FOLIO OF COMPOSITIONS

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Abstract

As a result of six years of research in further developing my personal compositional techniques, this portfolio contains eight pieces of music. Each one of them is an attempt to solve certain aesthetic or technical problems concerning composition, by finding a viable balance between coherent construction and intuitive creativity.

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Title	Instrumentation	Time of completion	Duration
Homage to Anton Webern	Clarinet in B♭ and bass clarinet in B♭	Dec 2007	ca. 5’
String Quartet	Two violins, viola and cello	Apr 2009	ca. 8’
Melting Clocks	Percussion and piano	May 2010	ca 9’30”
Permutations	Solo violin	Jan 2011	ca. 7’
Reflections	Orchestra	Feb 2012	ca. 10’
Recursion	Solo piano	Jun 2012	ca. 5’30”
Hocket of Petty Selves	6 solo voices and chamber ensemble (8 players)	Sep 2013	ca. 10’
Three Aphorisms, for wind quintet	Flute, oboe, clarinet in B♭, horn in F, bassoon	Oct 2013	ca.6’30”

Contents of the accompanying CD

1. Homage to Anton Webern
   (Midi recording)
2. String Quartet, Part I
   (Live recording)
   Performed by the Diotima String Quartet,
   April 2009, State Conservatory of Thessaloniki, Thessaloniki, Greece
3. String Quartet, Part II
   (Live recording)
   Performed by the Kreutzer Quartet
   Edited workshop and live recordings
   June 2012, Sir Jack Lyons Concert Hall, York
4. Melting Clocks
   (Midi recording)
5. Permutations
   (Midi recording)
6. Reflections
   (Midi recording)
7. Recursion
   (Live recording)
   Performed by Christina Katidou,
   December 2012, State Conservatory of Thessaloniki, Thessaloniki, Greece
8. Hocket of Petty Selves
   (Midi recording)
9. Three Aphorisms, for wind quintet
   (Midi recording)

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I would like to express my deepest gratitude to my supervisor, Professor Thomas Simaku. His constant support, and encouragement, as well as his deep understanding of my artistic concerns and perspectives helped me complete the portfolio without deviating from my own personal path.

I would also like to thank the Department's staff for their supportiveness adjusted to the individuality of every student.

Finally, I would like to express my deepest gratitude to my wife, Johanna, and my parents. Without their devotion and encouragement this study would have not been accomplished.

This work is dedicated to the memory of my father and to my one year old daughter, Sophia - Christina.

Author's declaration

I confirm that the work in this folio of compositions and commentary is my own and has not been submitted for examination at this or any other institution for another award. Any reference made to the work of others is indicated in the references section and the body of text.

Commentary on the compositions

1. Introduction

In an effort to summarise six years of research in a synoptic introduction, I will try to put my work in context by outlining the general principles that formulated my attitude towards composition, by presenting the objectives of my research, my influences and artistic predilections and, finally, some of my basic techniques.

1.1. General principles

> When a system of "meaningless" symbols has patterns in it that accurately track, or mirror, various phenomena in the world, then that tracking or mirroring imbues the symbols with some degree of meaning - indeed, such tracking or mirroring is no less and no more than what meaning is.
>
> - Douglas R. Hofstadter[1]

The above quotation from Douglas R. Hofstadter summarises quite succinctly my philosophical approach to musical composition. To my mind, the presence or absence of a highly organised structural pattern sets a definitive barrier between meaningful music, on the one hand, and randomly dispersed, amorphous sound, on the other.

Of course, this rather simplified postulate serves merely as a starting point, as a means of orientation for me. It is known that in any formal axiomatic system in mathematics the 'negative space' of the set of all false statements does not necessarily outline the 'positive space' of the true ones. In a similar manner, I believe that what is not music cannot define adequately what music is.

However, by analysing compositions of the 20th century I have come to realise that while self-consistent, well thought-out structures are always present in any work that I deem aesthetically "successful", the same is also true for pieces or even trends of musical composition I consider more or less problematic. In other words, it seems that while a coherent construction is a compositional sine qua non, its mere existence alone may not guarantee meaningful musical results.

Hence, where is the missing point? Paraphrasing Hofstadter, I think that a lack of correspondence between structural 'patterns' and 'various phenomena in the world', the absence of isomorphism - to put it more formally -, is the core of the problem. I shall further clarify this crucial statement, especially as far as the definition of 'various

[1] Hofstadter, *Gödel, Escher, Bach: An Eternal Golden Braid*, P-3

phenomena' in relation to music is concerned, by employing an example taken from the criticism of post-Webernian serial music.

Jonathan W. Bernard, summarises Ligeti's criticism about integral serialism in his article 'Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution'. Among others, he writes:

> [Ligeti] found problematic 'the organization of all the musical elements' – that is, pitch, duration, timbre, dynamics, mode of attack – 'within a unified plan' because he 'detected within it a discrepancy: quantification applied equally within the various areas produced, from the point of view of our perception and understanding of musical processes, radically different results, so that there was no guarantee that a single basic order would produce analogous structures on the various levels of perception and understanding'. Unity, therefore, existed only on the level of verbal description, 'clapped on the musical events from the outside'[2].

It is obvious that this failure of a 'single basic order' to 'produce analogous structures on the various levels of perception and understanding' is an aspect of the problem of isomorphism. Moreover, while an ordering of musical elements may be meaningful in areas such as pitch perception, an arbitrary mapping of this ordering onto the field of durations, for example, may be problematic due to the different mechanisms employed in our perception of speed and duration. To quote Ligeti once again:

> [...] those physical speeds which are perceived by my ears in the form of pitches lie (as far as my nervous system is concerned) not in the physical realm of speed, but in an area of the mind in which perceptions are qualitative, not quantitative. For this reason a basic order that postulates a ratio of a:b as a regulating factor common to both pitch and duration (or speeds) is irrelevant, indeed meaningless in relation to a musical structure, which in structural terms reflects mental rather than physical processes[3].

To put it more generally, so that a structure "works" a certain correspondence has to be established between it and our perceptual system, an isomorphism that connects the two of them and creates 'meaning'.

I think that a logical construction without properties like those mentioned above would remain a mechanical exercise deprived of any expressive power, let alone

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[2] Bernard, 'Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution', in. *Music Analysis,* Vol. 6, No.3. (Oct., 1987), pp. 207-236, 208

[3] Ligeti, G., 'Fragen und Antworten mit mir selbst', in *Ligeti in Conversation*, pp. 124-37, 131

meaning. On the other hand, a loose compositional structure based mainly on intuition might give the impression of a directionless improvisation risking consistency in the name of a rather questionable "freedom".

As a composer I felt that I should follow neither of those two extremes, but instead search and develop my personal musical language by finding a way in-between.

1.2. Research goals

During my studies at York I had the opportunity to pursue my quest, i.e. composing music that "works" for me, according to the postulates set out above. I think that since the unification of structural discipline with expressive freedom is an objective of a complex, subtle and elusive nature, its fulfilment should be founded on empirical methods, so that unity is not imposed 'on the musical events from the outside'. Certain compositional techniques should be developed, tested in practise, evaluated, adjusted to new findings and accordingly modified, through a constant interaction between artistic intention and the resulting sound.

The nature of the specific research, the outcome of which is a folio of compositions, defines the nature of the objectives. In opposition to fields like mathematics, biology or physics, where new findings are the apparent goal, in a folio of compositions what is sought after is the work of art itself. This is especially true in our pluralistic era, as opposed to the common practice period which has long gone by. Nowadays, radically different and even conflicting musical ideas and attitudes participate equally in the formulation of a heterogenous global musical landscape.

In that sense, new ideas in the field of contemporary musical creation coincide almost entirely with the personal musical idiom of every single composer. That idiom is shaped by the interaction of many factors like personal taste, attitude or influences, to name just a few. In the following section I shall attempt to give a short overview of the context within which my personal compositional language was developed.

1.3. Influences

My musical language is a result of constant interaction between musical as well as extra-musical influences. As an example of the last ones let me mention my graduation thesis at the Aristotle University of Thessaloniki, which examined Fractal Geometry and Chaos Theory in connection with their application in music. These theories influenced my compositions, yet only indirectly. In musical composition I have adopted and used general notions, like the idea of deriving maximum foreground complexity from background simplicity, rather than pursuing a literal application of mathematical

formulas. Nevertheless, I do approve computer-aided composition on the condition that algorithmic processes serve as a means and not as an end themselves. In that spirit, I have used OpenMusic, a visual programming language developed in IRCAM, in several of the works included in this folio.

My philosophical views on music have also been influenced by Douglas R. Hofstadter, especially by his ideas about meaning, isomorphism and recursion. Likewise, the limitations of language, as pointed out by Ludwig Wittgenstein, and the incompleteness inherited in every formal system, as proved by Kurt Gödel, have also had an impact on my understanding of the limitations of constructivism in music.

The visual arts, especially painting, are another extra-musical source of inspiration. I am a great admirer of the way Salvador Dalí used traditional techniques to create groundbreaking forms. Furthermore, the clarity by which M.C. Escher designed his illusion drawings, his astounding combination of technical discipline with creative imagination, have inspired musical analogies in my works as well.

As far as pure musical influences are concerned, I acquired sound knowledge of the Western European musical past, during my undergraduate studies in musicology and as a teacher of music theory.

As a composer and analyst, I have greatly been influenced, among others, by Bartók's innovative ways of approaching chromaticism as well as by the conciseness of Webern's musical language. Works of Iannis Xenakis and György Ligeti have shown me alternative paths out of the modernistic crisis, while the reaction of spectral composers like Grisey, Murail, Saariaho and Radulescu against serialism and post-serialism, their effort to liberate music from an obscure symbolism, have helped me focus on the physical properties of sound.

1.4. Techniques

All compositions of the present folio are pervaded by a common interconnecting line recognisable by recurring ideas concerning the evolution of certain techniques such as:

1. Symmetry
2. Layering
3. Canonic techniques
4. Transformative processes
5. Use of the Golden Section

The context within which these techniques have been used as well as their development during the course's progression will be examined next.

1.4.1. Symmetry

I think that repetition as a broader concept is as important for the consistency of musical language as is frictional force for keeping the universe together. From that point of view, a sinusoidal sound wave sharply distinguishes itself from noise due to the repetitive pattern its waveform exhibits as opposed to the randomness of a noise signal.

Symmetry is a kind of structural repetition acting in the background of musical construction. A symmetric chord, for example, is the reiteration of an intervallic pattern in pitch-space. Symmetry occurs frequently in my compositions in various parameters of the construction. Several large-scale constructions like those found in most compositions of mine, such as *Homage to Anton Webern, String Quartet, Permutations, Reflections* or *Three Aphorisms,* make more or less extensive use of symmetry.

However, the rigid application of symmetric construction in my first piece (*Homage to Anton Webern*), for example, evolved a few years later into a more flexible employment of symmetry, as found in my orchestral piece (*Reflections*). A network of symmetric correlations between formal sections in *Melting Clocks* also renders a sense of consistency in the piece, as is the case in *Permutations for solo violin*. Nonetheless, each of the two pieces uses these correlations in a totally different context.

1.4.2. Layering

The complex outputs of processes where simple patterns are repeatedly being applied onto themselves in Fractal Geometry have always been fascinating to me. Therefore, one of the most frequent methods I used for deriving complex musical structures from much simpler recursive processes was "layering" of the material. By that I mean the superimposition of multiple simple elements in such a way that intricate, composite musical events come to the fore. Consider, for example, the way the tone rows are intertwined in *Homage*, or the gradual addition of rhythmic layers that intensify complexity in *Melting Clocks* and *Hocket of Petty Selves*. By constantly working on this technique, I achieved greater levels of complexity by using simpler processes each time.

Moreover, the technique of "layering" is related to hierarchically structured levels of importance in my compositions. As an example, macro-structural layers concerning harmonic direction, strategic projection of crucial intervals or long scale changes in texture defined in many cases the composition of the "micro-structural" details, like melodic lines, rhythmic activity or dynamics, in most of my works. A characteristic sample can be found in *Melting Clocks*, where a single set of carefully chosen background rules controls the complex polyrhythmic activity in the foreground.

1.4.3. Canonic Techniques

I have always been a great admirer of Ligeti's canonic techniques, because of their ability to derive surface complexity from background simplicity. Furthermore, the proper uses of canon guarantee smooth transitions from one structurally important point to another. Of course I have adapted this technique to my personal expressive needs, and used it in various and quite different ways. Two contrasting examples are the canon of the second part of *Homage,* as compared to the techniques used in both parts of my *String Quartet*.

1.4.4. Transformative processes

The concept of transformation is central to my perception of development and direction towards a goal in a piece of music. I experimented with different kinds of transformative processes in every piece included in this folio of compositions. The 10-minute textural escalation in *Hocket* and the transformation of a sonic "cloud" into a unison melody in *Reflections* are just a few examples.

1.4.5. Use of the Golden Section

The use of Golden Section is not at all new in composition. Many composers like Bartók, Ligeti, Xenakis and others have employed the Golden Section in the most disparate ways and with radically different artistic results. Personally, in using Golden Section I have found a consistent way of dividing time-space asymmetrically. I consider it as another pattern, as an "invisible" motive that lends clarity to the form.

All the aforementioned techniques are combined in a cooperation that gives the distinct vein of the works to be examined in more detail in the following pages.

2. Homage to Anton Webern, for Clarinet and Bass Clarinet

I was deeply influenced by Anton Webern's work when I decided to compose *Homage*. At that time I had just begun my studies at York, and I was very interested in creating the proper technical tools in order to develop a mature personal style. Impressed by Webern's unique ability to derive a maximum of music from a minimal of structural elements, I tried to focus mainly on formal construction and experiment with its inherent potential. Mostly, I sought to find a balance between unstrained expressivity and coherent construction. Hence, Webern's musical idiom was used as a starting point, as a motivation for me to explore the bounds between rigidity and expressivity.

The piece is a constant allusion to Webern's op.27, though only in a humorous, playful manner. Therefore, it consists of three miniatures based on the derived row of **Figure 1**.

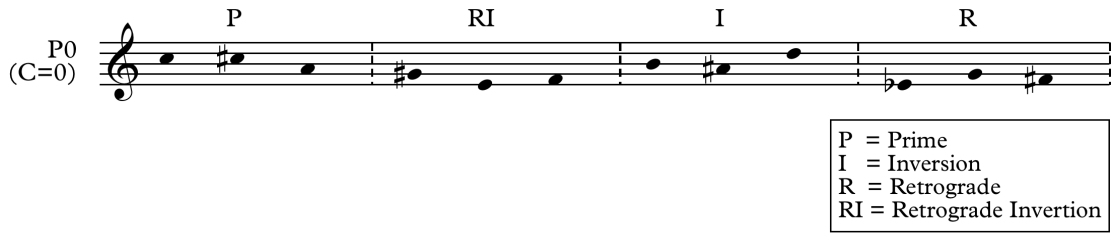


Fig.1: The derived 12-tone row of the piece

Palindromic construction of phrases, due to hexachordal combinatoriality, is one of the main features of *Invention* (first miniature), the same as in the first part of Webern's *Variations.* However, a different systematisation of elements lends *Invention* its distinct character. To begin with, the frequent use of small melodic intervals gives a lyrical tone to the piece. Secondly, there is an organisation of other elements besides pitch, such as register, playing techniques, articulations and note values. Still, this systematisation is used only partially in the middle section of *Invention* (mm.30-60). The material is therefore arranged in such a way as to provide an increase in activity and textural density, rendering thus a developmental character to the section.

Tables 1 and **2** demonstrate an example of this careful parametric organisation, by comparing two selected fragments of the middle section, that of mm.30-35 (**Table 1**) and mm.42-45 (**Table 2**). Four interlaced tone rows act simultaneously, each having a distinct set of characteristics. The increase in tension is evident as the section progresses. There is an expansion in register, an acceleration of the note values and a gradual homogenisation of texture.

TABLE 1 (mm.30-35)				
Row	**Register**	**Articulation**	**Technique**	**Note Value**
P6	E5-D♯6	Marcato	Flutter-tonguing	1/16
R6	E4-D♯5	Staccato	Normal	1/32
R3	E3-D♯4	Staccato	Normal	1/32
P3	E2-D♯3	Marcato	Flutter-tonguing	1/16

TABLE 2 (mm.42-45)				
Row	**Register**	**Articulation**	**Technique**	**Note Value**
RI6	G♯5-G6	Staccato	Normal	1/32
I10	F4-E5	Staccato	Normal	1/32
I6	D3-C♯4	Marcato	Normal	1/32
RI10	B1-A♯2	Marcato	Normal	1/32

Tables 1 and 2: Systematization of elements in the middle section of Invention (mm.30-35 and 42-45)

Finally, the self-similarity between form and content, which is apparent by observing the overall formal construction of *Invention* in **Table 3**, is worth mentioning. Each phrase is a palindrome, in the same way as are the subsections, the sections and finally the complete form of *Invention*.

	mm. 1-11	**mm. 12-19**	**mm. 20-29**	**mm. 30-41**	**mm. 42-48**	**mm. 49-60**	**mm. 61-70**	**mm. 71-78**	**mm. 79-89**
Sections	A			B			A (R)		
Subsections	A	B	A (R)	A'	B	A' (R)	A (R)	B	A
Length (in semiquavers)	33	24	30	34	22	34	30	24	33

Table 3: Overall form of Invention

The second miniature, *Canon*, is a reference to the canonic construction of the second movement of Op.27. It bears a farcical mood (note the *Presto e burlesco* indication at the beginning of the score), not only at a directly audible level, but also at a deeper,

structural one. While listening to the first measures, one perceives chromatic scales moving at different speeds in opposite directions, in the manner of a mensuration canon, so to speak. This is not what is really going on underneath though, as we can realise by looking at **Figure 2**, where two prime and two inverted combinatorial transpositions of the 12-tone row form a double canon. However, the tone rows are interlocked in such a way and in such a narrow region of pitch-space, that they cancel each other out.

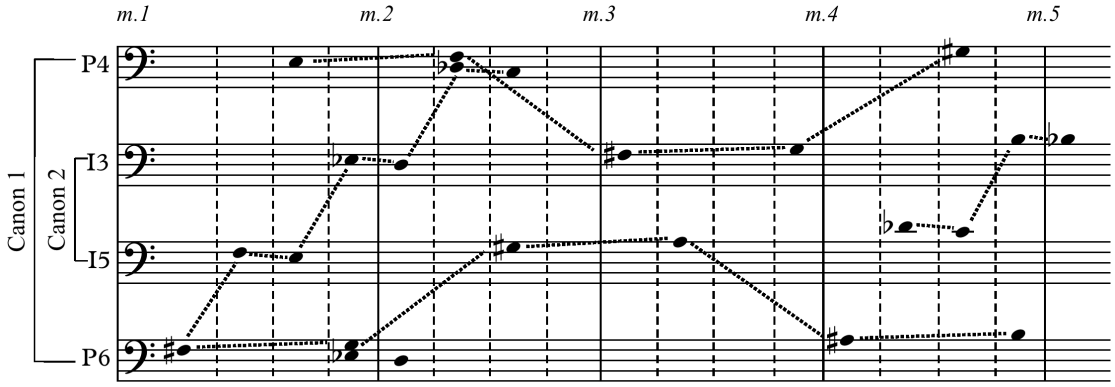


Fig. 2: Audible and inaudible pitch structure of CANON (dotted lines and staff rows respectively, mm.1-5)

Of course, this is not a joke on serialism. It is rather a personal way of going beyond serialism by using its own means, and this becomes clearer as *Canon* unfolds: gradually, the tone rows emerge from the uniform chromatic aggregate by changes in register, dynamics and articulation. Therefore, *Canon* transforms itself in a kaleidoscopic way. In the end, the tone rows withdraw one after another, until only I3 is left to close the piece in a humorous manner.

The mocking spirit is also sustained in the final miniature, the *Passacaglia*, which is nothing more than a continuous repetition of *Canon's* first four interlaced tone rows (see **Figure 2**). However, this is not a literal parroting, since it is based on the methodical addition or omission of tone rows, in such a way as for the material to be constantly renewed.

This is apparent in the structure of the ostinato (mm.1-4) illustrated in **Figure 3**. Due to the omission of certain pitches, the ostinato sounds like a fresh tone row. Still, by the gradual addition of the remaining pitches, it is constantly being put into new perspective.

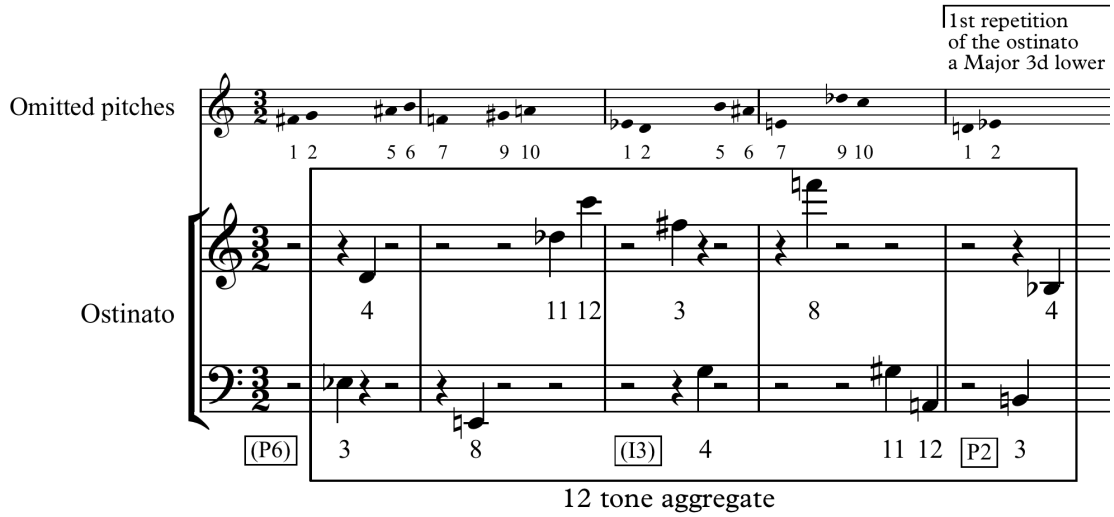


Fig. 3: Pitch Structure of PASSACAGLIA's ostinato

Furthermore, as *Passacaglia* progresses, besides pitch addition, there is also an increasing accumulation of tone rows that renders to the piece an elevation in tension and textural density. The *Passacaglia* closes in the same way it begins, by progressive withdrawal of the participating tone rows, until, once again, only the ostinato remains to conclude the piece.

3. String Quartet

The *String Quartet* is chronologically the second work I completed during my PhD at York. Defining its time of composition is of importance, as the quartet is placed at the beginning of a quest for a new personal vein. In this piece I tried to combine, on the one hand, the aesthetic expectant of a structurally coherent music, which evolves and transforms in a dynamic direction towards a harmonic goal, with the practical problem of developing the appropriate technical tools for its more complete materialisation, on the other.

While composing the string quartet I have tried to address this problem by hierarchically ordering the structural parameters according to different degrees of importance. I began by solidifying the macro-structural foundations and then moved on to the composition of micro-structural details. As parameters at the top of the hierarchy I set the formation of an interconnected network of projection and development of particular interval classes, the careful handling of pitch-space and the transformation of texture.

With regard to the practical aspect of the problem, I decided to rely on canonic procedures so as to realise smooth transitions from one structurally important point to another, particularly in the first part of the work. It should be noted that I did not use the canon in the strict sense of the term; the canon acted more like a general principle on whose basis material was controlled.

Figure 4 depicts the melodic content of the "canon" with which the first part of the work begins. Each staff's row constitutes a "stage" of transformation of the melodic line. Starting from unison (stage I.) and by the insertion of a new pitch every time, the melodic line ends up in the twelve-note aggregate of stage XII. The widening of ambitus is noted above each staff in a boxed text. The pitches on the upper left of each staff belong to a "model motif" that is being circularly permutated. Fragments of those circularly permutated stages provide the material for canonic manipulation, instead of the usual canonic imitation of melodic lines.

The interconnection of the resulting complex foreground with a much simpler underlying background structure becomes evident as we observe more closely the highest and lowest pitches of the intervals that "enclose" each stage of the melodic activity (the "boundary intervals[4]" from now on). Besides the gradual increase in ambitus, the succession of these intervals has a downward direction with semitonal

[4] Higher and lower pitches that define the bounds of a projected interval, or a region of activity in pitch-space. The term is borrowed by Michael Hick's article *Interval and Form in Ligeti's Continuum and Coulée* . (see Hicks, 'Interval and Form in Ligeti's Continuum and Coulée' in *Perspectives of New Music*, Vol. 31, No. 1, (Winter 1993), pp. 172-190, 174).

steps, from interval [E6-E6] to [G4-F♯5]. Thus, there is an interval-expanding, “filling” activity in pitch-space that leads to the chromatically saturated octave in m. 13.

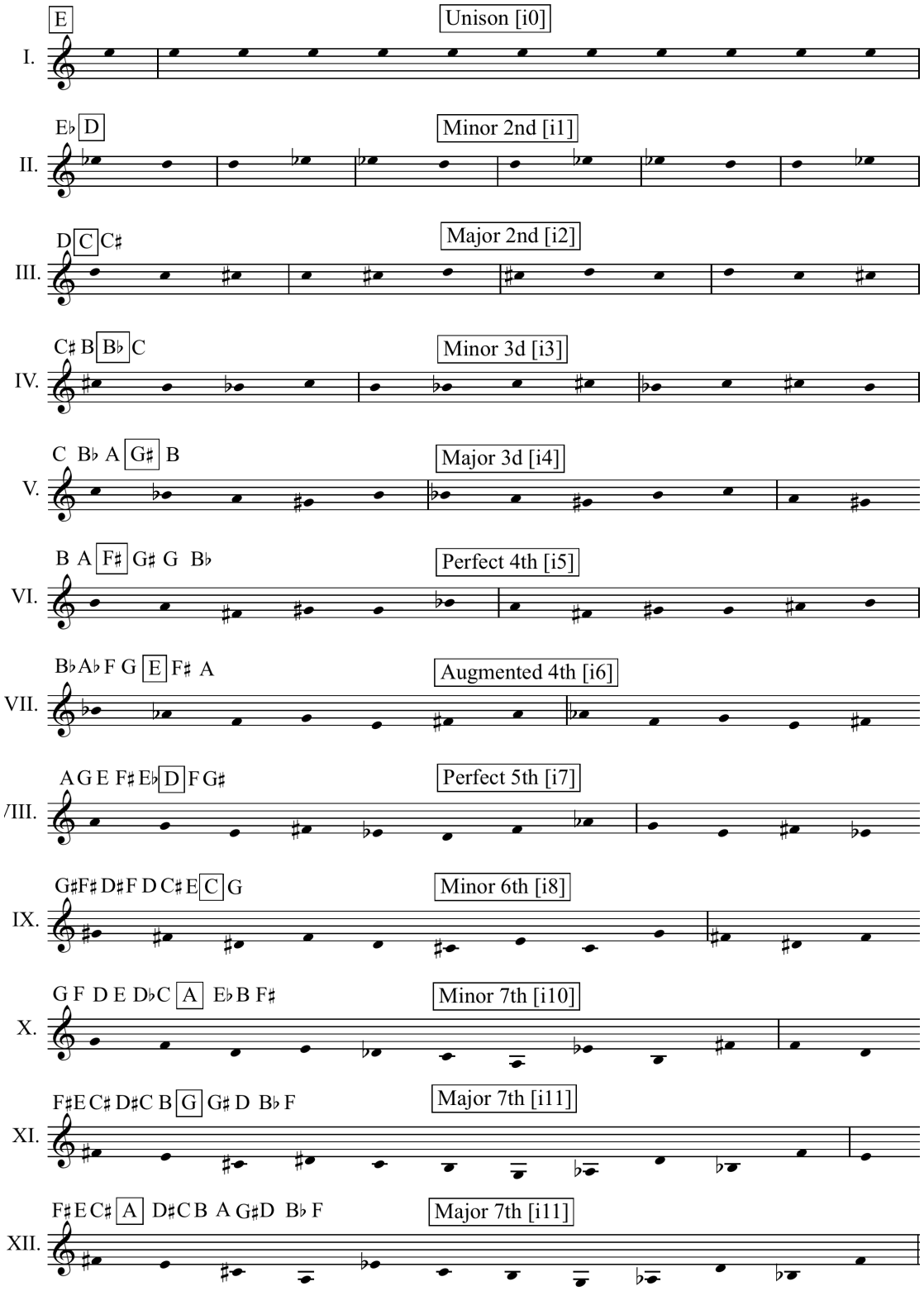


Fig. 4: Melodic content of the canon which opens the first part of the Quartet (mm. 1-13). (The accidentals apply only to the pitch they are noted)

From then on, a reverse -but similarly designed- process unfolds. The chromatically filled major 7th "loses" its pitches one by one, with only the highest and lowest being left in m.21. The major 7th remains "empty" in mm.13-34, where a mirror canon takes place above and below major 7th's highest and lowest pitches respectively. In a similar "thinning-out" of texture, only two pitches (C6 and D6) remain in m.34 played by the violins and doubled by viola and cello two octaves lower. These pitches, acting as symmetric "leading tones" are followed by their resolution, a [C♯2-C♯7] interval, in m.35 (middle of the first part of the work). A mirror canon in 4 parts follows, that ends up in a cadential tutti on a G duplicated in two octaves [G3-G4-G5] in m.55. A coda comes next (mm. 55-68). There, transposed melodic fragments of the first canon's "stages" move downwards, taken by viola and cello, while in violins I and II they are being scattered to the highest region of the piece, losing gradually their pitches and leaving only B♭8 sounding at *ppp* dynamics in m.68.

As it is evident in **Figure 5**, the concept of expanding and contracting intervals runs throughout the overall formal structure of the first part. It forms the internal relations of the intervallic network of the piece, acting like an abstract, "invisible" structural motif.

There is also another "invisible motif", that of Fibonacci numbers, which defines the subsections of the piece, as this is illustrated on the lower part of **Figure 5**. Of course, this "invisibility" refers only to what is directly perceivable. On a deeper level, it contributes to the structural consistency and to the sense of an uninterrupted flow of the piece. Finally, unity is also achieved since common manipulation processes of the same melodic material (that of **Figure 4**) are used throughout Part I, in a more or less "disguised" way.

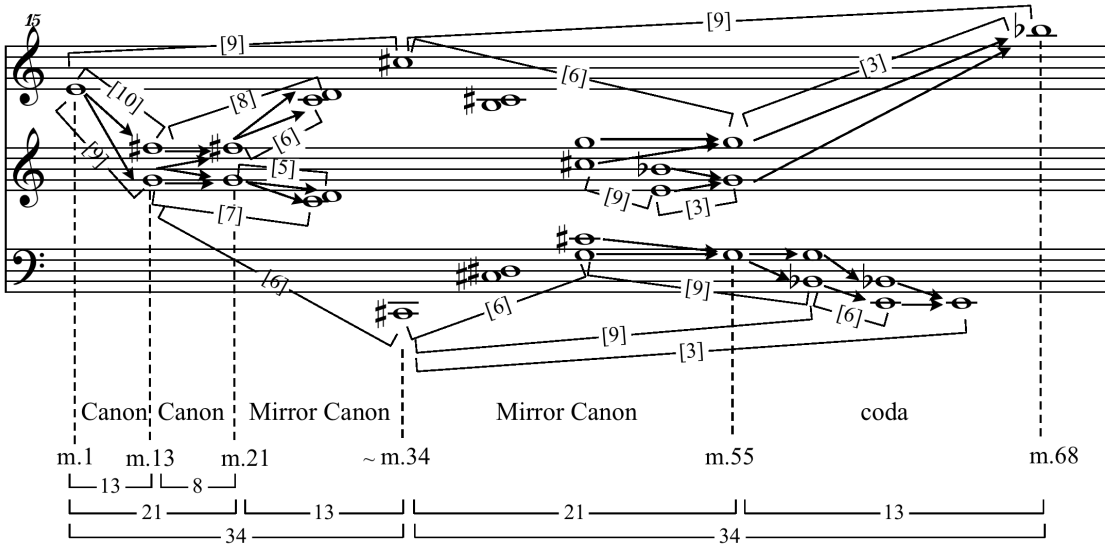


Fig. 5: Overall formal structure of Part I.

Part II shares common melodic content with Part I. Melodic fragments of the "stages" of Part I are presented in a more lyrical manner. Additionally, Part II is based on the same hierarchical structuring of the material. Certain intervals are projected and form an intervallic network. These are: a) the interval class [1] (semitone) presented as a major 7th [11] or a compound minor 2nd [13], b) the perfect fifth [7] and c) the minor 6th [8][5]. They are also used as building blocks for the construction of important cadential chords. **Figure 6** is a pitch reduction of mm.1-18 that demonstrates this network of intervallic relationships.

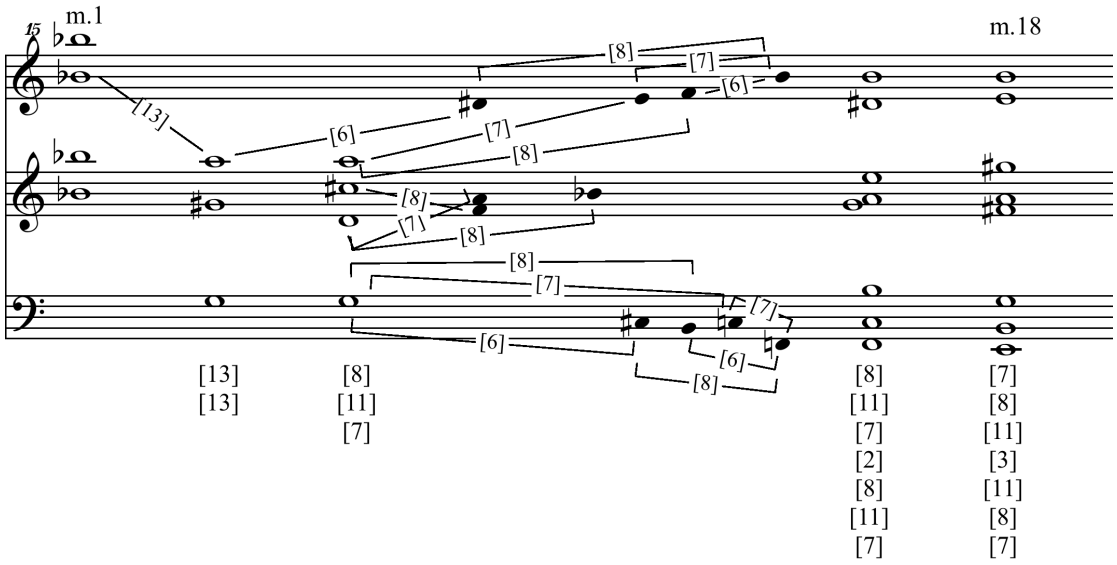


Fig. 6: Pitch reduction of mm.1-18, Part II. Chordal structures are illustrated by the staggered intervals in brackets.

The last chord of **Figure 6** (m.18) is a crucial cadential chord. It is followed by an ascending canon in 6 parts that leads higher in register. The canon's pitch array is shown in **Figure 7**.

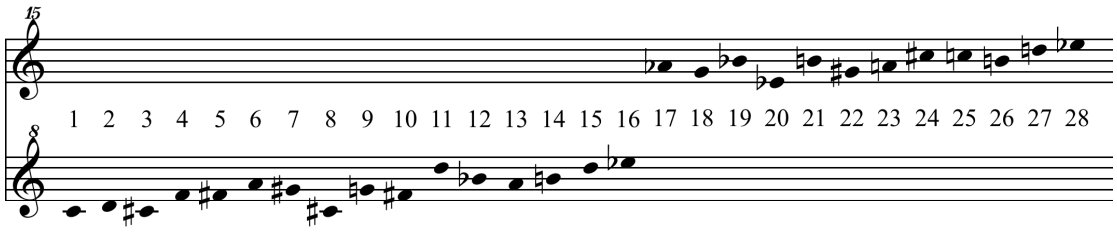


Fig. 7: Pitch array of the canon, mm.10-29, Part II.

[5] The numbers in brackets refer to the vertical or horizontal distance in pitch-space in semitones. Therefore, [8] means 8 semitones, noted either by a minor 6th or an augmented 5th .

The dominant intervallic cells are underlined in the course of the canon. **Figure 8** demonstrates the symmetries between the canon's starting and arrival points in pitch-space. Each important intervallic formation stands out as a quasi-chordal aggregate. Special emphasis is given to the symmetrical centre of the section, which consists of the chordal aggregate [B5-D6-E♭6] in *f* dynamic.

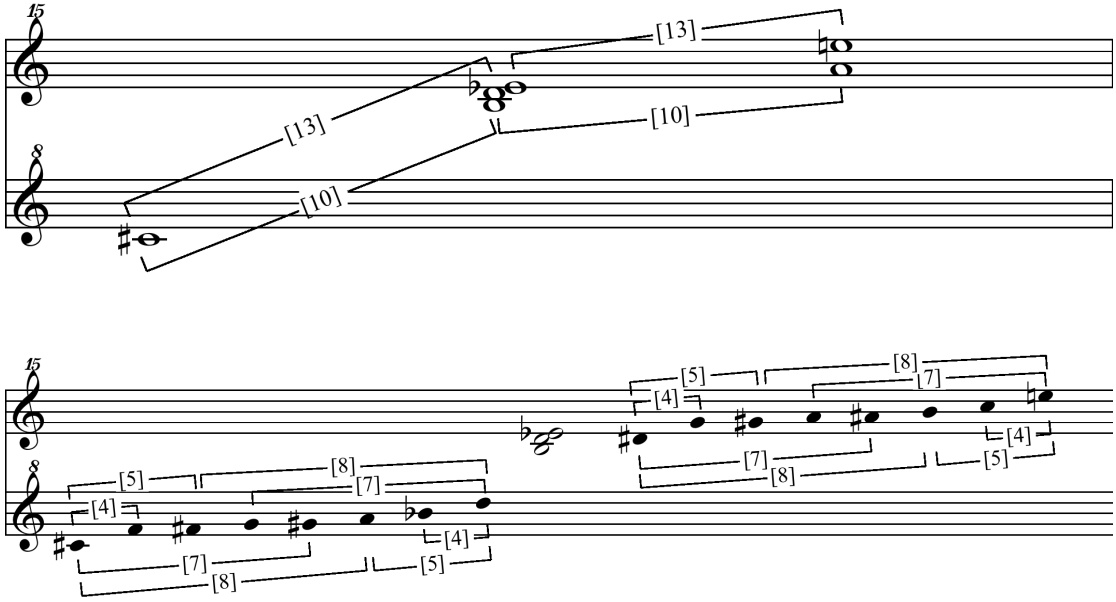


Fig. 8: Pitch reduction and symmetrical construction of mm.18-29, Part II.

The cadential chord of m.18 appears once again, in m.29, as the canon's harmonic goal (**Figure 9**). However, important and contrasting differences connect the two chords. Firstly, the first chord has a spatial ambitus of a compound perfect 5th of 55 semitones, while the second has a span of just a perfect 5th of 7 semitones (maximum vs minimum ambitus). Secondly, the first chord has a *fff* dynamic as opposed to the *ppp* of the second one (contrast in dynamics). Finally, the second chord is a transposition of the pitch-class set of the first chord. The boundary interval of the first chord [E2-B6] appears inverted on the second [A6-E7]. Both of them, however, are placed at pivotal structural positions in the piece. Each one signals a change in the way the piece evolves, thus defining formal sections. The use of golden section is once again in play, since both chords appear at the "negative" and "positive" golden sections of the piece respectively[6].

[6] The terms "negative" and "positive" golden section have been used by Ernő Lendvai in his book *Béla Bartók: An Analysis of his Music.* The smaller line segment on the left of the golden section defines it as "negative" as opposed to the "positive" one, where the smaller segment is on the right. [Lendvai, *Béla Bartók: An Analysis of his Music*, 21]

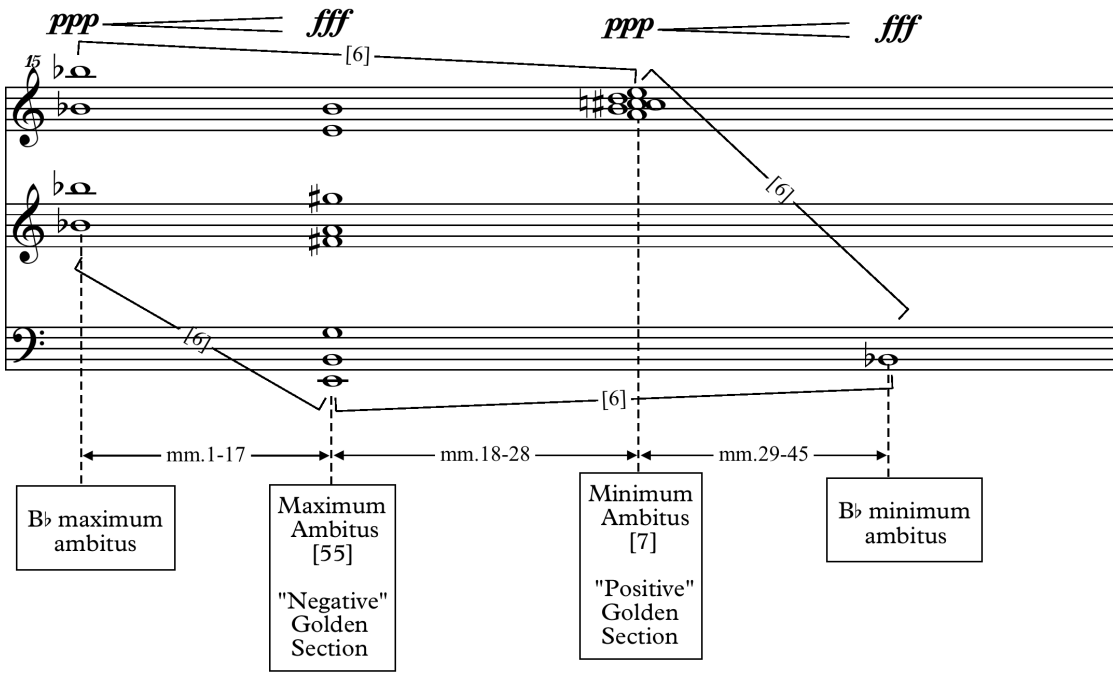


Fig. 9: Cadential chords of mm.18 and 29, Part II.

The last section of Part II (mm. 29-46) is a retrograde inversion of the first section, but not in a literal sense. It is a kind of "recapitulation", where the two sections are also related by contrasting elements. Therefore, the first section begins with a B♭ in the highest register, expanded in three octaves as opposed to its unison version in the end. Moreover, while the opening B♭ emerges gently, almost from silence, in the closing section B♭ turns into noise, in a hectic crescendo beyond *fff* that stops abruptly, as if a malfunctioning machine breaks off.

The outcome of the *String Quartet's* experiment deemed satisfactory to me, for several reasons of either technical or expressive nature. I decided to set out the musical material by inventing a personal technique of layering, where the structural parameters were hierarchically organised. A number of general principles (like the "invisible motifs" of intervallic expansion and contraction) contributed to the design of a macro-structural network, consistent enough to control more efficiently and to a greater depth the micro-structural details of my work.

4. Melting Clocks

In *Melting Clocks*, a complex sonic "image" is created by the interaction of a number of elementary sonic cells. These cells exist and act without being directly perceivable. However, a change of behaviour of some or all of them leads to a gradual change of the large-scale sonic image. An analogy could be drawn to the pointillistic technique of painting, where single dots of pure colour are combined to synthesise a complex image on a higher level of construction.

These "dots" are mostly single pitches having a periodic pulsation, imaginary "clocks" ticking at certain speeds. Additionally, the "pointillistic painting" is not static, but it evolves in time and is subjected to kaleidoscopic transformations when some or all of its elementary cells gradually change their behaviour (e.g. a change in pitch, duration, dynamic etc). In this way, clear structural starting and arrival points in-between transitional states determine the formal sections of the piece. These structural points are further interrelated in terms of orchestration, of registral, rhythmic, dynamical or harmonic connections.

The piece opens with a cluster of a chromatically filled perfect fifth consisting of 8 pitches sounding together in perfect synchronisation with a periodicity of one semibreve. Gradually, one by one, each "clock" alters its pitch, duration and dynamics, thus blurring the opening regular rhythmic pattern. This transformative process lasts up to bar 32, where all "clocks" regain their stability. However, they are rearranged in such a way that only the 2-line ostinato of **Figure 11** is perceived. In this way, a chord is transformed into a two-voice cellular pattern.

A clear demonstration of the way the elementary cells act is shown in the passage depicted in **Figure 10**. Four "clocks" (F4 and B4 on the Vibraphone and E4 and A♯4 on the Piano) are in play. Each one of them has a steady periodic pulsation of a minim, but also a different offset. The perceivable result of this combination is a 4-note cellular pattern of consecutive quavers.

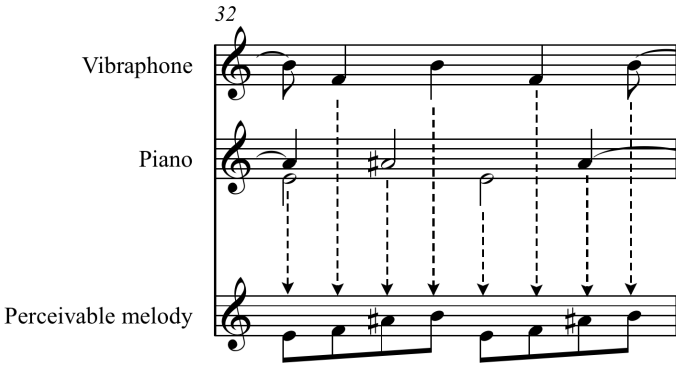


Fig. 10: Right hand lines on Vibraphone and Piano at bar 32. The resulting melodic line is marked by dashed arrows.

This ostinato pattern is accompanied by a second one which results from the interaction of four more cells. **Figure 11** depicts the perceivable two-voice cellular pattern. Each "voice" repeats a distinct pitch-class set.

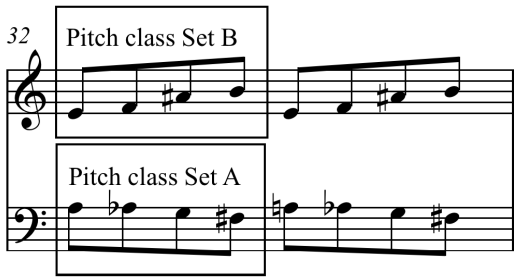


Fig. 11: Two-line ostinato at bar 32

Most of the harmonic and melodic material of the work relies on these two symmetric pitch-class sets: set A (0, 1, 2, 3) and set B (0, 1, 6, 7). Each set acts also as a melodic or harmonic cell since every structurally important harmonic or melodic formation in the piece is the result of combinations of the sets' transpositions (**Figure 12**).

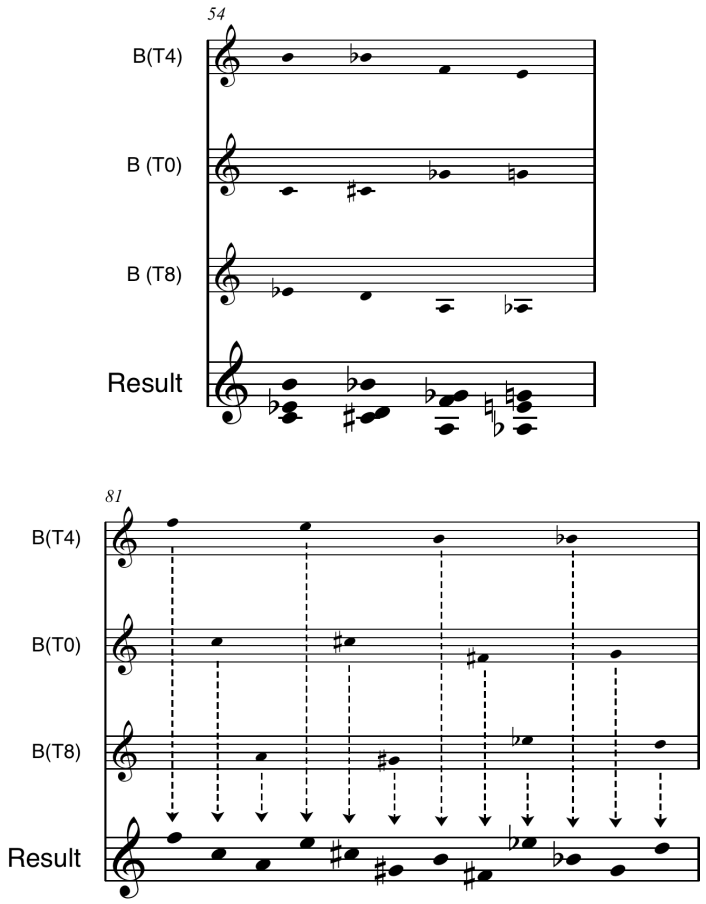


Fig. 12: Vertical interlocking of 3 transpositions of set B (Piano line in m.54) and horizontal interlocking in m. 81 (Piano line). T0 = Transposition from C=0.

Almost every melodic or rhythmic line of the piece is compound. It is the outcome of superimposing two or more layers, the result of the cooperation of many simpler melodic or rhythmic patterns acting in the background (**Figure 13**).

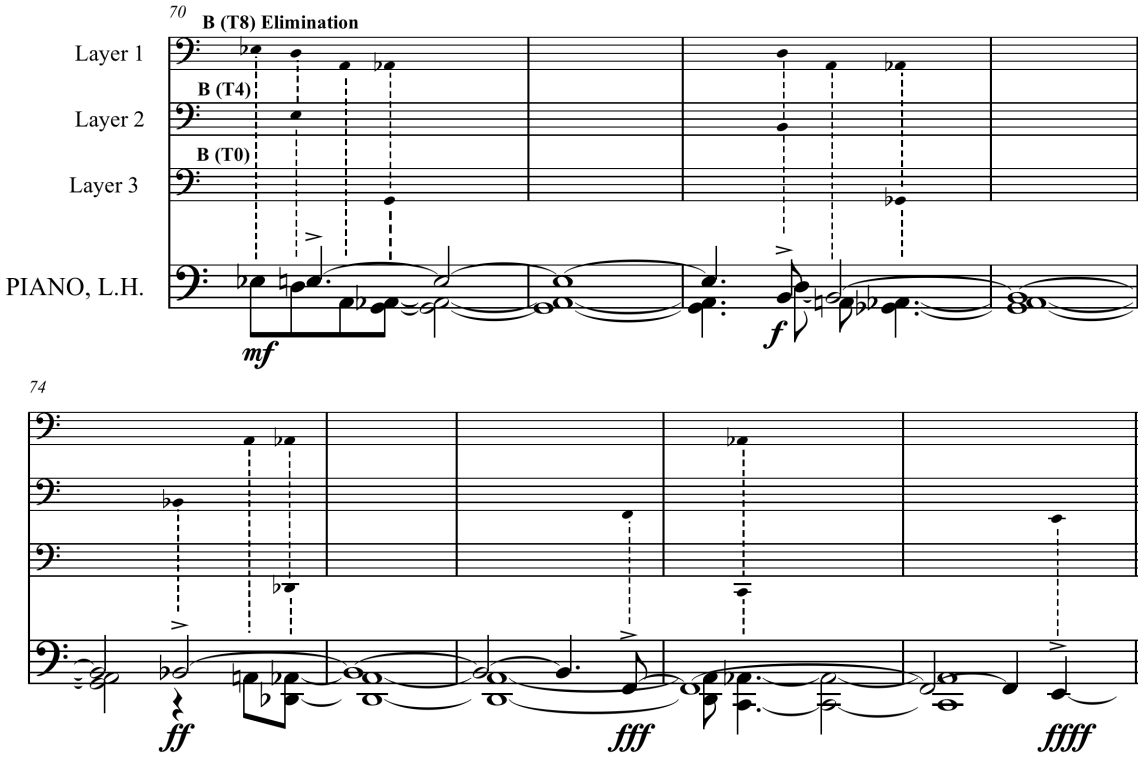


Fig. 13: Piano line at bars 70 - 78 as a result of the cooperation of three simple rhythmic-melodic layers

The construction, as far as rhythm is concerned, takes advantage of the contrast between starting and arrival cadential points of a regular periodic pulse as opposed to transitional states of an irregular and fluid rhythmic nature. Furthermore, important structural points are interconnected throughout the piece by sharing the same periodic pulse.

A different transformational mechanism comes into play in SECTION B (mm. 32-50). Its developmental character is apparent, as is seen in the first draft score (**Figure 14**) before its reduction for Piano and Vibraphone. There is an increase in the number of the participating voices and also a multiplication of the motivic material. Also, a significant expansion occurs in pitch space.

Gradually, all melodic patterns become chords. Some of them fade out by decelerating and finally stopping. Others, however, continue until they are synchronised to form a twelve-voice cadential chord with a periodic pulse of 5 quavers.

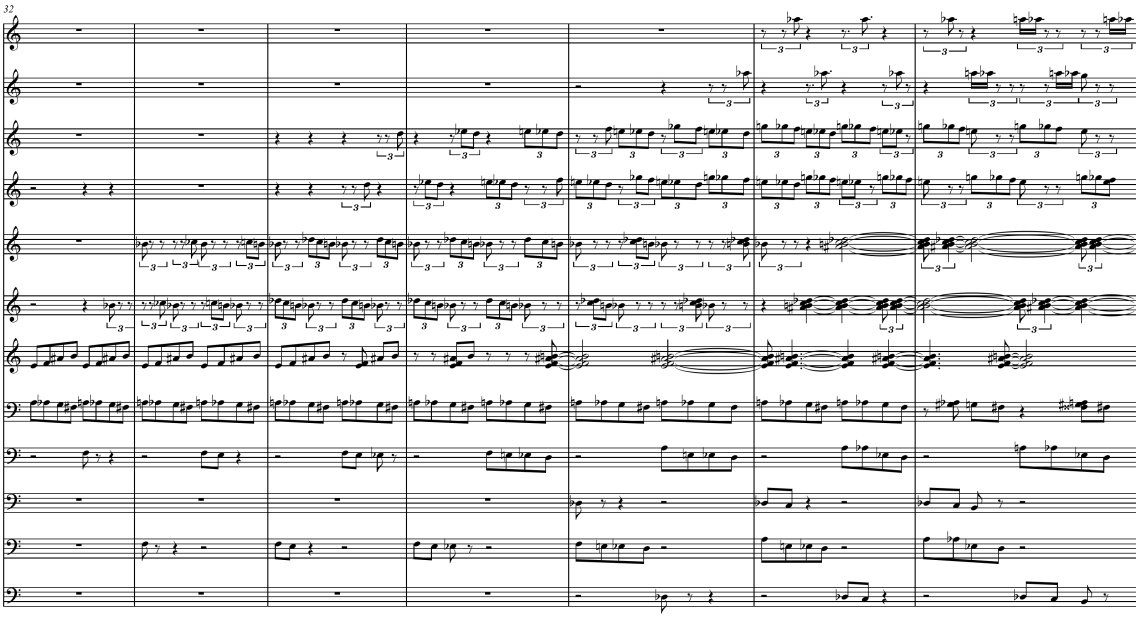


Fig. 14: Draft score of SECTION B (mm.32-38)

SECTION C opens with the participation of non-pitched percussion. Two independent layers of activity cooperate: a polyrhythmic process carried out by the non-pitched percussion and a process similar to that of SECTION A played by the pianist. Both layers become increasingly dense and complex until they reach a climax at bar 81, with the piano playing a rapid twelve-note melody (**Figure 13**, m.81) and the participation of the xylophone. This melody is gradually eliminated until only two pitches remain (G♭6 and F7) marking the end of SECTION C at bar 85.

Special care has been taken for the composition of the polyrhythmic percussion part of this section. At bar 53 the Low Tom-tom starts to repeat a rhythmic cell every 14 semiquavers, establishing a 14/16 meter. After three repeats, this line split in two new rhythmic layers: An accelerating and a decelerating one. The rhythmic cell in the accelerating layer is slightly varied (**Figure 15**).

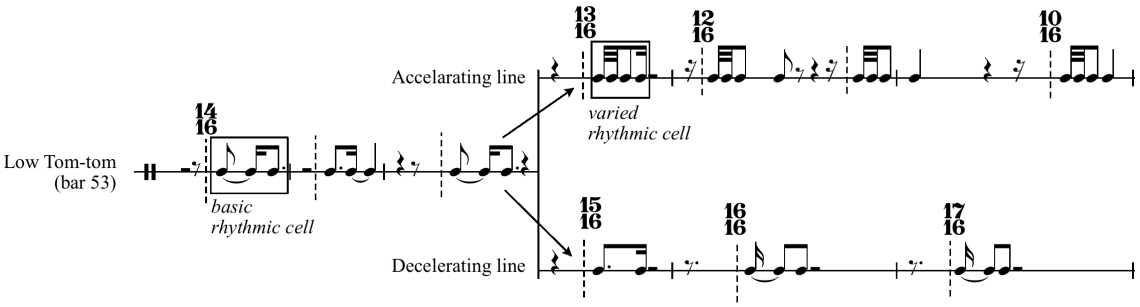


Fig. 15: Analysis of the Low Tom-tom line (bar 53).

At the time of this split, the initial rhythmic cell is taken by the Medium Tom-tom, but this time in a new, contracted meter of 13/16. In the same way, after 4 repeats, this line also splits in two new ones. This process is repeated consecutively by the other non-pitched percussions. As a result, a polyrhythmic complex consisting of 16 layers comes to the fore.

A literal application of such a polyrhythmic design would face two major problems: firstly, a single performer having only two hands and secondly, an unvaried, chaotic and unintended musical effect.

However, the compositional intent was completely different:

1) Meters should always be clearly audible.
2) This metric setup should always be accompanied by an increasingly dense rhythmic background, emerging from the interaction of the accelerating layers.
3) The overall timbral direction should head from percussion of darker sonorities towards brighter ones.

To that end, there was a need for reduction and transcription of the 16 voice complex, according to the following rules:

1) If a note belonging to a decelerating line coincides with another that belongs to a higher sounding percussion, the higher note is deleted. In this way, overshadowing of the decelerating lines is avoided.
2) If a note belonging to an accelerating voice coincides with another that belongs to higher sounding percussion, the last one dominates. In this way, the rhythmic design of meters is not overshadowed. Furthermore, in this case, accelerating layers of higher percussion gradually dominate over accelerating layers of lower percussion. The aforementioned timbral direction is secured.
3) Finally, if more than two percussion instruments sound together, only the lowest and highest sonorities prevail. This allows the percussionist to perform with maximum ease and agility.

The polyrhythmic construction of SECTION C is also repeated in SECTION D, from m.85 to m.103. There are, however, important differences:

1) There is a new tempo, 1.5 times faster than the original one.
2) There aren't any rhythmic variations of the basic motivic cell.
3) A "Cantus Firmus", so to speak, is given at each rhythmic layer, in the same way a COLOR is adjusted on a TALEA (**Figure 16**). By that, a canon is created that has a descending melodic direction. Each time the cantus firmus exhausts its pitches, it is repeated an octave lower.

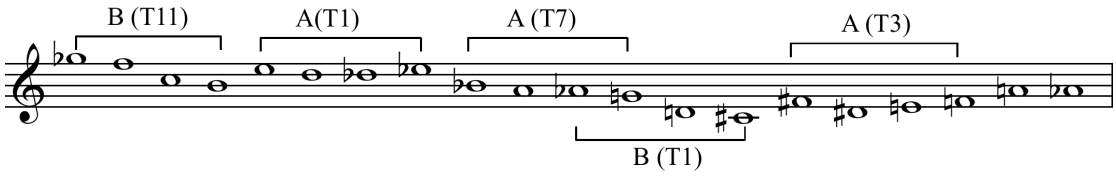


Fig. 16: Pitch Array for the canon starting in m.85

4) This time, the accelerating layers are the most prominent. The acceleration process is designed to be stabilised at a steady 3-semiquaver periodic pulse. Thus, the overall polyrhythmic complexity is gradually reduced to a pulsation of a dotted quaver.
5) Only two rules are in play, both concerning pitch distribution.
    a. There is no change in pitch, unless there is a change in meter.
    b. The previous rule is cancelled, when an accelerating layer arrives at the 3 semiquavers pulse. From then onwards, every periodic pulse takes a consecutive pitch from the canon's Pitch Array. In this way, the canon seems to "melt" in the low region of the pitch-space.

The canon is interrupted in m.103. From then on, and up to m.112, a further collapse of pitch space leads to even lower areas in register. **Figure 17** shows the canon's last chordal aggregate as the starting point, and the chord of bar 112 as the arrival point of that transformation.

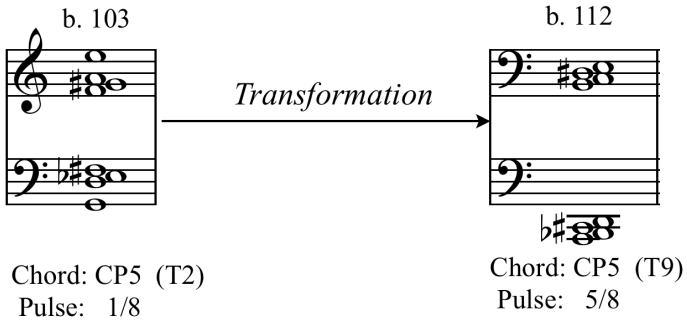
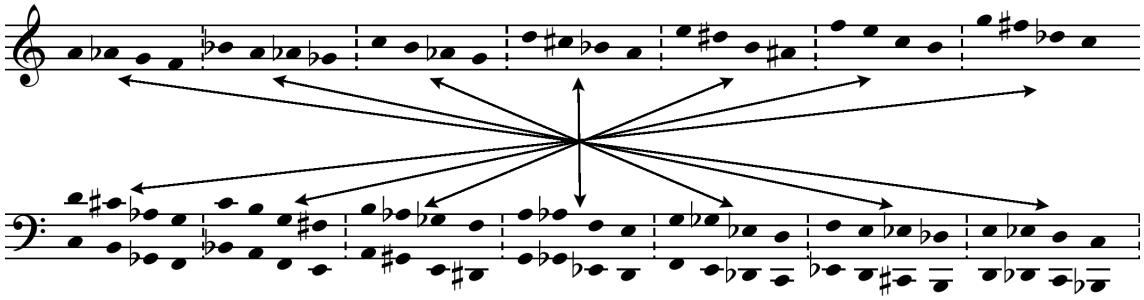


Fig. 17: Cadential chords marking the beginning and ending of SECTION E. CP5 = Chromatically filled Perfect 5th.

SECTION E is bounded between these two cadential points. It shares common transformational mechanisms with SECTION B, and also similar melodic material, as is evident in **Figure 18**.

SECTION B: Consecutive melodic cells,
Piano, b.39-41



SECTION E: Consecutive melodic cells,
Piano, b.106-109

Fig. 18: Similar melodic material in SECTIONS B and E

Furthermore, the processes of SECTION F (mm.113-144) are similar to that of SECTION A, only slightly altered. However, from m.114 to the end of the piece there is a decelerating direction in contrast to that of SECTION A. There is also a steady descent towards the lowest register of the piece. The ultimate goal is a final chord having the same pitch content and the same periodic pulse as the opening chord of the piece. However, due to the extremely low register in conjunction with the use of the sustain pedal on the piano, the final chord is perceived as a dark and fuzzy noise.

5. Permutations, for Solo Violin

There are two pieces for solo string instruments that attracted, besides their highly artistic qualities, my attention for specific technical reasons. One of them is the first part of Ligeti's Sonata for Solo Cello, and the second is "Hora lungă" from the same composer's Sonata for Solo Viola. I sensed that both pieces share common characteristics concerning the way they have been constructed. They are comprised, more or less, of several short intertwined phrases that evolve like living organisms as music unfolds. Some, prominent in the beginning, fade away and finally become extinct in a developmental "decrescendo", so to speak, while others, looking initially insignificant, dominate in the end. Additionally, these brief, almost motive-like phrases occurred to me as building blocks of a new language with strong narrative and expressive potential.

With that in mind, I started out to compose a piece for solo violin, having similar abstract properties but also significant differences, adjusted to my personal musical idiom and expressive intent. So, I kept the concept of "building blocks" but took it to an extreme; I composed seven such blocks that sharply contrasted each other, seven "events" so to speak, each one having a characteristic "colour" (defined by playing techniques) and a distinct motivic structure (see **Table 4**).

Two more parameters determine the nature of these events, their duration and pitch content. But, while the events are clearly different from each other due to their stable characteristics ("colour" and motivic structure), the duration and pitch content of each one of them alters. Therefore, as the work progresses, the events seem to vary, keeping at the same time their distinctive character.

The carefully designed ordering of these seven events comprises the first section (SECTION I) of the piece (mm.1-18). All seven patterns share transpositions of just two different pitch-class sets, that of 4-1 and 4-9[7] (**Table 4**: I., II., V. and III., IV., VI., VII. correspondingly). The chromatic scale results from the combinations of these sets (i.e. II+III, VI+VII etc.). Furthermore, no other transpositions of these two sets are used throughout the rest of the piece. In this way a "harmonic" unity is achieved.

[7] according to Allen Forte's classification, see Forte, *The Structure of Atonal Music*, 179

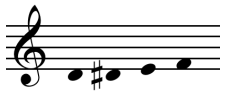
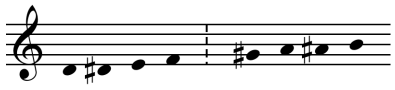
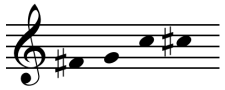
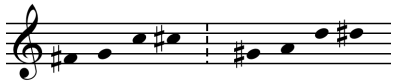
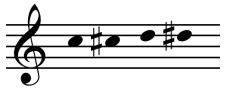
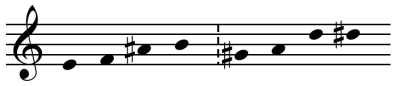
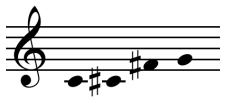
	"COLOUR"	PITCH CONTENT (pitch-class sets)	DURATION (in crotchets)
EVENT A	1. Tremolo	I. 	a. 21
EVENT B	2. Ordinario	II. 	b. 13
EVENT C	3. Fast Arpeggio	III. 	c. 2
EVENT D	4. Accented double stops	IV. 	d. 2
EVENT E	5. Harmonics, glissando	V. 	e. 8
EVENT F	6. Pizzicato	VI. 	f. 5
EVENT G	7. Trills	VII. 	g. 3

Table 4: The seven "events" forming the first section of the piece (mm. 1-18)

The whole piece consists of seven sections. The total duration of each section is 54 crotchets (as much as the sum of the durations of SECTION I). Moreover, in each section all seven events participate. However, they do not appear at the same frequency. As we can see in **Table 5**, the more we move towards the middle of the work, the shorter their durations become, while the frequency of their appearance increases, thus, intensifying the developmental activity. In other words, the events "break" into smaller fragments that disperse in each section, in a constantly renewable permutation.

Length (in crotchets): 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54

SECTION I.	A i; B ii; C iii; D iv; E v; F vi; G vii
SECTION II.	B i; F ii; C iv; B i; A v; D vi; F ii; E vii; A v; G iii; D vi; A v; D vi; E vii
SECTION III.	F i; D ii; F i; D ii; B v; E iii; C vi; F i; A vii; D ii; C v; F i; D ii; B v; C vi; D ii; C vi; F i; G iv; B v; C vi; A vii
SECTION IV.	D i; B vii; C ii; G vi; F v; E iv; F v; C ii; D i; C ii; D i; F v; G vi; D i; C ii; D i; C ii; F v; A iii; F v; G vi; C ii; B vii; D i
SECTION V.	F vii; E vi; D v; A iv; C i; D v; G ii; E vi; D v; G ii; C i; D v; G ii; F vii; C i; E vi; B iii; D v; G ii; C i; G ii; C i
SECTION VI.	D vii; A vi; C v; A vi; F iii; C v; D vii; E ii; A vi; C v; G i; B iv; E ii; G i
SECTION VII.	C vii; B vi; G v; F iv; D iii; A ii; E i

Table 5 : Distribution of "events" among the seven sections of the piece. Each letter corresponds to an "event" according to Table 4. Below each letter is a roman number of the respective pitch content.

The process of permutation has a second aspect as well. Besides the reordering of the events, the pitch content of every event is also interchangeable in each section. Event A, for example, has pitch-class set **i** as its pitch content in Section I, **v**. in SECTION II, **vii**. in SECTION III, etc..

Observing **Table 5** we also see that the ordering of the sets from SECTION IV onwards is retrograde. Thus, from a harmonic point of view, the pitch material is recapitulated in retrograde form.

Table 6 shows that all seven pitch formations (rows) pass consecutively through all the events (columns).

	A	B	C	D	E	F	G
I	i.	ii.	iii.	iv.	v.	vi.	vii.
II	v.	i.	iv.	vi.	vii.	ii.	iii.
III	vii.	v.	vi.	ii.	iii.	i.	iv.
IV	iii.	vii.	ii.	i.	iv.	v.	vi.
V	iv.	iii.	i.	v.	vi.	vii.	ii.
VI	vi.	iv.	v.	vii.	ii.	iii.	i.
VII	ii.	vi.	vii.	iii.	i.	iv.	v.

TABLE 6

	A	B	C	D	E	F	G
I	21	13	2	2	8	5	3
II	8	21	2	5	3	13	2
III	3	8	5	13	2	21	2
IV	2	3	13	21	2	8	5
V	2	2	21	8	5	3	13
VI	5	2	8	3	13	2	21
VII	13	5	3	2	21	2	8

TABLE 7

Tables 6 and 7: Distribution of pitch content (TABLE 6) and durations (TABLE 7) among events (notated in capital letters, upmost row) and sections (capital roman numbers, leftmost column).

In a similar way, if we add the fragments of each event in every section, we find that all seven durations also pass successively through each event, as it appears in **Table 7**. Finally, if we add the columns of **Table 7**, we realise that each event has the same overall duration, that of 54 crotchets. While in the frames of the work in total the events are thus hierarchically equal, a different event dominates each separate section, the one having the highest frequency of appearance. In this way, the piece is continuously transformed in a kaleidoscopic way.

The symmetrical ordering of the pitch content and the durations contributes to the sense of structural coherence and stability, while the constantly renewable permutation of the events contributes to the perpetual development and transformation of the material.

6. Reflections, for large orchestra

Two of the many dimensions of the sense of "reflection" constituted the source of inspiration for the composition of my work for large orchestra: on the one hand, the mirroring of an object on a surface and, on the other, the strong connection of the word to the concept of symmetry.

The first dimension renders to reflection an elusive quality. The reflection of an object on the surface of a lake, for example, is distorted when the surface is unsettled and creates ripples. When stillness returns, the image is restored to its original form.

In its second meaning, reflection is connected to the sense of symmetry, with well known applications in musical composition. The operation of inversion, for example, constitutes the reflection of a musical motif in relation to a horizontal axis of symmetry, while the retrograde operation constitutes the reflection in relation to a vertical one.

Thus, the second meaning of the word has a geometrical, stricter dimension. It concerns the cohesion and soundness of form, the logical correlation between abstract objects via specific operations.

My intention was to bring these two contrasting qualities of my concept of reflection together: the coherence of the symmetrical construction, on the one hand, with the acoustic sense of a music that flows and continually changes its shape, on the other.

Describing the work concisely, we would say that it consists of transitions from one texture to another through transformative processes. In general, a micro-polyphonic sonic cloud emerges from silence and is transformed into a melodic line. Having passed through different processes, it gradually sinks back to the "cloud", which, in its turn, dissolves again into silence.

This process is completed in nine formal sections, each of which is set into boundaries by cadential chords, structurally important intervals or characteristic variations in texture.

Section I (mm. 1-24) opens the work with a mirror canon of sixteen voices. Eight voices (violin II, oboes, bassoons and violoncelli doubled by 3 contrabasses) move contrary to the other eight (violin I, flutes, violas and clarinets), based on the pitch arrays of **Figure 19** which are a major seventh apart.

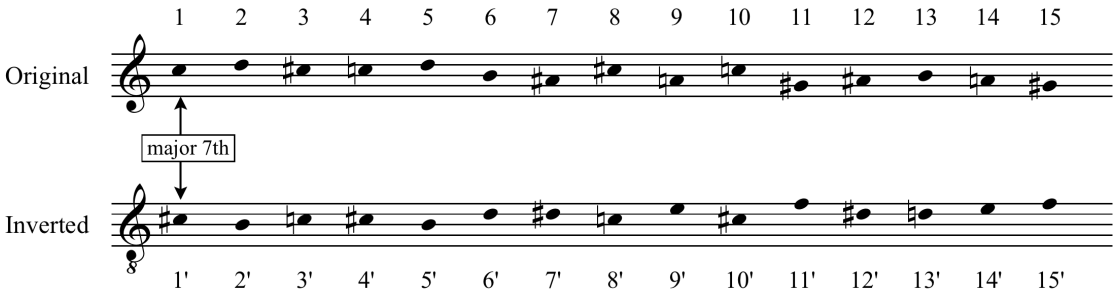


Fig. 19: Pitch arrays for the mirror canon of sixteen voices, SECTION I

SECTION I, after going through various chordal formations, culminates in a twelve-note chord that is played by the whole orchestra. Next, at SECTION II (b.25-41), a mirror canon of eighteen voices (**Figure 20**) empties the pitch-space, thus leaving only two pitches, the highest and the lowest of the twelve-note chord, which form a compound interval of a major seventh [G1-F♯7] similar to the opening one [C♯4-C5], but transposed by a tritone. At this point it is worth noting that with the combination of the pitches of the two major 7ths we arrive at the symmetric set (0,1,6,7) with Forte Code 4-9, which plays an important role later on in the work. From now on I shall refer to this with the term "4-9 set".

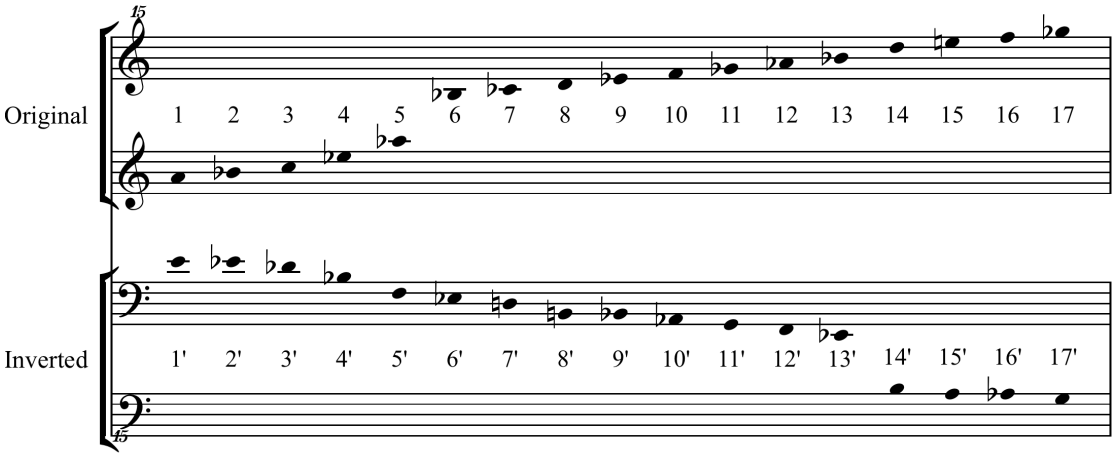


Fig. 20: Pitch arrays for the mirror canon of eighteen voices, SECTION II

SECTION III (mm.42-58) is transitional. It leads to a drastic change of texture by means of an unusual canon of twelve voices. This canon consists of six states (**Figure 21**). It is designed in such a way that in each state the rhythmic density, the number of pitches and its range are increased, but at the same time the number of its voices decreases. This happens because in each state more and more voices coincide rhythmically with the rest. Thus, polyphony is reduced from 12 voices to 6, 4, 3, 2 and

finally to one and only melody (mm.57-58), played tutti by the string instruments in three octaves (state 6 in **Figure 21**). In this extensive melodic line all twelve pitches of the chromatic scale participate (from now on, for reasons of abbreviation, I shall refer to it with the term "Cantus Firmus"). This is the point of the work where the sonic cloud transforms into a melody. Furthermore, it coincides with the negative golden section[8] of the whole piece.

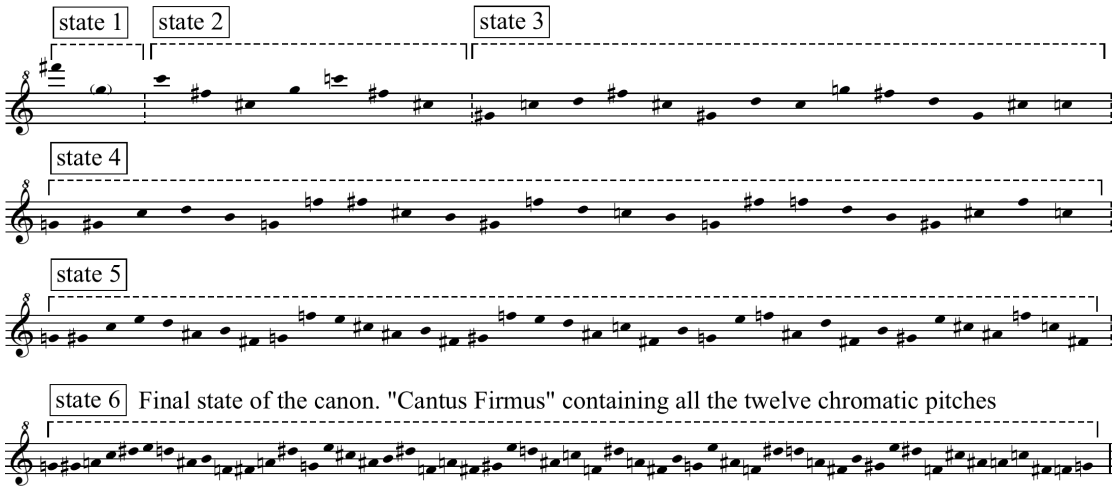


Fig. 21: Pitch array for canon of twelve voices, SECTION III. The pitch in parenthesis does not participates in the canon. It is actually heard as G1 on the Contrabass. It is notated here because of its pivotal role in the transpositional procedures that create the "Cantus Firmus" of the canon.

Melodic material from the Cantus Firmus of mm.57-58 is used for the construction of melodies and chords for the next three SECTIONS (sections IV, V and VI). By means of a methodically planned omission of pitches the Cantus Firmus is gradually transformed into a "4-9 set" in SECTION IV (strings, mm.59-65). This chord constitutes the starting point of a sequence, which opens the next section, SECTION V (mm.66-78). At the same time, in a second layer, a solo by the Cor Anglais takes up the Cantus Firmus (m.66). Other woodwinds and later brass instruments join Cor Anglais in a heterophonic manner. This activity ends with the creation of one more chordal layer . It also has as starting point another "4-9 set", just before the beginning of SECTION VI (mm.79-86). There, the two chordal layers form a mirror canon of sixteen voices (**Figure 22**). At the same time, the Cantus Firmus appears in the string instruments (mm. 79-86), and with the gradual removal of pitches it transforms into a major 7th [B-A♯].

[8] Lendvai, *Béla Bartók: An Analysis of his Music,* 21

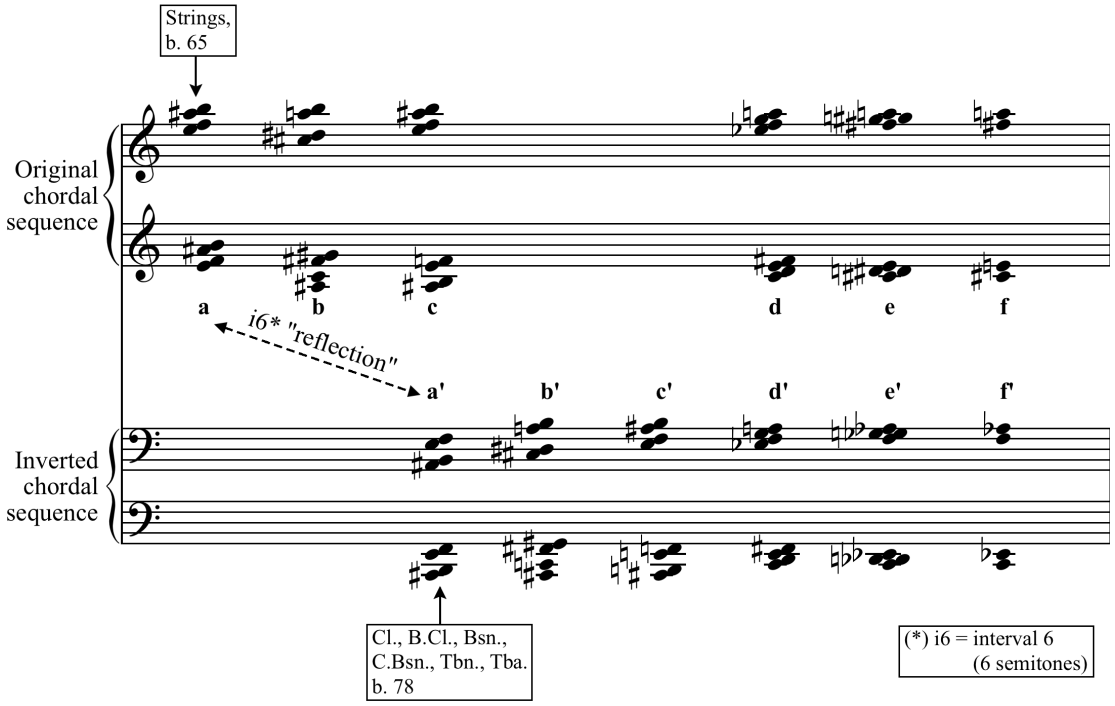


Fig. 22: Mirror canon of the two chordal layers, SECTIONS V-VI. Important start and arrival chordal formations are marked by letters (a, b, c, etc). Transitional chords resulting from voice leading have been omitted.

SECTION VII (mm.87-103) is a retrograde reflection of SECTION III with differences, however, regarding the way it moves in pitch-space. Nevertheless, it maintains its transitional character, though in the opposite direction: The canon of SECTION III in retrograde motion transforms the "Cantus Firmus" into a minor second [C3-C♯3] with which Section VIII (mm. 104-120) begins. This time the melodic line sinks back to the "sonic cloud".

The last two sections, SECTIONS VIII and IX, are retrogrades of SECTION II and I correspondingly. But these are not literal palindromes since remarkably different manipulations of the material take place, as is evident in **Figure 23**.

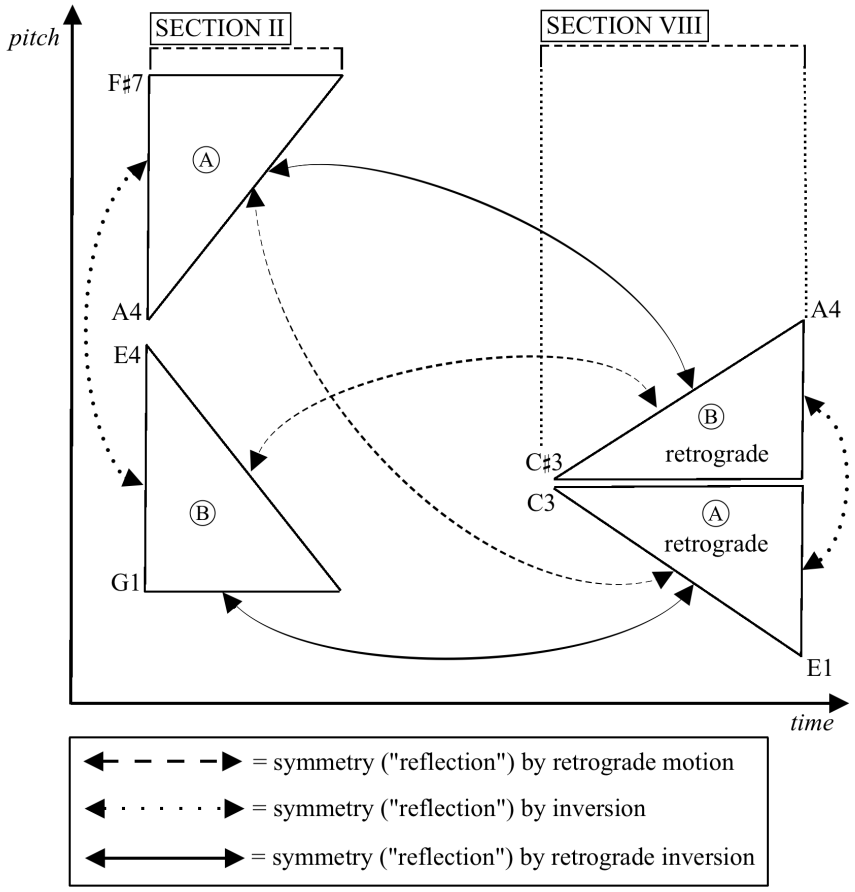


Fig. 23: Symmetrical relations of SECTION II and SECTION VIII. Circled letters A and B correspond to the ascending (Original) and descending (Inverted) pitch arrays of Figure 25 respectively.

In the last section, SECTION IX (b.121-145), the pitch array of the canon of SECTION I is used in retrograde form. But while SECTION I symmetrically "fills" the pitch-space, the direction of SECTION IX is upward. The "sonic cloud" gradually dissolves into silence with the same C that opens the work as its last pitch, but this time at the highest region of the orchestra (C8).

Figure 24 depicts the overall pitch-space structure of the piece with focus on the important chords and "boundary intervals"[9] that determine the beginning or end of formal sections. Moreover, the corresponding network of their symmetrical relations is depicted as well, i.e. their "reflections" at a macro-structural level. Besides the apparent symmetrical construction with the tritone as the pivotal interval, it is worth noting that this symmetry is not valid between the first and the last interval of the piece [C-C♯]. This happens within the frame of a more general reference to the structural scenario of the allegro sonata form. The first three sections are a kind of exposition, the three central

[9] see Hicks, 'Interval and Form in Ligeti's Continuum and Coulée' in *Perspectives of New Music*, Vol. 31, No. 1, (Winter 1993), pp. 172-190, 174.

ones a development and the three last ones are a recapitulation in retrograde direction that returns to the original "tonal centre", neutralising thus the "structural dissonance", so to speak.

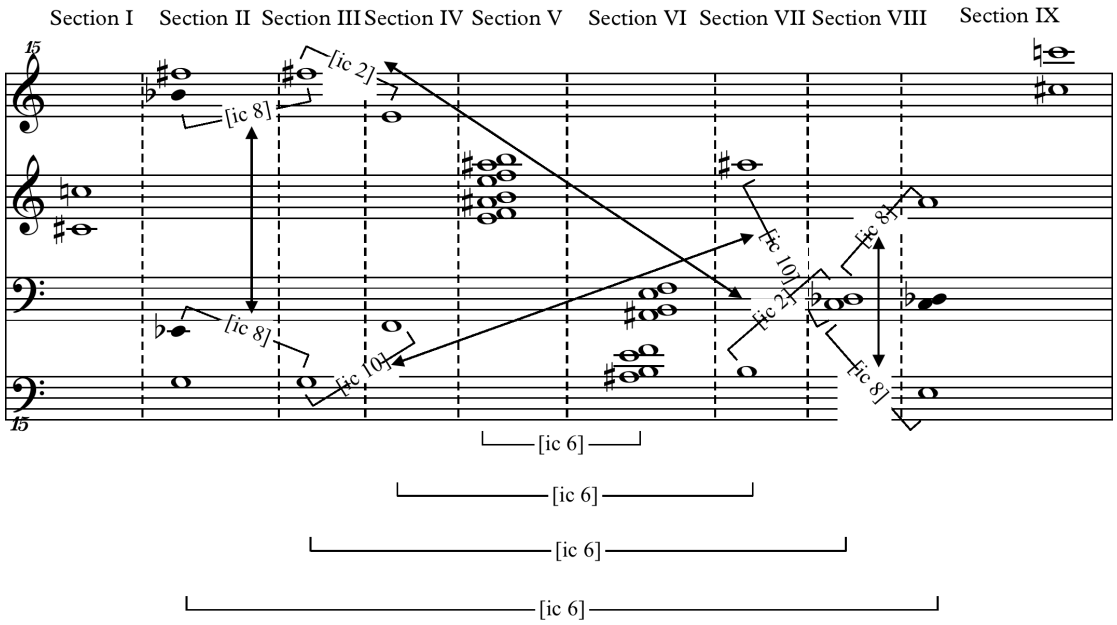


Fig. 24: Outline of the overall Pitch-space structure of the piece and network of intervallic relations. ic = interval class (f.e. ic6 = interval class of six semitones).

The overall formal structure of the piece is illustrated in the next and final figure (**Figure 25**). The macro-structural "reflections" among the sections are noted at the bottom of the graph. Additionally, the graph shows the extensive use of the golden ratio (golden section) as far as the length of the formal sections and their in-between analogies are concerned.

One can easily perceive that an extensively and well-considered structure is the solid foundation of the work. In the frame of an effort to bring opposites together, a strictly defined form is the basis of a music which I have intended to flow smoothly, like a cloud that constantly changes shape according to the direction of the wind. To that end, extensive use of the compositional technique of the canon is made. The property such a device has is the smooth transition from one point to another, as it sustains the common pitches. Even the choice of the golden ratio for defining the relationship between the sections has to do with inherent properties of it: "neither symmetric nor asymmetric", according to Ligeti, it at the same time guarantees the logical analogy, while it avoids the triviality of 4, 8 or 16 bars that constitute the basis of periodicity in classical form.

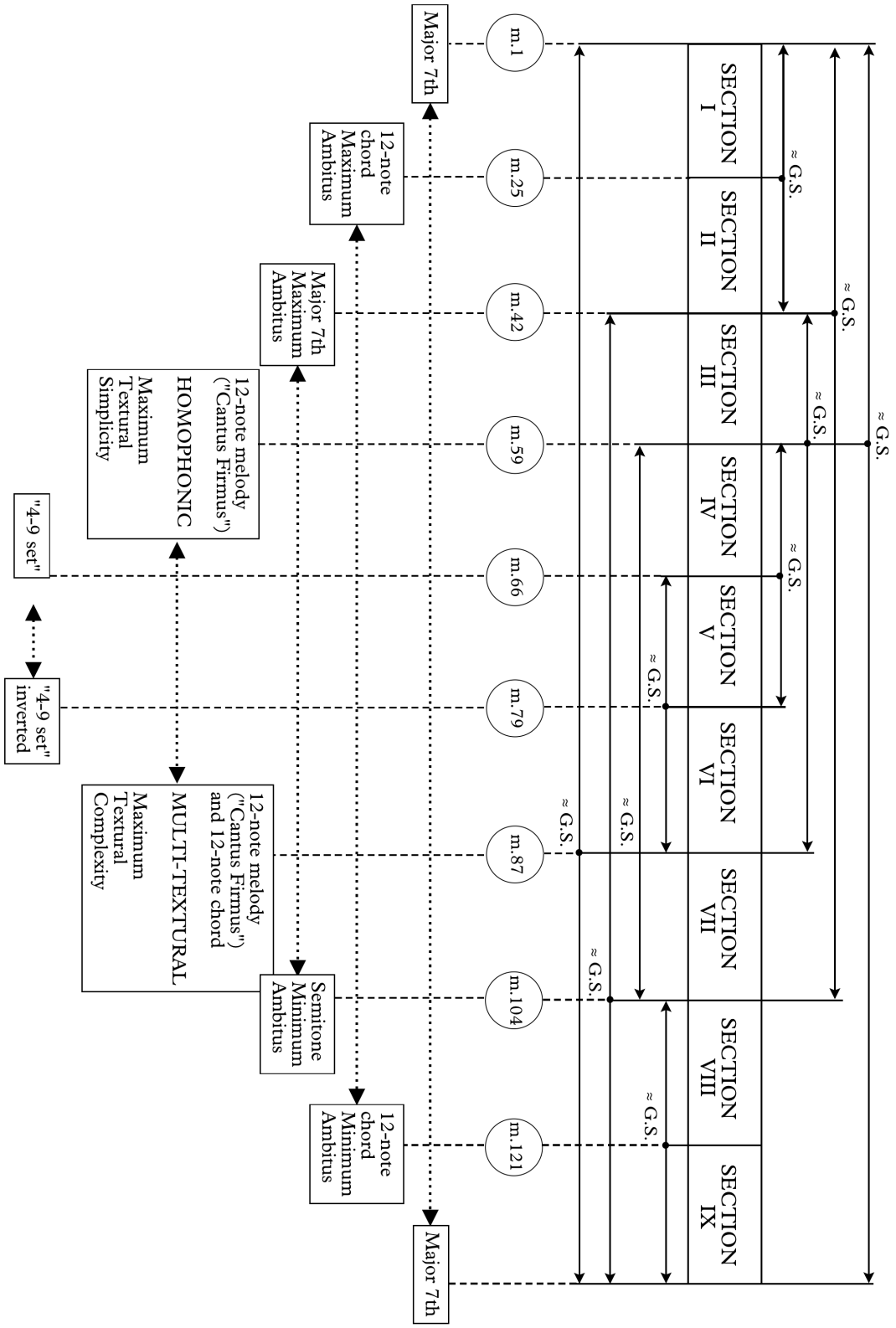


Fig.25: Overall structure of the piece and various symmetries ("reflections") on horizontal (time) axis. G.S. = Golden Section.

7. Recursion (on a Theme by K.Tsougras), for Solo Piano

The concept of recursion, known from mathematics and especially from fractal geometry, is closely connected to that of self-reference according to Douglas Hofstadter:

> The concept is very general. (Stories inside stories, movies inside movies, paintings inside paintings, Russian dolls inside Russian dolls (even parenthetical comments inside parenthetical comments!) -these are just a few of the charms of recursion).[10]

I am often inclined to give titles that describe my compositions in a self-referential manner. "Melting clocks", "Reflections", "Permutations", for example, refer to what actually happens in those works at a deeper level of construction.

Thus, "Recursion" for Solo Piano attempts a personal approach to the traditional theme and variation form, with the concept of the title defining the form of the work. The choice of the theme itself obeys this principle. It is a miniature of 8 measures (mm. 1-8) by the Greek composer Kostas Tsougras, which, besides the fact that it is used as a theme for variations by himself, is also an allusion to Anton Webern's Concerto for Nine Instruments, Op. 24, since it is based on the free use of the tone row of the work (**Figure 26**).

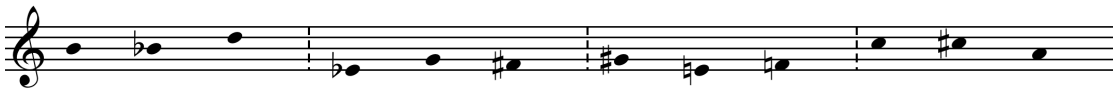


Fig. 26: Webern's derived tone row

In other words, I refer to a composer who refers to another composer by writing variations on a theme that is itself a kind of variation. Furthermore, at an even deeper level of recursion the fourth variation of the work contains variations of the three last ones as well as of the theme, as we shall see next.

As we can see in **Figure 27**, the theme results from two transpositions of the original and two of the inverted unordered trichord (0,1,4), which constitutes the elementary cell from which Webern's tone row is derived as well. Small touches, such as adding a pitch (marked in parentheses) at the end of each 4-bar phrase do not lessen the central role of the trichord in question. This level of intense concentration as well as the

[10] Hofstadter, *Gödel, Escher, Bach: an Eternal Golden Braid*, 127.

symmetrical ordering of the trichords constitutes the constructive axiom on which the composition of my work is based.

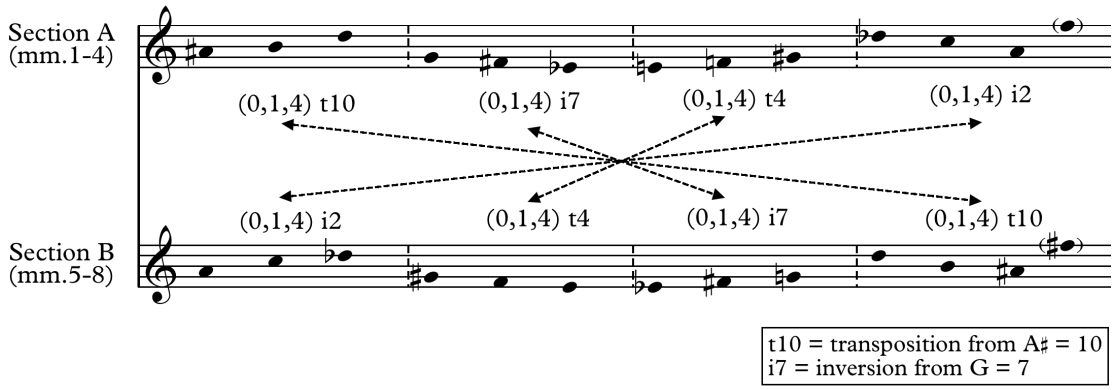


Fig. 27: Pitch structure of the theme (mm.1-8)

Webern's tone row has the property of maintaining its unordered trichords untouched after specific transpositions or inversions. This is the property that the first variation (*INVENTION I*, mm.9-17) makes use of as far as the choice of the pitch material is concerned (**Figure 28**). From that point on, at a more superficial level, the variation is based on a contrapuntal "echoing" of the characteristic motifs of the theme and on the complexity resulting from their in-between interference.

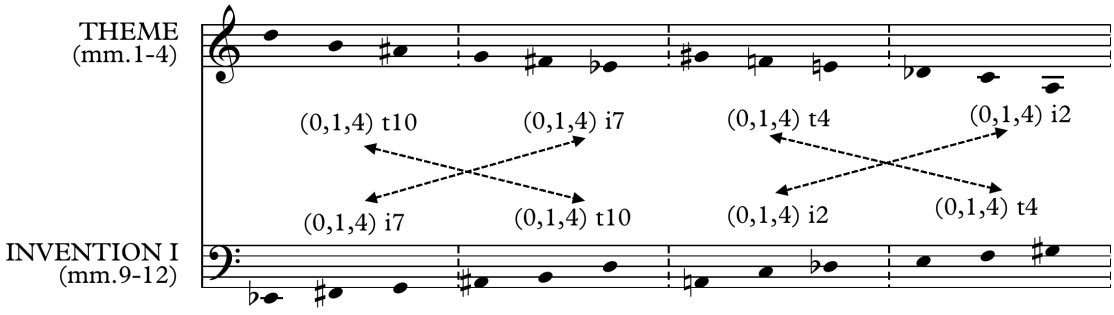


Fig.28: Invention I (mm.9-12). Common pitch content by inversion.

Another characteristic that runs through the whole work is that of multi-layered construction. The superimposition of multiple layers in the background results in a compound rhythmic-melodic line in the foreground, as can be seen in the extract from the second variation (*INVENTION II*, mm.18-27) in **Figure 29**.

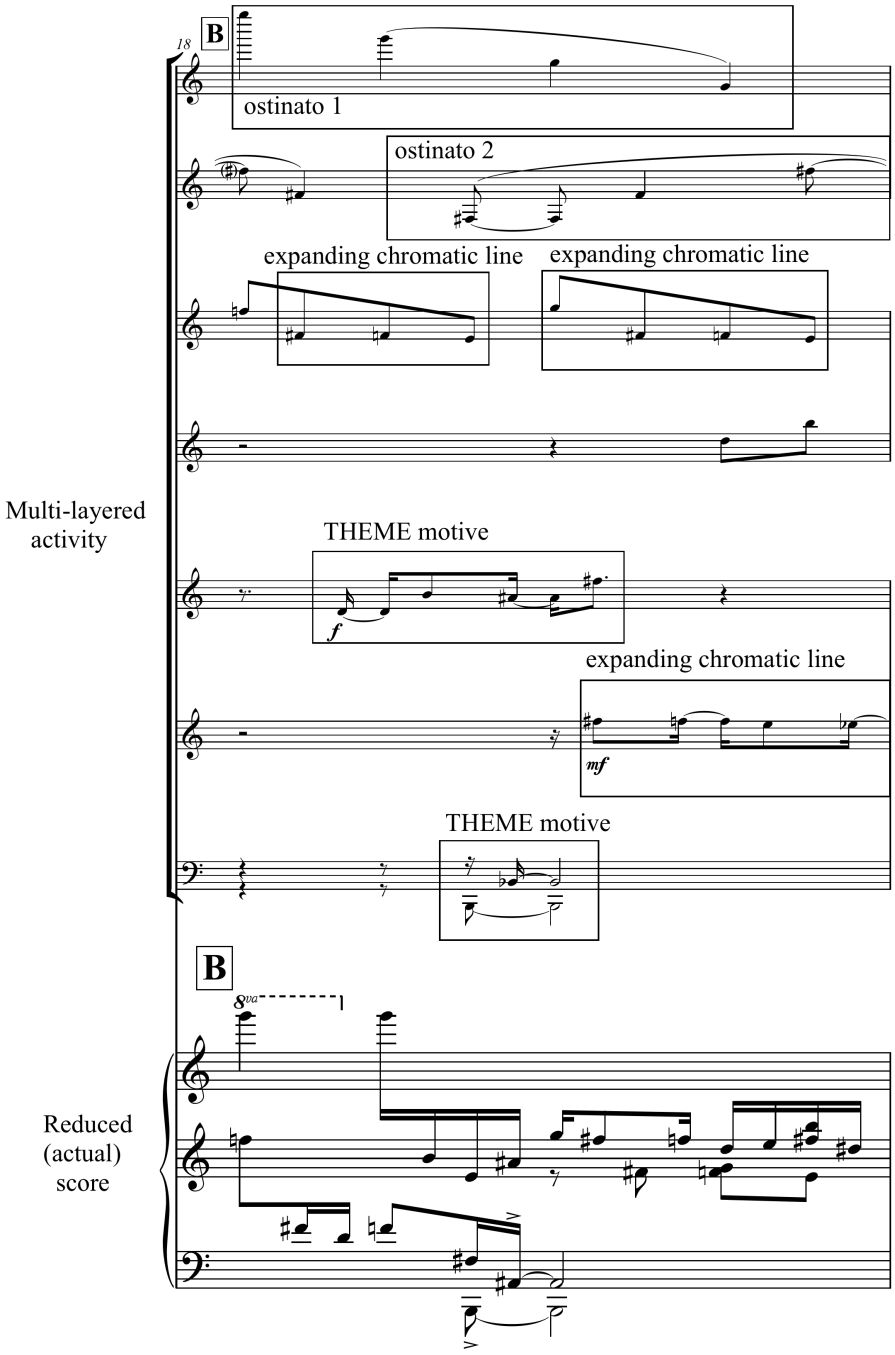


Fig. 29: Multi-layered construction of the melodic lines. Below the small staffs which demonstrate the layers' activity is the reduced score.

At this point the symmetrical construction of the second variation is worth mentioning: Its second half (mm. 22-27) is an inversion of the first (mm.18-21). (**Figure 30**)

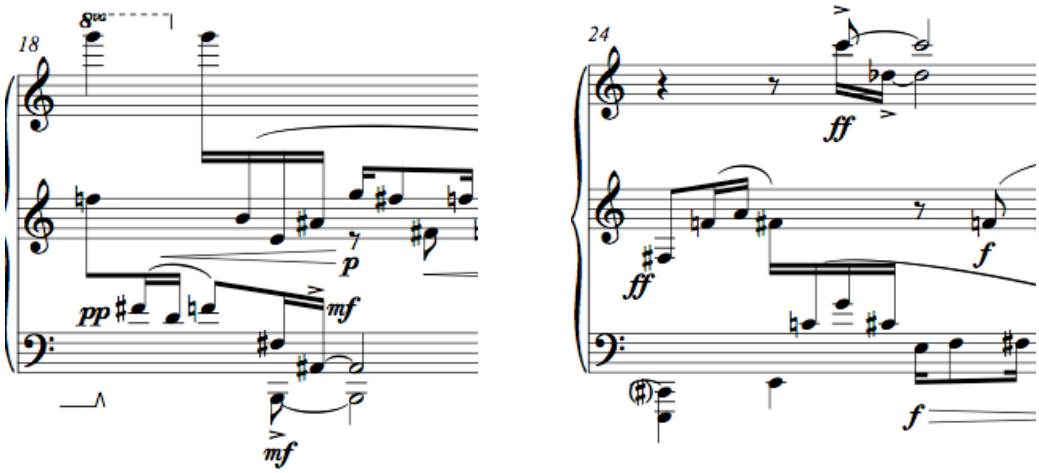


Fig.30: Inversional relation of the two sections of Invention II

In the third variation (mm.28-42) two voices form a crab canon that accompanies four "free" voices, which, from the middle of the variation onwards, move at retrograde motion, but in the opposite direction in pitch-space (for example, the melodic line B2-D4-A5 becomes A2-D4-B5).

In this variation recursion occurs at two levels. On the one hand, the very nature of the crab canon technique is self-referential, since there a melodic line is accompanied by its own palindrome. On the other hand, the combination of the two melodic lines is a variation of the theme, as it exposes the inversions and transpositions of the cell trichord in the order they appear in it (**Figure 31**).

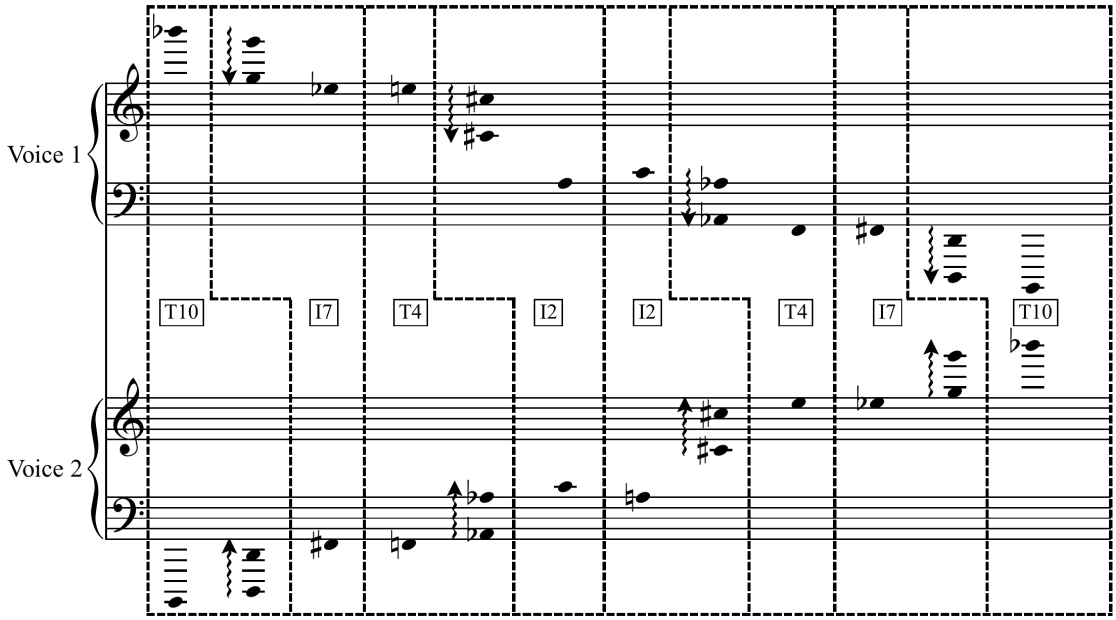


Fig. 31: Pitch structure of the crab canon (Variation III, mm.28-42). The boxed text refers to the various transpositions (T) or inversions (I) of the cell trichord (0,1,4)

As the work progresses, the recursive process grows deeper with the *Passacaglia* of mm. 43-133 as its climax. The 2-voice crab canon of Variation III is used as its ostinato with minor modifications. The recurring ostinato, which, as we have previously seen, is itself a variation of the theme, accompanies a series of successive variations of the three last variations in a single passacaglia form. At the same time, the ostinato itself gets varied by contracting its rhythmic cell (two repeated values) from the 4/4 of m.43 to the 3/8 of m. 121 (**Table 8**). Because of these contractions, the variations accompanied by the ostinato become deformed due to their increase in speed and density. A characteristic example is the contrast between the expressive, slow *Crab Canon* (mm.28-42) and the spasmodic scherzo of its variation in the *Passacaglia* (mm.67-72).

	time signature	4/4	7/8	3/4	5/8	2/4	3/8	2/8	7/32	3/16	5/32	2/16	3/32	3/8
voice 1	ostinato cell in 32nds	24 : 8	20 : 8	16 : 8	16 : 4	12 : 4	8 : 4	6 : 2	5 : 2	4 : 2	4 : 1	3 : 1	2 : 1	1 : 1
voice 2	ostinato cell in 32nds	16 : 16	12 : 16	12 : 12	8 : 12	8 : 8	4 : 8	4 : 4	3 : 4	3 : 3	2 : 3	2 : 2	1 : 2	1 : 1

Table 8: Contraction of the ostinato's rhythmic cell (mm.43-121).

From m.91 until the end we hear the conclusive "coda" of the work, which consists of imitations of the ostinato in canon form. From the moment the rhythmic acceleration reaches the demisemiquavers of m.121 the ostinato noisily sinks to the lowest register of the Piano, closing the work.

The overall formal structure of the *Passacaglia* is depicted in **Table 9**. Another level of self-reference is worth mentioning here: there is a symmetric arc form (rehearsal letters E to K) within the wider arc form of the *Passacaglia*.

rehearsal letter	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
time signature	4/4	4/4	7/8	3/4	5/8	2/4	3/8	2/8	7/32	3/16	5/32	2/16	3/32	(3/8)
form	ostinato	THE MA	A	B	C	B	A	THE MA	canon a 3	canon a 4	canon a 4	canon a 3	canon a 3	ostin ato
			Variations based on Variations that have the above rehearsal letters											

Table 9: Overall formal structure of the Passacaglia (mm.43-133)

Each one of the four variations is an allusion to some known kind of form. The first two are inventions; the third is crab canon and the last one passacaglia. In spite of the fact that each one of them can, in most cases, exist independently, they are composed in such a manner that when they succeed one another without pauses they give the sense of a uniform work, the building blocks of which are also smaller works in a self-similar manner.

Closing, I would like to remark that while the score gives the impression of a "*bravura*" for Piano, in reality it constitutes a demanding *étude* on composition itself. As an admirer of the Goldberg Variations and the Musical Offering, where J.S. Bach dismisses with incomparable mastery the limitations set by the given musical material, I have attempted to compose a study on form, utilising, to the highest possible degree for myself, the innate potential of my material.

8. Hocket of Petty Selves

Greek poet Giannis Skarimbas (1893-1984) is, by general acceptance, an entirely peculiar and personal voice in Greek letters. Besides being an adversary of the established civil values, he has been one of the first man of letters who introduced surrealistic elements in modern Greek literature. One of the characteristics of his poetry that has always impressed me, is the co-existence of the old-fashioned rhyme with the ground-breaking content by means of a peevish, almost eccentric handling of the syntax of the modern Greek language. For several years now, the idea of setting his poems to music has been a difficult, yet tempting challenge for me. I decided to meet this challenge during my PhD at York by setting the poem "Petty selves", which is cited below, to music:

Petty selves[11]

So fine was tonight my sorrow,
all came in silence, passionless,
and found me -with none missing-
my mistakes.

And as I recognised all of them around me -drums and cymbals-
all held, trumpets and violas
PETTY SELVES who watched me,
all my blunders.

Ah!...what a troupe, somewhat of bumps,
drunken and out of tune musicians,
as they looked like -with their swollen noses-
clowns.

And what an inspiration to give me the baton
in front of a tripod with mysterious melodies
whereupon my failed works were written
-march songs!

Ah...what an inspiration!... Master of the wrong notes always me,
with my baton now held high -I say- with horrors
there, with this band I shall march

[11] The translation from the Greek language has been rendered by Evi Rodiou

on the streets.

And as I go with backwards steps
in horns and santurs they will bang them
my clowns-leaping in the air-
the battle songs...

In a mocking mood, the poet describes himself as a composition of disparate and controversial elements. In spite of their apparently paradoxical nature, these elements are acknowledged by the poet as those integral pieces of himself that bestow uniqueness and depth on his existence.

The existence of controversial elements that complement each other reminded me of the optical illusion paintings of Salvador Dali (a characteristic sample, seems to me, the painting "Paranoiac Face" in **Figure 32**).

Fig. 32 : Salvador Dali, "Paranoiac face"

By closely observing the collateral elements one perceives a specific depiction. However, when looking at the painting from a distance and as a whole, one discovers a completely different image that emerges as a result of the way in which the collateral elements are arranged.

In this spirit, I have tried to compose a work in which each isolated structural component has some independent hypostasis (either purely musical or as an allusion to extra-musical ideas), whereas the co-existence of the collateral hypostases creates a musical illusion painting different from the individual components.

The melodic and harmonic content is based on a melodic ostinato of 24 pitches, which from now on will be referred to as COLOR, in correspondence with the medieval

isorhythmic technique of the same name (**Figure 33**). The COLOR consists of four transpositions of the ordered hexachord of the whole-tone scale so that when its circle is completed all 12 pitches of the chromatic scale have appeared twice.

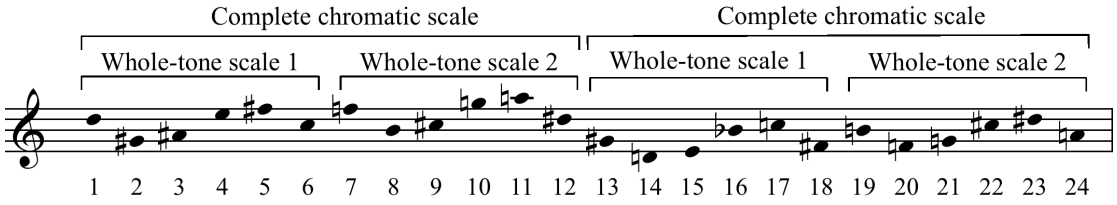


Fig.33 : The melodic ostinato (COLOR) on which the melodic and harmonic construction is based

The COLOR is constructed in such a way that with the proper segmentation its pitches become each time different members of a harmonic series. In other words, they are always basic pitches or extensions of a major chord (**Table 10**).

		d	**g♯**	**a♯**	**e**	**f♯**	**c**	**f**	**b**	**c♯**	**g**	**a**	**d♯**	**g♯**	**d**	**e**	**b♭**	**c**	**f♯**	**b**	**f**	**g**	**c♯**	**d♯**	**a**
S1	**H**	7	5	11	1	1	11	7	5	11	1	1	11	7	5	11	1	1	11	7	5	11	1	1	11
	C	E				F♯		G				A		B♭				C		C♯				D♯	
S2	**H**	5	7	1	5	11	1	5	7	1	5	11	1	5	7	1	5	11	1	5	7	1	5	11	1
	C	B♭			C			D♭			E ♭			E			F♯			G			A		
S3	**H**	1	11	11	1	9	3	1	11	11	1	9	3	1	11	11	1	9	3	1	11	11	1	9	3
	C	D		E			F			G			A♭			B♭			B			C♯			D
S4	**H**	1	1	1	1	9	3	1	1	1	1	9	3	1	1	1	1	9	3	1	1	1	1	9	3
	C	D	A♭	B♭	E		F		B	C♯	G		A♭		D	E	B♭		B		F	G	C♯		D
S5	**H**	1	1	1	1	9	1	1	1	1	1	9	1	1	1	1	1	9	1	1	1	1	1	9	1
	C	D	A♭	B♭	E		C	F	B	C♯	G		E♭	A♭	D	E	B♭		F♯	B	F	G	C♯		A
S6	**H**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	C	D	A♭	B♭	E	F♯	C	F	B	C♯	G	A	E♭	A♭	D	E	B♭	C	F♯	B	F	G	C♯	D♯	A

Table 10: Successive harmonizations of the COLOR. S1 = first segmentation, S2 = second segmentation,etc. H = Harmonics, C = Major Chords

Obviously, the sequences of the chords initially form ascending octatonic scales. It must be noted that the reference to ascending scales runs throughout the work. This reference musically depicts the sense of escalation that the poetic text conveys. The successive superimposition of these scales gradually thickens the harmonic rhythm and forms the

completed COLOR at the sixth segmentation, where each pitch constitutes the root of a major chord. The harmonizations of **Table 10** appear in the work almost in the same order as shown in the above example (S1, S2,....,S6, S5,....,S1 and so on) and each time with greater participation of the sixth segmentation.

By properly superimposing the COLOR with its transposition a semitone down, every pitch of the COLOR becomes a root, while every pitch of the transposition a third or fifth of a major chord (**Figure 34**).

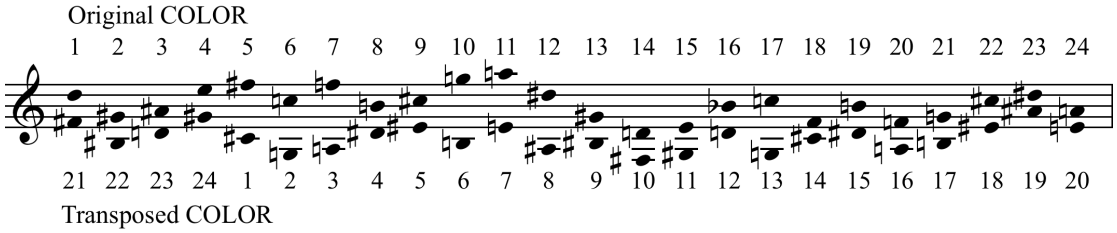


Fig. 34: Superimposition of the original and transposed COLOR

Finally, with the suitable ordering by height, the combination of the COLOR and its transposition also forms successive ascending major scales (**Figure 35**).

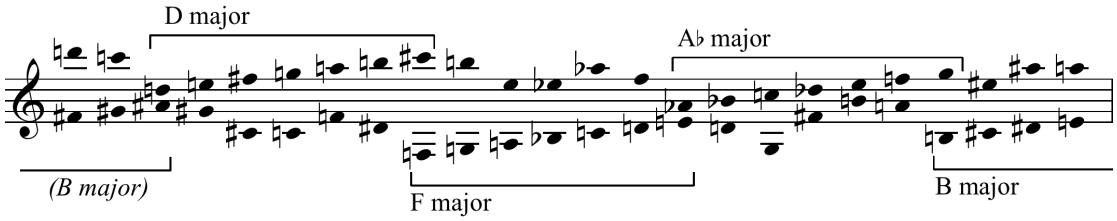


Fig. 35: Major scales resulting for the superimposition of the two COLORS

The utilisation of these elements imparts on the harmonic language of the work a sense of ambiguity, even irony, where opposing elements, such as diatonicism and chromaticism, co-exist and complement each other without making the work tonal or atonal.

Paradox, contradiction and irony have also formed the starting point for the construction of the rhythmic ostinato of the work, which from now on I shall name TALEA in correspondence to the melodic COLOR. In **Figure 36** we see the TALEA of the first stanza of the poem.

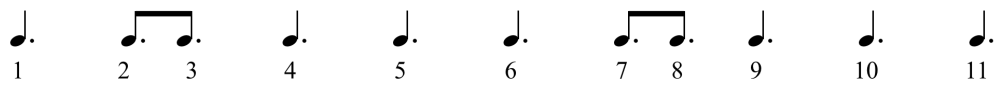


Fig. 36: TALEA of the first stanza

It is an asymmetrical rhythmic shape of 11 rhythmic values that makes the 24-pitch COLOR rotate every 11 pitches.

The choice of the TALEA is not random. It constitutes the rhythmic basis of a very popular Greek dance, the *zeibekiko*, which was in fact very dear to the poet G. Skarimbas. It is a slow, ritual dance, the roots of which are considered to lie in Greek antiquity. It is usually performed by one person.

Zeibekiko has, of course, nothing to do with the spirit of the grotesque march to which the poem refers. The narration of the poem certainly follows an escalation from the quiet sorrow of the first stanza to the hectic march song of the sixth. To project this escalation, another TALEA (as another "petty self") is added at a faster tempo to each stanza. The superimposition of different tempi of the same TALEA gives the impression of a paradox march, performed by 'drunken musicians' that are 'out of tune' (**Figure 37**).

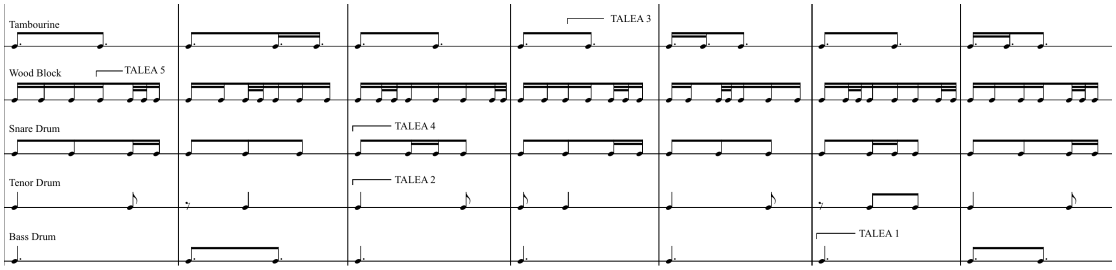


Fig. 37: Superimposition of five different tempi of the TALEA, percussions from m. 347

The idea of a "self" that consists of many smaller "petty selves" is applied to the way I have decided to musically render the text. Thus, while the first stanza is sung by one voice, the second stanza is sung by two. The new voice interjects lyrics from the first stanza in the text of the second one, so that the meaning of the poem becomes enlightened each time in a different way.

As can be seen in **Figure 38**, only the reading of the text of the first voice renders the authentic text ("all held trumpets and violas /PETTY SELVES who watched me,/all my blunders"). The reading of the text of the second voice renders a different, but equally self-existent meaning ("my sorrow, my mistakes -drums and cymbals-"). The combination of the two voices gives to the verse a new meaning, connecting each stanza to the previous one ("[*my sorrow*] trumpets and violas [*my mistakes*], PETTY SELVES who watched me, all my blunders [*drums and cymbals*]").

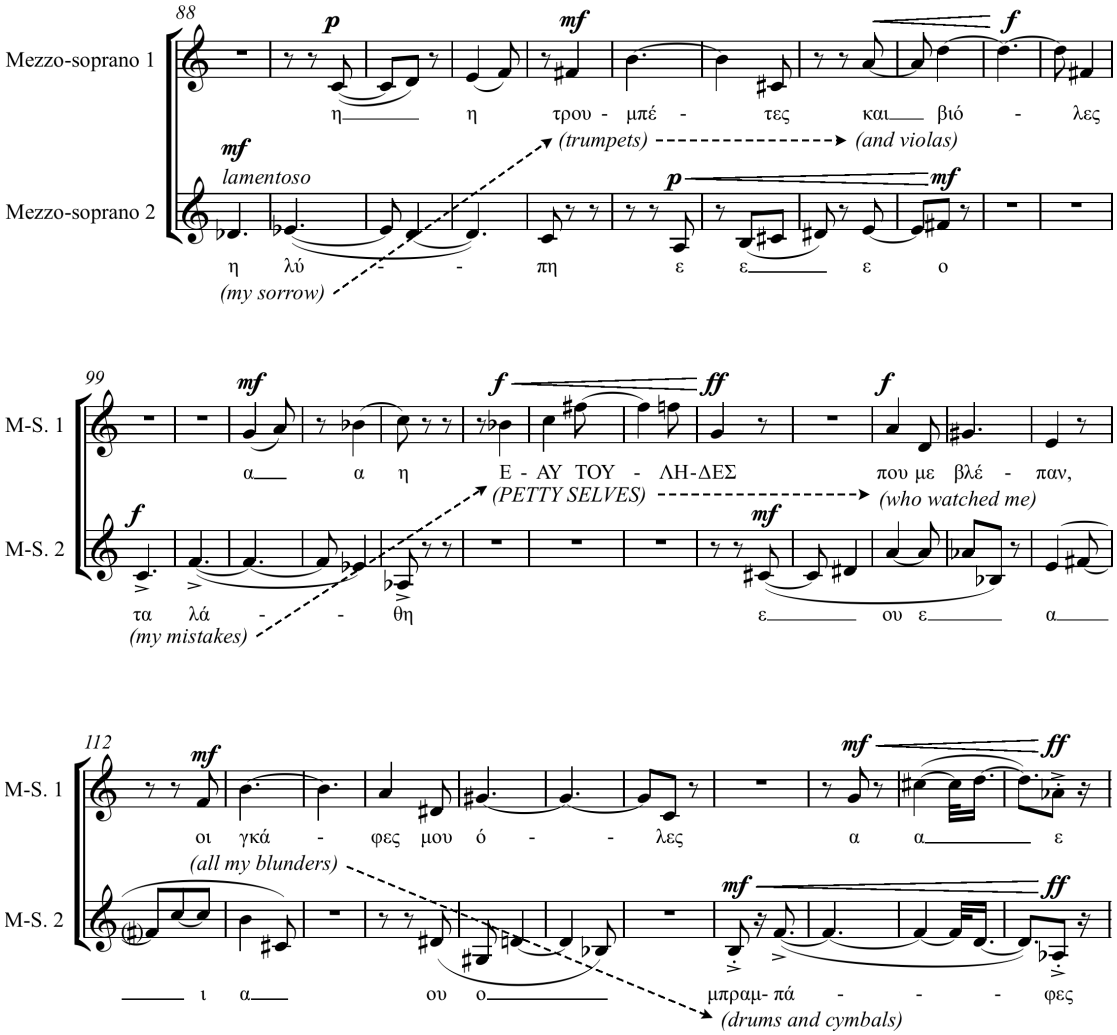


Fig. 38: Interference of words from the first stanza (mezzo-soprano 2) with the verse of the second(mezzo-soprano 1), mm.88 - 122

The same process repeats itself in the third stanza with three voices, in the fourth with four and so on. Thus, complexity is increased step by step until the work comes to its climax in the sixth stanza with the participation of six voices (6 "petty selves"). The work finishes with the voices departing one by one, singing in hocket form the last word of the sixth stanza ('battle songs'), which also constitutes the conclusion of the whole poem.

At the same time, the TALEAs depart in such an order that the slowest (that of the first stanza, depicted in **Figure 36**) remains at the Bass Drum, revealing thus the rhythmical shape of the zeibekiko dance and giving the impression of a "troupe" departing.

Ambiguity, paradox and irony run through the structure of the whole work. Due to the COLOR, it provides a sense of passacaglia, without this being the case, since

pitches of the COLOR are often left out or replaced or even spread to different instruments, while the COLOR is inconsistent with the TALEA. Tonal elements (major chords and diatonic scales) contribute to the structure, though out of tonal context. The poem of G. Skarimbas is used, but a different text is heard because of the interjection of verses by the six voices. Finally, while the TALEA is the rhythmical basis of the zeibekiko dance, what results from the superimposition of the various tempi is a comical circus march.

9. Three Aphorisms for Wind Quintet

Three Aphorisms is the final piece added to my folio. This is why the compositional objective was twofold: I imagined a set of contrasting, epigrammatic pieces bound together by common harmonic material, on the one hand, as well as a synoptic overview of my artistic development during my study at York, on the other.

In that sense, the piece is full of allusions to my previous works. Some references are directly perceivable, while others are more subtle, having mainly to do with the manipulation of the background material. In all cases my main concern was to highlight the "common line" that interconnects each piece of my folio with the next one in a coherent sequence. This, hopefully, depicts an evolution towards the formation of a personal expressive language.

The first *Aphorism* is a straightforward exposition of the harmonic process that constitutes the base on which the whole work has been built (**Table 11**). It is an upward, quasi-chromatic line (see bottom row). This line is not always heard. It acts as a model where every pitch of it is a fundamental pitch (root) of a harmonic series. Each column (*a* to *t*) is a chord composed of five members of the respective series. However, while the root progression is ascending, the harmonics move downwards, gradually altering the chordal structure. In this way, the first chord is a shrill chromatic cluster, while the last one is a brilliant unison. It is important to clarify that each harmonic is used as a pitch-class rather than a pitch at its corresponding register. Therefore, the last chord of the piece is not a literal unison, but a single pitch expanded in four octaves. It's also worth mentioning that at certain steps of the sequence major chords are created that attribute an elusive sense of tonality to the piece.

	a	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**	**l**	**m**	**n**	**o**	**p**	**q**	**r**	**s**	**t**
Harmonics	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1		
	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1			
	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1				
Root	F♯	G	G♯	A	A♯	B	C♯	D	D♯	F	G	A	A♯	B	C♯	D	D♯	E	F	F♯

Table 11: Harmonic progression of the first "Aphorism". Each column is a chord (labeled a, b, c, d, etc) composed of five harmonics (each having the respective index number) based on a root progression (bottom row).

The aforementioned harmonic material is a development of the idea that drives the harmony of my previous work, *Hocket of Petty Selves*, where every pitch of the chromatic ostinato is also a member of the harmonic series. Therefore, the first *Aphorism* is a remote reference to *Hocket.* However, this transformative process is used here as a mere tool in such a way as to produce a quite different aesthetic result.

The manipulation of the harmonic series is being taken a step further in my second *Aphorism,* which displays a playful spirit. As an allusion to *Homage to Anton Webern,* which was the first piece I composed during my studies at York, the second *Aphorism* also uses tone rows as structural elements of a music that is not dodecaphonic. Two such mock "tone rows" provide the pitch material of the piece (**Figure 39**). At a first glance they look like typical rows in the idiom of Webern: both are transpositions of a derived tone row in such a way that their hexachords are combinatorial. A closer look at **Figure 39** reveals the actual construction: every trichord is a set of harmonics (noted below each row) with the corresponding fundamentals noted on the top of each trichord.

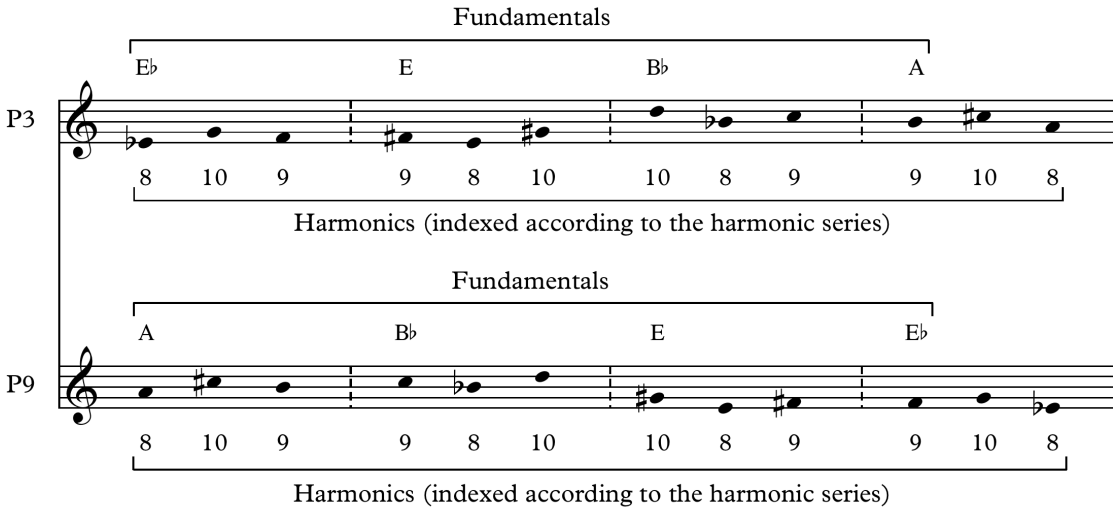


Fig. 39: Actual pitch structure of the two transpositions of the tone rows (second Aphorism).

The pitch content of each row changes every four measures, due to the replacement of the harmonics with higher (in P3) or lower ones (in P9). The final stage of this transformation is depicted in **Figure 40**. The rows "melt", so to speak, as the piece progresses, in a process similar to that used in the first part of my *String Quartet.* The latter employs these transformational "stages" towards an opposite direction: starting from a single pitch, it ends up in a twelve-tone aggregate. In this way, the second *Aphorism* can be seen as a "hybrid" derived from the synthesis of two remarkably different works. Nonetheless, there are indications of a common background in both *String Quartet* and *Homage* as far as the aesthetic intent is concerned.

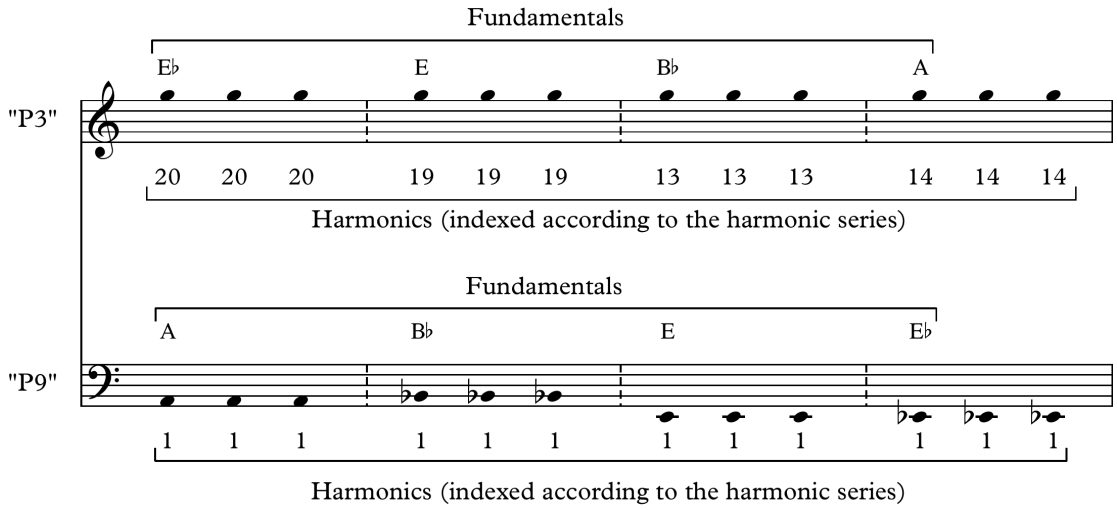


Fig. 40: Final transformational stage of the "tone rows" (second Aphorism).

Based on the idea of composing a piece by using the simplest possible sonic units, as dots are deployed in a pointillistic painting, the last *Aphorism* is an allusion to *Melting Clocks,* composed a few years earlier. The latter lends its external shape to the final *Aphorism* but not its internal content, which is once more based on the first *Aphorism's* harmonic sequence. Here however, the sequence consists of 39 chords, almost double the chords of Part I. Additionally, the fundamentals are moving downwards while the harmonics ascend, in an inverted motion as related to the first piece. That being so, the final *Aphorism* opens with a fundamental D4 played in unison by all the instruments and ends with the same D4, but this time as the sixteenth harmonic of an inaudible fundamental.

The piece is divided into three formal sections (of 10, 10 and 24 measures respectively) that are clearly separated by cadential chords emerging from the stabilisation of the rhythmic cells into steady rhythmic patterns. The last section (mm. 21 - 44) is a vivid canon that uses the harmonic sequence as its melodic material.

10. Conclusions

As stated in the introduction of this commentary, my main focus during my studies at York was the development of a personal musical language that would combine structural clarity with unstrained expressivity to the highest possible degree. The overview of the works presented in this commentary clearly outlines the existence of common elements that constitute the distinct vein of my works. These common elements pervade the whole folio and connect each piece with the next one.

Techniques already present in my first works were developed, enriched and most importantly, put into perspective. The systematic parametrisation of elements in *Homage*, for example, served as a tool so that a freely conceived texture could come to the fore. In this case, the initial inspiration can be seen as analogous to the raw shape of a sculpture which is further refined in its details with the help of the aforementioned parametrisation.

The *Homage* experiment inspired structures like those of the *String Quartet* and *Reflections* for orchestra, where the elements of the composition were hierarchically organised according to different levels of importance. There, the macro-structural projection of certain important intervals within a network of carefully thought out intervalic relationships allowed greater artistic freedom in the composition of the refining details of the completed work.

In a similar manner, the progress during the composition of every piece was a valuable lesson, a guide for composing the next one. In this way, new ideas were born, tested in practice, assessed and provided the background for future explorations. As a result, my experience in composition expanded as it becomes evident by comparing my first pieces to the last ones: while a common line connects each composition with another, there is a significant change in the way I approach the compositional process in general. In that sense, I consider my goal fulfilled, since I have gradually come to realise that the search for the path is the path itself.

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