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Franco Donatoni's *Refrain*

Use of Process and Interpolation

Refrain was composed in 1986, commissioned by Amsterdam's 'Nieuw Ensemble'. It holds a special place in Donatoni's oeuvre, because it served as a model for 4 more subsequent works. *Frain* of 1989 is a short extrapolation of *Refrain*, lasting 1'50" that uses the same instrumentation and textures as its predecessor, and was also commissioned by the Nieuw Ensemble. In 1991 an invitation from Melbourne's 'Elision Ensemble' prompted *Refrain II*, which used the ensemble's more generous resources of both woodwinds and strings. A further rereading in 1993 added brass to create a chamber symphony: *Refrain III*. Finally, a challenge from the 'Nieuw Ensemble' to the composer to rethink the material so as to eliminate sustaining instruments resulted in 1996's *Refrain IV*, written for an octet of mandolin guitar, harp, harpsichord, piano, vibraphone and marimba. It would be a very interesting study to trace how each version uses the material of the original piece, and how each version relates to the rest. At the time of this writing, however, there was no availability of either scores or recordings of any but the original version of the piece.

Refrain comes from the mature period of Donatoni's output, following the compositional crisis the composer suffered in the early 1970s. His comeback revealed a more thought out compositional process that is economical in its choice of materials, and a more careful and

contained choice of instrumental forces. This piece is written for a peculiar ensemble, at least in the Western European tradition. It seems to draw as much from mediterranean folk practice, as it does from Schoenberg's: *Serenade* or Mahler's: *2nd Symphony*, both of which use mandolin. Actually the choice of instruments is not one of chance or commission necessity; the composer uses it as a structural device. The relationship of plucked versus sustained timbres is a very strong force in the piece.

Even on a first listen of *Refrain* one is aware that this play of timbres is what outlines the different sections of the piece. A first look at the score reveals a very complex surface structure of virtuosic instrumental writing, and a steady fast pulse that fluctuates very little. The different sections do vary however in density, register and, as mentioned, timbre. It's also easy to perceive a gesture differentiation among different sections. Lastly, a differentiation between vertical and horizontal prominence of pitch organization is comes through to the ear and the eye.

This paper will explore how Donatoni uses the above mentioned elements structurally. Specifically, the use of multi-stage processes and his use of varied repetition and interpolation, as well as his methods of transformation will be addressed.

The first dissection in order would be to outline and label the different sections of the piece. The most obvious divisions occur where the winds and arco strings enter, playing a homophonic chorale-like texture. In concert with the composer's own choice of title, let us call those sections: "refrains". The remainder of divisions are based on careful observance of changes in texture, tempi, use of musical space, and pitch material choices. Table 1 shows a graphic formal outline of the piece.

Table 1: Formal outline. Texture trajectory.

Section 1	mm: 1-27	Plucked: [Cb, Vla] & Mba at m. 8	♪ = 88	
1st “refrain”	mm: 28-36	Sust.: [Cb, Vla (arco), BCl, Pic] & Mba.	♪ = 77	
Section 2	mm: 37-42	Plucked: Hrp.	♪ = 88	
Section 3	mm: 43-68	Plucked: Hrp chords & [Mand, Gtr].		
2nd “refrain”	mm: 69-75	Sust.: [Cb, Vla (arco), BCl, Pic] & Mand.		♪ = 77
Section 4	mm: 76-84	Plucked: [Cb, Vla] & Mba		
Section 5	mm: 85-89	Plucked: Hrp & [Mand, Gtr]		
Section 6	mm: 90-95	Plucked: {Hrp & [Mand, Gtr]} & Mba.		
Section 7	mm: 96-103	Plucked & Sust.: Hrp & [Vla, Cb (arco)] & Gtr.		
Section 8	mm: 104-108	Plucked & Sust.: Hrp & [Vla, Cb (arco)] & [Gtr. & Mand]		
3rd “refrain”	mm: 109-117	Sust.: [Cb, Vla (arco), BCl, Pic] & Gtr.		♪ = 77
Section 9	mm: 118-126	Sust. Interrupted by Plucked: [Pic, BCl] against [Mand, Gtr, Hrp].		♪ = 99
Section 10	mm: 127-144	Tutti: [Pic, BCl] continuous, {[Vla, Cb, Mba, Mand] & [Gtr, Hrp]}		
Section 11	mm: 145-150	Sust. & Plucked: {BCL & [Cb, Vla (arco)]} & [Gtr, Hrp]		
Section 12	mm: 151-153	Plucked & Sust. mixing: {[Vla, BCL] & [Cb, Hrp]} against Gtr.		
4th “refrain”	mm: 154-162	Sust.: [Cb, Vla (arco), BCl, Pic] & Hrp.		♪ = 77
Section 13	mm: 163-168	Sust.: [Cb, Vla (harmonics)] & Pic.		♪ = 99
Section 14	mm: 169-174	Sust. & Plucked: [Cb, Vla (harmonics)] & Pic vs. Mand, & Mba (m. 172)	Gradual Build up	
Section 15	mm: 175-189	Sust. & Plucked: [Cb, Vla (harmonics)] & Pic vs. Mand,, Mba & Hrp.		
Section 16	mm: 190-195	Sust. & Plucked: [Cb, Vla (harmonics)] & BCl. & Gtr, Hrp.		Breakdown
Section 17	mm: 196-202	Plucked: Hrp & [Mand, Gtr]	♪ = 77	
5th “refrain”	mm: 202-207	Sust. & Plucked: [Cb, Vla (arco), & BCl, & Mand] & Hrp, & Gtr.		
<i>Coda</i>	mm: 208-210	Tutti: [Cb, Vla (arco), & BCl], [Pic, Mba & Mand] & [Gtr, Hrp].	♪ = 88	

Let's look at how the composer organizes blocks of material. Overall, he uses an additive process. Pitch elements are accumulating over the course of the piece, both horizontally and vertically. In the large-scale structure, it's easy to see that individual phrases tend to get longer as the piece progresses, starting with opening 2-note motivic cells, which gradually give way to long strains of scalar aggregates. The vertical accumulation is manipulated through the use of register and timbral counterpoint. Registrally, the overall motion of the piece is from low to high, though the composer is careful to provide relief when a specific register is saturated. A conscious differentiation between vertical sonorities and horizontal linear motion is used structurally as well. That is evident in overall texture transitions from section to section, as well as in how individual instruments participate in the texture. "Refrain" sections, for example, favor verticality, while intermediate sections are either linear or linear against chordal blocks of material. Individual instruments will usually enter being either strictly linear or chordal, and will switch as the sections change. This can be seen in several places. Section 1 will be looked at in more detail later, so let's look at the Harp in section 2. It comes in after the 1st "refrain" with a radical texture change. Not only is it linear, but also has the characteristic gestural major 7th grace notes that the marimba introduced in section 1. When the Guitar and Mandolin enter in section 3, however, it switches to a strictly chordal accompaniment, and then at m. 52 all three instruments dovetail linear strands of material. This will be intercepted by the 2nd "refrain" and the reminiscent of the opening section 4, and will be resumed at section 5, where the three instruments joined by the Marimba, resume their ascending linear material until the next "refrain". After that, however, the same three instruments are suddenly playing chordal material that dovetails the pitches of the two winds that grew out of the "refrain" and are now (section 9)

antiphonally intersecting the plucked instruments. This is taken a step further in section 10, where the winds have gradually become a continuous stream of 32nd notes, that is punctuated by chords of *col legno* strings and Marimba, only to be intersected again, this time by all the plucked instruments with a texture that's both chordal and linear.


Section 13 starts a new slow build-up process. A new texture of string harmonics and Piccolo in a linear texture with limited pitch content starts picking up instruments (mandolin, marimba) on its way to an upper register frenetic tutti at section 15. Here the texture is linear but in a contained manner, and locked vertically. This will then break down at section 16 before giving way to the last, very chordal "refrain", and the Coda.

A closer look at how pitch material is generated is now due. All the pitches in the piece are products of manipulations of a basic [0, 1, 4] pitch-class set (3-3). This establishes a direct link can be made to Schoenberg, and Webern. Donatoni was fascinated with the second Viennese school. He has borrowed pitch material models from Schoenberg before, in his *Etwas ruhiger im Ausdruck* (1967), which is an essay on all the possibilities available with a single measure (m. 8) from Schoenberg's piano piece op. 23, no 2. In *Refrain* the connection can be drawn with the opening five measures of 'Nacht', the 8th song of *Pierrot Lunaire* (op. 21). The opening section of 'Nacht' is constructed with strings of chained [0, 1, 4] sets. The ways in which the two composers deal with this material are too similar to be just a coincidence. Schoenberg rotates the set outward, which creates a [0,3, 4, 7] and chains this to the prime forms of the original set to produce: [(Eb, E, G) (F#, A, Bb, Db)]. At m. 5 the Cello plays [0, 1, 4] and the B. Clarinet a five pitch ascending chromatic aggregate starting a minor 3rd above the highest pitch of the Cello's set. Both of these devices are used extensively in *Refrain*.

Donatoni uses many complex permutations of the set. These include internal and external rotation, chaining that produces larger sets out of which he extracts all possible subsets, and intervallic segregation of the set. Ex. 1 shows some of these permutations. Ex. 1 b), c) and d) show the standard manipulations of the prime form. Ex. 1 e) and f) show how chaining produces the superset $[0, 1, 4, 5]$, if RI is chained above, and $[0, 3, 4, 7]$ if chained below the original. Interestingly, e) & f) are also the characteristic pitches of the harmonic minor and the blues scale respectively, a feature the composer takes advantage of.


Example 1

a) $[0, 1, 4]$ b) retrograde c) inversion d) retrograde/inversion



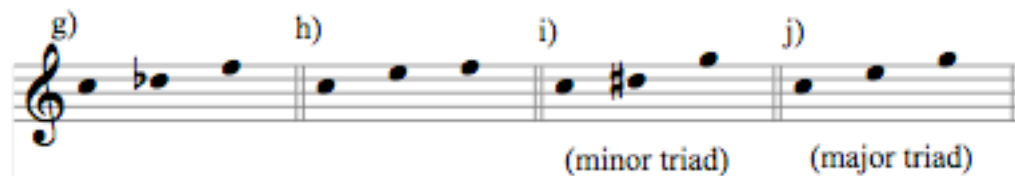
(All sets transposed to C).

e) chained with RI f)



(harm. minor upper tetrachord) (blues scale)

From each of these two [e) & f)] we can extract two additional subsets: $[0, 1, 5]$, $[0, 4, 5]$, and $[0, 3, 7]$, $[0, 4, 7]$, which provide us with major and minor triads, and P4 contained trichords:



(minor triad) (major triad)

Additionally, a chromatic subset $[0, 1, 2]$, and $[0, 1, 7]$, as well as several 2-note subsets can be extracted that provide the composer with all the basic material. Indeed, one could reduce any pitch collection in the piece to either one of the above, or several of the above collections linked together in some way.

Another characteristic feature of Donatoni's use of pitch material in *Refrain*, is the use of pitch centers. This does not imply tonal centers in any way, but rather pitches that serve as points of reference in certain sections of the piece. This could involve single pitches or collections of pitches that persist through a section. In section 1, for example, which will be analyzed in more detail later, the collection (B, B \flat , G) keeps coming back. In section 2, the harp uses pitches (D \sharp , C, B) as an axis around which it spins of other pitch material to expand its registral space. A few measures later in the same section, the mandolin is obsessed with an F \sharp (m. 43), which then the Harp takes over at m. 46 and uses it consistently as the top note of its chords. At m. 50 the top note becomes B, which is then turned over to octaves in the guitar at m. 56. In section 4 the 3 vertical constructions shown in ex. 2 serve as a frame of reference that ties together all the linear pitch collections.

Example 2



In section 7 the Viola and Bass recycle pitches: G, G \sharp , A \sharp , B consistently, joined by the lower staff of the Harp in m. 102. The guitar in the same section alternates between two sets of pitches beginning at m. 101: C \sharp , F \sharp , A, C and D, E \flat , F A, with the first collection always ordered, and both of them in fixed octaves.

In section 12 the accentuating chords are really of two kinds, that alternate, and in section 13 the Piccolo is dancing around C, while the string harmonics are also fixated on four pitches per instrument. Section 17 has the harp pounding G# in three different octaves, while the guitar arpeggiates an E major chord, which will then turn into the final chord of the piece as we'll find out at the more detailed look into the "refrain" sections. This approach to pitch is consistent with the composer's global processes. By keeping an element, in this case a pitch or collection of pitches, constant, and then interpolating it with different material, unity is achieved.

Additionally, the unfolding of material becomes a very organic growth process that makes sense to the listener, because there is a point of reference in the pitch world that provides a thread to follow, even when there are all twelve pitches sounding simultaneously, which happens often during the course of the piece.

Let's zoom in now into specific sections that are in need of a closer look. These are chosen for analysis over others based on their structural significance in the overall structure, and on the degree in which they reveal the composer's intentions and craft. It will be shown that the techniques employed to structure the pitch material and large-scale formal design are equally successfully applied in the construction of the small details.

The opening bassline starts a process of varied repetition, both internally and externally. Ex. 3 illustrates how measures 1-13 are structured. It's immediately apparent that mm. 7-13 include the same sequence of pitches as mm 1-7, with additional single pitches inserted either before or after a group of two pitches to complete some version of the [0,1,4] set. The use of the [0,1,4] is only hinted at the beginning, with the only group of 3 pitches that appears, [B, B \flat , G], all other notes grouped in pairs, carefully concealing the process. The chain of [0,1,4] 's that begins at m.7 is recycled at m. 13 now with more rests in between groups to allow for the

vertical permutations that also take place. Similarly, the sequence of pitches played by the viola starting at m. 7 is recycled beginning at m. 13, 3rd ♪ .

Let's look now at how the bassline is structured internally. The brackets above the upper staff of ex. 3 indicate the internal groups of the phrase. Each constitutes of three elements: the descending minor 3rd (C-A), the descending chromatic aggregate (D, C#, C, B, A#) and the descending minor 2nd (F-E). Each subsequent group is subjected to interpolation. The second group inserts the first complete [0,1,4] (B, Bb, G), which retains its relative place between the descending minor 3rd and the chromatic aggregate. The third group inserts 2 pitches in the descending minor 3rd element that expand it outward (a minor 3rd from above and a minor 2nd from below). It also expands the descending minor 2nd element at the tail end of the group by adding upward chromatic notes that give us chromatic tetrachords [E-G] and [A-C]. Also, the descending chromatic aggregate (element 2) undergoes a reduction each time it comes back: the first time it consists of 5 pitches, the second time 4, and the third time 3.

As the second phrase starts to state [0,1,4] at m. 7 we can see that this is done systematically as well. The original first element (descending minor 3rd) will be turned into [0,1,4] by adding half-steps first above and then below it, while the second element (chromatic aggregates) will be consistently completed with a minor 3rd from above, as is the third element (F-E) since it's the lowest note on the instrument, and the lowermost register of the piece.

Example 3

Bass

m. 1

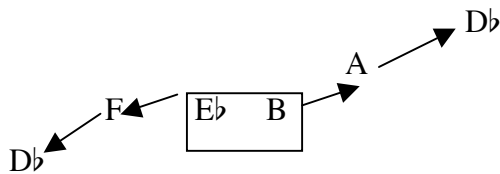
m. 7

The image displays three systems of musical notation for bass clef instruments. The first system consists of two staves, labeled 'm. 1' and 'm. 7'. The second system also consists of two staves. The third system consists of two staves. Vertical dashed lines connect notes across staves, indicating vertical relationships. Solid boxes highlight specific 3-note cells in the upper staves of each system.

Let's take a look at how things work vertically in the same section. In ex. 4 we can see that the viola dovetails a rotation of the 3-note cell, and then continues upward, mirroring the previous 3 bass statements of [0,1,4], also expanding the texture upwards.


Example 4

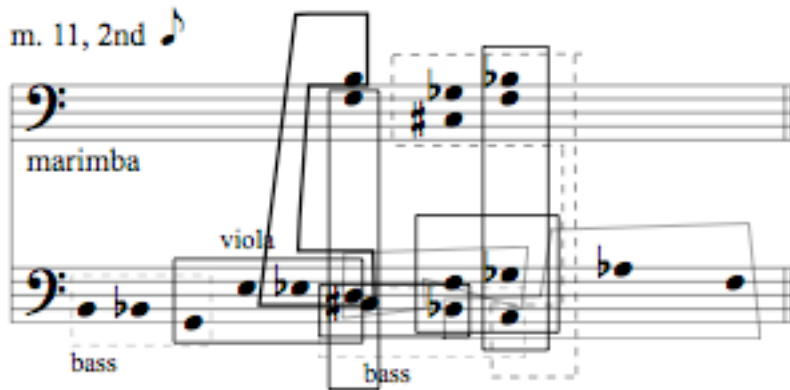
The image shows a musical score for two instruments: viola and marimba. The score is in 4/8 time and starts at measure 7. The viola part is on the top staff, and the marimba part is on the bottom staff. The marimba part is highlighted with dashed boxes, showing its entry and how it interacts with the viola part. The marimba part consists of 2-note chords that serve as a vertical link between the viola and the bass.



The marimba enters playing 2-note chords that serve as a vertical link between the viola and the bass. In the above example, the marimba's F# completes a rotation of the last viola [0,1,4] by adding a minor 3rd below, while the E♭ pulls back a half-step away from the next bass [0,1,4] completing its own rotation. This process starts to add a fourth note to the 3-note cell that gradually becomes more perceptible as the marimba grows into a linear entity. As this process unfolds it becomes extremely complex to separate the different permutations of the cell, as is illustrated in ex. 5. It is clear, however, that pitches are linked in groups of four and that the vertical dimension starts to become increasingly important.

Example 5

m. 11, 2nd 



marimba

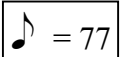
viola

bass

bass

It is also clear that from m. 16 on, the role of the marimba changes. It gradually abandons its vertical cell completion function and takes on linear properties that become fully apparent at m. 20. The marimba starts to sound on its own vertically, whereas before it was always aligned with the plucked strings. When it does, it adds intervals of 3rds (or 6ths) to either side of the cells stated by the plucked strings. By m. 20 the marimba has broken out of both its previous accompanimental function and the closed-position statements of [0,1,4]. Also, the plucked strings are now playing homophonic vertical accompaniment to the marimba linear bursts, completely transformed from their role in the opening section. The marimba takes on a specific gestural character that it will maintain for the rest of the piece, namely the short fragments of quasi-scalar aggregates with the grace note that 's a major 7th (inversionally equivalent to minor 2nd) away from the note it precedes. In this section (mm. 20-27) the central pitch axis is the collection [F, F#, A, B \flat] or [0,1,4,5] which includes the original set, and also is the upper tetrachord of a harmonic minor scale, which will be used several times later in the piece. The composer takes this pitch collection and its subsets and builds other scale fragments around them, some chromatic, some diatonic, and several harmonic minor. The most important

function of this section though is the fact that it's taken properties that lead directly into the first "refrain" section of the piece.

At this point, the "refrain" sections will be analyzed and compared to each other. There are five "refrain" sections, and they all share a common tempo, that of . The most striking feature they share is their timbral identity that is radically different from the other sections the first three times the "refrain" appears, and, even though less so toward the climax of the piece, remains consistent. This involves the homophonic grouping of four instruments against one or two others that have been playing before the "refrain" enters and maintain their respective identity and function through the "refrain", thus creating a link between it and what came before. The group of four instruments is fairly consistent; it includes: Piccolo, Clarinet, and arco Viola and Bass. At the point of entrance of the first "refrain" it's the first appearance of both the wind instruments and the bowed strings in the piece. Another common feature among all appearances of the "refrain" is that the Piccolo enters with an Eb. All "refrain" sections are mainly comprised of vertical accumulations of pitches spaced a major 7th (inverted half-step) apart over a 4-octave range.

The first appearance at m. 28 introduces the sustained timbres organized vertically. The marimba is in fact the only linear element, and its role is dual: to complete vertical sonorities (as before) and to propel forward motion. It accomplishes this by taking over the chromatic sets from the Piccolo and descending away in acciaccatura figurations. The vertical organization of the "refrain" is organized carefully. The arrangement of the chords is fixed and will carry over to the next "refrains" with certain permutations. Ex. 6 shows the vertical arrangement, excluding the acciaccatura figurations and the trills.

Example 6 (*grace-note groups & trills omitted*).

1st "refrain"
mm. 28-36

There are 22 chords that can be classified into 5 types:

- 1) A descending chromatic set of 5 pitches distributed to: Bass, B. Clarinet, Viola, Marimba, Piccolo (from low to high). There are 9 chords of this type, as can be seen in ex. 7; chords numbered: 1, 2, 3, 5, 9, 10, 19, 20, 22.
- 2) These chords use the same instrument order of distribution as type 1, but the chromatic aggregate is broken into two subsets after the B. Clarinet, so that one subset is Bass-B. Clarinet, and the other is Viola-Marimba-Piccolo. The interval between the two subsets (B. Clarinet-Viola) is either a minor 7th, as in chords numbered: 4 & 6, a major 6th in chords numbered: 8 & 21 or a minor 6th in chord numbered: 13.

- 3) A descending chromatic set of 4 pitches distributed: Bass, B.Clarinet-Viola (in octaves), Marimba, Piccolo. Such are chords numbered: 11, 12, 17, 18. In fact, chord # 12 is picking up the chromatic chain of pitches from chord # 11, and links it to chord # 17 and then to chord # 18, which is identical with # 11, since the chromatic scale was exhausted with #17.
- 4) A descending chromatic set of 3 pitches distributed: Bass-Viola (2 octaves apart), B.Clarinet-Piccolo (2 octaves apart), Marimba. Such are chords numbered: 14, 15, 16.
- 5) A variation of type 4 that occurs once at chord # 7, and it only includes two chromatic pitches (B \flat , A) distributed as in type 4 chords with B \flat , played by strings (2 octaves apart) and A played by winds (also 2 octaves apart). There is no marimba in this chord, and this type of chord, with its different grouping of instruments will be explored in later appearances of the “refrain”.

There seems to be a quirky palindrome construction in the big picture of this section. Ex. 7 shows the same chord-sequence with different types of brackets identifying the different types of chords. A careful look will reveal that chords # 8-21 are arranged symmetrically around the group 13-16. Also, chords # 1-9, excluding # 7, have a palindrome shape around the group 5-6. The composer accentuates this with the *gruppetti* before chord # 5, which are the notes of the first two chords (first three for the Piccolo), showing a point of reversal. Furthermore, chords # 1 and 22 (first and last) are identical, as are # 2 and 20, and, as mentioned before, # 11 and 18.

Example 7

1st "refrain"
mm. 28-36

Pic.
Mba

Vla
B. Cl.
Cb.

19 20 21 22

One could of course find more such symmetries by breaking down each chord into two or three note groups, and tracing a trajectory of fixed pitches in the section. It wouldn't serve any purpose in the big picture, however, since this first "refrain" transforms itself into the subsequent ones without too much dissecting on the composer's part.

The second appearance of the "refrain" happens at mm. 69-75. It consists of 14 chords extracted out of 'refrain' 1, intercepted by 14 new chords, so that a chord from the previous refrain is always followed by one of the new chords. The chords taken from the previous 'refrain' have been partitioned, so that only the notes played by the winds are used. They are extracted from chords numbered 1, 2, 3, 4, 5, 6, 8, 9, 10, 13, 19, 20, 21, 22 of the 1st "refrain".

All belong to chords of type 1 or 2. The new chords that interpolate the extracted ones are shown in ex.8 in the order that they appear.

Example 8 (*brackets do not carry over any associations from previous examples*)

2nd "refrain": 'interpolation' chords

It's immediately apparent that they are structured like chords of type 1 from the previous "refrain", minus the extra pitch previously played by the marimba. They all share pitches B & C, which create an ostinato-like texture that penetrates the whole section. The remaining pitches of these chords classify them into four kinds, identified in the example by the different brackets.

The difference among the four kinds is the distance between the fixed group of Piccolo-Viola and the fixed group of Bass-B.Clarinet that fluctuates from a major 7th to a minor 6th. We saw a similar fluctuation in chords of type 2 of the first "refrain".

Another connection between the first and second "refrains" is the descent away from the chords that the marimba was fulfilling the first time around. This is now taken over by the strings that descend away from the 'interpolation' chords (since they don't share pitches with the carried over chords). The mandolin that has continued from the section before the second "refrain" dovetails the descent of the strings.

The third "refrain" section, which occurs at mm: 109-117 takes the process a step further.

The first measure (m. 109) of the section is sufficient to illustrate the new stage of manipulation of the “refrain” materials:

Example 9

3rd "refrain"

Pic.
Vla.

B Cl.
Bs.

The first thing one notices in ex. 9 is that the grouping of instruments has evolved. In regards to horizontal activity, we now have low instruments (Bass-B.Clarinet) against high instruments (Piccolo-Viola). Vertically, there are two things going on. The grouping according to instrumental family from the previous “refrain” is maintained by spacing the two instruments of each family a half-step (actually, an octave plus a major 7th) apart. This half-step vertical relation is consistent even through the different rhythmic disposition of the two instruments in each group. From another point of view, the horizontally grouped instruments are always beginning the figurations a minor 3rd apart and end it inverted (major 6th) in voice-exchange. The shapes of the figurations within each groups move in either parallel motion, (as in the low group in ex.) or in a quasi-mirrored motion around the starting pitches of the figuration (as in the high group of ex. 9). The pitches of the Piccolo figuration are generated by spinning out horizontally the

pitches of the first three chords of the winds, plus the pitches of the first string chord of the third “refrain” (m. 69, 2nd ♯). This was even hinted at, at the very first “refrain” with the grace –notes before chord number 5 (m. 29, 3rd ♯) which, as mentioned before, are the pitches from the previous chords. The guitar descending figures are comprised by the same collection of pitches just played by the winds and strings, spinning out yet another linear version of the same sonority. As this “refrain” comes to a close at m. 117, unlike all previous ones, things will not change radically to begin a new section. Instead, the pair of the wind instruments will break out of the “refrain” and continue in the same manner into the new section, which gradually gains properties of the “refrain”. The fact that the intermediate section now takes such properties causes the next “refrain” section to make a strong statement of its identity.

“Refrain” no. 4 enters at m. 154, this time very boldly, for the first time in *f* with a homophonic statement that can’t be mistaken for anything else. This time it also opens up the high register, coming in two octaves above all previous entrances, with all the instruments at a high tessitura. The pitch material is identical to the third “refrain” but without the figurations. So, the first chord of m.154 is identical to the first bracketed chord of ex. 9 (m. 109), the second chord of m. 154 is identical to the second bracketed chord of ex. 9, and so on. The harp fulfils the exact same function that the guitar performed in the previous “refrain”, only now it rolls the sonorities in an ascending direction; very appropriately so, since everything else lies in the high register.

The last “refrain” doesn’t start until m. 202, even though the tempo change happens before that, at m. 196. This last version of it does not include the Piccolo, which saturated the high register in the section preceding it (mm.175-189). In fact, several things have been transformed. Timbrally, the Piccolo has been replaced by the mandolin, though the other three

instruments are still included, and in the right vertical disposition, Bass, B.Clarinet, Viola (from low to high). The harp plays its familiar role once again, spinning out harmonies, yet those harmonies are very different this time. All half-steps have disappeared, leaving behind only 3^{rds} and 6^{ths} that vertically form 2nd inversion triads. Among those, the E major triad appears 13 times. And there are 16 more triads, both major and minor built on pitches shown in ex. 10.

Example 10



These pitches arrange themselves symmetrically around G# and also form two [0,1, 3, 4] sets that are also symmetrical around G#, as well as a 5-pitch chromatic aggregate that observes the same symmetry. These nine pitches are the last line of resistance to the E major triad that will prevail as the only harmony of the Coda section. It's interesting how the guitar doubles all the triads in this last "refrain", finally playing things that are voiced and disposed very naturally for the instrument, only to end up playing in the Coda the most resonant thing it can possibly muster: a E major chord across all six strings, as if the whole piece was designed so that the guitar can play this final chord.

Now let's turn our attention to a stage in the process of transformation, where a section starts taking on "refrain" characteristics. Sections 6-7-8 are stages in connected in such a way. It's obvious right away that there's a group of four instruments playing, beginning at m. 90. They may be playing linear scale aggregates, but they are locked together rhythmically.

Moreover, the pitches they play at the beginnings and endings of their linear motion, the pitches that actually sound together are half-steps apart, as if it were the “refrain” chords in a closed position. In fact the departure chord for the ascending runs is pretty consistently a chromatic tetrachord. Also, the highest note of the final sonority of each run is pretty consistently a high E \flat in the marimba, the same pitch that the refrain always starts with. Lastly, the marimba is in character, as it was in the first “refrain” even though it’s incorporated in the texture seamlessly. Section 7 is introduced with the viola that comes in arco for the first time outside a “refrain” section. Not only is it arco, but it also plays only four pitches (G, G \sharp , A, \sharp , B) which happen to be the spinned-out notes of a type 2 chord from the “refrain”. When the Bass comes in (also arco) it duplicates the same pitches as the viola, and the two instruments lock phase in section 8, and carry out in that manner into the next “refrain”. The mandolin that enters at section 8 repeats two identical phrases, each time using different grace-notes in a pattern very much like the Piccolo pitches of “refrain” section.

So, we’ve seen that there’s a very gradual progress in the way elements are being transformed. What seemed a radical contrast in texture when the first “refrain” appeared, was transformed over the course of the piece into an almost imperceptible crossfade. The way the composer carefully conceals the processes, while at the same time keeping his materials very constant, reveals the level of his craft. The ability to generate such a complex surface structure out of very simple building blocks and his ability to contain such a complex surface structure so that it always remains very coherent is striking. Such is also his ability to relate to the canon and continuity of Western practice, borrow models from it and then totally appropriate them, and even twist them so that they seem like they came from a different practice, as was the case with creating a harmonic minor and a blues scale out of a cell used by Webern and Schoenberg. In

fact, it wouldn't be surprising if the title of this piece was actually a reference to the song structure of *Pierrot Lunaire*.