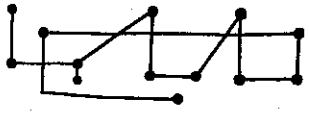
WAYFINDING IN JOHN LUTHER ADAMS'S *FOR LOU HARRISON*



TODD TARANTINO

SEVERAL YEARS AGO MY WIFE HAD A VISITING PROFESSORSHIP in central Pennsylvania. As a break, we went to a Country Fair to see its amusement park rides, livestock and large vegetables. I have never been a fan of amusement park rides; while I have ridden a roller coaster here and there, to put it mildly, I've never found it to be a very pleasant experience. At this carnival, I climbed aboard one of those pendulum pirate ships. Perhaps you've been on one; the ship rocks back and forth, higher and higher with each swing before reaching the top. At that point it either flips over, giving a moment of weightlessness, or else slowly starts to make smaller and smaller arcs before settling again at its bottom. My experience of the ride began pleasantly enough, but as it continued and its process became clear I became more and more disoriented; I'm told I turned white and clutched my hands tightly. After the highpoint of the arc, I could relax slightly knowing that the ride would

soon be over. Eventually the process ended (none too soon) and I told myself I would never ride a pirate ship again.

On board, my strategy was clear: I had to grin and bear the process until it reached its conclusion: my discomfort level rising and falling in relation to the process. Nonetheless, because the process was predictable, there was no sense of guessing the ship's next move, as one might do on a roller coaster, or next environment, as might happen in Disney's far less traumatic Mister Toad's Wild Ride. On the pirate ship, I endured.

It strikes me that a lot of process music takes its listeners for a pirate ship ride, and sometimes it is as hard to leave a concert hall as it is a pirate ship. In music such as Ligeti's *Poeme Symphonique*, Reich's *Piano Phase* or *Pendulum Music*, or Boulez's *Structures*, Book One, the sonority at any given moment is as much a function of an overriding system as any other musical parameter. Process and algorithm are especially conspicuous in the work of John Luther Adams, from early compositions such as his "Sonic Geography of the Arctic" from *Earth and the Great Weather* (1990–1993) to his recent memorial tribute *for Lou Harrison* (2003). These are compositions that present a texture or several alternating textures with little or no harmonic activity, whose moment-to-moment sonorities are guided by number and algorithm. Their mechanics are not too difficult to discern, but to move beyond their surface, there are few models for the listener or analyst.

EXAMPLE 1: ADAMS IN THE BROOKS RANGE OF ALASKA. ABOVE HIS HEAD IS AN AEOLIAN HARP.

In this paper, I will begin by peering under the hood of John Luther Adams's *for Lou Harrison* to demonstrate its mechanics. Having done so, I will propose a model for perception and analysis based on Adams's conception of "Music as Place," and finish by exploring this metaphor in the context of Adams's work as a whole and *for Lou Harrison* in particular.

John Luther Adams, not to be confused with his contemporary John Coolidge Adams, the composer of *Nixon in China*, was born in 1953. His standard biography tends to mention his experience as a drummer in various 1960s era New Jersey rock bands before he became interested in the music of Varèse, Feldman and others based on their being mentioned on the back of a Frank Zappa LP. After studying with Jim Tenney for a few years at California Institute for the Arts and then taking a string of odd jobs—a librarian and organic farmer in Georgia for instance—he moved to Alaska, where he currently lives in the boreal forest outside of Fairbanks.[1] Adams has steadfastly clung to his adopted home, seeking in many instances to create a music that reflects the place in which it was made. In so doing, Adams doesn't aim to illustrate or narrativize Alaska, though one can certainly hear "Alaska" in the work, but rather tries to transform Alaska into music, using the alchemical notion of art *à la* Cage, which suggests that music should "illustrate nature in her mode of operation." To do this, Adams has both translated actual environmental sounds—such as recordings made of aeolian harps placed in various parts of the Brooks Range in *Earth and the Great Weather*, and scientific measurements in his 2004–6 installation work *The Place Where You Go to Listen*—and "sounded" imagined "environments," as in *The Light That Fills the World* (2001) and, as I will discuss, *for Lou Harrison*.

for Lou Harrison is the third of a trio of evening-length memorial compositions. The first, *Clouds of Forgetting, Clouds of Unknowing* (1991–95), is dedicated to his father, and the second, *In the White Silence* (1998), to his mother. In the brief preface to the score, Adams writes of his close relationship to Harrison: "Lou Harrison was a generous friend and wise mentor to me for almost 30 years. His faith in and support of my music was a decisive influence in my life. I learned more from my time with Lou than from any of my institutional studies. And he was an inspiring model of how to live, without regret or bitterness, as an uncompromising independent composer."[2]

According to Adams, he first considered scoring the work for chorus and gamelan before settling on its present instrumentation: two pianos, string quartet and string orchestra. This orchestration, with its percussive/arpeggiating, sustaining and lush elements, is a characteristic

palette for the composer.[3] Each group uses a particular gesture: sustained notes and open sonorities for the strings, arpeggiations and percussive elements for the pianos, and a singing sound for the solo strings.

Adams provides relatively few expressive indications in the score. The tempo marking is "approximately 60" and the dynamic is *forte*. Arpeggios are given the blanket instruction that they should crescendo to *fortissimo* on reaching their apexes. The large-scale form of the sixty-two minute work is remarkably simple—nine alternating sections as shown in Example 2.

The A sections present a series of arpeggios in the pianos and solo strings over sustained pitches in the *tutti*, while the B sections are lush, in the style of the "Lost Chorales" of *In the White Silence* (1998). Both sections are characterized by constant saturation of the pitch space. Adams writes: "About halfway through [the composition] I recalled a small piece of [Lou's] called *A Joyous Procession and A Solemn Procession* [and] came to think of the A sections of my homage to him as joyous processions and the B sections as solemn processions."[4]

There are three elements that can be said to be *a priori* to Adams's recent work: gamuts, pitch rotation, and tempo layers. In order to understand this composition further, I will look at each of these in turn.

Gamut

Each section of the work uses a different, though not exclusive, five, six or seven-pitch collection or "gamut," built from series of alternating intervals and providing the pitch material for a given section. These gamuts are presented most clearly in the global arpeggios that open each section. (see Example 3, m.1–2) Though gamuts have a lengthy history, in the modern period they are associated with the music of John Cage. Adams's gamuts share a stronger affinity with the pitch gamuts of medieval theorists. Gamut signifies the sum total of possibilities and

A1	B1	A2	B2	A3	B3	A4	B4	A5
m. 1–88	89–222	223–310	311–444	445–532	533–666	667–754	755–888	889–983

EXAMPLE 2: LARGE-SCALE FORM OF *FOR LOU HARRISON*

Adams's use of them tends to be all-embracing, From the perspective of the overall ensemble the full gamut is constantly present.

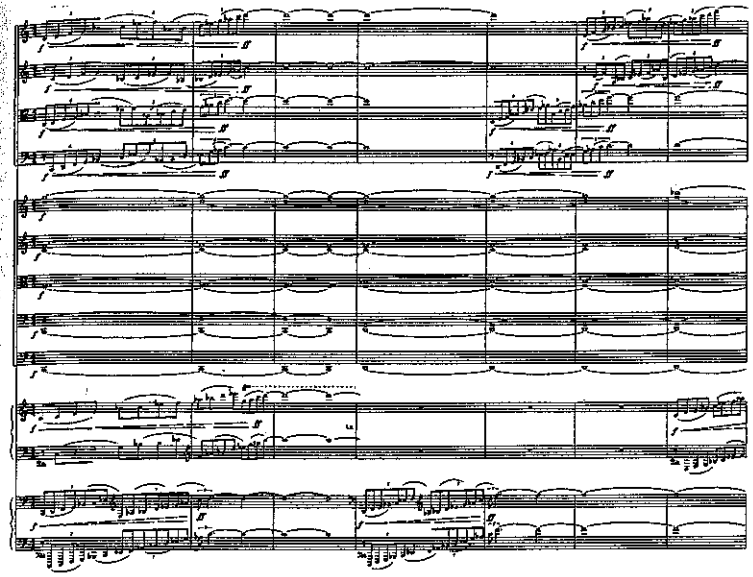
In the pervasive use of the complete pitch gamut, consonance, dissonance and harmonic motion become moot concepts. All pitches sounded are "consonant" with each other; no pitches are dissonant. If a pitch is not within the gamut, it is simply unavailable for that section of music. Because the gamut doesn't change within a section—the shortest of which lasts six minutes—the listener is deprived of harmonic expectations. The gamut becomes a coloring of it all, so that any perception of dissonance, consonance or harmonic motion resides in the listener rather than the piece.

The gamuts for all sections of *for Lou Harrison* are provided in Example 4. At first glance, there doesn't appear to be much that ties the individual gamuts together. Compressing the individual collections within the octave, A1's gamut appears to be a C natural minor scale while that of A2 and B2 is C Lydian; A4 seems to be respelled C Locrian.

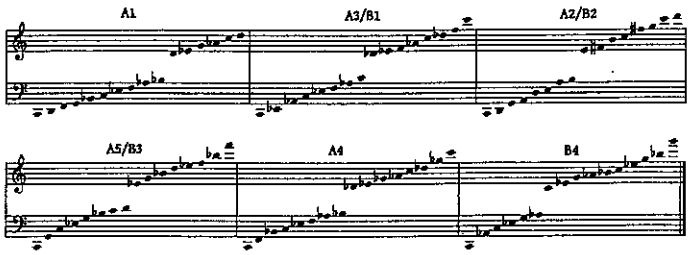
While these observations are true, in compressing the pitch material within an octave we ignore one of the most important aspects of Adams's pitch use: these gamuts are relatively fixed in register based on the range of the respective instruments.[5] That is to say, the gamut A1 is projected on a different range for the cellos than it is for the violins. To get a sense of the richness of the whole, imagine a piano missing certain strings.

In use, each gamut is piano-sized; as conceived, however, the gamuts are limited to sixteen pitches built on C. These sixteen pitches consist of a four or eight-pitch "fundamental" and one or more of its transpositions or "overtones." Individual gamuts are constructed from intervallic series and altered as necessary to keep them within a five, six or seven-pitch collection. Thus gamut A1, shown in Example 5, seems to be built from chains of fourths a whole step distant and altered to fit a seven-tone collection.

Example 6 shows A2/B2, which appears to be built of chains of fifths a whole step distant, and again altered to fit a seven-tone collection. While there is little doubt that these gamuts are constructed in alternating linked intervals, Adams thinks of them in terms of the intervals between adjacent pitches. For him, A1 is comprised of alternating major seconds and minor thirds (altered to fit a seven tone scale) and A2 is comprised of alternating major seconds and perfect fourths (again altered).[6] Linked interval gamut construction is more apparent in the alternating thirds and fourths gamut B1/A3, which is composed of an alternating interval "fundamental": m3-P4-M3-P4-m3-



EXAMPLE 3: *FOR LOU HARRISON*, MM. 1–8



EXAMPLE 4: GAMUTS IN *FOR LOU HARRISON*

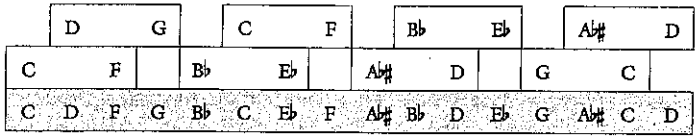
P4-M3 with two "overtones"; that is, duplicates at the octave and double octave, as shown in Example 7.

B3/A5, shown in Example 8, is composed of alternating fifths and minor sixths duplicated at the octave, twelfth, double octave, and double octave plus a fifth.

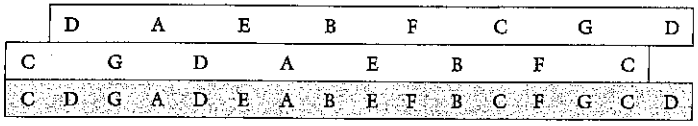
The gamut for A4 is unique, comprising chains of fourths at the octave altered to fit a seven-pitch collection, as shown in Example 9.

Finally, B4 is also unique, more complicated, and messier: alternating sixths and fifths at the octave, twelfth, double octave, and double octave plus a fifth altered to fit a five-tone collection. This is shown in Example 10.

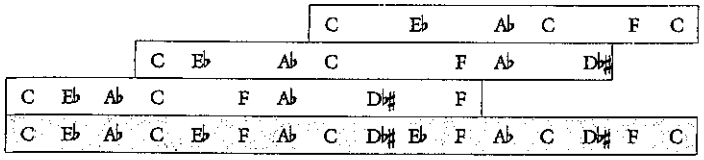
A few things are worth highlighting in this enumeration. First, overall the interval content of these gamuts seems to expand, moving from seconds to sixths. Unlike *Clouds of Forgetting, Clouds of Unknowing* or *The Light That Fills the World*, the normative interval does not expand to an octave at the work's conclusion. Beyond this vague expansion, I can see no connection between the order in which the gamuts are presented and any of the other processes of the work. One gets the sense that the order of gamuts is chosen strictly for the resulting sound qualities. At the same time, one may get a sense of returning and restarting pitch-wise insofar as A3 uses the same pitch material as B1, making a larger



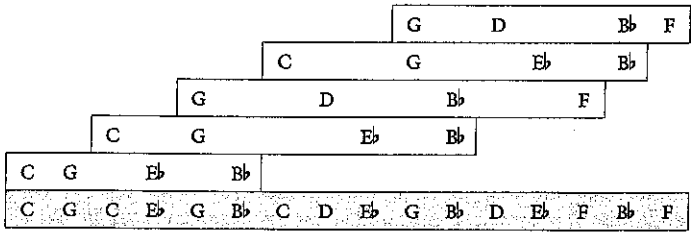
EXAMPLE 5: ADAMS'S GAMUT, A1



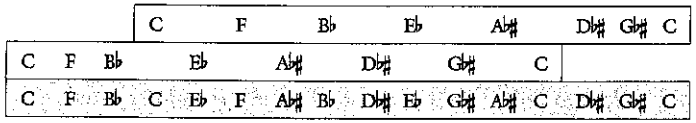
EXAMPLE 6: ADAMS'S GAMUT, A2/B2



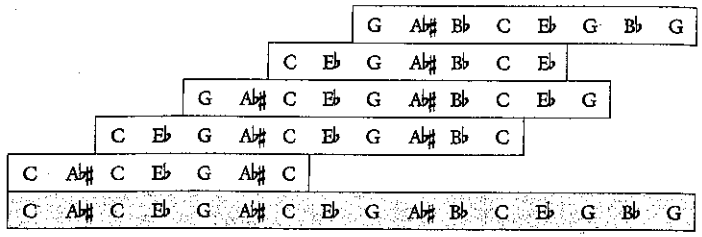
EXAMPLE 7: ADAMS'S GAMUT, B1/A3



EXAMPLE 8: ADAMS'S GAMUT, B3/A5



EXAMPLE 9: ADAMS'S GAMUT, A4



EXAMPLE 10: ADAMS'S GAMUT, B4

scale division at the opening of B3. This process is mirrored in the second half with the pitch material of A5 matching that of B3. However, given the duration of the sections, this not a particularly salient division.

Second, with the exception of A1 and A2/B2, when Adams duplicates an interval series he does it in line with the harmonic series. Thus in B3/A5, the "fundamental" is the interval series P5-m6-P5 on C; this "fundamental" is matched by equally strong "overtones" throughout its "harmonic series." B4 has a different "spectral" footprint. In *for Lou Harrison*, the A sections tend to use the entire gamut, while the processes of the B sections restrict themselves to the gamut's fundamental.

Pitch Rotation

Adams's primary melodic operation is rotation of the pitches of the gamut. Theoretically, rotation is related to chord inversion, a salient feature of his earlier works, for instance the harp arpeggios of *Dream in White on White* (1992).[7] In *for Lou Harrison*, Adams treats each gamut as if it were a triad and each rotation as an inversion of a chord. Adams uses his gamuts in an almost sculptural way. With each rotation we see a slightly different angle on the same material. As a whole, the melodic material of *for Lou Harrison* is derived from presenting all rotations of a particular gamut; when this process is completed, the section closes.

By way of illustration, Example 11 shows Piano 2 in measures 889–895. If we number the pitches of the gamut from the lowest

to the highest (1–16), we have a full presentation of gamut A5: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16, followed by its first rotation: 2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,1.[8] In *for Lou Harrison*, pitch rotation is applied throughout both A and B sections. As I will discuss later, rotation is also applied to several other structural parameters.

Tempo Layers

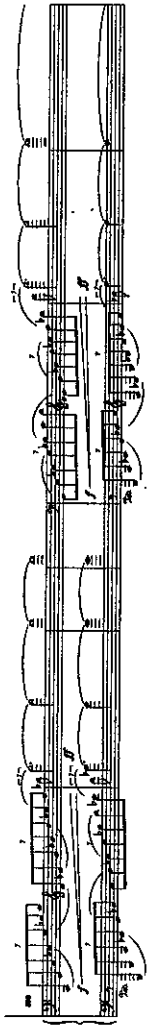
In his recent music Adams subdivides his ensemble into multiple simultaneous tempo layers articulated through tuplet subdivisions of a shared meter; within their assigned tempo layer, instruments tend to mark time. Thus in the constant 4/4 of *for Lou Harrison*, one layer is assigned multiples of quarter notes, another quintuplets, another sextuplets and another septuplets. These tuplets do not articulate a relationship between the notated duration and the common tempo, as in "a quintuplet quarter against a quarter" but rather are an easy shorthand for coordinating related tempos here: the quarter note equals 60, 75, 90, and 105 respectively, united under a particular "corresponding tempo" (here MM = 60);[9] he could as easily notate each line in its own tempo without tuplet brackets. Often Adams gives a sustaining instrument, such as the organ, the role of "sound board." When instruments are in this capacity, they tend to present gamuts or gamut subsets at a particularly slow tempo; in so doing they provide a resonating space for the more active instruments.

In *for Lou Harrison*, the different tempo layers are fairly obvious and remain the same for the entire composition, switching instruments for the B sections. Example 12 outlines the tempo layers and their assigned instruments.[10]

In the A sections, the fastest material is given to instruments with lower tessitura, while in the B sections, the opposite tends to be the case. The sustaining "sound board" is eliminated in the lushly contrapuntal B sections.

What are we to make of these tempo layers? For the listener, they create a sonic haze in which individual rhythms are lost to the greater whole. Nonetheless, these numbers are key to several aspects of the piece.

With the three concepts of gamut, rotation and tempo layers in mind, I would like to move deeper into the construction of the individual sections. I will first explain how they work and then propose a metaphorical model for perception and analysis.



EXAMPLE 11: *FOR LOU HARRISON*, PIANO 2, MM. 889–895

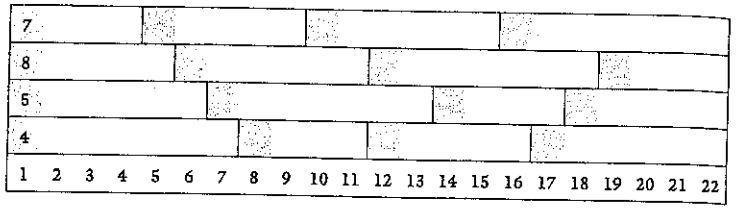
	A Section		B Sections
Piano 1	4	Piano 1	7
Solo Violin 1	5	Solo Violin 1	7
Solo Violin 2	5	Solo Violin 2	6
Solo Viola	6	Solo Viola	5
Solo Cello	6	Solo Cello	4
Piano 2	7	Piano 2	4
Violins	Sound Board	Violins	6
Violas	Sound Board	Violas	5
Cellos/Basses	Sound Board	Cellos/Basses	5

EXAMPLE 12: TEMPO LAYERS AND THEIR ASSIGNED INSTRUMENTS

THE MECHANICS OF *FOR LOU HARRISON*

The A sections, of which Example 3 is representative, are simple in concept. Over a sustaining background of orchestral strings, we are presented with arpeggiations of the section's gamut rotated in duos at multiple simultaneous tempi. Each tempo layer—high solo strings, low solo strings, Piano 1 and Piano 2—presents sixteen rotations of the gamut. The orchestral strings, too, rotate pitches within the gamut sixteen times, though instead of rotating through individual elements, their pitches are grouped into tetrads which are themselves rotated: (1 2 3 4), (2 3 4 5), (3 4 5 6), (4 5 6 7) et al.[11] Within each duo, Adams has the two instruments (or hands in the case of the pianos) play a tight canon: the septuplet layer at the septuplet, the sextuplet layer at the sextuplet and so forth.

In the 88 measures of section A1, as in the other A sections, there are four subsections (A1a, A1b, A1c, A1d) delineated by the four points (m.1, 23, 45 and 67) at which the various tempo layers coincide and the entire ensemble strums the gamut simultaneously though at different speeds. Within each subsection individual "strums" occur at measure timepoints determined by permutations of the numerical series [4,5,6,7]. This is shown in Example 13.



EXAMPLE 13: SCHEMATIC OF PHRASE LENGTHS IN A1a: MM. 1–22; SHADED BOXES INDICATE THE BEGINNING OF "STRUMS."

Given that it takes less time for a gamut to be strummed in septuplet eighth notes than eighth notes, Adams sustains the highest pitch of the rotation until the timepoint of the next strum.

Interpreting the diagram above, the phrases of the septuplet layer (piano 2) correspond to 4+5+6+7 measures; the sextuplet (solo viola and cello) 5+6+7+4; the quintuplet (solo violins) 6+7+4+5; and the quarter (piano 1) 7+4+5+6. The sustaining strings are divided among high and lower strings and share the same phrase series as the pianos. Thus saturation is not only of gamut and tempo layer, but also phrase length.

The phrase length series of A1a are themselves rotated in A1b, A1c and A1d, as shown in Example 14. One would expect the series rotation to continue in section A2a where it left off in A1d. This is not the case. For variety, Adams has each layer process through the phrase length

		A1a (1–22)	A1b (23–44)	A1c (45–66)	A1d (67–88)	
Orch. Strings	High	7 4 5 6	4 5 6 7	5 6 7 4	6 7 4 5	Piano 1 (quarters)
	Low	4 5 6 7	5 6 7 4	6 7 4 5	7 4 5 6	Piano 2 (septuplets)
Solo Quartet	High	6 7 4 5	7 4 5 6	4 5 6 7	5 6 7 4	(quintuplets)
	Low	5 6 7 4	6 7 4 5	7 4 5 6	4 5 6 7	(sextuplets)

EXAMPLE 14: PHRASE LENGTH ROTATIONS, A1 (MM. 1–88)

Orch. Strings	High	4 5 6 7	5 6 7 4	6 7 4 5	7 4 5 6	Piano 1 (quarters)
	Low	5 6 7 4	6 7 4 5	7 4 5 6	4 5 6 7	Piano 2 (septuplets)
Solo Quartet	High	7 4 5 6	4 5 6 7	5 6 7 4	6 7 4 5	(quintuplets)
	Low	6 7 4 5	7 4 5 6	4 5 6 7	5 6 7 4	(sextuplets)

(a) Section A2—mm. 223–310

Orch. Strings	High	5 6 7 4	6 7 4 5	7 4 5 6	4 5 6 7	Piano 1 (quarters)
	Low	6 7 4 5	7 4 5 6	4 5 6 7	5 6 7 4	Piano 2 (septuplets)
Solo Quartet	High	4 5 6 7	5 6 7 4	6 7 4 5	7 4 5 6	(quintuplets)
	Low	7 4 5 6	4 5 6 7	5 6 7 4	6 7 4 5	(sextuplets)

(b) Section A3—mm. 445–532

Orch. Strings	High	6 7 4 5	7 4 5 6	4 5 6 7	5 6 7 4	Piano 1 (quarters)
	Low	7 4 5 6	4 5 6 7	5 6 7 4	6 7 4 5	Piano 2 (septuplets)
Solo Quartet	High	5 6 7 4	6 7 4 5	7 4 5 6	4 5 6 7	(quintuplets)
	Low	4 5 6 7	5 6 7 4	6 7 4 5	7 4 5 6	(sextuplets)

(c) Section A4—mm. 667–754

EXAMPLE 15: PHRASE LENGTH ROTATIONS IN A SECTIONS.

Orch. Strings	High	7 4 5 6	4 5 6 7	5 6 7 4	6 7 4 5	Piano 1 (quarters)
	Low	4 5 6 7	5 6 7 4	6 7 4 5	7 4 5 6	Piano 2 (septuplets)
Solo Quartet	High	6 7 4 5	7 4 5 6	4 5 6 7	5 6 7 4	(quintuplets)
	Low	5 6 7 4	6 7 4 5	7 4 5 6	4 5 6 7	(sextuplets)

(d) Section A5—mm. 889–983

EXAMPLE 15 (CONT.)

series rotation as well. Thus given that Piano 1 begins section A1 with (7 4 5 6), it begins section A2 with the first rotation of their original phrase length series (4 5 6 7). In this way gamut rotation and tempo layer determine every pitch and every duration in the A sections.

Within each subsection, there are no structural highpoints; arguably, there are none within each full A section. Time is cordoned off and events are tailored to fit the allotted time. Each moment is an equivalent, if determined, experience. One moment is no more important than any other. The listener, immobile, allows the events to occur without interacting with them.

The B Sections

Our first impression of the B sections is a much richer, more romantic environment. Again rotation is the primary melodic device, and again the gamut provides all the pitch material. While the A sections utilize the full gamut, with the exception of their openings, the B sections focus on the eight-note fundamental of the gamut. As befits their "solemn" nature, the B sections are far more polyphonic in texture and measured in gait. If the numerological cosmos of the A sections is 4,5,6 and 7; the B sections add 8.

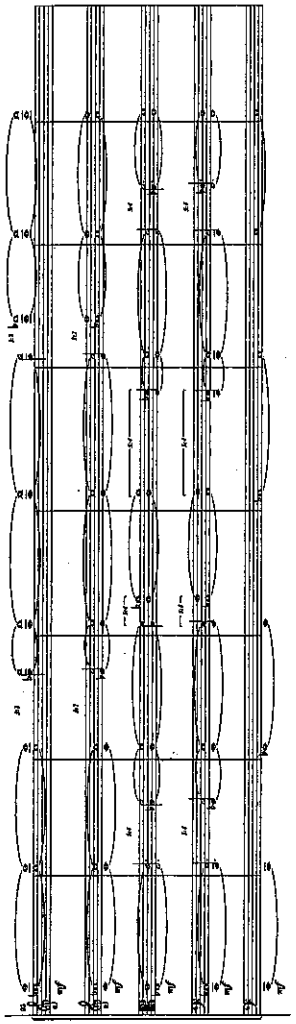
As with each A section, Adams begins his B sections with a simple two measure strummed presentation of the full gamut. The pianos and solo strings arpeggiate the gamut while the orchestral strings present their opening sonorities (tetrads of the lower portion of the gamut

fundamental) in double-stops.[13] What follows are a number of complex processes begun simultaneously in the orchestral strings and Piano 2 before being joined by the processes of Piano 1 and the solo strings. Eventually, the various layers drop out one by one. At the end of each B section there is a notated fermata of two measures.

Within the orchestral strings there are three layers based on register: the basses, the low strings and the high strings; together with Piano 2, the bass part determines the duration of the B section. The bass rotates the eight-note fundamental of the gamut sounding each pitch for eight beats.[14] Examples 16a and b show the bass's motion through the gamut fundamental of B1.

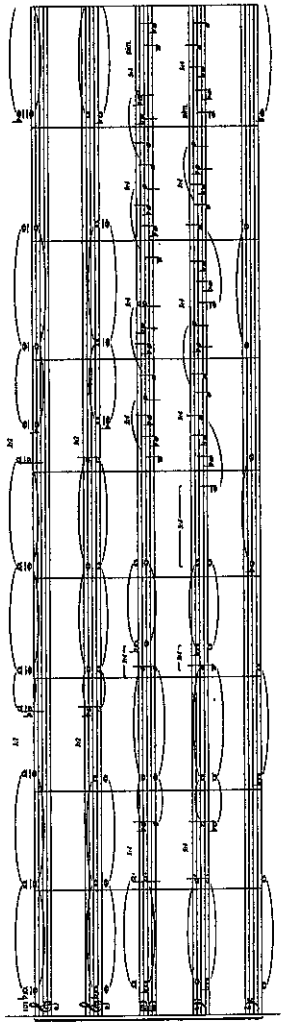
Within their tempo layers, the other orchestral strings present rotated gamut fundamental arpeggiations in canon (see the beginning in Ex. 16b starting just before m.106), bookended by a presentation of the gamut fundamental in tetrads. The arpeggiations are organized into two groups of four pitches. The second group always begins on a lower pitch than the ending of the first group. Both high and low strings follow the same pattern. In the canons there are occasional "extra" notes, as, for instance, in the viola at 107. These extra notes form a process within a process that, with a few exceptions based on playability, also rotates through the gamut fundamental. Finally, in each canon, the *dux* has a slightly longer duration than the *comes*. Thus in the cello/viola canon beginning just before m.106, the viola's arpeggio has a duration of 9 × quintuplet quarter note, while the cello's duration is 8 × quintuplet quarter note. This means that for each rotation the *dux* repeats the series eight times, while the *comes* repeats it seven times. With the eight rotations complete, the process ends and the chords that opened the section return, the final of which is sustained an extra two measures. Piano 1 (in septuplets) has the same process omitting the opening and closing chords.

Piano 2's process is more complicated (see Example 17). The bass holds each note of the gamut fundamental as a pedal point for a full sixteen measures (64 beats), rearticulating the pitch after every eight beats. Together with this is a complicated canon often obscured in the score as Adams has notated the part for playability rather than analysis. The *comes* (beginning in the right hand) plays the gamut fundamental in sequence holding the final pitch for an extra beat, that is, the eight-note series rotates after nine beats. The *dux* has an overlapping range-expanding process. Every eight beats, the gamut fundamental begins again, with the final pitch being held for an added beat. As demonstrated above, thus, in the first presentation (Piano 2, left hand, measure 98–99, switching to right hand, measure 100) after the eighth pitch, the first pitch is repeated for two beats. After the second



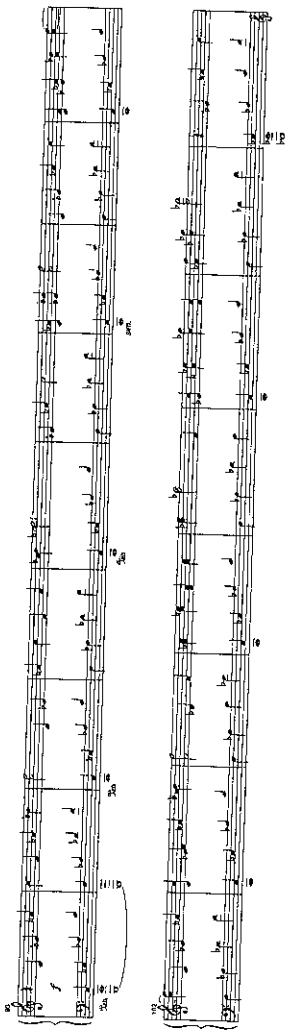
(a) Orchestral Strings, mm. 93–100

EXAMPLE 16: ORCHESTRAL STRINGS, MM. 93–109.



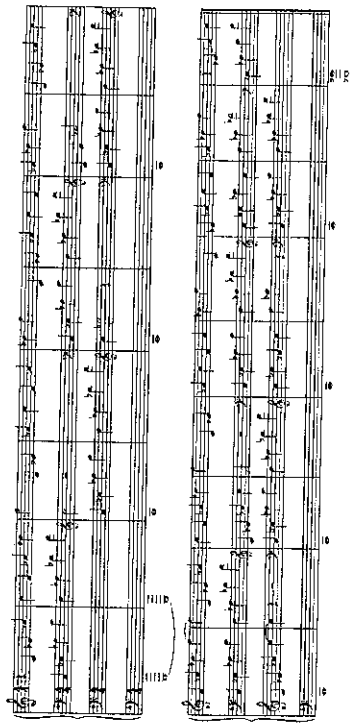
(b) Orchestral Strings, mm. 101–108.

EXAMPLE 16 (CONT.).



(a) Piano 2, mm. 93–109

EXAMPLE 17: CANONIC ROTATIONS



(b) piano 2, mm. 93–109, renotated to demonstrate canonic strands

EXAMPLE 17 (CONT.)

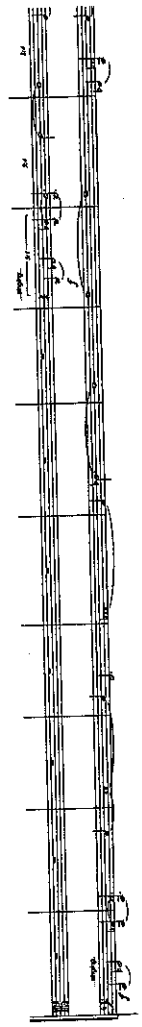
presentation the first two notes are sounded, the last being held for two beats, making a total addition of three beats and so forth. On the seventh presentation, the gamut fundamental is presented twice. On the eighth presentation the gamut fundamental has no addition. This process repeats with each rotation of the gamut.

The solo strings have their own clockwork that begins in the cello, ascends in register through the solo violin, entering at a faster "tempo" with each instrument. Each layer presents the eight pitches of the gamut fundamental, rotated eight times before cadencing on C. Because of the different durations inherent in the different tempo layers, this final C descends through the full frequency spectrum from high violin C to low cello C.

Accompanying this first nonmetronomic playing in the score, Adams provides the expressive indication ". . . singing . . ." (Example 18). While the rhythms here remain integer multiples of their respective normative durations, their patterning is seemingly at random. In fact, within each layer is a rhythmic algorithm or talea that remains the same with each phrase, but uncharacteristically changes with each section in a nonintuitive way. Thus noting the durational series in each B section yields the table in Example 19.

While the durations at the extremities remain the same, the interiors seem to lack a pattern. In fact, the algorithm is based on the relation of each successive pitch of the gamut to the gamut's initial pitch. Taking the four-pitch groupings and treating them as an eight-pitch stacked chord, Adams numbers the pitches from 1 through 8 based on where they stand in vertical relation to the initial pitch of the gamut (see Example 20), and "plays" the numbers in the characteristic melodic figure of the section, here C-E♭-A♭-C; F-A♭-D♭-F to create the *talea* (1 2 4 6), (3 5 7 8). Surprisingly, the *taleae* do not themselves rotate.

All of the many processes of the B section are coordinated such that their midpoints occur at the same time; they will all begin their fifth iteration simultaneously. (In B1, this occurs in m. 157.) In these sections Adams sculpts his sound in a non-linear manner: each B section expands from a focal point, much as spokes from an axle or wax dripping around a candle. Rather than moving forward from a specific point to a specific point in the way that one builds a story from beginning to middle to end, Adams constructs his narrative from the center and asks that it be experienced as moving toward and away from that center. The listening experience is much like a cyclone, with more and more complexity, more and more elements entering before clearing out ever so briefly at the midpoint; from there, all the accumulated complexity fades away. The listener doesn't ride the experience, but rather passes through it.



EXAMPLE 18: CELLO/VIOLA, MM. 121–130.

B1	1	2	4	6	3	5	7	8
B2	1	3	5	7	2	4	6	8
B3	1	2	5	6	3	4	7	8
B4	1	3	4	7	2	5	6	8

EXAMPLE 19: SOLO STRING TALAE IN B SECTIONS.

1	2		4	6		
C	E♭		A♭	C		
		F	A♭		D♭	F
		3	5		7	8

EXAMPLE 20: RELATION OF A JUXTAPOSED CHORD TO GAMUT.

To summarize my analysis, in *for Lou Harrison*, there are two perfected musical objects that alternate. One is a series of rotated gamut arpeggiations at different speeds, their entrances ordered in permutations of four, five, six, or seven measures and placed within a particular duration. The other, rotations of gamut fundamental arpeggiations organized around the number eight, spreads from a central axis. In texture, it moves from relative simplicity to greatest complexity before returning to relative simplicity. Throughout the composition, time passes and sounds happen; one section moves to another. Because the piece does not contain the conditions necessary for creating expectations, the listener cannot interact with the work by guessing what will come next. Rather the work is a vast environment within which the listener is placed.

Given the constant saturation of the pitch space, the consequent meaninglessness of consonance and dissonance, and the primacy of embodied structural process as narrative, we are left in the uncomfortable position that the choice of one pitch over another at any given time is irrelevant to the composition. The experiential reality does not

rely on pitch-based tension. The piece would have the same environmental reality whether it used the gamuts it uses or some other gamuts. The pitches Adams chooses, while effective, are merely icing, provided as an incentive for the listener to sit still for sixty-six minutes. Absurd though it may seem, in essence, it is somehow nothing more than a structure manifested through sound.[15]

"Music of Place" versus "Music as Place"

If expressing a structure through sound is the point of the composition and the structure is expressed without anomaly, then neither analytical models noting formal incongruities nor layered theories of analysis are particularly helpful. Furthermore, noting the structure is meaningful in the way an algorithm is meaningful: it may be an elegant machine, but it is still a machine. How then can we ascribe meaning to this clockwork?

In a 1998 interview Adams is quoted as saying about his compositional goals: "[By 1991] I'd begun to move beyond music about place, toward a more complete sense of music as place. In these pieces, the musical textures and gestures evoke the feeling of northern landscapes, but they're no longer direct translations of sounds from the natural world."[16] Adams is suggesting a difference between a representational music that expresses a particular environment, and an abstract music that creates an imaginary landscape. Both categories of expression, the "music of [physical] place" and the "music as [metaphysical] place," partake of the same concerns and use the same gestures. Recall the photograph of Adams holding a wind-driven harp on a cliff in the Brooks Range (Example 1). To recreate the sense of these mountains in a place outside of Alaska, Adams recorded aeolian harps placed in various locations and later transcribed their sounds.3 In this way, he could capture the environment, through a symbol of that environment, here its winds, caught in their activation of tuned strings. In transcribing and orchestrating this sound as *Earth and the Great Weather*, Adams recreates an Alaskan landscape as perceived by an uninterested observer (the wind-driven harp) in a ritual setting—the concert hall. Interspersed with these winds are percussion quartets that seek to evoke another symbol of the North: the calving of glaciers. In combining these two sound-symbols, Adams creates something greater than an artist-centered tone poem. He represents a particular environment, a physical location in Alaska, through musical transcription of archetypical sound-symbols of that environment. With a change of symbols, similar representations could be made of places as diverse as the jungles of New Guinea or the subways of New York.

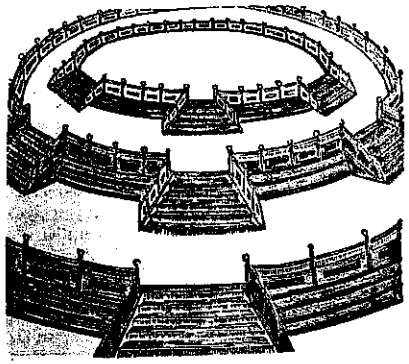
To create the "place" of an abstract landscape, Adams uses the same techniques (translating "nature" to "sounds") that he uses in his "representational" music. In the abstract music the "winds" and the harps are both products of Adams's imagination. The world he presents is a familiar Platonic-Pythagorean orderly universe of sounding number, and the place within that world is manifested in the speed and strength of its winds and the architecture of its landmarks. The fixed strings of the aeolian harp become the fixed pitches of the gamut. The winds that excite these harps are transcribed as the arpeggiations of the gamut. As the harps placed within an environment are excited at different speeds, so too is the gamut. With each rotation, the listener sees, hears, and feels the winds from a slightly different angle.

In being constructed from left to right as passing time segmented, the A sections present an environment devoid of features, simply transcribed winds experienced by the listener in time. The B sections are constructed differently: a span of time is chosen, its central point noted and events are balanced on that axis. The placement of these events is such that their central point is the same as the axis of the entire section. If the A sections are more natural, the B sections are more architectural, objects within the A environment. These structures don't engage the listener, tugging his heart this way and that, rather, like many ritual structures, the listener passes through them.

While many ritual structures come to mind as a metaphorical analytical model for the B sections, I would like to explore two particularly apt ones: the Circular Altar at Beijing's Temple of Heaven, and the Tholos, or beehive, tombs of Mycenae.

Visitors to the Circular Altar are impressed immediately by its sense of proportion and the craft of its construction (see Example 21). Each of its three white marble tiers is made of nine rows, each comprised of a multiple of nine stones: the ninth row has eighty-one stones, the tenth, ninety and so forth. The number of stairs and gates are also multiples of nine. For its architects, nine was the number of highest auspiciousness; ancient Chinese cosmology saw heaven as circular and comprised of nine levels and earth as made of nine continents, centered around China. The farther one moved from this most auspicious center, "the more hostile, uninhabitable and strange the lands become."[18] When the Circular Altar was built in 1530, the Ming emperor prayed for good weather from its center. Nowadays, on climbing to the top the requisite activity is to push past the other tourists to get a photo of oneself at the center of the universe.

Past or present, the Circular Altar is a perfectly ordered physical space built around a central ritual axis. A visitor, or the emperor himself,



EXAMPLE 21: CIRCULAR ALTAR, TEMPLE OF HEAVEN, BEIJING.

approaches it, walks through it to the central point—the axis from which all symmetries radiate—and walks out. In leaving, they experience the same structure in reverse, whether approaching a new vista (walking through) or retracing their steps (walking back).

How can we use this metaphor as a model for listening to process compositions such as *for Lou Harrison*? Given the constant saturation of the pitch space, analyzing its harmony or counterpoint, while perhaps an interesting narrative in itself, is not the primary narrative: the composition does not privilege tension and release.[19] To rephrase, neither of the two most powerful possible perceptual saliences of it—larger-scale intervallic expansion (ambiguous in this work though not in all of Adams's work) and the mysterious engulfing properties of "sound" (a debatable topic to say the least)—relies on pitch choice as an arbiter of moment-to-moment experience in the way that they do in a tonal composition. Beyond momentary shifts from one section to another, listeners don't feel themselves to be perceptually near or far from a normative sonority.

Instead, an architectural model can offer a way to gauge the temporal experience in a composition such as this. Like the altar, the B section has a central point and structures that radiate from it. Like the tourist at the altar, the listener in the ritual space of the B section judges his or her location in the structure by their relation to the larger architecture, specifically, the center. In the architectural reality of the Altar, a physical

point is only meaningful in relation to the full structure; the central ritual axis is only meaningful because of the symmetries that radiate from it. Without the structure built to contain it, the same geographic coordinate would be meaningless.[20] The same is true for the central point in Adams's B sections, the coming together of a structural polyrhythm or phase-shift, or for that matter the transcribed winds. Without the frame, "sound" would not be "music."

If we accept the architectural model of structure and consider the individual sections as places that the listener traverses in time, a percipient can judge location and progression in relation to the larger structure of the work: its beginning, the time that has passed since that beginning, and its assumed, or hoped for, ending. This is the same whether the metaphorical structure is the Temple of Heaven, the Empire State Building or the *galis* of Old Delhi. We judge our level of tension in this highly saturated music relative to the listener's and the process's relation to and distance from certain poles of safety; as the listener or traveler approaches known areas, the sense of unease diminishes.

Applying this theory of structure now to the B section, for instance B2 (measures 311–444), one can note three points of security: the two-measure presentation of the new gamut (an area in which the listener is secure and insecure at the same time), the central point (m. 379—effectively a far-out point, to use Taruskin's parlance, though more symbolic than perceptual), and the notated fermata that closes the section (a point of repose). The areas of greatest insecurity would seem to be the points furthest removed from these structural pillars. In *for Lou Harrison*, there are large barren swaths of insecurity. In a piece like Steve Reich's *Piano Phase* these no-mans lands are arguably more numerous and less threatening.

If we consider distance to/from points of stability as a primary perceptual model, this very distance is the key to mapping out how "lost" the listener is in the structure. Through this, the analyst can create a stand-in for higher-level consonance and dissonance. Thus, in a world in which there are no other factors at play, levels of "consonance" and "dissonance" could be determined by simply noting the halfway point between areas of stability. In *for Lou Harrison*, however, the calculation is complicated by the increase in density which contributes to an increase in perceptual tension: imagine entering a maze of streets in which the further you go, the more people there are.

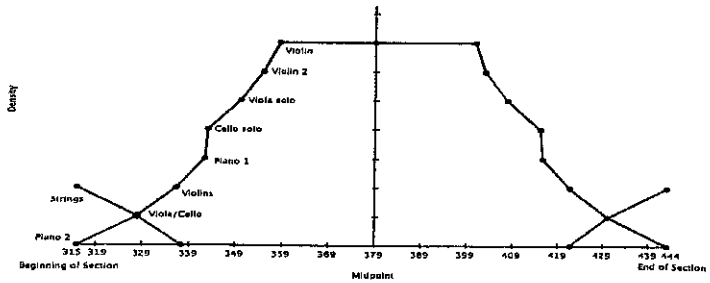
To envision this heightening of perceptual tension, I suggest again turning to architecture and the arch, or to extend the metaphor of the ritualized memorial space—*for Lou Harrison* is, recall, a memorial work —its precursor: the dome of a tholos or beehive tomb.

The chamber of a Tholos tomb (Example 22) is created by placing stones on top of one other such that each level pokes out slightly further into the space of the dome, a process known as corbelling. While the forms of individual tombs differ—some are above ground, some below, some are true domes, while others have several changepoints in their arcs—and while scholars have debated and refined mathematical models regarding their construction, among those who study such things, there seems to be an agreement that the corbelling process did not use a consistent slope.[21] In their article on modeling prehistoric corbelled domes, Fan and Brooks stress the importance of the changepoint in the overall arc of the dome in order, it seems, to give the structure a greater stability.[22]

With this in mind, turn again to Adams's B sections. Mapping out the entries of the various layers as points on a curve with the timepoint of entry along the x-axis and the density mapped to the y-axis demonstrates that like an ancient corbelled dome, Adams's B sections have change-points in their density over time (see Example 23). Entries are not evenly spaced, but correspond to the orchestration levels of the work: the strings and pianos are the first level with the lyrical soloists atop.

I doubt highly that Adams was consciously seeking to represent a tholos tomb, a plateau or *tepui* in the B sections. What I am suggesting is that this architectural model provides a reasonable facsimile of the process of perceiving the density and the tension/confusion in the B sections of this composition. The processual dissonance is not a straight line or curve, but instead proceeds to a particular tension goal before moving beyond it.[23] Mapping out the tension as such demonstrates a sort of perceptual breakdown of the B sections from beginning (here

EXAMPLE 22: THOLOS OR BEEHIVE TOMB: THE TREASURY OF ATREUS.



EXAMPLE 23: GRAPH OF DENSITY OVER TIME, *FOR LOU HARRISON*, SECTION B2: MM. 315–444.

315) to entry of Piano 1 (342); entry of cello (343) to entry of violin (358); and from there to the midpoint (379).

The various models I have proposed to understand how process tension stands in for harmonic tension could be applied to other process works, whether their narratives are derived from increasing density or polyrhythmic complexity. These graphic representations continue the inexact artistic process of translation. As Adams represents a natural world in sound, these graphic representations seek to take that sound and translate it back to landscape. To take a metaphor to its own far-out point, the environment proposed by Adams in *for Lou Harrison*, with its A sections of rushing winds and B sections of ritual spaces, is Adams's image of a memorial ground for Harrison that the listener explores in Adams's time. In this landscape, the listener stands passively: deprived of expectations, he or she must simply abide until the process reaches its inevitable conclusion.

Notes

1. A concise and readable biography can be found in Alex Ross's portrait of the composer. Alex Ross, "Song of the Earth," *The New Yorker* (May 12, 2008).
2. Program note to *for Lou Harrison* (Taiga Press, 2003).
3. A look at the catalog of mixed instrument works demonstrates that most have a similar palette. Note even Adams's "Japanese" work, *In a Treeless Place* (1999), is for three shakuhachi ("sustaining"), three kotos ("percussive/arpeggiating"), sho ("sustaining") and cello ("lush").
4. Email to the author, 24 April 2006. Adams also makes no apologies for the lush sound of the A sections, saying "Lou was a pretty emotional guy." The Harrison piece is scored for high and low voices, trombones, four large tambourines and an enormous gong carried on a carriage. In the solemn processions, tambourines and gong are replaced by hand bells and a bass drum. The processions are repeated for the time allotted.
5. I say "relatively" because Adams is not above changing register when exigency calls for it. The registral fixity is perhaps related to Varèse's use of fixed sonorities "projected" into space, see Jonathan Bernard's *The Music of Edgard Varèse* (New Haven: 1987).
6. In acoustic works, Adams has shown little interest in utilizing the full chromatic complement within a gamut. *Red Arc/Blue Veil* (2002) makes use of it, as did an early version of *The Immeasurable Space of Tones* (1998–2001).
7. Adams says this correspondence of rotation and chord inversion comes from Feldman. Personal correspondence, 18 July 2008.
8. In gamuts that have the same pitch classes as opening and closing pitches, the rotations tend to elide, rather than reuse (. . . 12,13,14,1,2,3 . . .). See, for instance, Piano 2 during section A1.
9. If the quarter note is at 60 bpm, steady quintuplet quarters are equivalent to quarter notes at 75: ((60/4)*5). "Corresponding tempo" is a tempo that unites several disparate tempi.
10. Page 1 of the score is representative of all A sections; Page 20 is representative of all B sections.

11. This is effectively the same process. If we think of each note of the tetrad as a particular stratum, then within each stratum there is a slow arpeggiation of the gamut.

12. For example, Piano 1 in A1d (6 7 4 5) becoming (7 4 5 6) in A2a.

13. Technically, these opening tetrads have series that remain the same for the beginnings and ends of each B section. See the opening of B2 for example: (1 2 3 4), (2 3 4 5), (3 4 5 6), etc. This is not consistent as Adams has made accommodations based on a desire to have the strings play *non divisi*. See for instance the opening and conclusion of B1. Numbering the pitches of the gamut from 1–8 and labeling according to ascending pitch the orchestral strings minus the bass at m. 93–108 play: (1 3 2 4), (2 4 3 5), (3 5 4 6), (4 6 5 7), (5 7 6 8), and (6 8 7 1) rearticulating every eight units of their respective normative values.

14. The bass in B2 uses the series of fifths built on C.

15. One could say the same of Reich's *Piano Phase* (1967) or any number of process compositions.

16. Gayle Young, "Sonic Geography of the Arctic: An Interview with John Luther Adams." *Musicworks* 70, 1998: 38–43.

17. The literalness of the transcription is debatable. Adams's wish to transcribe nature is evident as early as his *songbirdsongs* (1974–1980) which present, again debatably, the sounds of nature unadorned by composerly interaction. Nevertheless the semiotic association of arpeggios and winds is longstanding.

18. See Livia Kohn, *Early Chinese Mysticism* (Princeton, 1997), 87ff.

19. Adams equivocates when asked about the question of tension and release. In an email to the author on 24 April 2006, he writes: "I don't think in terms of consonance and dissonance in the usual sense. Tension and release is more a product of texture, weight and the sheer physical volume of sound. . . . The ear shifts from one tempo layer to another to another. As the waves of sound ebb and flow, the individual layers come in and out of focus. Maybe these textural changes provide a temporal/textural tension and release that takes the place of harmonic consonance and dissonance."

20. Even assuming the physical coordinates of the central axis could have some sort of astronomical or historical significance, it is still a significance based on a system that is then placed on the land. Outside of an arbitrary system, the land itself has no inherent value.

21. Of late, the question of what mathematical models can tell us about the construction of and relationships between ancient corbelled domes has been of considerable interest to archaeologists and statisicians alike; until recently models were limited to two-dimensional renderings. Such domes include underground tombs such as Mycenae's Treasury of Atreus as well as the above ground tombs of Crete. The *locus classicus* of the field appears to be W.G. Cavanaugh and R.R. Laxton, "The Structural Mechanics of the Mycenean Tholos Tomb," *Annual of the British School at Athens* 76 (1981), 109–140, whose single curve model was later updated. See, for instance, Y. Fan and S.P. Brooks, "Bayseian Modelling of Prehistoric Domes," *The Statistician* 49, part 3 (2000), 339–354 and Nicole Lazar et al "Corbelled Domes in Two and Three Dimensions: The Treasury at Atreus," *International Statistics Review*, Volume 72, no 2 (2004), 239-255. It is thought that similarities in mathematical structure indicates similarities in construction technique; similarities in construction technique might indicate contact between builders.

22. Recognizing changepoints, one notes four stages in construction: a small foundation; a near vertical wall to approximately shoulder height; the more tapered dome; and the horizontal capstone to hold it in place. Fan and Brooks, 340.

23. Furthermore it suggests that there is a certain importance to the measure in which both Piano 1 and the solo cello enter.