transliteration:

*In . rouzé . cho . gharbâl . bebizad . jân . râ
Peydâ . ârad . ghorâzeze . penhân . râ
jâni . ke . konad . khiré . mahé . tâbân . râ
bi . pardé . shavad . noor . dahad . keyvân . râ*

Word by word translation:

**This . day . like . sieve . sifts . the soul
It finds . brings . the scrap . the obscure
The soul . that . makes . stare . the moon . shining
Without . veil . becomes . light . gives . the cosmos**

Literary translation/interpretation by John Moyne and Coleman Barks:

**Days are sieves to filter spirit,
reveal impurities, and too,
show the light of some who throw
their own shining into the universe.⁸¹**

In *Days Are Sieves*, the main focus of the quatrain is the process of sifting and filtering, which is applied to various parameters of the movement, from harmony and rhythm, to its timbre and texture. The quatrain is iterated twice in two different manners. In the first round which spans mm. 1-63, Saariaho has divided the quatrain into fragments of one to two words. Throughout this section, the words and music flow gradually and with various levels of rhythmic activity to evoke the effect of a mixture of various materials passing through a sieve. In the second section, mm. 64-70, the entire quatrain is heard once again, and this time, it sounds smooth and steady. The smoothness and consistency are manifested in the form of harmonic stability, and rhythmic, timbral, and textural homogeneity.

The harmony of the movement reveals the relationship between the voice and orchestra most explicitly. After dividing the quatrain into fragments of one to two words, Saariaho has

⁸¹ Moyne and Barks, *Unseen Rain*, 4.

extracted the chords from Cont's voice and orchestrates them. In order to unify the electronic and orchestral parts, she has applied resonant filters to the voice and duplicates the resonated pitches as chords in the orchestra. These chords linger in the space for various durations and function as the main harmonic field of the movement. Echoing the resonated chords in the orchestra also amplifies and brightens the harmonies of Cont's voice. The reduced form of the chords below demonstrates their progression and change in time. The adjacent chords share some of their pitches with each other and other pitches move within close intervals. The smooth harmonic shifts are countered by more stark contrasts in the rhythmic and melodic patterns, timbre, texture, and register.

Example 26

The musical score for Example 26 is presented in four systems, each containing two staves (treble and bass clef). The score is divided into measures by vertical bar lines. Performance instructions are placed above each system of staves.

- System 1:**
 - mm. 1-5: *sempre libero, sensibile, calmo*
 - mm. 6-9: *sempre libero, sensibile, calmo*
 - mm. 10-13: *sempre calmo*
 - mm. 14-17: *tenero*
- System 2:**
 - mm. 18-21: *delicato*
 - mm. 22-25: *più fermo*
 - mm. 26-29: *più fermo*
 - mm. 30-34: *molto espressivo*
- System 3:**
 - mm. 35-37: *poco agitato*
 - mm. 35-37: *fermo*
 - mm. 35-37: *fragile*
 - mm. 35-37: *misterioso*
- System 4:**
 - mm. 47-49: *energico*
 - mm. 50-51: *energico*
 - mm. 52-57: *calmato, semplice*
 - mm. 58-63: *dolce*
 - mm. 64-70: *meno mosso, calmo, espressivo*

Saariaho's approach to the concept of filtering to the rhythms of *Days Are Sieves* is more poetic. She has juxtaposed various rhythmic ideas and changed the rate of their activity at every segment of the text which takes between four to five measures. By doing so, she has emulated the process of sifting any mixed material with various grain sizes. The rhythmic character of *Days Are Sieves* can be described as dynamic, unpredictable and in constant motion and transformation. (Follow the rhythmic changes with each entrance of the text in this excerpt.)

Example 2782

Delicato **33 Più fermo**

17 **Delicato** **33 Più fermo** (non trem.)

Fl. 1 *mf* *vibr. ord.* *mp* *p* (non trem.)

Fl. 2 *mf* *vibr. ord.* *mp* *p* (non trem.)

A. Fl. *mf* *vibr. ord.* *mp* *p* (non trem.)

Ob. 1 *mp* *vibr. ord.* *p* (non trem.)

Ob. 2 *mp* *vibr. ord.* *p* (non trem.)

Cl. 1 *mp* *vibr. ord.* *p* (non trem.)

Cl. 2 *mp* *vibr. ord.* *p* (non trem.)

Cl. 3 *mp* *vibr. ord.* *p* (non trem.)

Hr. 1 *mp* *vibr. ord.* *p* (non trem.)

Hr. 2 *mp* *vibr. ord.* *p* (non trem.)

Hr. 3 *mp* *vibr. ord.* *p* (non trem.)

Hr. 4 *mp* *vibr. ord.* *p* (non trem.)

Trpt. 1, 2 *mp* *vibr. ord.* *p* (non trem.)

Trbn. 1 *mp* *vibr. ord.* *p* (non trem.)

Trbn. 2 *mp* *vibr. ord.* *p* (non trem.)

Trbn. 3 *mp* *vibr. ord.* *p* (non trem.)

Trbn. 4 *mp* *vibr. ord.* *p* (non trem.)

Timpani *mp* *vibr. ord.* *p* (non trem.)

Percussion *mp* *vibr. ord.* *p* (non trem.)

Wood Chime *mp* *vibr. ord.* *p* (non trem.)

Claret *mp* *vibr. ord.* *p* (non trem.)

Vibraphone *mp* *vibr. ord.* *p* (non trem.)

Sizz. Cym. *mp* *vibr. ord.* *p* (non trem.)

Tamt. *mp* *vibr. ord.* *p* (non trem.)

Large Tambourine *mp* *vibr. ord.* *p* (non trem.)

CE, Cl. *mp* *vibr. ord.* *p* (non trem.)

on strings *mp* *vibr. ord.* *p* (non trem.)

on keyboard *mp* *vibr. ord.* *p* (non trem.)

Delicato **33 Più fermo** *pizz.*

Vln. I *pp* *vibr. ord.* *mp* *p* *pizz.*

Vln. II *pp* *vibr. ord.* *mp* *p* *pizz.*

Vla. *pp* *vibr. ord.* *mp* *p* *pizz.*

Vla. *pp* *vibr. ord.* *mp* *p* *pizz.*

Vcl. *pp* *vibr. ord.* *mp* *p* *pizz.*

Vcl. *pp* *vibr. ord.* *mp* *p* *pizz.*

D.B. *pp* *vibr. ord.* *mp* *p* *pizz.*

D.B. *pp* *vibr. ord.* *mp* *p* *pizz.*

Fin *pp* *vibr. ord.* *mp* *p* *pizz.*

32 34 Poco agitato

Fl. 1

Ob. 1 2

Cl. 1 2
vibr. ord.

Bsn. 2

Hr. 1 3 2 4

Tpt. 1

Tbn. 1

Tuba

Timp.

Bamboo Chimes

Perc. 1 Vib. 2 Mar. 3

Tam-tam arco Glass Chimes L.v.

Hrp. D# Eb, C#, A#

Pno.

Cel.

34 Poco agitato

Vln. I (I) N. S.P. S.T.

Vln. I (II) N. S.P. S.T.

Vln. II (III) N. S.P. S.T.

Vln. II (II) N. S.P. S.T.

Vln. N. S.P. S.T.

Vlc. N. S.P. S.T.

D.B. N. S.P. S.T.

EL.

9 jini

Like its harmony and rhythm, the movement's timbral quality is subject to gradual or rapid changes that line up with the fragments of the texts as well as the chords. These changes complement and reinforce the block-like sonority of *Days Are Sieves*, which is less typical of Saariaho's approach to timbre. Generally, she creates gradual transitions from one timbre to another and creates structures that transform seamlessly in time. For instance, in *Verblendungen* (1984,) the orchestra and tape and move in opposite directions simultaneously. The piece is about fourteen minutes and based on Saariaho's tone/noise axis. The orchestra starts with a dense cluster of pitches and is countered by a heavy layer of noise in the electronics. In time, the two parts change places and move to the opposite extremes of the tone/noise axis. At the end of the piece, the orchestra plays different kinds and levels of instrumental noise, while the electronics consist of pure pitches.⁸³ According to Saariaho: "In spite of their different, sometimes opposite materials, the orchestra and the tape should build a common, inseparable sound world."⁸⁴

Changes in the harmony, rhythm, timbre, and especially instrumentation of *Days Are Sieves* have a direct impact on its texture as well. There are constant shifts from dark to transparent, granular to smooth, thick to thin, and organized to chaotic sonorities throughout the movement. For instance, the first thirteen measures are dark and thick, and in mm. 14-17, the texture becomes relatively lighter and more transparent. In mm. 18-34, chaos and density grow considerably, but the growth is disrupted by a sudden change in the instrumentation in mm. 35-37. One can hear a considerable intensification and activity in mm. 38-43, which leads to brief lightness in mm. 44-46. Starting from m. 47, another wave of intense and granular texture

⁸³ "Verblendungen," Kaija Saariaho, accessed June 24, 2021, <https://saariaho.org/works/verblendungen/>.

⁸⁴ Kaija Saariaho, "Verblendungen."

appears and is washed away by a surprisingly bright and smooth fragment in mm. 58-63. With the second iteration of the quatrain in mm. 64-70, the texture remains consistently light and transparent.

Worth considering is that darker and more chaotic sections coincide with words such as ‘ghorâze’ (scrap) and ‘penhân’ (obscure.) Contrarily, ‘jân’ (soul,) ‘mah’ (moon,) and ‘keyvân’ (cosmos) are associated with smoother, brighter, and more transparent sections. By creating these textural, timbral, rhythmic, and harmonic shifts Saariaho has tried to generate the sense and sound of sifting which results in the separation of the coarse and fine particles. On a more literal level, she has incorporated instruments such as the sizzle cymbal, guiro, bamboo chimes, sandpaper blocks, and tam-tam with a wire brush to imitate the sound of sifting. As mentioned before, *Days Are Sieves* can be divided into two main sections; mm. 1-63 (A) and mm. 64-70 (B.) This division has resulted in two oddly balanced sections. The lack of structural balance has a poetic justification considering the context of the quatrain. With its smooth and fluid quality, section B is the resolution of section A, where the music and text are executed incrementally. Both the music and text get sifted in A, and they reach a pure, smooth, and consistent state in B.

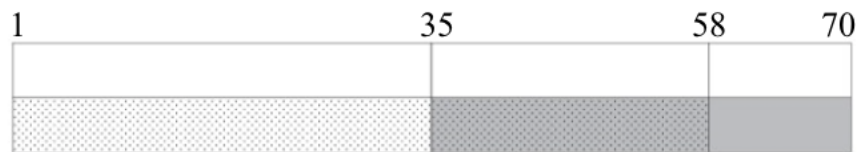
Saariaho has treated the electronics with the same approach, and combined two layers of Cont’s voice. The first layer is a clear and intelligible version of his recitation of the quatrain, and the second layer contains a saturated and filtered rendition of the recitation. In section A, the saturated layer dominates the foreground of the electronic part, and the text is relatively harder to comprehend. Both layers are slightly stretched which represents the slow passage of the material

through the sieve. In section B, this layer recedes and lets the intelligible version be heard clearly. This time around, the speed of both layers is normal.

Once again, everything impure is sifted and anything that passes through the sieve is refined and pure. Worth noting is that while sections A and B mark the change from incomprehensible to comprehensible, this change does not happen suddenly. Throughout mm. 35-58, the two layers of voice start to shift grounds gradually and the intelligible layer begins to move to the foreground slowly and set a smooth transition to the contrasting section B.

EP Analysis

Example 28



Since the harmonies of the orchestral part of *Days Are Sieves* are directly based on the chords derived from Cont's voice, and never deviate from it, I regard the entire orchestral part as consonant. The constant presence of the electronically generated chords in the electronics ties the voice and orchestra together in a more effective fashion and amplifies them further.

In the first thirty five measures, the distortion and stretching of Cont's voice which results in a lack of clarity in the words creates an entirely dissonant section. The slow transition of the text from incomprehensible to comprehensible in mm. 35-58 should be considered a hybrid of dissonant and consonant with a gradual trajectory towards consonant. Mm. 58-70, which encompass the second iteration in normal speed and with clarity, create the fully consonant section of the movement.

V. Dialogue

Transliteration:

*Goftam ke ze khordi délé man nist padid
Ghamhâye bozorgé to dar oo choon gonjid
Goftâ ké zé del bé didé bâyard négarid
Khord ast o dar oo bozorghâ betvân did*

Word-by-word translation:

*I said . that . of . slightness . heart of . mine . is not . visible
the sorrows . enormous . of yours . in . it . how . they fit
they said . that . from . heart . to . eye . shall one . look
small . it . is . and . in . it . enormity . one can . see*

Literary translation/interpretation by John Moyne and Coleman Barks:

**I am so small I can barely be seen.
How can this great love be inside me?
Look at your eyes. They are small,
but they see enormous things.⁸⁵**

There are abundant examples of dialogue between different characters in Rumi's poetry, and this quatrain is one of them. This dialogue involves the lover and the beloved, with the lover as the superior, grandiose, and glorious being, versus the beloved, who is inferior, humble, and insignificant. The first two hemstitches of the quatrain represent the lover and their plea to the beloved. In the last two hemstitches, the beloved responds to the lover and completes the quatrain. Saariaho has taken full advantage of the inherent duality of the quatrain and applied it to *Dialogue's* register, tempo, texture, melodic intervals, and gestures of the orchestral and electronic parts. The contrast in these parameters leads to a schism in the structure which will be discussed in the following paragraphs.

⁸⁵ Moyne and Barks, *Unseen Rain*, 40.

As in the previous movement, Saariaho has repeated and fragmented the quatrain to underline its key words and ideas. At the beginning, she has used the words ‘goftam’ (I said) and ‘khordi’ (slightness.) By revealing only these two words, which can also be interpreted as concealing the rest of the hemstitch, she has highlighted the insignificance and smallness of the lover who is also the speaker of the first two hemstitches. Shortly after this fragmented rendition of the first hemstitch, we hear its complete version. Afterwards, each of the second, third, and fourth hemstitches are repeated twice consecutively, with the second repetition being slightly varied.

To emphasize on the smallness of the lover, Saariaho has used the high and middle registers of the instruments such as the piccolo, celesta, crotales, high registers of the harp, violins, and piano. The entire section covering the first two hemstitches spans across mm. 1-92 (A) mainly focuses on the middle and high registers exclusively. Mm. 93-140 (B) mark the second section which showcases the third and fourth hemstitches of the quatrain. The low winds, brass, and strings along with the low register of the harp and piano create a sharp contrast that sounds like a sudden rupture.

Applying different filters to Cont’s voice is Saariaho’s strategy for blending the electronic and orchestral parts of *Dialogue*. In section A, Cont’s voice goes through a high-pass filter which passes frequencies higher than any given cut-off frequency, and attenuates frequencies lower than it. In this section, the cutoff frequency is so high that the voice is intensely altered and the words are highly distorted. A comparison of the voice in the first and second hemstitches reveals that the second hemstitch is slightly clearer than the first one. However, it never reaches the ultimate eloquence required for facilitating the comprehension of the text. In contrast, in section

B, a low-pass filter which allows the passing of low frequency signals, modifies Cont's voice and makes it sound deeper and murkier than normal. While the text is more comprehensible relative to section A, its level of clarity changes with each iteration. Generally, the second iteration of the third and fourth hemstitches is more intelligible, and there is an increasing tendency towards its transparency.

Dialogue starts with the piccolo playing the pitches A-flat and G, which is followed by the word 'goftam' (I said.) The normal contour of 'goftam' is descending. The descending contour of both the A-flat and G dyad on the piccolo and 'goftam' match each other. The descending minor second is repeated in m. 7 (G, F-sharp) on the piccolo, m. 11 (E, D-sharp), mm. 11-12 (E, D-sharp and A, G-sharp) on the vibraphone, and m. 13 (C, B) on the violin. The alignment of 'goftam' with B, A-sharp (flute 1,) D, D-flat (piccolo,) and A-flat, G (flute) in m. 19 further reaffirms their relationship. The second hemstitch starts in m. 44 with the word 'ghamhâ' (sorrows,) with an ascending contour. In the same measure, the flutes follow the lead with the first flute playing D, E-flat, the piccolo F-sharp, G, and the third flute C, D-flat. The phrase 'khord ast' (it is small) marks the beginning of the last hemstitch. As in 'goftam,' the contour of 'khord ast' is descending, but its intervallic span is slightly larger than 'goftam.' This descending contour is reflected in the music with some modifications. Firstly, Saariaho has used a descending minor third interval, instead of a minor second, to duplicate 'khord ast' in the orchestra. Secondly, the orchestral phrase duplicating the fourth hemstitch appears after the first utterance of the fourth hemstitch in m. 116. The first melodic fragment imitating 'khord ast' appears in m. 123 and starts with F-sharp, D-sharp in the first violins:

Example 29 (mm. 121-125)⁸⁶



The dyad is echoed by the piccolo in m. 124. In m. 127, the same melody is repeated on the piccolo, and this time, it aligns with the second iteration of the fourth hemstitch. This instance solidifies the connection between the voice and orchestra.

Sections A and B also vary in their tempo markings. A's tempo is 96 BPM and its overall energy and intensity increases gradually. There is a rupture at the beginning of section B, which is emphasized by a sudden drop of the tempo to 76 BPM and 'maestoso' and 'grave' as expressions. The energetic and motoric quality of section A is emphasized by perpetual patterns on the harp, piano, and celesta and melodies that rotate among the woodwinds and create a vortex of flowing melodies. In contrast with section A, section B starts with explosive chords that span across the orchestra and construct a homorhythmic texture. These chords complement the low and abrasive sound of Cont's voice and boost its solemn and deep quality. Although still present, the flowing melodies now move more slowly, and their combination with the chords makes them sound less energetic.

All the parameter changes mentioned above contribute to the changes in the texture of *Dialogue*. The movement begins with a light and transparent texture, and the changes in the register, tempo, orchestration, melodic gestures, result in a denser, and at times, more chaotic texture in section B.

⁸⁶ Saariaho, *Circle Map*, 85.

On paper, section A spans ninety-two measure, and B forty-seven. With the change of tempo from 96 BPM to 76 BPM, A takes approximately 2':20" and B 2':40" which is a much slighter difference. On the other hand, B's heavier tempo, extended phrases, and slow transitions can confound one's perception of time and make the section sound longer than its actual duration and, certainly, much longer than A. I believe that in organizing *Dialogue's* form and time Saariaho may have been inspired by Grisey's ideas on the relativity time and its perception.

Grisey conceptualized and applied his system to several of his works, such as *Vortex Temporum* (1996) and detailed it in his essay *Tempus Ex Machina: A composer's reflections on musical time* written for a course at the Internationale Ferienkurse in Darmstadt in 1980 and revised in 1985.⁸⁷ In this essay, he has emphasized on the heterogeneity of the musical time based on its organization, execution, and perception. Thus, he has divided time into three layers and calls them 'skeleton,' 'flesh,' and 'skin' of time. In this categorization, Grisey has investigated the amount of composer's control over musical time. The skeleton of time is the quantitative layer of it, organized and analyzed by the composer in the form of note values or conventional time units, such as minute and second.⁸⁸ Grisey has used the term flesh of time to describe the qualitative aspect of time in relation to the sound material. The flesh of time is defined and judged based on its execution by the performer. According to him: "We will be attentive here to the relativity of any temporal structure from the moment a sound materializes it."⁸⁹ At this point, the existence of music as sound in time and space becomes central. Finally,

⁸⁷ Gérard Grisey, "Tempus Ex Machina: A composer's Reflections on Musical Time," *Contemporary Music Reviews* 2 (1987): 274.

⁸⁸ Grisey, "Tempus Ex Machina: A composer's Reflections on Musical Time," 239.

⁸⁹ Grisey, "Tempus Ex Machina: A composer's Reflections on Musical Time," 257.

the skin of time is about the experiential and psychological aspects of it and how the musical time is perceived through listening. As Grisey describes: “With the skin of time, we enter a field where the composer notices more than he acts. The skin of time, a place of communication between musical time and the listener's time, is not very open to his interference.⁹⁰”

Grisey’s three layers of musical time and his special attention to the experiential aspect of it (skin of time) led him to investigate the relationship between two consecutive musical events and our perception of their temporal quality. Worth noting is that this system is based on Grisey’s personal and poetic views of the musical time and does not entail any analytical and quantitative methods.

While Saariaho has not fully complied with Grisey’s method of organization and perception of time, I believed that she has modeled a system in which higher frequencies in the orchestra and electronics move at a relatively faster tempo, and are perceived more contracted than low frequencies that happen to unfold more slowly. By pairing faster rates of vibration in high frequencies with nimble rhythmic gestures, and slower rates of vibration in low frequencies with heavier rhythms, Saariaho has built a stronger connection between pitch and rhythm. Therefore, she has created a firmer relation between the two parameters and played with the listener’s sense of time in a profound and effective manner. The inherent dichotomy of the quatrain has become another powerful tool for establishing her personal, methodical, and yet, poetic system for organizing time in *Dialogue*, and she has succeeded to shift our perception of the music.

⁹⁰ Grisey, “Tempus Ex Machina: A composer’s Reflections on Musical Time,” 272.

EP Analysis

Example 30



Since the timbre, register, melodic contour, and texture of the orchestral part are based on the voice, I consider it as an extended consonant section that spans through the whole movement. The homogeneity of the orchestra is countered by various degrees of intelligibility of the text in the electronics. The stretched, filtered, and distorted quality of Cont's voice uttering the first two hemstitches should be regarded as dissonant (mm. 3, 9, 19-27, 44-58.) In mm. 93-95, and mm. 116-118 the degree of comprehensibility increases considerably, yet the granular quality of the voice impacts its intelligibility. Hence, these two sections should be considered as a combination of consonant and dissonant. Finally, Cont's voice is at its clearest level in mm. 102-104 and 127-130, which these sections in the area of consonant in the spectrum of the expression parameter system.

VI. Day and Night, Music

Transliteration

*Âvâzé torâ tab'é délé mâ bâdâ
andar shab-o-rouz, shâdo gouyâ bâdâ
âvâze khaste-ye to gar khaste shavad khaste shavim
âvâzé to chon nâye shékar-khâ bâdâ*

Word-by-word translation

*The song of . yours . temper of . hearts of ours . may agree with
at night . and in day . jubilant and . eloquent . may it be
song of . weary of . yours . if . weary . it gets . weary . we get
song of . yours . like . reed . sweet . may it be*

Literary translation/interpretation by John Moyne and Coleman Barks:

**All day and night, music,
a quiet, bright
reedsong. If it
fades, we fade.⁹¹**

In *Day and Night, Music*, several elements from the previous five movements of *Circle Map* are identifiable. Saariaho has restated the modified versions of some of the most salient ideas of movements one through five, and treats the final movement as a recapitulation of the piece. One of these salient ideas is the wind sound that was present in the first movement, *Morning Wind*, in the electronics and accentuated in the form of perpetual motifs in the percussion, piano, and strings. In *Day and Night, Music* the effect reappears in the electronics and orchestra. Techniques such as the breath tone (air sound) on the flutes, trombone, and tuba, continuous gestures like scraping the sandpaper blocks and tremolo on the swish cymbal emulate the sound of the wind. One of the three layers of the electronic part is the pre-recorded sound of the wind which blends with the rest of the electronic sounds and the orchestra. The second layer of the electronics, labeled as noise, is Cont's voice with its pitch component removed from it by

⁹¹ Moyne and Barks, *Unseen Rain*, 2.

AudioSculpt almost entirely and mostly consisting of the white noise. The third layer comprises of chords generated from Cont's voice processed and accompanied with resonant filters. Despite having the highest amount of pitch material compared to the other layers, the noise content of this layer is fairly audible and instrumental to the timbral homogeneity of the electronic layers. Generally speaking, in this movement, the text remains fairly obscure and at the background of the rest of the sounds. I interpret this effect as a means of highlighting the music, which is also part of the title of the movement, *Day and Night, Music*. As though the words are not of much importance at this point, and what matters is music which should be the main presence in *Circle Map's* universe.

Like the previous movements, Saariaho has used various musical ideas to capture the concept of circle in *Day and Night, Music*. Along with the specializing the sound of the wind across the twelve channels, she has created a circle by modifying the form of the quatrain. In the original version of the quatrain, the order of the hemstitches is as follows:

- 1) âvâzé to chon nâye shékar-khâ bâdâ
- 2) andar shab-o-rouz, shâdo gouyâ bâdâ
- 3) âvâze khaste-ye to gar khaste shavad khaste chavim
- 4) âvâzé to chon nâye shékar-khâ bâdâ

In m. 15, which coincides with the first appearance of the text, Saariaho has omitted the first hemstitch and started the movement with the fourth one, which is repeated in m. 24. The fourth hemstitch is followed by the second and third hemstitches in m. 28 and m. 32 respectively.

The fourth hemstitch is uttered once again in m. 36 and reiterated in m. 42.

- 4) âvâzé to chon nâye shékar-khâ bâdâ (x2)
- 2) andar shab-o-rouz, shâdo gouyâ bâdâ
- 3) âvâze khaste-ye to gar khaste shavad khaste shavim
- 4) âvâzé to chon nâye shékar-khâ bâdâ (x2)

Omitting the first hemstitch, and beginning and ending the electronics with the last hemstitch is an effective solution for creating a circular form in where the start and finish points are the same. In my analysis of movements one, three, and five, I discussed the musical representations of the circle in elements such as the melodic lines that move across the instruments, and ascending and descending gestures moving in opposite directions. In movement six, the distribution and movement of the melodic lines among the instruments is similar to movements one, three, and five. The melodies are fragmented and distributed among the instruments of each section. The fragments travel from one instrument to another and create a long line of melody that circulates in the space, which also emulates the movement of the wind. The effect is especially audible during the live performance at the hall. In the example below, the melody starts on bassoon 1 in m. 7, transitions to the bass clarinet, clarinet 1, clarinet 2, oboe 2, and oboe 1. Then, it circles back to clarinet 1 in m. 13, bassoon 2, and later, to bassoon 1.

Example 31 (mm. 7-15)⁹²

Poco a poco più energico,
ma sempre sensibile

Fl. 1
Fl. 2
Alto Fl. 1
Cl. 1
Cl. 2
Ob. 1
Ob. 2
B.Cl.
Bsn. 1
Bsn. 2

⁹² Saariaho, *Circle Map*, 90.

Musical score for Example 32 (mm. 44-45). The score includes parts for Flute 1 and 2, Alto Flute, Oboe 1 and 2, Clarinet 1 and 2, Bass Clarinet, Bassoon 1 and 2, and strings. The woodwinds play melodic lines with dynamics like *mp* and *mf*. The strings play a rhythmic pattern of ascending and descending arpeggios.

The circular motion also emerges in the string section in the form of repetitive ascending and descending melodies and arpeggios.

Example 32 (mm. 44-45)⁹³

Musical score for Example 32 (mm. 44-45) focusing on the string section. It includes parts for Violin I, Violin II, Viola, Violoncello (Vlc.), and Double Bass (D.B.). The strings play a complex rhythmic pattern of ascending and descending arpeggios.

Day and Night, Music's core rhythmic organization is based on the pattern of long and short syllables of the quatrain. The order of the quatrain's syllables is as follows:

⁹³ Saariaho, *Circle Map*, 97.

--..--..----
 --..---.----
 --.-.-.-.-.-.-
 --..--..----

Long syllables: _

Extra long syllables: —

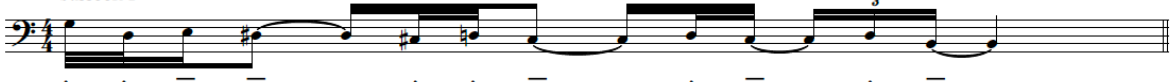
short syllables: .

The most prominent fragment which influences the rhythmic organization of the whole movement is [. . – –]. The most frequently heard musical representation of this pattern is a motif consisting of two short values, e.g. thirty-second notes, followed by two longer values, e.g. sixteenth notes. The movement opens with this pattern on bassoon 1 and permeates to the rest of the orchestra. Evidently, the pattern does not remain the same throughout the movement and undergoes different variations including changes in the order of the short and long rhythmic values, and their number of repetition. Prior to the appearance of the first hemstitch in m. 15, the connection between the rhythmic patterns of the music and language remains obscure.

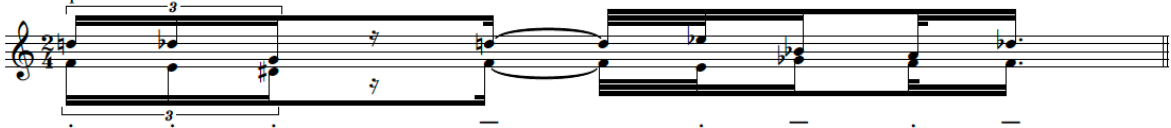
Nevertheless, the mechanical and rigid quality of the rhythms reminisces movement two whose rhythmic organization is strictly based on the text. In both movements, Saariaho has introduced the text after establishing the rhythmic character of the movement in the orchestra. Some of the passages of *Day and Night, Music* are based on the rhythmic pattern of the quatrain are provided below:

Example 33

m. 1
bassoon 1



m. 16
oboes 1 & 2
doubled by clarinets, bassoons
& percussion



m. 24
bassoon 1 & double bass
doubled by flutes



â-vâ-zé to chon nâye shékar-khâ bâ-dâ

m. 28
cello, bassoon,
doubled by flutes



andar shab-o-rouz, shâdo gouyâ bâdâ

mm. 30-31
piccolo



mm. 32-35



âvâze khaste-ye to gar khaste shavad khaste shavim

m. 36
bassoons 1 & 2
doubled by double bass



âvâzé to chon nâye shékar-khâ bâdâ

m. 42
piccolo

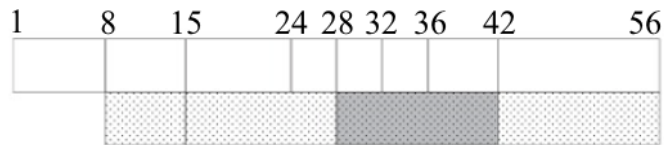


To make the connection between the text and music clearer, Saariaho has orchestrated the passages which accompany Cont's voice differently from passages that only echo and emulate the rhythmic patterns of the text without the voice. For example, in m. 24, the grainy sound of the double basses, bassoons, flutes, and percussion results in a more consistent blend of the orchestra and electronics. Additionally, this grainy sound combines with the harsh consonants such as 'kh' (sounding like **x**) and 'sh' (sounding like **f**) in the text and amplifies them. In m. 28, a similar timbral quality is repeated with slightly less abrasiveness, which again, matches the consonants of the text. In both of these cases, the composer has taken complete advantage of the low instruments to emphasize on the dark and heavy quality of Con't voice. The focus on the low register decreases gradually in mm. 32, 36, and 42, and along with that, the granular and coarse quality of the orchestral sounds diminishes as well. At this point, Saariaho has moved towards a brighter, smoother, and more delicate ending is obvious, and in so doing, she has brought the timbral quality of *Day and Night, Music* extremely close to the beginning of movement 1, *Morning Wind*. She has completed another large circle and ended the piece where she had started in *Morning Wind*.

The overall incomprehensibility of the words in this movement can be interpreted as a musical representation of 'fading out' in Bark's interpretation of the quatrain and the transformation of the words into music.

EP Analysis

Example 34



The consistent effort of the orchestra at imitating the rhythm, contour, harmony, and timbre of the speech and voice determines its consonant quality according the Expression Parameter system. The presence of the text in these parameters changes in different sections, and the text-based material does not dominate the movement at all times. For instance, the perpetual motifs of thirty-second notes in the accompaniment on the piano (e.g. mm. 9-14) marimba (e.g. mm. 24-27) harp (e.g. mm. 33-36) celesta (e.g. mm. 42-52,) and strings (e.g. mm. 42-54) are not necessarily derived from the text. Yet, they always accompany at least one instrument with direct melodic or rhythmic relation to the text. Similarly, the harmonies in the orchestra feature several extra pitches from the chords in mm. 24, 28, 32, 36, and 42, which are generated from the voice. Because of the dominance and familiarity of the text-based material, the entire orchestral part of *Day and Night, Music* is consonant.

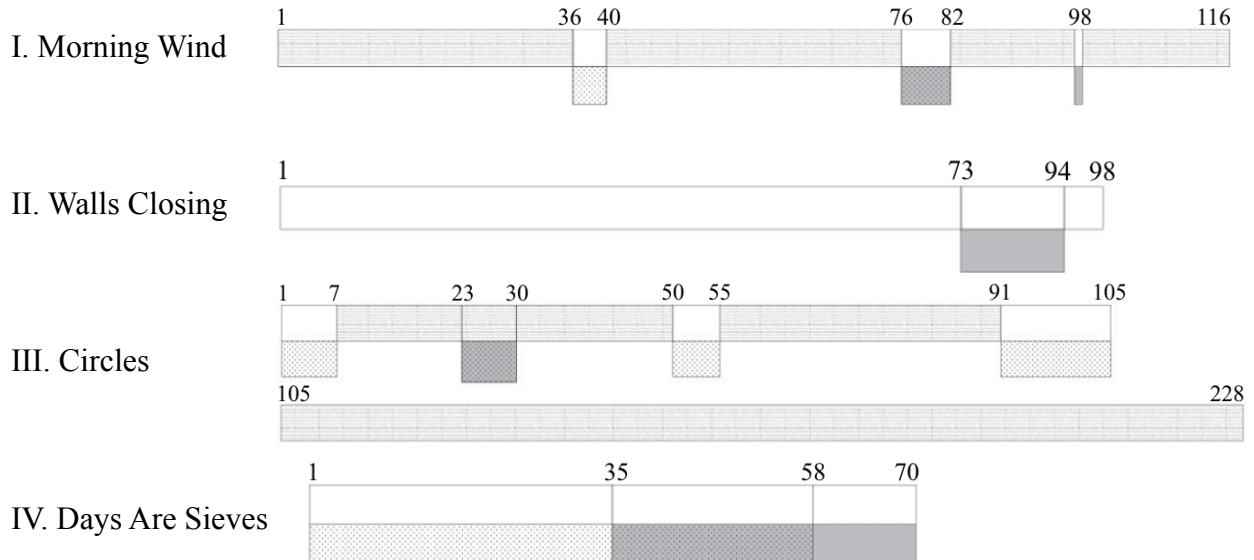
In the multi-layered electronics, the sound of the wind permeates the speech and never allows the text to dominate the overall texture of the movement. In mm. 28-42, the words become relatively more intelligible compared to the rest of the passages. This section is marked as a hybrid of consonant-dissonant with features of activity (increase in the comprehensibility of the words) and counter-activity (noise, distortion of the voice and text.)

Chapter 3: Expression Parameter Analysis and Texture

In this chapter, I put my observations on *Circle Map*'s Expression Parameter analysis in a larger context and take a closer look into the interplay and effect of the consonant and dissonant sections. Afterwards, I examine the textural changes of the movements and examine the effect of these changes on my perception of the piece.

Based on my categorization of consonant (action) in dissonant (counteraction,) the orchestral part is considered consonant if harmony, melodic contour, rhythm, or timbre audibly imitate Arshia Cont's speech. A lack of discernible connection between the orchestra and speech creates a dissonant section that can last from a fragment to an entire movement. In the electronic part, sections with clear and perceptible utterance of the quatrains are regarded as consonant. Contrarily, any distortion in the pitch, register, speed, etc. of the voice leading to the vagueness and incomprehensibility of the text is marked as dissonant. The expression parameter diagrams for all the six movements of *Circle Map* are provided below:

Example 35



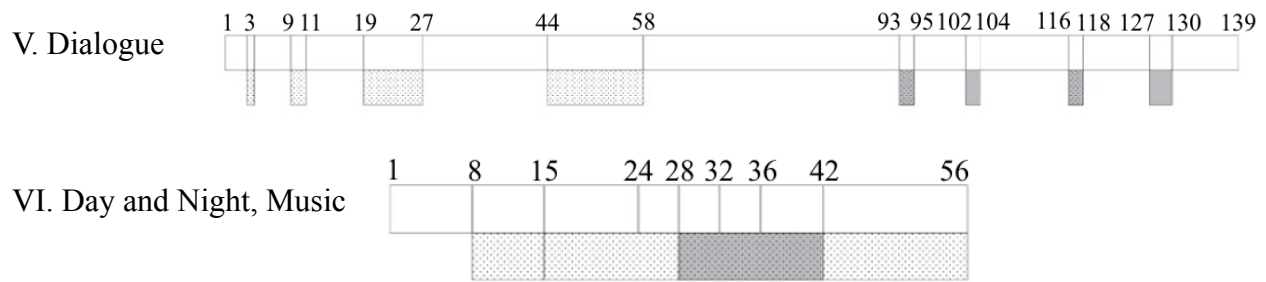


Table 3

Momvement	Orchestra	Electronics
I	mostly dissonant	mostly consonant
II	consonant	consonant
III	mostly dissonant	dissonant
IV	consonant	equally consonant and dissonant
V	consonant	equally consonant and dissonant
VI	consonant	mostly dissonant

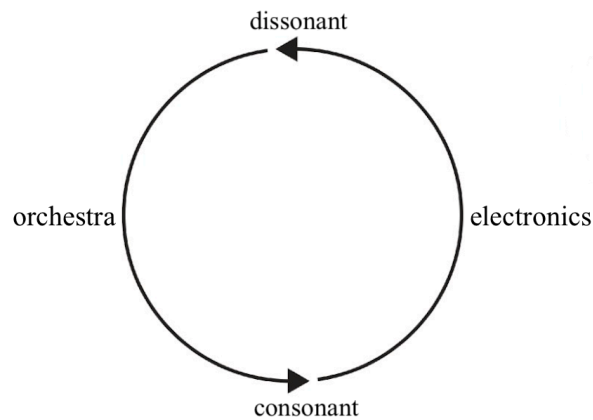
A closer look at the trajectory of the orchestral part and the diagrams shows that the orchestra starts with a mostly dissonant quality and gradually moves towards consonant. With its rhythm, harmony, and melodic contour strictly based on the text and analysis of Cont’s voice, the orchestral part of the second movement is in sharp contrast with movements one and three whose orchestral parts are largely dissonant. Yet throughout the piece, the overwhelmingly consonant character of the orchestra reveals Saariaho’s main intention for using the orchestra as a force to echo Cont’s voice. In several cases, the orchestra reflects the text more explicitly than Cont’s distorted voice. In effect, Saariaho has let the orchestra speak and be the second narrator of *Circle Map*.

Contrary to the orchestra, the electronics become progressively dissonant over the course of the piece. The mostly consonant character of the first two movements is interrupted by the entirely dissonant third movement. In the fourth and fifth movements, there is a temporary equilibrium of dissonant and consonant, but the fuzzy and distorted electronics overwhelm movement six and reinforce the effect of dissonant as the final sonic impression of the entire piece.

The clarity of speech in the consonant sections of *Circle Map* often separates it from the orchestra and generates a heterogeneous texture. The consonant sections of the electronics, when combined with the orchestra increase the textural complexity and variety. On the contrary, any distortion of the voice and text and their dissolution in the orchestra happens for the purpose of integrating and blending the two parts together. In such sections, the two parts complement each other and function as a unified texture. The interplay between these two contrasting types of texture creates an ongoing ebb and flow across the piece. Additionally, the switch of focus between the intact and distorted versions of the words, reflects Saariaho's close attention to the meaning and deeper context of the quatrains, rather than the mechanics of the language and voice. Towards the end of *Circle Map*, the textural integration of the orchestra and electronics happens quite organically. As mentioned earlier, this type of process is typical of Saariaho's approach to the timbral and textural transformations, and although smooth, leads to impressive results in the dramatic trajectory of the work.

A comparison of *Circle Map*'s electronic and orchestral parts demonstrates the gradual change of their character from consonant to dissonant and vice versa. The sonic result of this meticulously-organized structure is a well-balanced sound world that transforms smoothly from

one end of the axis to the other. In their transition towards the opposite ends of the axis, the orchestral and electronics parts can be imagined to draw two curves. When seen together, the curves form a full circle that encompasses all the six movements of *Circle Map* and completes their sonic and dramatic journey.



Conclusion

My analysis of *Circle Map* revealed several important points about this piece and Saariaho's world as a composer. According to her remarks, the analysis of Arshia Cont's voice, reciting Rumi's quatrains in Persian, is only a starting point in her creative process, and in this case, she has felt free to modify the result of her analysis to achieve sonorities and structures that appeal to her ear. By utilizing a hybrid of techniques from the spectral and computer practices, and taking inspiration from Nature, e.g. birdsong, wind, Saariaho has composed a piece that, as Pirkko Moisala puts it, is perceived and appreciated by the ear. Her subjective and flexible approach to analysis has allowed her to explore the conceptual and poetic qualities of Rumi's quatrains. Throughout the piece, various expressions of the circle and circular motion appear. Perpetual melodies in a circular shape, instrumental dialogues that whirl in the space, and electronic sounds that travel across the twelve channels emulate the shape of a circle. All the

features mentioned above show that Saariaho has created and maintained the balance between the quantitative aspects of sound and her personal interpretation of the quatrains. In the majority of the movements, Saariaho has devised two contrasting musical characters that reflect the inherent duality of their corresponding quatrains. Sometimes, the two characters merge together and become a single, hybrid musical entity. For example, the static and dynamic musical characters blend together slowly and become one. Other times, they stay independent and reach balance by maintaining their contrast. In movement five, the character of the lover and beloved remain intact and independent, and they take their own time and space in the movement.

In *Circle Map*, the orchestra and electronics comprise a grand meta-instrument which is at the service of the text. In several instances, the timbre, texture, harmony, and rhythm of the two parts emulate and evoke the same parameters of Arshia Cont's voice, and in other cases, the orchestra is free and independent from the voice. Valentina Kholopova's Expression Parameter system, which consists of the binary of consonant (action) and dissonant (counter-action) is an apt tool for analyzing these changes and understanding the structure of *Circle Map* on the micro (movement-by-movement) and macro (the entire work) levels. Those sections of the orchestral part that emulate the timbre, harmony, melodic contour, or rhythm of the text audibly are considered consonant. Any clear and utterance of the text in the electronics is also consonant. Saariaho has used similar rhythmic patterns and melodic contours to mimic the rhythmic and melodic aspects of the quatrains respectively. She has also incorporated different resonant filters and orchestration techniques to imitate and amplify the harmony and register of Cont's voice. In the orchestra, a lack of harmonic, timbral, and rhythmic resemblance with the speech is interpreted as dissonant. Any distortion and incomprehensibility of the speech in the electronics,

is regarded as dissonant. Based on these criteria, the orchestra's general trajectory is from dissonant to consonant. On the contrary, the electronics become progressively distorted and, therefore, dissonant.

When combined with the orchestra, different degrees of clarity in the voice influence the overall texture of *Circle Map*. The more articulate and perceptible the speech, the more audible its contrast with the orchestra. On the other hand, by blending the orchestra and electronics together, Saariaho has often distorted the voice. As the orchestra imitates the text and voice more clearly, and the voice coalesces with the orchestra, the timbre and texture of *Circle Map* become more homogeneous. This gradual timbral and textural unification are typical of Saariaho's music, and in the case of *Circle Map*, it can be interpreted as the ultimate unity of the lover and beloved, which is one of the core concepts of Sufism and Rumi's spiritual beliefs. If the beginning of *Circle Map* is about setting music to poetry, its end is certainly poetry in the language of sound and music. The music is speaking and the circle is complete.

Appendix: Interview with Kaija Saariaho

1. Aida Shirazi: Did *Du Cristal* and ... *a la fume* influence *Circle Map* in any way?

Kaija Saariaho: Well not consciously, because those two pieces were written twenty five years prior to this piece, and after that I wrote several other orchestral pieces. Of course, every experience you get from a proceeding work, it has some kind of influence for sure.

2. A.S.: Did your earlier electro-acoustic works (such as *Vers le Blanc* and *Stilleben*) have any influence on *Circle Map*? Has your approach to electronics nowadays changed after your IRCAM years?

K.S.: I think my approach with electronics has changed little by little over the years. When I did the course at IRCAM, we were working with PDP 10 computers and since it was a complete time sharing system, we were working a lot at night. Also, the power of the computers was much less, something that has changed radically. When I started working with electronics and computer, nothing could be done in real time. However, in *Circle Map* I have a lot of pre-recorded material and that comes from my experience with orchestras and orchestra rehearsals. Since the rehearsal time is so short, I decided that this time if I write for electronics and orchestra, they need to pre-exist so I don't even start asking for more time for working with live electronics and the orchestra. So, it was a practical decision. And with this practical decision came from the fact I was recording Arshia Cont's voice reading the text in the original language. I don't understand Persian at all and I had never worked with a language that I didn't know, so this was a very different kind of experience. I have the poems in many translations, especially I like one of the translations that I found on one of my trips to New York. But of course, like

translating any poetry, these translations are very free. They absolutely don't have and don't even try to have the rhythm of the original text. I became very intrigued by the rhythm of the speech and prosody of the text, and that is why I started analyzing it. As a result of my analysis, I started developing different materials based on Arshia's voice and its rhythms and sounds, so then very naturally, it became a part of the piece.

Also, I'm married to Jean Baptiste Barrière who developed certain tools at IRCAM in those years, and those tools happen to interest me a lot. We have a small studio at home, and he, for example, was creating the electronic parts for me. I had a clear idea about what my electronics are going to sound like, but then he used those tools which are the grandchildren of the original ones I used back in the 80s at IRCAM. So that connection exists very much even if I'm not practically working in an IRCAM studio.

3. A.S.: It seems to me that the timbral axis that you talk about in your article “Timbre and harmony: Interpolations of timbral” structures is still central to your work.

K.S.: Yes, it is present in my music because it is very present in my imagination. I think it is very much the way I think about music. But on the other hand, it is not so structured. For example. I always write my orchestral music in full score. Also, I always have a lot of sketches, different sketches of the harmonic structure, that I'm going to use and in this case I had the rhythmic analysis of Arshia's speech, but otherwise when it comes to orchestration and the instrumental colors, I don't have any plans. I just start writing the score so my only criteria is that when I write a specific passage, is it satisfying to me or not. So in that sense, what I formalized in this article is not something that I do consciously really. The idea of tension and release, and

consonance and dissonance can sometimes be completely opposite. Sometimes it can be that the bright colors form very dissonant chords and the release can, then, not be a release from the noise or a very complex spectrum, because the complex spectrum can have different kinds of nature. It can be disturbing noise, but it can also be soothing whisper, wind, or periodic sound, like waves. So, it is not completely systematic. Sometimes, they (the two spectra) can be super-imposed.

4. A.S.: Apparently, you have revised Circle Map. Could you talk about the things you changed in the piece?

K.S.: I often revise the dynamics. It's really difficult with orchestral works to predict them.

5. A.S.: Could you talk about your process, especially for works with electronics? Do you work on the electronic and acoustic parts simultaneously or does working on one part follow the other?

K.S.: Often, I cannot write the orchestral part before having the electronics. On the other hand, I don't know exactly how my electronics are going to be [duration and some sounds] before having quite a bit of composed material. We made tests when I had the ideas of different voices. Then, I analyzed the rhythms for the electronics, and the intonation for the second movement. And the electronics for that part is nothing but cutting the poem. So every movement is a little bit different when it comes to electronics. Sometimes the text gives more to the instrumentation than the electronics does. I really like to go back and forth and make them hand in hand. In the second movement, the instruments imitate the intonation of the voice. In *Days are Sieves*, I have harmonic filter banks and create these resonant filters and the poem goes through the filters but

there are certain pitches that resonate and then I use those pitches for the harmonies in the orchestral part.

6. A.S.: To what extent are the harmonies informed by the analysis of the voice versus intuitive choices? Are the quarter tones derived from the sound of speech?

K.S.: Some of the harmonies in the orchestral part come from the analysis of the voice, but they are mainly separate. The main connection comes from those filter banks—something that unifies the electronic and orchestral parts. I'm completely free even when I deal with analysis and computers. I just use them to inspire myself, but I don't feel attached to them. I would say the second movement is where I am most strict. In other parts of the piece, I occasionally use the material that I analyzed, and a lot of times, there is only the hint of that material there, and I create most of the music intuitively. The quarter tones come from the analysis of speech. I move freely among the octaves to create strange sonorities [in *Days are Sieves*.]

Bibliography

Actor Project. "Instrumental Synthesis." Accessed June 30, 2021. https://www.actorproject.org/tor/timbre-lingo/2020/6/14/instrumental-synthesis-timbre-lingo-11#_ftn2.

Anadolu-Okur, Nilgün. "The Enduring Allure of Rumi and Sufism in American Literature." In *Muslims and American Popular Culture*, edited by Iraj Omidvar and Anne Richards, 248-284. New York: Praeger, 2014.

BBC. "Sketches for Mortuos Plango, Vivos Voco (1980) Jonathan Harvey," Cut And Splice 2005. BBC Radio 3. 2004. Accessed July 10, 2021. <https://www.bbc.co.uk/radio3/cutandsplice/mortuos.shtml>.

Clements, Andrew. "Out of the Shadows." *The Guardian*, August 25, 1995.

Ewell, Philip A. "The Parameter Complex in the Music of Sofia Gubaidulina." *A Journal of the Society for Music Theory* 20, no. 3 (September 2013): 1-6. <https://mtosmt.org/issues/mto.14.20.3/mto.14.20.3.ewell.php>.

Drozzina, Aleksandra. "Schnittke, Gubaidulina, And Pärt: Religion and Spirituality During the Late Thaw and Early Perestroika." PhD diss., Louisiana State University, (2020).

Faber Music. "Jonathan Harvey." Accessed July 11, 2021. <https://www.fabermusic.com/we-represent/jonathan-harvey>.

Foruzanfar, Badiozzaman. *Kulliyat-e Shams*. Tehran: Amir Kabir Press, 1957.

Grisey, Gérard. "Tempus Ex Machina: A composer's Reflections on Musical Time." *Contemporary Music Reviews* 2 (1987): 239-275.

Harvey, Jonathan. "Jonathan Harvey on the record." Interview by Bob Shingleton. *An Overgrown Path*, May 20, 2014. <https://www.overgrownpath.com/2014/05/jonathan-harvey-on-record.html>.

Harvey, Jonathan, "Mortuos Plango, Vivos Voco: A Realization at IRCAM." *Computer Music Journal* 5, no. 4 (Winter 1981): 22-24. <https://doi.org/10.2307/3679502>.

Kaija Saariaho, Email to author, April 14, 2019.

Kaija Saariaho. "Nymphéa." Accessed June 21, 2021. <https://saariaho.org/works/nympea/>.

- Kaija Saariaho. "Verblendungen." Accessed June 24, 2021. <https://saariaho.org/works/verblendungen/>.
- Kholopova, Valentina. "Parametr ekspressii v muzykal'nom iazyke Sofii Gubaïdulinoï" (The expression parameter in the music of Sofia Gubaidulina). In *International Conference Proceedings of Moscow Forum*, vol. 25: 153-160. Moscow Conservatory, Moscow. 1999.
- Kholopova, Valentina. *Sofia Gubaïdulina: Monografiia* (Sofia Gubaidulina: A monograph). Moscow: Kompozitor, 2011.
- Manning, Peter. *Electronic and Computer Music*. Oxford: Oxford University Press, 2004.
- McAdams, Stephen, Saariaho, Kaija. "Qualities and Functions of Musical Timbre." *ICMC Proceedings* 85 (1985): 367-374. <https://quod.lib.umich.edu/cgi/p/pod/dod-idx/qualities-and-functions-of-musical-timbre.pdf?c=icmc;idno=bbp2372.1985.058;format=pdf>.
- Moisala, Pirkko. *Kaija Saariaho*. Urbana: University of Illinois Press, 2009.
- Moyne, John, and Barks, Coleman. *Unseen Rain*. Putney: Threshold Books, 1986.
- Rodet, Xavier, Potard, Yves, and Barrière, Jean-Baptiste. "The CHANT Project: From the Synthesis of the Singing Voice to Synthesis in General." *Computer Music Journal* 8, no. 3 (Autumn 1984): 15-31. <https://doi.org/10.2307/3679810>.
- Saariaho, Kaija. "Biography." Accessed July 15, 2021, <https://saariaho.org/biography/>.
- Saariaho, Kaija. *Circle Map*. London: Chester Music Limited, 2012.
- Saariaho, Kaija. "Composer Kaija Saariaho about Nature..." Facebook Video, January 29, 2016. <https://fb.watch/v/2RIIaQusk/>.
- Saariaho, Kaija. "Interview With Kaija Saariaho," interview by Aida Shirazi, June 25, 2019, audio.
- Saariaho, Kaija. "Kaija Saariaho on The Role of Nature in Her Work." Carnegie Hall. February 17, 2012. 1:24. <https://www.youtube.com/watch?v=pEmSVqegTi4>.
- Saariaho, Kaija. "Timbre and Harmony: Interpolations of timbral structures." *Contemporary Music Review*, 2:1 (1987): 93-133. <https://doi.org/10.1080/07494468708567055>.
- Saariaho, Kaija. "Using the Computer in a Sear for New Aspects of Timbre Organization and Composition." *International Computer Music Association*, Rochester, New York, (October 1983): 269-273. <http://hdl.handle.net/2027/spo.bbp2372.1983.021>.

Schimmel, Annemarie. *Rumi*. New Delhi: Oxford University Press, 2014.

Service, Tom. "Meet The Composer: Kaija Saariaho in Conversation with Tom Service." In *Kaija Saariaho: Visions, Narratives, Dialogues*, edited by Tim Howell, 3-14. New York: Routledge, 2011.

Smalley, Dennis. "Spectromorphology: Explaining Sound-Shapes," *Organised Sound*, 2: 2 (1997): 107-126. <http://www.yorku.ca/vannort/smalley-spectromorphology.pdf>.

Wise Music Classical. "'Kaija Saariaho, Circle Map (2012).'" Accessed April 25, 2019, <http://www.musicsalesclassical.com/composer/work/1350/47338>.