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#### Abstract

This thesis presents an analysis of The Soft Moon, a composition for chamber orchestra. The work, which lasts approximately 15-20 minutes, reflects upon the images and spirit of Italo Calvino's fictional works, and in particular the story by the same name which initially inspired it. The analysis which accompanies this composition examines the parameters of pitch. harmony, timbre, rhythm, dynamics and formal structure, as well as psychological factors, that animate the work. While The Soft Moon is not a representational piece in the literal sense, most of its materials and its "temperament" can be understood as correlating with the original story.


## RÉSUMÉ

Cette thèse presénte une analyse de The Soft Moon, une composition pour orchestre de chambre d'une durée de 15 à 20 minutes. L'oeuvre s'inspire des images et de l'esprit des écrits fictifs d'Italo Calvino, et tout particulièrement du roman dont il porte le nom. L'analyse qui accompagne cette composition porte sur les paramètres de hauteur de son, d'harmonie, de timbre, de rythme, de nuances et de structure formelle; elle traite en outre des facteurs psychologiques qui animent l'oeuvre. Bien que The Soft Moon ne soit pas une pièce représentative au sens littéral du terme, on peut dire qu'elle est en corrélation étroite avec le roman original pour ce qui est du matériel et du "tempérament."
"...Captured by terrestrial gravity, the Moon moved closer and closer. contracting its orbit around us. At a certain moment the reciprocal attraction began to alter the surface of the two celestial bodies, raising very high waves from which fragments were detached and sert spinning in space, between Earth and Moon
especialy fragments of hrar matter which finally fell upon Earch.
Later, through the influence of our tides, the Moon was impelled to move away again. untilit reached its present orbit..." But a part of the lurar mass, pertaps half of it,
had remained on Earth,
forming the continents.
(from the preface to tzero, chapter: "The Soft Moon", Italo Calvino, 1923-1985)

## Introduction Part I

## Commutuality

The initial motivation for The Soft Moon ${ }^{1}$ was the eponymous chapter in Italo Calvino's book zeror $^{2}$, and especially the suggestive images of its preface, quoted above: "....the Moon moved closer and closer....the reciprocal attraction began to alter the surface of the two celestial bodies....the Moon was impelled to move away again....but a part of the lunar mass, perhaps half of it haic : sained on Earth." These images of convergence and divergence, attraction and

[^0]repulsion, and exchanged and commingled properties, suggested to me the concept of dynamic equilibrium as an organizing musical principle, which I subsequently compressed into the concept of commurualiz.
"Commutuality" expresses the spirit of The Soft Moon, and
informs the work's unfolding of harmonies, rhythms, phrases, structure, dynamics and timbre. For example, most of its harmonies are constructed of intervals that converge and diverge; note densities accumulate and subside; phrases contract and expand, as do rhythms and ranges; timbral articulations migrate between orchestral complementarity- i.e, juxtaposition or separation of instrumental families- and orchestral unification.

At the same time, these patternings often contain phenomena that are the "opposite" of the prevailing expression. This hearkens back to the other aspect of commutuality, in which there is an exchange or commingling of qualities (such as the earth and moon containing portions of each other). In The Soft Moon, one example of this commingling is the glissandi of the cello juxtaposed by its "opposite", staccato and pizzicato articulations, in the other string instruments. Another example is the celio's general ascents and descents- which constitute the predominant organizing gesture of the first section- being themselves periodically "repelled" in the opposite direction by other instruments' articulations. A third manifestation is the cello's undergoing an overall expansion of range, while the other strings contract their harmonies.

In sum, The Soft Moon manifests commutuality in the commingling or migrazion of opposing articulations, opposing evolutions of harmony, range and rhythm, and in the exchange of roles.

## Introduction Part II

## Additional reflections on commutuality

Commutuality, as mentioned above, suggests dynamic equilibrium as one of its aspects ${ }^{3}$ For example, in The Soft Moon, measurts 154-160 contain both a prevailing static harmony as well as internal movement and fluctuation. L. T. Olken describes Calvino's interest in balance and dynamic equilibrium in With Pleated Eye and Gamer Wing: 4

> Calvino may not be dominated or inspired exclusively by the single passion or desire for cosmic harmony....ne does encounter in Calvino's narratives, however, an increasing, almost haunting insistence on symmetrical arrangement- in structure, action, and expression of thought- which reflects a particularized need for the organic ordering of forms in a world where such may be the only possible remaining aspiration toward harmony.

The inter-connectedness of the earth and the moon, in the preface of The Soft Moon, suggests this kind of commutuality.

Another representation of commutuality in the book tzero, is its narrator "Ofwfq"5, who is:
... a protean being as old as the universe and as new as the latest racing
car...that sees with contemporary eyes and knows with ancient
experience. 6

[^1]Qfwfq's consciousness is both dimensionless, that is, outside of time, and multi-dimensional, ie., everywhere, within time. He moves between the past, present and future with equal facility, a capacity reflected in the palindromic construction of his name ${ }^{7}$.

There is also a "Cageian"s element to commutuality. Since a phenomenon can move towards or away from any other-as well as exchange or commingle qualities with any other- an observer can consequently view anything in multiple ways. ${ }^{9}$ As L T. Olken observed in the case of Calvino ${ }^{10}$ :

Calvino's "science of control" is a geometry, variously applied through ever-changing forrulue in which each component, each figure, often each act, is an open-ended symbol...Whatever form the symbol takes, its final purpose is to illustrate its place : it the infinite combinations of ways in which man arranges and disposes of his life- the infinite possibilities.

In the composition, The Soft Moon, this aspect of commutuality is reflected in the multiplicity of meanings that different gestures, articulations and textures may contain. ${ }^{11}$

[^2]
## Introduction Part III

## Science and narrative fantasy

"The Soft Moon" recounts cataclysmic events that took place on earth in the geological distant past. The story's attraction for me is its unusual perspective, which Beno Weiss summarizes in his book, Understanding Calvino (1993) ${ }^{12}$ :

What is different in "The Soft Moon" is that at first we erroneously assume that the cataclysmic events described occurred when there was not yet life upon the earth. But we soon learn that they actually took place in a highly developed civilization that first was destroyed by the lunar bombardment and then rebuilt and replaced by an exact replica of itself: our modern society. Since then, having inherited the ills of our precursor, civilization has not advanced, and no changes for the better have occurred.

In "The Soft Moon", as well as numerous other stories of his, Calvino filtered scientific theories and patterns through the lense of narrative fantasy ${ }^{13}$, Beno Weiss situated this propensity of Calvino in the context of his career ${ }^{14}$

Under the influence of the Argentine author of exotic prose fiction Jorge Luis Borges, the Swiss founder of modern linguistics Ferdinand de Saussure, the modern critics Roland Barth and Vadimir Propp, semiotics, structuralism- the entire spectrum of recent theories of narrative and even comic strips-- Calvino once again changed course
when he wrote Le Cosmicomiche, 1965 (Cosmicomics) and Ticon zero, 1967 (t zero). He abruply pulled away from his familiar themes, making use of modern science as a means of creating illusory circumstances in order to communicate a new vision of reality. In essence, so to speal, his new stories are cosmogonic fairy tales constructed around scientific propositions that permit him to narrate tales of science fiction reaching all the way back to our primordial universe.

Much of my fascination with Italo Calvino's works has stemmed from this commutuality of science and fantasy. As I have done in other works of mine ${ }^{15}$, I have attempted to exploit this approach in The Soft Moon : Many of its materials and procedures derive from predetermined patterns, and generative images. On the other hand, given the multiple implications of commutuality, discussed above, additional associations are generated as well. In this spirit, The Soft Moon is ultimately not a representational piece, despite its specific visual impetus. Rather it is a visually inspired work, whose references, like those in Calvino's works, flow in many directions.

[^3]
## Introduction Part IV

## "Quickness"

Calvino's works are noted for their brevity of expression, as well as their sensitive use of repetition and digression. His most famous book, Invisible Cities (Le Città Invisibili, in Italian), amply demonstrates these practices: In brief chapters, mostly of one page, Marco Polo recounts for Kublai Khan imaginary cities in the Khan's empire that he has visited, each of which has its own particular set of physical and psychological qualities. Through subtle reperition of themes and rhythms, Polo (ie., Calvino) reveals that each city is also kindred with the others- which in fact they all are, since each reflects something of Polo's home city of Venice.

This exploitation of brevity- brevity of structure and representation-Calvino labeled "quickness" in Six Memos for the Next Millennium ${ }^{16}$.
.... I dream of immense cosmologies, sagas, and epics all reduced to the dimensions of an epigram. In the even more congested times that await us, literature must aim at the maximum concentration of poenry and of thought.

Calvino expounded elsewhere ${ }^{17}$ :
....[A] story is an operation carried out on the length of time involved, an enchantment that acts on the passing of time, either contracting or

[^4]dilating it. Sicilian storytellers use the formula "lu cuntu nun mettitempu" (time takes no time in a story) when they want to leave out linksor indicate gaps of months or even years. The technique of oralnarration in the popular tradition follows functional criteria...I wasattracted to folkrales....because of my interest in style and structure, inthe economy, rhythm and hard logic with which they are told.
"Quickness", however, is also commingled with its opposite,
"lingering": 18
Implicit in my tribute to lightness was my respect for weight, and sothis apologia for quickness does not presume to deny the pleasures oflingering. Literature has worked out various techniques for slowingdown the course of time. I have already mentioned repeticion, and nowI will say a word about digression....
Along the model of Invisible Cities and the folktales of which
Calvino spoke, The Soft Moon is logical in its musical constructions,
but not to the extent that every phrase or section is exhaustively
linked with another. Rather it is the work's "quickness", its
"attractions" of short or relatively short fragments, which in tandem
form over-arching continuities, and which convey a consistency of
materials throughout the work. At the same time, the "lingering" of
which Calvino spoke, is commingled with this "quickness"-
specifically in repetitions of harmonies or related harmonies,
rhythmic similitudes, sustained homophonic textures, and insertions
of temporal repose, rubato and silences.
18 Ibid. p. 46

In conclusion, then, The Soft Moon communicates through
"quickness" and "lingering"- which are themselves "commutual"the commutuality of musical parameters, and of science and fantasy.

## ANALYSIS

## Harmony

The methods used to generate the harmonies of The Soft Moon are variations on the generative principle of commutuality: In various parterns, intervals are expanded and contracted, inwardly, outwardly, or around a pitch axis.

## Qverview of Chords 1-3a

"Imperfect" symmetrical (mirror) chords 19 were formed by adding on both ends (high and low) ever-increasing intervals around a central, "axis", interval ${ }^{20}$. In general, these "imperfect" symmetrical chords were created by adding, on either end, two different versions of the same 'name' interval-for example, a minor 2nd on one end, and a major 2nd on the other. If, at some point, an already-present pitch class were obtained, I would then determine whether to alter the interval so as to obtain a new $\mathrm{pc}^{21}$, or retain the repeated pc for its resonance value. In addition, I would occasionally deviate from a strictly incremental expansion of intervals, and use other intervals (for an example, see chord3a, below), while still adhering to the general principle of expansion and imperfect symmetry. Finally, out of the various interval patterns, I identified dyads, trichords and tetrachords for potential future use.

Chord 1: The central interval is a minor 3rd (G-Bflat), around which are placed a major 2 nd (ic2) ${ }^{22}$ above and minor 2 nd (ic1) below; then, a minor 3rd (ic3) above, a major 3rd (ic4) below. Larger intervals at each end of the chord continue the pattern, until a somewhat palindromic structure is created: (from the low to high) 9-8-5-4-1-3-2-3-5-9.23 The general physiognomy of this chordlarger intervals at the outer extremes, smaller ones toward the middle- forms the template for succeeding variations (below):

Chord 2: Chord 1's intervals " +1 " are added to the bottom notes of chordl's dyads. For example, G-Bflat (ic3 ) becomes G-B natural (ic4); B flat-C (ic2) becomes B flat-D flat (ic3), etc. This procedure operates in both directions. As a consequence of the newly added intervals, a very dense chord is produced.

Chord 2a: Chord2's interval structure is retained, but the sonority is altered by the following: Utilizing $\mathrm{d}^{2}{ }^{24}$ as the starting point, ic5 produces the $g$ above; $g$ is then retained, and ic 2 produces a-natural; a is retained, and ic4 produces c\#, and so on. In the direction of the lower register the procedure is the same.

[^5]
## Chord 3: Chord l's intervals " +1 " are augmented by " +1 "

again, and, as in the case of chord 2, are added to the bottom notes of chordl's dyads.

Chord3a: Chord 3's interval structure is retained, with the exception of the middle-most interval-instead of ic5, now ic7. The sonority is altered, as in the case of chord 2a, by building first upon d 4 , and subsequently upon each newly generated note. For example: d-a-flat (ic6), a-flat-c-flat (ic3), and so on.

The five chords exhibit the following dyadic interval content

| chord 1: | 9 | 8 | 5 | 4 | 1 | 3 | 2 | 3 | 5 | 9 | 6 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| chord 2: | 10 | 9 | 6 | 5 | 2 | 4 | 3 | 4 | 6 | 10 | 10 |
| chord 2a: | 10 | 9 | 6 | 5 | 2 | 4 | 3 | 4 | 6 | 10 | 11 |
| chord 3: | 11 | 10 | 10 | 6 | 3 | 5 | 4 | 5 | 7 | 11 |  |
| chord3x: | 11 | 10 | 7 | 6 | 3 | 7 | 4 | 5 | 7 | 11 |  |



## Chords I-VI

Chords 1 ( 5 chords in total) are permutations of the middle hexachord of chord1, spanning from d4 to e-flat5 (ic. 41323). ${ }^{25}$ This particular hexachord is classified as "chromatic"; on each side of the inner minor 3rd, (G-B-flat), the chord is symmetrical. Removing the accidentals produces a "diatonic" version, with G\#-A again defining the axis. To obtain a third compressed version built around the same axis, the upper boundary of the "diatonic" chord is reduced by a major 3rd, and the lower boundary, by a minor 3rd. The compressed chord is fully symunetrical. The "chromatic" and "diatonic" versions of the hexachord are also re-written via octave displacement; the resultant sonorities are not symmetrical in any fashion, and are selected solely on the basis of their resonance. These five chords are subsumed within the category chord (N.B. Roman numeral, as opposed to Arabic). ${ }^{26}$

Chords If ( 4 chords) These four chords are permutations of the imperfect symmetrical chord spanning from middle $c$ to $b$ natural (first ledger line). The axis is now b4, a minor third up from the g\#4 that bounded chord l's axis. The interval classes comprising this chord are also larger than those of chord I (ic. 53645), and the structure is clearly triadic. ${ }^{27}$ The first compressed version is generated by flipping the two embedded triads (f minor and $b$ minor) through octave displacement. Whereas $b$ minor was placed

[^6]on top of $f$ minor, now the latter is placed upon the former. The second, slightly more compressed, version is created by revoicing the f minor chord tones, then doubling the root ( f ), and placing b minor, in closed voicing ${ }^{28}$, within the f triad. As a result, the new ic content becomes 612312; omission of ic6 reveals the chord's genesis as an imperfect symmetrical chord. Finally, the most expanded version of chord II (3 octaves +2 ) is created by displacing the chord tones of b minor and f minor over an even larger range than before.

Chords III: ( 5 chords) The sonorities in chord III are based upon an imperfect symmetrical chord which is itself constructed according to the "ic funnel" procedure (as last seen in chords 1-3a). The axis has been moved up, once more, by a minor 3rd, to dnatural. The ic profile is 641235 . Chord III gives rise to four other revoiced versions, created through displacements of various kinds; intervallic convergence and divergence plays no obvious role in the structure of these additional chords.

Chords IV: ( 3 chords) The generative chord of this group reverses the ic funnel procedure, by having ever decreasing intervals placed at the extremes, and larger intervals toward the center. Two adjustments, however, are made: 1) e-flat is doubled at the octave below, for resonance; and 2) what would be $\mathrm{c5}$, according to strict procedure (icl above b4), is displaced by an octave upward to c6. Two other compressed versions are created via octave displacemerts, with imperfect symmetries retained: 342144 and 312122.

[^7]Chords V: (3 chords) The generative hexachord of chord 1 has additional notes placed upon it, in both perfect and imperfect symmetry, above and below. The ic funnel is in increasing augmentation

Chords V: ( 5 chords) The first chord of this series is constructed of progressively increasing interval classes as the range moves upward. Its ic content, consequently, is 1235678 . The next chord is formed by moving the first chord's notes up or down by a minor or major second. The upper-most note and the lowest note, however, are always moved, respectively, down and up, so that range is progressively contracted. Each successive chord is formed by the same basic procedure, that is shrinking its preceding chord by small increments. Over the course of the five chords, range is contracted from 3 octaves +10 semitones to 1 octave +2 . The last chord's axis, b4, indicates the final convergence- that is, upon the single note b -natural. The echoing and reechoing of this pc , here and elsewhere, is partly owed to the aforementioned convergence.

Each of these chord types, 1-3a and 1-VI may be considered variations on the image of convergence and divergence.



## SECTION 1

## Overview

The spare pointillistic textures of the first ten measures give way to increasing augmentation of instrumental forces, wider ranges of dynamics and pitches, as well as a more complex interleaving of textures between instrumental groups. Omnipresent glissandi in the cello, as well intermittent ones in the other strings represent for the composer the attractions and repulsions of "The Soft Moon." At the highest formal level, the section is composed of two subsections of nearly equal duration, each of which contains several large-scale "waves." A brief "tag" follows the subsections, which functions as a precursor and transition, to the next section. The apex of subsection 1's first wave (c5) is the highest arrival point in the entire section. The next wave arrives at b4, a semitone lower. The apex of subsection_2's wave is c4, lower still, which subsequently undergoes a relatively long descent to the end of the subsection. From this overview one may extrapolate an image of high energy that eventually- albeit unevenly-dissipates, similar to matter that nearly escapes gravity, but eventually falls back into orbit, and arrives at a point or region of relative stasis. Formally speaking, the onsets and endings of waves, and their intervening crests and troughs, form the significant structural points in this section (See below).


Subsection 1 mm. 11-25 ( $\left.1^{\prime} 12^{\prime \prime}\right)^{29}$ : At m. 11 the cello starts on $\mathrm{f} \# 2$ and makes a general ascent to $\mathrm{C}, \mathrm{m} .17$, traversing nearly half of the subsection's duration, 36". A rapid descent to b2 initiates the subsection's second general ascent, which arrives on $\mathrm{c} 5, \mathrm{~m} .22$ The length of the second ascent, mm. 18-21, takes half the duration of the first ascent, 18". A gradual descent to eflat2, lasting another 18 ", covers the remainder of this subsection.

Subsection 2 mm 26-42 ( $1^{\prime} 17^{\prime \prime}$ ): This subsection's general ascent, in the cello again, starts on the same e-flat2, m. 25, and arrives at c4 at 30", m. 32. It remains there as the other strings and winds/brass state the harmony in limited aleatoric fashion for seven seconds. Thus, the total duration of the general ascent to $\mathbf{c 4}$, mm. $26-33$, is $37^{\prime \prime}\left(30^{\prime \prime}+7^{\prime \prime}=37^{\prime \prime}\right)$, which nearly matches the duration of subsection 1 's first general ascent ( $36^{\prime \prime}$ ). At the instigation of the brass and winds, the remainder of the subsection ensues, mm. 34 42: C 4 in the cello continues, but is now "modulated" through vibrato and the doubling of $\mathrm{Vn2}$. After about 18", a rapid descent to b2 is reached (m. 39), followed by a final descent to d2 (m. 41).

Tag mm. 43-47 (21"): The sustained articulation of the cello, and its slight vibrato, are a faint recollection of the earlier waves. The fluid expression of those glissandi, however, now gives way to the repeated flurries in the violins, viola and harp. These last few measures conclude the opening section, but, particularly in their

[^8]repeated presentation of g 4 and b -flat4, also augur the forthcoming section, Dance of Air.

From the beginning to the end of the entire section, there are smaller intervening waves (glissandi), whose onsets and endings mark lower-level structural points, or phrase boundaries. These undulations are also instigated-or, conversely put, interrupted- by distinctive changes in other instruments' articulations, harmony, dynamics, and/or timbre

For example, the first instigation, chord $\mathbf{V}_{1}$, is stated by pizzicato (strings); the next one, chord $\mathbf{V}_{2}$, pizzicato; the third, a "surprise" arco g major triad, followed by a solo pizzicato on the same pc as the cello, which is then followed by echoing instrumental color (harp, temple block, timpani); the fourth, a solo pizzicato. The fifth instigation involves several changes in articulation: 1) a return to group pizzicato, and 2) both chords $\mathrm{V}_{3}$ and $\mathrm{V}_{4}$ being used, though "out of order" (meaning the more compressed chord $\mathrm{V}_{4}$ comes before the less compressed chord $\mathrm{V}_{3}$ ). 30

In reviewing the following complete list of subsection _ 's chords, one observes the addition of brass and winds (as instigators) at measure 18; they constitute part of the augmentation of forces mentioned above. Also of note is the general harmonic pattern in the strings, mm. 11-19, which moves from the widest-range $\mathrm{V}_{1}$ to the more compressed $\mathrm{V}_{5}$, eventually converging on the b-natural. (Other harmonic patterns in this section, besides the VI types, which similarly express expansion and compression, will be discussed
following this list.) Finally, it is important to note that continuous change of articulation, in and of itself, plays an important role in this section:

## Subsection 1

## General ascent \#1 (mm. 11-17)

m. 11/b. 1: Pizzicato, mezzo forte- $\mathbf{V I}_{1}$ (chord), instigating onset of the cello "wave."
m. 12/b. 4: Pizzicato, mf ${ }^{31}-\mathrm{VI}_{2}$, strings and tom-tom, interrupting the small cello descent, and then instigating a brief re-ascent (containing a dynamic "swell"). 32
$\mathrm{m} .13 / \mathrm{b} .3$ : Glissando, dynamic swell ; interrupting the fermata, and instigating the cello's brief undulation.
m. 13/b. 4 Pizzicato, mf, solo violin; coloring the cello's brief crest at the same pc (g\#5); also, instigating the reverberation in harp and percussion.
m. 14/b. 3: Pizzicato, $m f-p{ }^{33} \mathrm{~V}_{4}$ followed by $\mathrm{VI}_{3}$, with Tomtom and timbale; instigating the cello ascent to d 4 , the highest crest prior to the subsection's midpoint crest, c5. Also, the loud-soft dynamic anticipates the same dynamic pattern that obtains prominence in later sections.
$\mathrm{m} .15 / \mathrm{b} .1$ : Glissando, $p$ - anticipation of V chords; instigating the rapid cello descent from d4.

[^9]33 Mezro forte-piano
m. 15/b. 4: Jeté, $m f-V_{3}$, with flute, auguring the oncoming fermata
m. 16/b. 3: Ponticelle, tremolo, p-f-p $-\mathrm{V}_{5}$; instigating a brief downward slide in the cello and its accompanying dynamic swell.

## General ascent \#2 (mm. 18-21)

m. 18/b. 2: Ordinario dynamic swell ad lib. (strings); fp trombone; resonating the cello's pc, b-natural; the hom and bassoon bound the pc, by sounding a semitone, respectively, above and below. Together, all instigate the cello's "modulated" b-natural.

## m. 20/b.I: Glissando, $f$, strings; staccaro flurries in

 woodwinds and brass; instigating the cello's $f$ dynamic swell.General descent to end of subsection 1 (mm. 22-25)
m. 22/b. 1: Tremolo fp, strings; staccato single notes in the woodwinds and brass; marking the cello's crest, b4, and its shift to Ponticello, as well as instigating its descent to e3 (m. 23).
m. 24/b. 2: Ordinario, pp , strings; instigating the cello descent from e3 to e-flat2.
m. 25/b. 2: Ordinario, dynamic swell, strings, woodwinds and brass; ending their brief silence, instigating e-flat 2 undulations.

## Subsection 2

General ascent and sustain of crest, c4 (mm. 26-37)
m. 26/b. 1: Harmonic, $p$, violins; coloring the undulations in the cello and bass.
$\mathrm{m} .27 / \mathrm{b}$. 3: Pizzicato, $p, \mathrm{Vnl}$, and bowed vibraphone and harp harmonic, instigating the viola's "surprise" harmonic and cello's subsequent undulations (including its dynamic swell ).
m. 28/b. 3: Saltando, fp, violins, viola; instigating the ascent to d-flat3.
m. 29/b. 4: Pizzicato, $f$, violins, viola, and brass/woodwinds; instigating a ponticello "up-and-down" in the cello's overall descent to 22 (m. 30).
m. 30/b. 3: Glissando, mf , preceded by harp "grace notes"; instigating a glissando to g 2 and then to C , in the cello.
m. 31/b. 3-m. 33: Pizzicato, $p / f$, all strings (but cello), and staccato, oboe and trumper, instigating the undulating c4 in the cello.
m. 38/b. 3: Ponticello, fp, violins and viola; instigating descent to $b 2$.
m. 39/b. 1: Short attack on d3, violins; instigating a brief rise to d3.
m. 40/b. 1: Glissande, $p$, violins and viola- with double bass harmonic, and rapid figures in oboe, bassoon and trumper, instigating the final descent to d 2 .

Pitch organization and Harmonic movement in Section 1

The overall contour of the cello's glissandi roughly match the contours of the harp, vibraphone and celesta lines in the Dance of Air. The up-and-down fragments in the Dance (by 2nds and 3rds, usually), as well as the similar melodic shapes in the transition following the Dance, correlate, as well, with the lower level waves of section 1. Finally, the first three boundary points (of the cello's glissandi) are $\mathrm{f} \#, \mathrm{a}$ and $\mathrm{g} \#$, which are, respectively, chord tones of the first three instigating VI chords.

Section l's harmonies unfold as a sequence of "chord groups"- as described above- VI chords followed by IV, III, II and ${ }^{3} 4$. Every so often, a chord from another group appears within the main group. For purposes of clarity, the following list of harmonies includes only the more conspicuous or important chordal structures:
$\mathrm{VI}_{1} \mathrm{~m} .11$
$\mathrm{VI}_{2} \mathrm{~m} .12$
$\mathrm{V}_{3}$ fragment, m. 13
$\mathrm{VI}_{4}, \mathrm{VI}_{3}, \mathrm{~m} .14$
$\mathrm{IV}_{\mathbf{2}}$ fragments m. 15/b. 1
$\mathrm{V}_{3} \mathrm{~m} .15 / \mathrm{b} .4$
$\mathrm{VI}_{5} \mathrm{~m} .16$
" $\mathrm{V}_{6}$ ", b-natural, m. 18

[^10]IV3 m. 20
$\mathrm{IV}_{\mathbf{2}} \mathrm{m} .22$
IV3 m. 24
$\mathrm{V}_{1}$ m. 25
$\mathrm{H}_{3} \mathrm{~m} .28$
IV2 m. 29
$\mathrm{III}_{1} \mathrm{~m} .30$
III4 m. 31/b. 1
$\mathrm{III}_{5} \mathrm{~m} .31 / \mathrm{b} .3$
$\mathrm{III}_{3} \mathrm{~m} .32$
$\mathrm{HII}_{2}$ and $\mathrm{III}_{3}, \mathrm{~m} .33$
$\mathrm{III}_{2} \mathrm{~m} .34$
III and II (fragments), m. 35-36-harp and vibraphone
$\mathrm{H}_{3} \mathrm{~m}$. 37-40
chord 1 m .40 , flute
$\mathrm{H}_{4} \mathrm{~m} .42 / \mathrm{b} .1$
$\mathrm{H}_{1} \mathrm{~m} .42 / \mathrm{b} .2$
$\mathrm{I}_{1} \mathrm{~m} .44 / \mathrm{b} .3$ (woodwinds and brass)
$I_{2} \mathrm{~m} .44 / \mathrm{b} .4$ (woodwinds and brass)
$13 \mathrm{~m} .44 / \mathrm{b} .4$, etc. (strings)

These sequences of chords reveal two interleaved patterns: 1) a general evolution from the IV chord group to the I chord group; and 2) within each chord group, varying evolutions between chords of larger and smaller ranges. The first pattern is readily apparent upon viewing the list above. One example of the latter pattern is the following: In the IV group, there is a general expansion of range from $\mathrm{IV}_{\mathbf{3}}$ to $\mathrm{IV}_{1}$, but also, within that, a return back to the smaller
ranged IN3. Subsequently, there is an insertion of an "alien" Ichord, and a final return to the more expanded $\mathrm{IV}_{2}$ chord.With regard to commutuality, there are divergences andconvergences in the relationship between the cello and the otherstrings:
In terms of the former, the cello and the other strings undergodistinct evolutions of pitch and harmony. Second, they are often of"opposite" articulations, ie., glissandi in the cello, and pizzicati orshort articulations in the others. A third contradistinction is theirseparate evolution in range expansion and contraction-namely, thecello gradually covering more range, the others, less range.
On the other hand- now, speaking of convergence- the
pizzicati (and short articulations) and glissandi combine as an
"attack-resonance" gesture (the paradigm of which is discussed
toward this paper's end). Second, through their shared identity asstring articulations, they constitute a complementary timbre againstthe non-strings- an important feature of this work. And third, boththeir sustained and short gestures function as a precursor to theexpanded treatment of sustained and staccato textures that comelater.

## SECTION 2 (Dance of Air)

This section, as its title suggests, utilizes rhythm in a more clearly organized fashion than was evinced in the previous section. Each of the orchestra's four main instrumental groups sounds a distinct rhythmic pattern, in a repeating or slightly varied fashion The groups are: 1) strings; 2) harp, celesta and vibraphone; 3) woodwinds and brass; and 4) non-pitched and indefinite pitched percussion. Like the previous section, this one is also constructed of two large subsections, followed by a "tag."

## Harp. celesta and vibraphone

Of the four groups, this is the most rhythmically active, and the one around which the other three are constructed. In throughcomposed fashion, triplet 8 th notes, 16 th note subdivisions, and corresponding rests, suggest triple or compound time, but eschew metric regularity in their phrasing. Consequently, there is both a general sense of rhythmic regularity, in that the pulse remains consistent, as well as a sense of flux, resulting from the lack of clearly delineated phrases. Accompanying this metrical ambiguity is the ever-changing number of attacks per measure ${ }^{35}$, in particular, patterns of "crescendo" and "diminuendo" of attacks. These patterns of increasing and decreasing correlate with the piece's generative image of waves, as well as the attraction/repulsion image. The table below displays the patterns, with bold numbers signifying the

[^11]"peak" of attacks within each pattern. Wave \#1, mm. 48-53 peaks at
8 notes per measure in m. 50; wave \#2, mm. 53-56 peaks at 9
attacks in m .54 ; wave \#3, mm. $56-63$ peaks at 11 attacks, in
measure 60 . Two other patterns are contained in these measures:

1) an increasing number of peak attacks- 8 to 9 to 11; and, 2) aprogressively increasing number of measures separating the peaks.
measure ..... $\begin{array}{llllllllllllll}48 & 49 & 50 & 51 & 52 & 53 & 54 & 55 & 56 & 57 & 58 & 59 & 60 & 61\end{array}$ ..... 62numbernumber
of attacks
per
measure

The harp's notes derive, for the most part, from chord 1 , with additional notes chosen freely. The celesta and vibraphone- in intermittent fashion, in the first 17 measures, and regularly in the second subsection- sound pcs in synchrony with the harp, a major 2nd and a minor 7th down from the harp's notes. A consistency of chordal structures is thus obtained.

As mentioned earlier, the overall contour of the harp's melody, particularly its ascents and descents, freely matches the general pattern of the cello's glissandi in the first two sections. At the motivic level, the up-and-down motion also recalls the wave-like patterns of the cello, the first of which is between $g 4$ and $b$-flat 4 . Approximately every measure, a new chord tone of chord 1 is
added to the harp. In this way, the interval content progressively expands, as does the range of pitches covered. (See diagram below.)


The vibraphone's and celesta's notes are matched to those of the harp in progressively decreasing time intervals, creating a certain compression of time, which is further reinforced by the rhythmic patterns of the other instrumental groups (to be discussed below). Secondly, since the notes of the vibraphone and celesta relate to the harp by the strict interval relationship described above, their pitches ascend, as well. (See figures below.)

The various accumulations of pitches and notes in these three instruments, over the course of the first 16 measures, generates another variation of the attraction/repulsion image: an ebb-andflow of density. As the figure below shows, starting at measure 50 . the number of actual notes in each measure, including those notes occupying the same attack time as another, continuously increases and decreases, and by different amounts. It should be noted, as well, that no measure contains the same number of notes as any other ${ }^{36}$. Lastly, there is an overall accumulation of note content that starts to ebb after m. 60. (For visual purposes, boldface numbers appear every-other measure):

[^12]
## Strings

The strings' phrase structure, like that of the harp, celesta and vibraphone, is essentially binary: one large subsection of 16 measures, and a second, of 15 measures. The first 16 measures mm . 48-63, are comprised of two identical 8-measure phrases, both entirely in pizzicato. Each phrase is itself constructed of two smaller phrases that occupy almost the same amount of time ${ }^{37}$ Their repeating and limited pitch content (described below), as well as their nearly identical "cadences", create a sense of ostinato.

The second large subsection, mm. 64-78, is more throughcomposed than the first, although there are patterns to be discerned: The first four measures repeat a pattern of trichords in changing rhythm, and the remaining 11 measures state a somewhat more regular $6 / 8$ pattern, with emphasis on new, recurring, trichords. The noticeable increase in the strings' rhythmic activity parallels that of the harp, vibraphone and celesta parts.

The first subsection's (string) notes derive from chord 1's core hexachord, as well as variants on it (see figure below). Both variants retain chord 1's general construction of 2nds and 3rds, although in reordered fashion: The first variant is generated by removing the upper two notes of the core hexachord, $c 5$ and e-flat5, and placing that same deleted interval content-a minor 3rd and major 2ndbelow d4. The second variant is generated by removing the "new" top notes, b -flat 4 and g 4 , and adding the minor third to the bottom

[^13] of harmony.
of the trichord. The first two measures, bar 48 and 49, come literally from chord 1. The a3 in measure two is inserted for both its sonorous effect, as well as for it's occupying the central axis of the core hexachord, that is, lying between g 3 and b -flat3.

The second subsection's notes derive, similarly, from chord 1's hexachord and variants, again utilizing only 2 nds and 3rds. This time, however, the interval movement is upward: The first variant is created by placing the major 3rd and minor 2nd, at the bottom of the chord 1 's core hexachord, above e-flat 5, and by removing the d4 and g4, as well. The second variant takes the first variant's upper intervals of a 3rd and a 2nd, and inverts them upward, around the retained a-flat 5 ( g -sharp 5 ). The bottom notes are similarly inverted around b-flat 4.


## Woodwinds and Brass

The woodwinds and brass comprise the third timbral stratum of this section. Although their pitch content is important, and will be explained below, their primary function is that of providing an
auxiliary rhythmic pattern to this section. Within successive 15 beat phrases there is a single insinuated brass/woodwind gesture. Each successive gesture, moreover, occurs four beats earlier than the previous one. In this way there is a slight rhythmic compression, that re-inforces the rhythmic accumulation of the harp, vibraphone and celesta. The rhythmic gestures themselves are throughcomposed 6/8 fragments, and are homophonically, that is, chordally, conceived.

## Gesture \#l, m. 51: This gesture occupies three beats, and is

 the shortest of the four gestures (through the first subsection). The highest notes all reside in the flute, whose first two intervals- the minor 3rd-echo the opening motive of the harp, by inversion and rhythmic diminution. The flute's remaining notes are freely composed by diminishing intervals- a major 2 nd followed by a semitone. In m .50 , the flute, clarinet and trumpet articulate aleatoric air tones, which in addition to coloring the large chord in the harp, vibraphone and celesta, function as a precursor to the brass/woodwind figures of m .51 .Supporting the flute's melody are 5 chords that derive from the intervallic structure of chord 3, and one chord which is essentially a variant of chord 32 The chords' interval content, from top to bottom is as follows: (413), (223), (413)- same chord as the first(415) and (32213). The sixth chord derives from chord 3a but with three alterations: 1) the addition of $c$-natural and e-natural to the original chord, for purposes of intervallic symmetry and chordal resonance; 2) pitch displacement, and, 3) the inclusion of eflat3 for
its resonance value. The chord's interval content is $(3482,10)$. Note the imperfect symmetry of the first, third, fourth and fifth chords, but just as importantly, the increase in the number of notes ( 4 to 6 ), and the overall expansion of the chords' ranges: 87810 II \{2 Oct + 1\}.

Gesture \#2 m. 53/b. 4m. 54/b. 3: This gesture, like gesture \#1, occupies three beats and is preceded by aleatoric air-tones, but utilizes a series of $6 / 8$ rhythms that is different than its predecessor's. Its register is also an octave lower than that of gesture \#1, conveying a slightly darker timbre. Its harmonies derive from the third "downward" variant of chord 1, which was also used in the strings

Gesture \#3 m. 56/b. 3-m. 58/b. 1: Gesture \#3 occupies seven beats, the most so far, and starts with metrical (that is, non-aleatoric) airtones, which then lead to pitched material in measure 57. The pith classes are selected, this time, from the second "downward" variant of chord 1. This time, however, a much larger range is covered, from middle c to $\mathrm{g} \# 6$, and the overall texture is thicker with all the instruments playing.

Gesture \#4 m. 59/b. 2-m. 61/b. 1: This gesture occupies eight beats, the most of the four. It is timbrally the darkest, by covering the range $\mathrm{b} 2-\mathrm{f} 4$, and by omitting the oboe, trumpet and flute. This gesture is also the most static in that only one harmony is stated.

The harmony derives its pitches from some of the strings' and vibraphone's parts.

In the second subsection (mm. 64-81), the brass and woodwinds adopt a less conspicuous role, in contradistinction to the other instrumental groups' increasing rhythmic activity and note density. The bassoon and trombone play sustained major and minor thirds in their lowest registers, resonating the same pitch classes that the celesta and vibraphone play at, or around, that time.

The other woodwind and brass parts play intermittent air tones, as well as pianissimo tremolos, whose pitch classes also connect with those found in the harp, celesta and vibraphone. By measure 74 , the sustained dyads are picked up by the first violin and double bass, and then rejoined by the trombone at m . 81which leads to the tutti sustained chord at m. 82 .

## Percussion

The percussion contributes two additional, and overlapping, rhythmic layers to the Dance. The first is articulated by the deepest percussion instruments, the tom-toms and timbales (and occasional bass drum): They play recurring phrases based on triple and compound meters, the first one being, for example, 3/4 3/4 3/8 $6 / 8$. Each repeated phrase, however, omits or inserts a note or two, thus avoiding a literal ostinato effect. The sequence of phrases, four in total, are identical in the first subsection and the second. In common with all phrases (in both subsections) is the initiating of
each phrase with the low tom-tom, or bass drum (as in m. 57), followed by a higher tom-tom or timbale. (See figure below.)

The second rhythmic layer is provided by the snare brush. The beginning rhythmic durations are generated by converting chord 1's interval content-specifically 54132 (note the slight alteration, by omitting the " 3 " after the middle " 2 ")- into a number of 16 th notes: five 16 ths, four 16 the, and so on. 38 The remaining snare patterns are through-composed, and, then everything is repeated in the Dance's second subsection.

## DANCE OF AR

 PERCUSSION
## EXAMPLE: MM 48-50


 ETRIRE/COMPOND TIME FRAGMENTS)

Sustained chord mm . 82-85: This chord constitutes the first of two transitional phrases- the second being mm. 86-98- that lead to the next main section, starting at m . 99. The chord's derivation will be explained in the discussion of the next main section; for the moment, it is worth noting that it states the identical harmony found in $m$. 14739 The tutti texture, ie equal and simultaneous statement of
strings, woodwinds and brass, reverses what heretofore has been a
fairly regular separation of instrumental families. From measure 99 onward, tutti becomes a more consistently heard texture.

The overall dynamic pattern in these three measures is $p$-to $f$ and then rapidly back to $p$, which correlates with the attraction/repulsion pattern mapped onto other parameters. In addition, each measure contains smaller dynamic swells on beats 3 and 4. The significance of the swell-in addition to displaying a micro-version of the "wave"- is its emphasizing the 3rd and 6th (the inversion of the 3rd); the interval of a 3rd figures prominently in the previous sections (most notably in the Dance), as well as in the next transitional section. Two additional patterns are: 1) an ascension of pitch range, from $\mathrm{c} \# 3-\mathrm{f} 4$ to d4-aflat5; and, 2) a timbral shift, from emphasis on the darker strings (Vcl. and Vla) at m .82 to increased representation of the brighter winds (oboe, clarinet and trumpet) at m. 84.

Transition, part 2 mm . 86-98 In this subsection, the woodwinds and brass recall their intermittent pointillistic textures of previous sections. In this context, however, pointillism is expanded out over thirteen measures and given more foreground importance than previously. The strings and spare percussion provide occasional punctuation of colorto. The general trend in this subsection is an ascension of pitch, an increasing coverage of range, and an increasing complexity of rhythm.

[^14]Three rhythmic patterns produce this complexity. One is a mid-range aggregate of triplet 16 th patterns and variants; the second is an echoing stratum that takes place one octave above the first, and, the third, a mid-range pattern of quarter and eight-notes (and rests). All three patterns express an up-down, wave-like, motion, sometimes from note to note, sometimes over the course of several notes. The general rhythmic organization of this subsection is that of short, staggered fragments gradually unfolding into longer patterns, culminating in an increased length of phrases and note density.

Until m. 94, most of the woodwinds and brass articulate some portion of each of the three levels described above, hence creating a Klangfarbenmelodie. They urilize pitch classes and pitch order from chord 2. From m. 94 until m.98, more freely derived pitches suffuse the rapid ascents, which nonetheless still retains the rhythmic shapes of the preceding measures, albeit in compressed fashion. After the flute, oboe and clarinet conclude their rapid ascent, the subsequent pause- and its resultant tension-lead to the next section.

## SECTION 3

In its basic structural symmetry, this section correlates with other sections: It is comprised of two large subsections which share similar material (mm. 99-109 and, mm. 120-135), which may be subdivided into two smaller phrase groups, plus a third subsection in between (mm. 110-119). Its "personality", however, differs through its condensed rhythmic interplay between instrumental groups, a single rhythmic stratum (for the most part), and more frequentlyheard tutti instrumentation. Lastly, its homophonic structures serve to contrast with the pointillistic materials immediately preceding this section.

The commutual images of "The Soft Moon" give rise to this section's various expansions and contractions of pitch range. With regard to non-pitched parameters, rapidly shifting rhythmic fragments, dynamics, and changing timbres, convey both local goaldirectedness (of 1 to 2 measures), and patterns of "surprise." Instrumental colors, for the most part, are selected for their capacity to continuously contrast with adjacent colors;

Pitch organization: The opening chord at $m$. 99 gives rise to the section's main sonorities, by way of octave displacement and "filtering" of chord tones. Intervening harmonies, linking the main ones, derive their interval content, as well, from the starting chord, but are fragmented and transposed aggregates.

The starting chord is an outgrowth of chord 1's central hexachord, whose construction is as follows: $\mathrm{d} 4, \mathrm{f} \# 4$ and g 4 are displaced down an octave, and b-flat4, c5 and e-flat 5, an octave
upward. The resulting gap between the outer trichords is filled in by six additional pitch classes, in such a way as to create a symmetrical chord (see figure at the end of this discussion). The subsequent main chords and the converged-upon single notes produce a general pattern of increasing and decreasing pitch range:
$\left[\begin{array}{cll}\text { m. } 99 & 4 \text { octaves }+1 & \\ {\left[\begin{array}{c}\text { m. } 110\end{array}\right.} & 1 & \text { smaller range } \\ \text { m. } 120 & 1 \text { octave }+10 & \text { larger } \\ \mathrm{m} .127 & 1 \text { octave }+6 & \text { smaller } \\ {\left[\begin{array}{c}\text { m. } 133\end{array}\right.} & 1 & \text { smaller } \\ \mathrm{m} .136 & 1 \text { octave }+10 & \text { larger } \\ \mathrm{m} .143 & 3 \text { octaves }+6 & \text { larger } \\ \text { m. } 147 & \text { tutti returns } & \text { (same) } \\ \text { m. } 150 & 4 \text { octaves }+1 & \text { smaller }\end{array}\right.$

The figure above reveals structural commutuality, resulting from the outer two ranges being the same, and from the repeating internal pattern of ranges 1,1 octave +10 and 1 octave +6 . Less apparent, though no less important, is the temporal component of this section's structure. The amount of time occupied by each microsection (e.g., mm. 99-109, 110-119, etc.) can be represented by the following:


Note that although mm. 147-149 are only three measures, measure 149 contains six seconds of silence, thus adding up to $10^{\prime \prime}$. The above remporal proportions divided by 2 yield: 111076374 5, which is the interval content of chord 3 . In this way, the attraction/repulsion pattern is recalled once more. At other structural levels, there are additional pitch patterns to be found, primarily "funnel" patterns (convergence from a large range to a small one) or wave-like contours. For example, measures 100-101 undergo a funnel-like contraction of range from 4 octaves + 1 to a single note, f4 (flute). Immediately following this is a wavelike (arch) melody/texture in the pizzicato strings, harp, celesta and vibraphone. These two phrases form the first smaller phrase of this subsection. Mm. 104-108 comprise the next small phrase, whose initially large range contracts to the single note, b3 (strings); mm. 108-110 does similarly, contracting to b3 again (harp, strings). The onset of the second large subsection, mm. 121-123, contract to f4 (clarinet); m. 124 contracts to $\mathrm{c} \# 5$ (harp, oboe); mm. 150-153 contracts to b4 (strings).

The figure below displays the unfolding of the main harmonies of this section:


## SECTION 4

Measures 154-160 reexpand the range outward, and sound the chord of m .99 several times, thereby marking the conclusion of section 3, and simultaneously initiating the final section of the piece. Of note, as well, are the arch dynamics and accelerandi and ritardandi which hearken back to the generative image of commutuality.

Structure: Measure 161 through measure 199 are comprised of two subsections. However, unlike adjacent subsections in other portions of this piece, which repeat or rework similar phrase materials, these do not. Rather, there is a more or less continuous unfolding of different articulations between (and among) instrumental families.

From m. 161 through m. 172/beat 2, "target" harmonies demarcate phrases whose lengths are related by fibonacci values, ${ }^{41}$ consequently producing phrases of progressively increasing size. The second part of this first subsection, mm. 172-179, reverses the pattern with phrases of progressively diminishing size, and which are all slightly more compressed than their counterparts in the first part. Overall, then, there is an arch shape of phrase lengths in this first subsection.

The first part of the next (second) subsection occupies mm. 179-187. As in the first subsection, phrase lengths are proportionally determined, but have no direct connection to the Fibonacci sequence; rather, they reveal a general three part form

[^15]
## (see figure below). Of note, the second part of this subsection, m. 188

 onward, displays the strings and non-strings at their mostcompressed, that is extremely narrow (and overlapping) range, and rapidly changing harmonies.


# Harmonic organization: Section 4's manipulation of harmonies and range is similar to that in other sections: A generative harmony is re-voiced, displaced, filtered or otherwise transformed over a number of measures. In this case, the generative harmony is chord 2. The above figure plots the harmonic organization. It should be noted that the generated chords are not symmetrical, nor "imperfectly" symmetrical; rather, they contain internal similarities, particularly at first in their triadic content, and later on, in their secundal construction. 

## Articulation and orchestration (Section 4)

Throughout much of The Soft Moon, the strings and nonstrings (woodwinds and brass especially) are kept separate, juxtaposing rhythm and color, but rarely "mixing" in any consistent fashion. In the final section, instrumental families are both mixed and separated, although it should be noted that priority is usually given to the strings. These string textures, along with the final sounds of the harp and timpani, recall The Soft Moon's opening measures; this creates, in a sense, a timbral "bookend" to the piece.
mm. 161- woodwinds/brass (reduced), harp mm. 163-179 tutti mm. 180-186 strings, harp, celesta, vib
mm. 194-196
mm. 197-198
mm. 199-201
mm. 202-210
mm. 211-218
mm. 219-end
strings (priority). harp, vib., timpani strings (priority), woodwinds, brass, harp tuti harp (priority) strings (reduced), woodwinds/brass (reduced), harp, vib., timpani strings (reduced), flute, harp

## Measures 166-172:

As indicated above, these measures utilize all instrumental families in presenting the section's chordal evolutions. Over the course of these evolutions, there are expanding and contracting range patterns within each family (see figure below). Secondly, there are tonal, or nearly tonal components- eg., rriads, dominant chords, quartal harmonies-embedded in one or more families. For example, the brass's first chord articulates D major, the woodwinds' second chord states a whole-tone harmony, the strings' third chord expresses pandiatonicism, and the fourth chord's strings utilize bichordality ( $C 7$ and $D$ major). Thirdly, there are a variety of range overlaps and pitch sharing between the instrumental families (see figure below):

HEASURE 166
RANGE
$\left\{\begin{array}{ccccc}168 & 169 & 170 & 172 \\ 200 T & 200 T+2 & 20 C T+3 & 40 C T+4 & 200 T+10\end{array}\right.$

At measure 199, the slapper, bass drum and snare initiate the final large forte chord. The tom-toms articulate a "sustaining" echo, with rhythms derived from the Dance of Air. The remaining instruments, over the next two measures (ie., through m. 201) undergo a decrescendo and eventually a dissipation of energy via the rapidly descending, soft, figures. Thereafter, the sparse harp and percussion statements, along with delicate string harmonics, state what may be considered an echo of those dissipated energies.

From mm. 211-222, chord 3 supplies the ascending
tetrachords in the strings and winds. The harp and timpani state a pitch ostinato, whose notes occur at distances numerically reflecting the interval content of several generative chords: Starting from $m$. 212/beat 2-and ignoring the c \# on beat 4- the distances between the harp's notes are: 6 quarter notes, $4,3,4,5,6,9$ and 10 , thus reflecting (with one omission) chord 2's interval content. The distances between the timpani's notes, starting from m. 213, are: 9 eighth-notes, $8,5,4,1,5,2,3,5,9$ and 18 , which essentially represent the interval content of chord 1 (the ' 18 ' represents the tritone interval plus one octave).

The final repeating measure of the piece places the distant pitches of the harp and timpani, g\#2 and g natural-7 respectively, in "orbit" around the double bass' harmonic (f natural), representing for the composer the concluding inter-relationship of the earth and moon, as described in the chapter's preface. ${ }^{42}$

[^16]The majority of orchestral textures in The Soft Moon draw on three approaches: 1) complementarity, or separation, of instrumental families and ranges, 2) a timbral pattern of attackresonance, or Klangfarbenmelodie 43, and 3) a general concept of "progression", both in terms of augmentaion or diminution of instrumental forces and/or notes, as well as expansion and contraction of ranges, register and density. Note that all three approaches reflect upon the generative image of commutuality, as explained in the opening introductions.

The opening 10 measures of the piece immediately present these three approaches:

1) Between two complementary colors, the strings and harp, the interval of a 3rd (allowing for octave displacement) is expanded outward from a minor 3rd to a major 3rd: first, from the harp's "a" down to the cello's f ( (mm. 1-3), and then, conversely, the cello's harmonic $b$ down to the harp's $g$ ( m .6 ). There is also registral separation of the two instrumental groups- the harp in the higher register, the strings (cello) in their lowest- which then closes in measure 5 upon the reattack of the harp and harmonic in the cello.
2) The violins' pizzicato (m. 6) initiates an attack-resonance sequence, which includes the harp's sextuplet-whose upper b-
natural is also anticipated by the cello's harmonic (m. 5)- then two pizzicato groupings in somewhat "echoing" (staggered) rhythm (mm $7-8$ ), followed by the cello's sustained low f\# and finally the harp's harmonic (m. 9). The reader will also recall that following these measures (starting at $m .11$ ), the non-cello strings instigate the various crests and troughs of the cello's glissandi; this is another manifestation of the atrack-resonance paradigm.
3) Orchestral progression, as described above, further informs the strings, in three ways. First, the strings' migration of register from measure 2-9 follows a wave (arch) shape, namely: low (cello, $\mathrm{f} \# 2$ )-high (cello, b5)-mid (violins and viola, mm. 6-8)-low (cello, f\#2). Second, the number of string attacks follows an arch shape, namely through an increase and subsequent decrease of attacks: one (single) attack- repeated- (mm. 2-5), two attacks (m. 6), nine attacks (m. 7) six attacks (m. 8) and one attrack (m. 9). Third, there is a continuous increase in the number of string instruments sounding: one (mm. 25), two (m. 6), three (m. 7) and four (m. 8).

These types of timbral patterns occur frequently throughout the piece. In the "Dance of Air", where (as discussed earlier) there is a separation of instrumental families, there are also two types of attack-resonance: 1) From $m .64$ onward, the bassoon and trombone sustain the accented pcs in the vibraphone and celesta; and, 2) The temple blocks sound rapid piano figures following every high register glissando in the harp, eg. m. $65, \mathrm{~m} .66, \mathrm{~m} .68, \mathrm{~m} .69$, etc. Lastly, as discussed earlier, there is rhythmic and note accumulation ("orchestral progression") that plays an important role in this section.

Throughout The Soft Moon the non-pitched and indefinite pitched percussion instruments often function as auxiliary color or "resonance" to the surrounding material. Nonetheless, they also articulate important timbral patterns in their own right, which are modeled on the same wave (arch) shapes found in other instrumental families. For example, in mm. 29-30 the percussion resonates the simultaneous forte pizzicati and accented woodwinds and brass. Their progression also follows an arch shape: (following the snare, which sounds simultaneously with the other instruments) tom tom, timbale, temple block, sand block, temple block and tom tom. The nearly palindromic pattern of these timbres is obvious, in addition to which there is a migration from low percussion to high, and back to low. In both cases the wave (arch) shape, is reflected. Other instances of this timbral pattem in the percussion occur at $m$. 31, mm. 37-41 (notice, also, the arch shape of the dynamics), mm. 48-49, mm. 57-59, m. 72, m. 73, and m. 99.

## Orchestral Balance

The chamber orchestra normally consists of two violins and one of every other instrument, that is, one viola, one cello, one contrabass, one oboe, etc., plus percussion and other miscellaneous instruments. Consequently, in contrast to the standard orchestra, whose strings comprise the majority of the ensemble, the chamber orchestra's strings consist of only five, a minority. This instrumental reversal necessitates care in juxtaposing the less intense strings (which are now five, at most) with the more easily heard and penetrating woodwinds and brass. With this in mind, the strings in the Soft Moon almost always play as a group; if there is a solo string event, for example Violin $1, \mathrm{~mm} .50-76$, a distinctive timbre and register (high) ensure its presence.

In general, within all instrumental families, tiere are few soloistic passages to speak of, rather homophonic textures (eg., mm. 166-175) or pointillistic textures (e.g., mm. 176-178). Interlocking sonorities are present throughout this work, as for example in section 4, which contains more consistently mixed sonorities, but they occur less frequently than "separated" ones.

When families are combined, each one retains a distinctive rhythmic, timbral and/or harmonic identity, such that clarity is maintained. Measure 20 contains an example of this, in which the strings and non-strings occupy the exact same pitch region. Clarity is ensured in three ways: 1) The strings attack a triplet eighth note later than the non-strings; 2) The strings play at a dynamic of forte that holds its own against the subito piano of the woodwinds and
brass, and 3) There are contrasting articulations, namely, group glissandi in the strings and staccato attacks in the non-strings.
Measure 29, beat 4 , shows the strings and non-strings occupying, again, the same pitch region, but now in reverse order, the strings sounding first and then the non-strings. These slight shifts in artack times between families not only convey a type of attack-resonance partern, as discussed above, but also help to maintain orchestral balance

## Conclusion

Following an early period of neorealism ${ }^{44}$, Italo Calvino's stories and essays became increasingly informed by a mixture of science, fantasy, folktale and strangeness. This signified not a departure from realism, so much as an exploration of new methods for self-understanding.

In a similar way, music resides in realism and fantasy. On the one hand, it communicates in an unmediated physical manner, touching the listener in a direct, "real", way. On the other, as a nonverbal medium it communicates indirectly, by stimulating processes of memory and association- which, by their inherent fluidity, give rise to imagination and fantasy. Music, therefore, migrates between its direct and indirect aspect, and thus operates upon its own internal commutualities.

In this spirit, The Soft Moon not only reflects my thoughts and feelings towards the story that inspired it, but the musical processes exercised in its creation and comprehension, as well.

[^17]
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## THE SOFT MOON

for chamber orchestra

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A Thesis composition submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements of the degree of Doctor of Music.

## Notes for THE SOFT MOON

The Soft Meon reflects upon the images and spirit of Italo Calvino's fictional works, and in particular the story by the same name which initially inspired it Specifically, it manifests the commingling or migration of opposing articulations, opposing evolutions of harmony, range and rhythm, and the exchange of roles.

## INSTRUMENTATION:

Flute/Piccolo
Oboe
B-flat Clarinet/Bass Clarinet (written at concert pitch)
Bassoon
Trumpet (C)
French Horn (written at concert pitch)
Trombone
Celesta/Piano (Celesta may be electric, to facilitate dynamics, if needed)
Harp
Percussionist I:
3 Timpani: 20" (f3-c4), $26^{\prime \prime}$ (b-flat2-f3) and $32^{\prime \prime}$ (d2-a2)
Percussionist II:
5 Temple blocks (bottom space-top space: low-high)
5 Timbales (bottom space-top space: low-high)
Wood block (being higher than the highest temple block)
Finger cymbal
Sand block (to be struck "horizontally" with a stick or a sandy object)
Slapper
Percussionist III:
Bass drum
5 Tom Toms (bottom space-top space: low-high)
Snare drum
Tam tam
Percussionist IV:
Vibraphone (including bow)
Xylophone (written at sounding pitch)
Tubular bells
Suspended antique cymbal
Glockenspiel
Crotale (A-flat5, bowed)

Violin 1
Violin 2
Viola
Violoncello (Cello)
Contrabass

All parts, except the double bass, piccolo, celesta and crotale, are written at concert pitch. Notes in the double bass sound an octave lower, except harmonics, which sound at pitch. The piccolo and celesta sound an octave higher than written. The crotale sounds two octaves higher than written.

As the celesta and vibraphone parts usually play at or around the same time, their staves are placed adjacent to one another, and appear together in the respective players' parts, for the sake of better coordination.

## GLISSANDI

Glissandi and pitch fluctuations are indicated by descending and ascending lines across the staff. The performer is asked to execute the melodic contour to the best of his/her ability. Notes placed within a glissando (that is, not at the end) indicate approximate pitch reference points; stems within a glissando indicate temporal reference points, and not accented beats.
N.B. At times, there are glissandi without specific notes attached, for example, $\mathrm{m} .24, \mathrm{~V}$. 1 and VIa. In such cases, they may be interpreted as expressive slides- such as those found in jazz music. The harp glissando in m. 40, similarly omits specific pitch content, in favor of general contour.
N.B. At times, the score indicates wide vibrato within a glissando, for example m. 14, cello. In such cases, it is to be considered a fluctuation of pitch within an overall glissando ascent or descent. Rate and range of fluctuation is left to the discretion of the performer.

## TERMINOLOGY

## s.t. sul tasto

s.p. sul ponte
ord. ordinario
pizz. pizzicato
quasi chitarra plucking very low near the sound board ("pres de la table").

Ric. ricochet- let the bow (or mallet) bounce off the string (or timpani).
n. riente, as soft as possible
ca. circa (approximately)
a.t. air tones. Blowing air through the instrument with or without producing a more conventional tone. The intended effect is wisps of white noise.
w.t. whistle tones
st. mute straight mute (brass)
con sord. con sordino, with mute

All harp, vibraphone, celesta and pizzicato notes (strings) are to resonate freely (i.e. without muting or damping), unless otherwise indicated.

Mallets/sticks used are:

1) normal timpani mallets
2) mallets with hard yam heads
3) mallets with soft yarn heads
4) mallets with rubber heads
5) brush
mm . 32-33- Within the boxes, the players repeat the given notes in any order, and alternate between $p$ and $f$.
mm . 86-98 contain notes in the woodwinds that are placed at the highest extreme of their playable range (see Instrumentation/Orchestration, by Alfred Blatter, p. 93 and $p$. 100, for reference). If the exact pitch is not obtained by the player(s), the composer's intention remains that of having a shrill sound at those moments.
m. 155- In the winds, notes in the boxes are played at a moderate tempo, followed by an ad lib. Accelerando within each part, over the course of the remainder of the measure. They reach their maximum tremolo speed at beat 6 . All other instruments perform in a conventional manner.
m .157 is performed similarly to m .155.
mm . 159-160 Fragments are repeated rapido (ad lib.), and then progressively slow down. Eventually, a staccato and sparse articulation is obtained.

Horn glissandi are produced by placing the hand progressively in or out of the bell.
In the vibraphone and celesta parts: ped. means sustain pedal; * means lift sustain pedal (stop the sustain).
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[^0]:    ${ }^{1}$ To distinguish between the chapter and musical work by the same name, The Soft Moon (italicised) shall indicate the musical work, and "The Soft Moon" (within quotation marks), the chapter.
    ${ }^{2}$ Ticon zeris) in the original Italian; See Bibliography.

[^1]:    3 Jonathan Kramer, in this regard, has utilized the term "kinetic stasis". (See Bibliography) ${ }^{4}$ See Bibliography, page 79.
    5 Qfwiq is the narrator of all of tzere, as well as its predecessor (and companion novelette), Cosmicamics
    ${ }^{6}$ From the back cover of $t$ zern. See Bibliography.

[^2]:    7 Symmetry also comprises his physical existence. In The Spiral", the firal story in Cosmicomics. Qtwfq narrates how as a primitive mollusk he clung to a rock and grew at randon but "in radial symmetry".
    8 I am referring to John Cage's concept of derial of intention.
    9 The reader is referred to Richard Feymman's chapter, "The Distinction of Past and Future." (in The World Treasury of Physics. Astronomy, and Mathematics- see Bibliography). In the World Ireasury of Physics, Astromomy, and Mathematics- see Bibliography) In that chapter, the author posits that 'particles of anti-matter can be regarded as
    particles of ordinary matter moving backward in time' (from the chapter's preface).
    10 With Pleated Eye and Gamet Wins: Symmetries of Itale Calving (1987). See Bibliography; page 113.
    11 One such example would be the several simultaneous levels of interest presented in the section, Textare and Orchestation.

[^3]:    15 "Between Times", for Concert Choir, 1991, is a previous example.

[^4]:    16 Presented at Harvard's Charles Eliot Norton Lectures in 1985. See Bibliography; p. 51
    17 Ibid. p. 35.

[^5]:    22 From this point on, I shall also use "interval class" to describe intervals, such that "ic1". for example, means one semitone
    23 From this point on, ics will be listed from lowest to highest.
    24 C4 is middle $C$.

[^6]:    25 See figure below.
    26 Their respective subscripts (e.g. Ile-chromatic) specify them further.
    $\boldsymbol{7}$ A tritonal relationship is also apparent: b minor over $f$ minor.

[^7]:    28 That is to say, with no gaps in between chord tones.

[^8]:    29 Since rubato and fermate are placed throughout this piece, many temporal proportions may be taken to be approximate. For purposes of analysis, however, proportions and durations will be assigned specific values.

[^9]:    31 mezzo forte
    32 mp -mf-p

[^10]:    34 V chords appear in section 4 (measure 179 onward).

[^11]:    35 Not incuding the occasional bowed vibraphone.

[^12]:    ${ }^{36}$ This correlates with the continuous alteration of instrumental articulation (in the first two sections).

[^13]:    37 This dovetrils with the general pattern of near-symmetry, aiready observed in the domain

[^14]:    40 The piano and orchestral bell appear for the first time, often resonating pitch classes found in the other instruments

[^15]:    41 A series of numbers in which each number is the sum of the preceding pair.

[^16]:    42 Though not essential to understanding this composition, it is worth mentioning that the conclusion of the chapter The Soft Moon portrays a thoughtful allegory: The ancient Earih is bombarded and partially covered by the "soft" moon: shards and clumps of (ancient) human construction also fly upward to the moon and become lodged within its surface. The timeless narrator, Qfwfq, now speaking in the reader's "present",

[^17]:    44 Neo-realism was the prevailing artistic movement in post-World War II ltaly; Calvino especially drew upon his experiences as a Partisan during the war, as well as his brief association with Communism. He left the Communist Party in 1957, as did many, in the aftermath of the Hurgarian Revolution of 1956.

