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Ecological Aspects of the Music of John Luther Adams

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ECOLOGICAL ASPECTS OF THE MUSIC OF JOHN LUTHER ADAMS

by

DAVID A. SHIMONI

A dissertation submitted to the Graduate Faculty of Music, in partial fulfillment of the requirements for the degree of Doctor of Musical Arts in Performance, The City University of New York

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This manuscript has been read and accepted for the Graduate Faculty in Music in satisfaction of the dissertation requirement for the degree of Doctor of Musical Arts.

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THE CITY UNIVERSITY OF NEW YORK
Abstract

ECOLOGICAL ASPECTS OF THE MUSIC OF JOHN LUTHER ADAMS

by

DAVID A. SHIMONI

Advisor: Professor Philip Lambert

The composer John Luther Adams envisions his role as one who re-imagines and re-creates relationships with other human and non-human beings through music. This dissertation consists of an examination of songbirdsongs, Earth and the Great Weather, In the White Silence, Strange and Sacred Noise, The Place Where You Go to Listen, and Inuksuit to determine whether, and how, Adams succeeds in re-creating these relationships.

In the Introduction various means of connecting music and the natural world are reviewed, a semiotic and ecomusicological framework for analysis is established, and a listening typology is suggested. In the following chapters, analysis of Adams’s six works is based on his compositional process, the musical scores, and the listening process that each piece facilitates.

What emerges are multiple ways in which Adams facilitates new relationships amongst people and between people and the natural world. In works like songbirdsongs, Earth and the Great Weather, and Inuksuit, Adams directly employs the sounds of the natural world but helps listeners to focus on them as sounds rather than as tools for his own compositional expansion. Works like The Place Where You Go to Listen and Inuksuit integrate listeners into their specific natural environments. In almost all of his works beginning with Earth and the Great Weather,
Adams limits the amount of personal expression that he puts into his music, structuring the music instead according to algorithmic processes. He also transfers creative responsibility to his performers in open works like *songbirdsongs* and *Inuksuit*, and in the former ethological rules established by songbirds guide the performers as well. In *The Place Where You Go to Listen* he leaves determination of the musical surface in the hands of the natural world itself. Finally, in all of his music, Adams asks the listener not to listen to his “message” but rather to an unfolding process in the music that parallels something in the natural world. The pieces reward a patient, prolonged attentiveness with an experience of beauty and/or power and a deep sense of place.
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This dissertation might not have happened were it not for Norman Carey, my program director at the CUNY Graduate Center. When I was searching for a dissertation topic and even considering not writing a dissertation, Dr. Carey brought my attention to an article featuring John Luther Adams. Dr. Carey also suggested that I look at the work of Jean-Jacques Nattiez, which proved to be a very important part of my framework. And he led me to Dr. Lambert, the world’s fastest editor. Finally, due to several intervening personal circumstances, Dr. Carey was willing to extend my enrollment at the Graduate Center until I completed the project. His support and suggestions during this process were invaluable.

I would not have heard The Place Where You Go to Listen or been able to explore the archive of John Luther Adams without the assistance of the Music Department of the Graduate Center, which awarded me a Doctoral Student Research Grant to travel to Fairbanks, Alaska.

For the figures in this paper, I received very timely and generous assistance from my sister-in-law, Genevieve Zetlan, and from Dan Pardo.
John Luther Adams himself was a great support and invaluable source of information. From the moment when I first made contact with him, he has been willing to answer any question, send me any score, and provide me with access to any resource I needed. More importantly, I thank John for his dedication to music and the planet. He is an inspiration.

Finally, I thank my whole family and especially my wife, Jennifer, whose patience with me throughout the last five years has been tremendous and wholly undeserved.
To my daughter Katarina
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CHAPTER 1. INTRODUCTION

The Challenge

The composer John Luther Adams likes to write both music and prose. His first book, *Winter Music*, is a collection of essays about music and life that he wrote over several decades. In an essay written in 2001 entitled “Beyond Expression,” Adams sets forth a belief that music can encompass more than the expression of emotion and drama characteristic of many Romantic composers:

In the nineteenth century, Western music was swept away by the cult of the composer—the solitary hero whose trials and triumphs provided the plot for extended musical narratives and dramas. But in the larger context of history Romanticism was an anomaly. It seems to me that much Western music before and since contemplates something more transpersonal, some deeper mysteries inherent in the sounds of voices, instruments and time.¹

Adams then connects our contemporary estrangement from the non-human natural world to the Romantic ideal of the individual:

The natural world is the most fundamental source of human intelligence, creativity, and culture. We don’t truly create anything except answers to creation. And we’re an inseparable part of nature. But in recent times we’ve forgotten this. In the nineteenth century European composers celebrated Romantic individualism and the rise of the middle class in industrial society. At the same time the West lost touch with our intimate connections to the Earth. And over the past two centuries the land and water, the wild animals, and the indigenous peoples of the world have paid a terrible price.

Finally, he articulates what he sees as a challenge for artists of all stripes today—nothing less than re-shaping the collective view of our relationship to the planet:

The challenge for artists today is to move beyond self-expression and beyond anthropocentric views of history, to re-imagine and re-create our relationships with this

planet and all those (human and other-than-human) with whom we share it. I believe that music, art, and literature in the twenty-first century must embody this change. If artists lead, society will eventually follow. . . . Art can be and in some ways must be intensely personal. But personal statements alone are not enough. Art has the power to take us beyond ourselves, to remind us of the larger, deeper miracles of the world.

This dissertation is an attempt to discover how Adams has approached that challenge. In this Introduction I describe some of Adams’s formative experiences, examine the aesthetic issues Adams’s essay presents, look at other attempts to incorporate the non-human natural world into music, and articulate an ecocritical and semiological framework in which Adams’s music may be examined. The body of the dissertation consists of the next six chapters, each about a different one of Adams’s compositions. The works examined here span a large part of his career (1974-2009) and are variously scored for chamber ensemble, percussion ensembles, orchestra with and without narrators, and electronic instruments.

By the time he wrote “Beyond Expression,” Adams had already written four of the works examined here and over forty works in total. It would be silly to evaluate earlier works in light of an essay that he wrote later on. Therefore, the paper should not be read as a trial to examine whether Adams is found to have been consistent with his statements or guilty of artistic hypocrisy. Moreover, his comment about “the challenge” to artists does not necessarily preclude there being other artistic challenges worthy of meeting.

The paper instead asks, what does it mean to “re-create our relationships with this planet” through music? What are the compositional means available to Adams? What new relationships might be in his work? How might they be perceived? And does a listener experience any of Adams’s works in a fundamentally different way from most earlier works of Western art music?
John Luther Adams was born on January 23, 1953 in Meridian, Mississippi. His father worked most of his life for AT&T, which led Adams’s family to move several times during his upbringing. From 1961 to 1968, the family lived in Millburn, New Jersey. It was there that Adams learned to play drums and helped form a band called “Pocket Fuzz,” which mostly played covers of the Beatles, the Byrds, and the Beach Boys. Beginning a lifetime pattern of favoring independent learning over formal training, Adams took only a few drum lessons and rarely bought sheet music for the songs he was covering. Although he listened to a lot of pop music, Adams’s exposure to classical music as a youngster was very limited. In his teens, though, he became a big Frank Zappa fan, and it was through Zappa’s music and record jackets that he found his way to Edgard Varèse.

Amidst the turmoil of 1968, Adams and his family moved to Macon, Georgia. Adams, with his long hair and liberal politics, struggled to fit into high school in the South. After he was kicked out of one private school, his parents enrolled him at the conservative Westminster School in Atlanta for his junior year of high school. There he met Margrit von Braun, the daughter of German rocket scientist Werner von Braun, and the two formed a lasting relationship. He also formed another band called “Sloth” with his classmates. He again became known as a troublemaker amongst the students, however, and was not invited back to the school after his junior year. Adams, therefore, never finished high school.

---

² The information that follows was culled from conversations with Adams, a chapter of Winter Music called “Roots and Influences,” and Adams’s unfinished and unpublished memoir.

³ Columbia Odyssey 32 16 0302, ©1969. Originally released as Morton Feldman—New
One afternoon around 1970 Adams turned on the television and saw an Arctic landscape with a small figure walking towards the camera from a great distance. After watching the television version of Glenn Gould’s radio program *The Idea of North*, Adams felt his first longing to escape the South and experience the white landscapes of the Arctic. Around the same time, Adams made two musical discoveries: John Cage’s book *Silence*, which deeply influenced his thoughts about music, sound, and the act of listening, and the LP, *Morton Feldman: The Early Years.* He describes the instant when he first heard Feldman’s music:

I put the record on. The first cut was *Piece for Four Pianos* from 1957. Within a couple of minutes I was transported to another world. When the music ended I picked up the needle and played it again. Who knows how many times I repeated this. I couldn’t figure out what it was about this music that made me feel this way—an almost painful longing for something that hadn’t yet happened, for a place that didn’t yet exist. And I wanted to be in that place for as long as I could. It was right about then that I knew what I wanted to do with my life.

The sensuality of Feldman’s music became a lifelong model for Adams. In the fall of 1970, Adams enrolled at Mercer University in Macon and immersed himself in music for the first time. He took his first composition lessons with Fred Coulter, who taught him classic serialist techniques and provided an electronic music studio in which Adams wrote his first electro-acoustic pieces. A recording of Alvin Lucier’s *I am Sitting in a Room* made a particularly strong impression around that time, as did Harry Partch’s book *Genesis of a Music*.

In the fall of 1971 Adams and Margrit moved to California. While Margrit enrolled at UCLA, Adams enrolled at the California Institute of the Arts in Valencia. There his composition teacher was James Tenney. Adams writes, “I can’t imagine what would have become of me, both

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musically and personally, had I not had the supreme good fortune of striding into his studio that [first] day.” Tenney had studied with Ruggles and Varèse and played in the ensembles of Harry Partch, Philip Glass, and Steve Reich. From Tenney, Adams gained an appreciation for that line of experimental composers that began with Charles Ives and Henry Cowell and extended through Cage, Feldman, Pauline Oliveros, and Lou Harrison. Speaking on behalf of the students in Tenney’s studio, Adams writes, “The sense Jim gave us of being part of a larger, deeper stream in music was a great encouragement to . . . young, self-styled iconoclasts.” Tenney was working on his monothematic Postal Pieces during Adams’s first year at Cal Arts. Adams writes:

> Not since Lucier’s I am Sitting in a Room had I heard music that so powerfully conveyed the physical magic of sound. The remarkable clarity and strength of Jim’s music, his fierce commitment to both intellectual discipline and sounding acoustical truth set the highest possible standards for me. All these years later I’m still trying to live up to James Tenney’s example.

Adams also studied with Harold Budd (counterpoint), Leonard Stein (composition and analysis), Serge Tcherepnin (independent work), Morton Subotnick (electronic music), and Mel Powell (analysis). The sensuousness of Budd’s Madrigals of the Rose Angel made a deep impression on Adams, along the same lines as Feldman’s music. From Tenney and Budd together Adams learned that “music could be intellectually sound and sound beautiful at the same time.”

Another composer who influenced Adams was Peter Garland, a fellow student of Tenney’s. Adams writes that a performance of Garland’s The Three Strange Angels at Cal Arts struck him deeply. In addition, Garland had already begun intermittently publishing Soundings, a new-music journal that he continued to publish for more than twenty-five years.

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7 Ibid.  
8 Ibid.  
9 Ibid.
Before Cal Arts I’d unconsciously subscribed to the notion that to be truly new and interesting, music had to be complicated. Now here I was surrounded by music that was formally simple yet sonically rich and bracingly new. Not just the music of Tenney and Budd, or Charlemagne [Palestine]’s incredible piano “strumming,” but also the music of my classmates Garland, [David] Mahler and [Michael] Byron. The fact that this music was intelligent and immediately alluring helped me understand what until then had been more of a concept than a real conviction: Music is all about sound.\(^\text{10}\)

At Cal Arts, Adams discovered Messiaen’s book, The Technique of My Musical Language, which helped him to develop his own ideas of creating modes from limited sets of intervals. He writes, “To this day when I compose in equal temperament I often use quasi-serial devices to mix my harmonic palette. The harmonic colors may be bright and consonant. But the method behind them is not all that far removed from those of Messiaen or even Boulez.” Adams also discovered Cowell’s book, New Musical Resources:

I’m not sure how much of Cowell’s thought I understood. But I remember how excited I was, especially by the chapter on rhythm, in which Cowell proposes nothing less than a “unified field” theory of music – the integration of pitch and rhythm through the whole-number relationships of the harmonic series. Cowell’s ideas about rhythm have inspired many other composers, from Conlon Nancarrow to Kyle Gann. And they’ve been a touchstone for my music ever since.\(^\text{11}\)

Adams wrote the first two pieces that remain in his catalog while at Cal Arts. Out of an exploration of bells and the English tradition of change ringing came bells for alto flute, violin, piano, harp, vibraphone and strings. Always Very Soft, a seven-minute piece for percussion trio and de-tuned cello, was inspired by the percussion music of Cowell, Cage, and Harrison.

While his experience at Cal Arts was opening Adams’s ears to new musical possibilities, California was also opening Adams’s eyes to the environmental threats of rapacious sprawl. The California condor, a majestic bird with a wingspan of ten feet and a lifespan of sixty years, was in the news, as it was verging on extinction. Habitat destruction, poaching, DDT poisoning.

\(^{10}\) Ibid.
\(^{11}\) Ibid.
electric power lines, and lead poisoning (the condors fed on animals shot with lead bullets) were some of the human causes of its decline.\(^\text{12}\) In the early 1970s, the last few wild condors lived in the Los Padres National Forest, not far from Cal Arts. Adams became obsessed with their fate. Near Cal Arts Adams also watched a colony of prairie dogs, whose habitat was being encroached on by sprouting housing developments. His desire for wilderness was also fed by his daily bus rides to Cal Arts from his apartment in Los Angeles:

At the Greyhound station I’d listen for the announcement of my bus, sung out by a stentorian baritone, like something right out of a piece by Partch: “San Fernando, Newhall, Saugus, Palmdale, Lancaster, Mojave, Inyokern, Lone Pine, Independence, Big Pine, Bishop...” I loved the poetry of those names and the places they conjured in my imagination —sere, empty desert places, clean, high mountain places that I longed to see, places in the much larger world out there beyond the teeming Los Angeles basin. I dreamed of staying on the bus past my stop and disappearing into those open spaces.\(^\text{13}\)

In the spring of 1973, Adams’s time at Cal Arts came to an abrupt end. His father cut off his funding, and Adams was forced to apply for accelerated graduation. Again his formal education was constrained. That summer he and Margrit moved back to Georgia. While living in the countryside south of Atlanta, he wrote *Green Corn Dance*, an homage to Native American drumming, influenced by rock and roll, Cage, Harrison, and Cowell. With a $700 grant from the National Endowment for the Arts, he bought two Sony tape recorders and a used Fender Rhodes electric piano. With those, he began to make electro-acoustic landscapes.

Late that year, Adams and Margrit moved onto a farm owned by J. Waymon Stokes, a mule trader. Adams worked for the owner and farmed a vegetable plot of his own. It was on this farm that Adams started listening carefully to birdsongs. He began to compose *songbirdsongs*, the first piece analyzed in this dissertation.


\(^{13}\) Adams, “Southwest,” unpublished memoir.
Now, following my studies with Jim Tenney and Leonard Stein, my teachers were the birds. . . . Working in a flurry of excitement I soon had the beginnings of *songbirdsongs* – a cycle of pieces for piccolos and percussion. This felt like the true beginning of my own musical voice.\(^1\)

John and Margrit were married in the summer of 1974. Their honeymoon was a canoe trip across the Okefenokee Swamp on the Georgia-Florida border. In the next year, Adams returned many times to Okefenokee. “These canoe trips awakened my passion for wild places,” Adams writes.\(^2\)

In the spring of 1975, Adams enrolled at Georgia State University in Atlanta for part-time graduate study with Charles Knox. There he met Anne McFarland, who taught flute. She and a colleague played the earliest version of *songbirdsongs*.

In the summer of 1975, Adams made his first trip to Alaska. Despite the vastness of the state, Adams was able to see many of its varied and spectacular ecosystems. He hiked up the side of the enormous Mendenhall Glacier near Juneau, where he heard the sound of the glacier melting deep beneath the surface (he later used similar sounds in *Earth and the Great Weather*). He took a canoe trip sponsored by the Sierra Club across Admiralty Island; there, in the old-growth rainforests, he heard ruffed grouse and hermit thrushes for the first time (and made notes that were later incorporated into *songbirdsongs*). He went to Denali (then Mt. McKinley) National Park, where “the air seemed to be saturated with music, just beyond the reach of our ears.”\(^3\) Finally he visited Glacier Bay and Katmai National Monument, home to a dense population of brown bears and the Valley of Ten Thousand Smokes. All in all, the variety of sights and sounds and the vast spaces completely seduced him.

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\(^1\) Adams, “Southeast again,” unpublished memoir.
\(^2\) Ibid.
\(^3\) Ibid.
From the old-growth rainforest to the highest mountain in North America to crashing tidewater glaciers to a volcanic moonscape, my first experiences in Alaska could easily have been the trip of a lifetime. Yet I sensed this was just the beginning. I’d found my home.17

Returning from Alaska to Georgia, Adams felt increasingly out of place. Although he loved life on the farm, he dreamed of moving to the North. In the meantime, his desire to connect to wild places was developing into a need to protect them. He lobbied in the Georgia Legislature against the building of a dam on the Flint River, where he had often canoed. Working for the Alaska Coalition, he also started to give presentations to local groups, with the purpose of encouraging people to write to their Congressmen in support of what became the Alaska National Interest Lands Conservation Act.

In 1976, Adams received a commission—his first—from the Atlanta Singers, whose conductor had been in the band “Sloth” with Adams. A canoe trip through the heart of the Okefenokee Swamp served as the inspiration for Night Peace. Adams’s father, from whom he had been somewhat estranged, came to the second performance of that piece. Clearly moved, he told his son afterwards that he would help financially with graduate school.

Adams applied to several schools. When he visited one of them, the chairman of the composition department told him that he was concerned about Adams’s lack of a traditional background. He told Adams that the first piece he would expect Adams to write would be “a composition in a traditional form, for instance a sonata for bassoon and piano.”18 After the interview, Adams sent the chairman a pithy rejection.

Not long after that, Adams realized that he was not cut out for academia. He preferred to learn what he still needed to learn on his own. He wanted to head for the wilderness. He

17 Ibid.
18 Ibid.
preferred Alaska, but when Margrit got a job working for the Environmental Protection Agency in Idaho in 1976, the couple moved there instead.

By this time Adams had received all the formal training he was going to get. His music was being shaped by his growing attentiveness to the natural world around him, his experience as a percussionist, the sensuality of Feldman and Budd, the single-minded rigor of Tenney, and the maverick ideas of Cowell, Partch, Cage, and Harrison. He was revising and developing *songbirdsong*, and he had made electro-acoustic tapes that he would shape into compositions many years later.

Throughout this dissertation I will include further details of Adams’s life amidst the musical analysis, but right now I want to look more closely at Adams’s artistic challenge and put it in its aesthetic and historical contexts.

**Nature in Music I: An Overview**

*The Quest for the Long White Whale*

In “Beyond Expression” Adams challenges artists to “move beyond self-expression and beyond anthropocentric views of history, to re-imagine and re-create our relationships with this planet and all those (human and other-than-human) with whom we share it.” By “re-imagine” I believe Adams is referring to an internal change in the artist, the creation of a new worldview and vision of the possible. With “re-create” Adams refers to the artwork itself, saying that it should present the human and non-human natural world in new ways. Adams is saying that not only should composers rethink their connection to the natural world but that something must be communicated to listeners as well. “Music . . . must embody this change. . . . Art can be and in some ways must be intensely personal. But personal statements alone are not enough.”
What Adams implies is that music is a semiological system. This proposition deserves examination. In the words of Ferdinand de Saussure, the French linguist who laid the foundation for semiology, a “sign” connects a sound-image (“signifier”) and a concept (“signified”) in the mind of a person receiving the sign. For example, in English the linguistic sign “cat” connects the sound [kæt] to the image of a cat in the receiver’s mind. A physical cat to which the person using the sign wants to refer is the “referent.” The logic of connecting the particular sound [kæt] with the image of a cat is, from a semantic perspective, completely arbitrary. What is important is that this sound is sufficiently supported by convention to maintain its relative stability in the English language.

Now let us think of music in semiological terms. Let us call the music the signifier and the concept (or chain of concepts) that the listener has after hearing the music the “signified.” Our re-created relationships with this planet are the “referent” which Adams wants to communicate. The question is, what forges the bond between the referent and the signified? In language, there are arbitrary conventions that connect sounds with the objects to which they refer. In Western music are there such rules?

The title of this section, “The Quest for the Long White Whale,” is taken from an essay by New Zealand sociologist Peter Beatson. Beatson reviews the history of nature imagery in classical music of New Zealand and provides a colorful restatement of this problem:

Nature—the referent, the ding an sich, the blatantly manifest yet epistemologically unknowable—lurks below the surface of the ocean of Being like a great white whale. The artist stands in a leaky boat, harpoon in hand. But how to drive the weapon home?  

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Many composers inspired by the natural world have tried to meet the challenge of getting the natural world into their music. What follows is a look at multiple ways in which they have attempted to do this. I will attempt to define each way and provide examples from different time periods. This is by no means a comprehensive listing of all musical instances but rather an inventory of some of the means available to Adams in reaching his aesthetic goals and a context for the evaluation of Adams’s music in subsequent chapters. I begin with three traditional techniques, then describe three technologically-dependent ones, and then list three more direct alternatives. Many compositions use more than one of these techniques.

1. Direct Imitation

The music of many cultures has long imitated sounds of the natural world. Deryck Cooke subdivides imitation into two types: “direct” and ”approximate.” According to Cooke, “direct” imitation may be made of “something which emits a sound of a definite pitch,”20 such as birdsong. One of the earliest notated birdsong imitations is in the Medieval rota *Sumer is icumen in* (c. 1250), where the cuckoo’s simple call is imitated vocally as part of a celebration of the arrival of spring (Figure 1.1). The common cuckoo’s call of two notes separated by a major or minor third fits easily into a tonal context. In the Renaissance more vocal imitations of cuckoos, nightingales, bird choruses, and chickens are found in pieces such as Jean Vaillant’s virelai *Par maintes fois* (late 1300s), Clément Janequin’s chanson *Le chant des oiseaux* (1528), and Pierre Passereau’s *Il est bel et bon* (1534). Though the imitations stand out for their use of nonsense

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sounds, repetition, and resemblance to simple bird utterances, Emily Doolittle makes the point that these pieces never stray from Renaissance contrapuntal techniques.  

Figure 1.1. *Sumer is icumen in*, a rota from c. 1250. The imitation of the cuckoo can be seen in m. 9.

In seventeenth- and eighteenth-century music, one finds instrumental imitations of a wide array of animals. There are well-known harpsichord miniatures by François Couperin (*Le gazoüillement*, 1716), Jean-Phillipe Rameau (*Le rappel des oiseaux*, 1724), and Louis-Claude Daquin (*Le coucou*, 1735). Bach’s only Sonata for harpsichord, BWV 963, contains a fugue that imitates a hen and a cuckoo. The German violinist Heinrich Biber wrote a nine-movement *Sonata violino solo representativa* (c. 1669), in which he dedicates one movement each to the imitation of nightingales, cuckoos, frogs, quails, cats, and cocks and hens. Haydn’s *The Seasons* (1801) also contains an abundance of imitations: “Summer” alone contains a crowing cock, flowing stream, shepherd piping, thunderstorm, bleating sheep, calling quail, chirping cricket, croaking frog, and evening bell.  

Imitative music could be both generic and virtuosic, as in the case of Vivaldi’s concerto for violin in A Major (1717). The outer movements of this piece contain both cuckoo-like calls

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22 Some of these would be better called “approximate imitations,” as explained later.
and virtuosic writing, leading the piece to be called either “Il Cucù” or “Il rosignuolo.”

Likewise, Handel’s Concerto for organ and strings, HWV 295 (1739), has gotten the nickname “The Cuckoo and the Nightingale” because of a second movement whose cuckoo sounds are clearer than any purported nightingale sounds.

In Mozart’s Ein musikalischer Spass (“A Musical Joke”), K. 522 (1787), it is possible that we see the first case of a composer imitating a bird not so much in melody as in form and style. The piece was long thought to be merely a parody of the popular music of Mozart’s day. In 1992, however, it was proposed that the inspiration for the awkward phrasings and off-key moments came from Mozart’s European starling, who died eight days before the completion of the piece.

An abundance of nineteenth- and early twentieth-century programmatic works for orchestra contained birdsong imitations: a few examples may be found in Beethoven’s Symphony No. 6 (“Pastoral,” 1808) (Figure 1.2), Smetana’s “From Bohemian Woods and Fields” from Ma Vlast (1879), Mahler’s Symphony No. 3 (1896), and Delius’s “The March of Spring” from North Country Sketches (1914). In all of these pieces the imitation of most of the birdsongs, though they provide exact pitches, is stylized (the simple call of the cuckoo being perhaps an exception). In fact, by this time composers were able to rely on high-pitched passagework containing a lot of trills to carry the connotation of birdsong, where “connotations”

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23 There are two different second movements, leading “Il Cucù” to get the label RV 335 and “Il rosignuolo” to get the label RV 335a, though neither second movement sounds particularly bird-like.

are, in Leonard Meyer’s definition, “those associations which are shared in common by a group of individuals within the culture.”

Figure 1.2. Ludwig van Beethoven, “Szene am Bach” from Symphony No. 6 (1808), featuring nightingale, quail, and cuckoo imitations.

In the first half of the twentieth century, some composers began writing actual transcriptions of birdsongs rather than stylized ornamentation. Béla Bartók developed what has been called a “nature music” style that often included short, overlapping imitations over an ostinato. An early example is “Night Musics” from the *Out of Doors* suite for piano (1926), which includes imitations of birds, cicadas, and frogs, juxtaposed with a chorale and peasant flute melody. A later example is the middle section of the second movement of his Piano Concerto #3 (1945), which contains birdsongs that Bartok notated while he was staying in Asheville, NC. The outer chorale-like sections of the movement are also, though less noticeably, derived from these birdsongs. Bartók’s expansive harmonic language allows for reasonably accurate transcriptions of these birds to be layered on top of one another.

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26 Bartók’s failure to notate the bird singers, however, has meant we are left to speculate about their identities. Maria Anna Harley suggests the Eastern towhee, wood thrush, and hermit thrush in “Birds in Concert: North American Birdsong in Bartók’s Piano Concerto No. 3,” *Tempo* 189 (1994): 8-16. I also hear the tufted titmouse.
Figure 1.3. Amy Beach, *A Hermit Thrush at Eve* (1922), measures 29-35. The hermit thrush imitations are the cadenza-like figures. Measures 34-35 are more expressive.

While staying at the MacDowell Colony, Amy Beach was captivated by the songs of the hermit thrush and included them in two piano pieces: *A Hermit Thrush at Eve* and *A Hermit Thrush at Morn*, opus 92 No. 1 and 2 (1922). Though Beach’s compositions are generally quite conservative harmonically, the imitative passages in these pieces are significantly more chromatic than the non-imitative passages; in addition, they are notated as cadenzas, implying a bird-like rhythmic freedom rather than a strict metrical placement (Figure 1.3). Beach, unlike most or all of her predecessors, points out in a footnote in the score that the songs are reproduced as authentically as possible.²⁸

²⁸ The same footnote appears in both scores: “These bird-calls are exact notations of hermit thrush songs, in the original keys but an octave lower, obtained at MacDowell Colony,
With Olivier Messiaen direct imitation of birdsong takes on a new importance. According to Maria Anna Harley, “Messiaen transformed birdsong from an ornament to an element of musical style, drawing particularly on its complex rhythmic ostinatos and varied melodic contours, and approximating birds’ microtonal intervals with the 12 chromatic pitch classes.”

He imitated birdsong generally in earlier works such as *La Nativité du Seigneur* for organ (1935) and *Quatour pour la fin du temps* (1941). Beginning with *Le merle noir* for flute and piano (1951), he began to insert specific birdsongs that he had notated into his compositions. He included them in many of his compositions for the remainder of his career. *Reveil des Oiseaux* (1953), portraying the dawn chorus, features birdsongs exclusively. Here, as in the thirteen-work opus *Catalogue d’oiseaux* (1956-58) for piano (featuring the songs of seventy-seven species of birds), the birds are clearly the subjects. In other works, such as the opera *Saint François d’Assise* (1960), birdsongs are just one element of the musical and dramatic texture.

What is significant is that in Messiaen’s music birdsongs clearly become structural entities. As Emily Doolittle writes, “Messiaen’s bird imitations go far beyond the simply programmatic. They permeate the melodies, harmonies, timbres, and forms—indeed the entire language of his bird-inspired compositions is informed by the birdsongs they [sic] contain. The importance given to birdsongs is radically different from that of most previous animal-inspired composers in that birdsongs are the substance of his work, not merely the surface.”

Although most of the direct imitations we find in Western Classical music are of birdsong, the release of the record *Songs of the Humpback Whale* in 1970 provided composers


30 Doolittle, “Crickets.”
with a new source of inspiration.31 Shortly afterwards George Crumb used amplified piano, cello and flute, as well as whistling, to imitate whale song in *Vox Balanae* (1971). Canadian composer Michel Gonneville used the ondes Martenot in *Le cheminement de la baleine* (1998) for a similar purpose.

More examples of direct imitation will be mentioned later. For now we can simply note that in Western classical music there has been a preponderance of birdsong imitation, a move from stylization towards authenticity of imitation, and increasing use of imitations as structural elements over the last century.

2. Approximate Imitation

![Figure 1.4](image-url)

Figure 1.4. Franz Schubert, “Wohin” from *Die Schöne Müllerin*, D. 795 (1824). The piano part imitates the “Bächlein” (brook).

According to Cooke “approximate” imitation is made of “something which emits a sound of indefinite pitch.”32 Already some examples of imitated frogs and crickets have been mentioned.33 Much more important is the sound of water, which has been frequently imitated. Little brooks are found in Vivaldi’s “La primavera” from *Le quattro stagioni*, Beethoven’s “Szene am Bach” from his Symphony No. 6, and Schubert’s “Wohin” from *Die Schöne Müllerin*

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33 Perhaps another one worth mentioning is Josquin des Prez’s frottola *El grillo* (“The Cricket,” 1505), which ingeniously imitates the echoing chirps of crickets.
Smetana’s “The Moldau” from *Má vlast* depicts a larger river. Fountains are imitated in Liszt’s *Les jeux d’eaux à la Villa d’Este*, and the ocean is depicted in Debussy’s *La Mer*. Thunderstorms have also been imitated in works such as Vivaldi’s “L’estate” from *Le quattro stagioni*, the fourth movement of Beethoven’s Sixth Symphony, Haydn’s *Seasons*, and Ferde Grofé’s *Grand Canyon Suite*.

Whereas stylization was a choice in direct imitations, composers are generally constrained to use accepted stylizations for approximate imitations, since these natural objects or forces do not emit sounds of a definite pitch. That is, the sound of a piano (the signifier) is quite different from the sound of a stream of water (the referent). Since something must connect the referent with a signified stream of water in the mind of the listener, certain kinds of stylized imitations have become connotations. For example, the “babbling” and “gurgling” of a stream is often imitated by a series of rhythmically even sixteenth notes progressing stepwise and circularly (Figure 1.4). The “whooshing” of ocean waves is often represented by sixteenths that are evenly spaced rhythmically but move over larger pitch spans.

3. Representation

Although some writers use the term “representation” to include the kinds of imitation that I have already discussed, I use it specifically to describe pieces that assign an element of the music to substitute for a part of the natural world that does not emit sound. Deryck Cooke explains that this “suggestion or symbolism of purely a visual thing, such as lightning, clouds or mountains, [uses] sounds which have an effect on the ear similar to that which the appearance of the object has on the eye.”

One famous example is Saint-Saëns’s “Le cygne” (“The Swan”)

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from Le carnaval des animaux. Unlike most pieces with birds as their subjects, this one does not imitate the song but rather the graceful movement of the swan—played by the cello—over the gentle ripples of the water (or perhaps the light reflecting on the water) played on the pianos.

Many of the other movements of Le carnaval also represent motion of animals and light. Ferde Grofé represents the sun coming up over the Grand Canyon in “Sunrise” in Grand Canyon Suite. Debussy’s Préludes for piano represent many non-sounding objects in the natural world, such as fog (“Brouillards”), heather (“Bruyères”), and water nymphs (“Ondine”).

When a composer uses representation, he will almost always employ what Lawrence Kramer calls a “designator”: a title, program note, or text that informs listeners of the representation, connecting the signifier to the referent.³⁵ For example, in Schubert’s song “Wohin,” Wilhelm Müller’s words, “I hear a little brook rushing” (Ich hör ein Bächlein rauschen), form the designator that connect the sixteenth note arpeggiations, the musical signifier, with the referent of “little brook” (Figure 1.4). Both Kramer and Peter Kivy discuss a moment near the opening of Haydn’s Creation whose musical meaning is literally illuminated by the text.³⁶ Under the final word in the phrase, Und es ward Licht (“And there was light”), Haydn changes a C minor harmonic landscape to a “bright” C Major one to represent the emergence of light. The music serves the text with a kind of tone painting, and the text serves the music by identifying the musical representation.

The necessity of a designator has led critics such as Eduard Hanslick and Roger Scruton to criticize the validity of musical representations.\textsuperscript{37} That is, if the listener needs a designator to identify the representation, how can the music itself be said to represent something nonmusical in the way that da Vinci’s *Mona Lisa* clearly represents a woman? Since many composers have tried to use representations to connect music and the natural world, it is worth briefly addressing these concerns.

To begin, Kramer argues, “the designator is never extraneous to the representation. It does not occupy an ‘outside’ in relation to a representational ‘inside.’ If Edvard Munch’s painting ‘The Scream’ were entitled ‘The Toothache,’ it would be quite a different work.”\textsuperscript{38} Deryck Cooke makes a similar point about Tennyson’s poem, “The Eagle,” whose words never mention the bird. A reader who is unaware of the title will come to a different interpretation of it than one who is aware. Designators thus exist in other arts as well.

Moreover, although connecting music to a designator might not be a strictly musical activity, Peter Kivy argues that it is necessary for one’s thorough “appreciation” of many works:

> By the appreciation of a work of art I mean a complex perceptual and mental activity that involves, among other things, seeing, or hearing, or otherwise becoming aware of various aesthetic and artistic properties; conceptualizing, judging, reflecting on what one becomes aware of, in other words, whatever relevantly goes on when works of art are experienced by competent spectators, hearers, readers. . .And among the things that take place in the process of artistic appreciation, one of them often is, clearly, the apprehending of artistic representations.\textsuperscript{39}

Representations work in music because of music’s basic physical essence as vibrations that change over time. The processes of pitch and rhythmic change give music a sense of motion.


\textsuperscript{38} Kramer, “Music and Representation,” 140.

\textsuperscript{39} Kivy, *Sound and Semblance*, 99.
along frequency and time dimensions. Even Hanslick writes, “The essence of music is sound and motion.”  
Scruton writes, “The experience of music involves an elaborate system of metaphors—metaphors of space, movement, and animation.” It is these metaphors in our experience of music that allow composers to use representations.

Perhaps the most common basis for metaphor in music is the association of “high” pitches with physical height and “low” pitches with physical depth. There is actually no vibrational justification for calling faster frequencies “high” and slower frequencies “low,” but the association is nevertheless central to many listeners’ experience of music. It is likely a connotation in Western societies by Meyer’s definition, but it does not seem to be inborn.

According to French experimental psychologist Robert Francès, “prior to any musical education, children do not place high and low pitches in space at all.”

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40 Hanslick, Beautiful in Music, 48.
41 Scruton, Aesthetics of Music, 80.
42 Carroll C. Pratt confirmed the existence of this phenomenon at Harvard University over eighty years ago, showing that the higher the pitch of a sound, the more “elevated” it seems. See Carroll C. Pratt, “The Spatial Character of High and Low Tones,” Journal of Experimental Psychology 13/3 (1930), 278-285. Scruton (Aesthetics of Music, 21) makes the point that even cultures that do not use “high” and “low” still hear the motion of music in space. “A French person, for whom bass notes are grave and treble notes aigu, nevertheless hears the movement from the first to the second as a rising, and the movement back again as a fall.”

43 There seems to be some biological justification for the metaphor in the act of singing; untrained singers tend to manipulate the larynx with their tongue and neck muscles—up for higher pitches and down for lower pitches. In addition, we tend to perceive higher notes resonating in our head and lower notes resonating in our chest. According to W. Stephen Smith (Professor of Voice at Northwestern University and author of The Naked Voice: A Wholistic Approach to Singing), however, proper voice training eliminates the need for laryngeal manipulation, and all notes likely resonate throughout our body. Conversation with the author, August 21, 2013.
In a musical representation—such as the piano parts in Schubert’s “Wohin”—a composer creates an *isomorphism* between the motion of the pitch of the music and the motion of the representational subject (here, the water) along the height dimension. It is also possible that from this perceived high to low movement along the pitch spectrum, we create what Jean-Jacques Nattiez calls “connotative chains.”⁴⁵ For example, both the oxen in Haydn’s *Creation* and the elephants in Saint-Saëns’s *Le carnaval des animaux* are represented with low notes. Although oxen vocalize low, elephants do not. It seems that the slowness of elephants’ motions and the volume of their bodies are what are represented along the high-low spectrum, rather than their vocalizations or their physical height. Likewise, lightning is almost always represented with high sounds (e.g., flutes or piccolos in Beethoven’s “Pastoral” Symphony, high glissandi in the piano in Grofé’s “Cloudburst”). The connotation could have originated with lightning’s high position in the sky, though I am more inclined to think its origin is lightning’s rapidity and weightlessness.

Peter Kivy also describes another kind of metaphor used in music. Rather than structural isomorphisms, this one is based on “synaesthetic adjectives,” terms that cross the sense modalities. That is, they “refer to some simple perceptual property perceived by a sense other than the sense of hearing.”⁴⁶ “Bright,” for example is a description borrowed from the visual sense and is essentially the metaphor Haydn used in the aforementioned excerpt from *The

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against this association: for example, cellists and bassists must reach down for high notes, while keyboard players reach to the right. The linguistic convention of calling high pitches “high” seems to have developed around the same time as the adaptation of diastematic notation, which pictures melodic movement on paper. Of the two settings of the text *ascendit Deus* in the liturgical chants for the Ascension, the older one predates the use of this notation and does not set the music with ascending pitches. See Jean-Jacques Nattiez, *Music and Discourse: Toward a Semiology of Music*, trans. Carolyn Abbate (Princeton: Princeton University Press, 1990), 122. ⁴⁵ Nattiez, *Music and Discourse*, 120. ⁴⁶ Kivy, *Sound and Semblance*, 62.
Creation. The characteristic of “sharpness” comes from the sense of touch and, according to Kivy and Schweitzer, is what Bach uses in the melodically jagged, rhythmically dotted texture of Jesus Christus, unser Heiland to represent “the strokes of God’s wrath.”47 Initially the transfer of a word between modalities is a use of metaphor. However, certain words (“bright,” for example) are now so customarily used in both sound and other modalities that they are given definitions in the Oxford English Dictionary for both semantic fields.48

Lawrence Kramer explains that with representation, the listener, once alerted by the designator, finds similarities between the “details, textures, or processes of the music and the designated object(s) of the representation. Once such likenesses have crystallized, the same listener can go on to make interpretive connections between the music as likeness and the music as structure.”49 The listener makes these connections as a result of forming a metaphor, since “to form a metaphor is to open up the possibility of two-way transfers of meaning, as the discourses in which each term of the metaphor is inscribed become available to the other term.”50

It is thus likely because of metaphorical listening that, as Kendall Walton writes, “music stands ready to take on an explicit representational function at the slightest provocation.”51 If a composer such as Adams wants to imitate birds or water, he has connotations that he can use for that. If he wants to represent mountains, all he has to do is insert mountains in the title and

49 Kramer, “Music and Representation,” 140-141.
50 Ibid.
include some music that reaches to high frequencies, and most listeners will be happy to go along.

That said, representation has its limits. For one, although a representation can point to an object, it is not clear what more it can say about it. Scruton cites Messiaen’s imitation of a *merle bleu* in “Le traquet rieur” from the *Catalogue d’oiseaux*, arguing that Messiaen “is asking us to recall the song of the blackbird, while attributing to it nothing specific apart from its atmosphere.”

Adams clearly wants to say more, but as Nattiez writes, linguistic syntax is “grounded principally in a subject and a predicate,” while in music, “the responsibility for joining character-phantoms with action-shadows lies with me, the listener, since it does not lie within music’s semiological capabilities to join subject and predicate.”

Another limitation for some composers is that many connotations and representations seem worn and as much about our perception and musical language as about the represented object. To find something more true to the natural world and less cliché than many connotations, composers have found alternatives to representation, some of them made possible by the emergence of new technologies.

4. **Quotation**

Recording technology has made it possible for composers to include the actual sounds of the non-human natural world in otherwise instrumental music. The earliest example of this is Ottorino Respighi’s use of a recorded nightingale in *Pini di Roma* (1924). Alan Hovhaness used recordings of great whales in *And God Created Great Whales* (1970), and Finnish composer

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52 Scruton, *Aesthetics of Music*, 129. Scruton misidentifies the bird; a “merle bleu” is a blue rock thrush, not a blackbird.
54 Ibid, 128.
Einojuhani Rautavaara used the sounds of birds recorded near the Arctic Circle in his *Cantus Arcticus: Concerto for Birds and Orchestra* (1972).

In all these pieces the instrumental music juxtaposed with the recordings is clearly influenced by the recordings. François-Bernard Mâche, however, brings the degree of correspondence between the two musics to a much higher level in many works written since the late 1960s. In *Sopiana* (1980), for example, a live flute and piano play carefully transcribed fragments of the songs of three bird species—Malayan shamas, icterine warblers, and marsh warblers (three species that would never sing together due to geographic separation)—simultaneously with recordings of the songs themselves. Mâche writes that the piece illustrates his desire “to abolish the distinction between raw sounds and musical sounds, between nature and culture.”

5. Soundscape recordings

The term “soundscape” has been in use since the late 1960s, at which time Canadian composer R. Murray Schafer initiated an educational and research group at Simon Fraser University in Vancouver called the World Soundscape Project. The project grew out of Schafer’s concern about the growing levels of ambient noise in Vancouver and the diminished variety of acoustic environments worldwide resulting from industrialization and environmental degradation. In his book *The Tuning of the World* (1977), Schafer categorized soundscapes, described ways of analyzing and repairing them, and gave exercises to increase our awareness of the sonic world around us. Schafer’s work inspired many sound artists to use modern

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technology to capture soundscapes on recording. Soundscape recordings may be of individual species, entire ecosystems, or even urban neighborhoods. According to Barry Truax, the soundscape composition is “a form of electroacoustic music, developed at Simon Fraser University and elsewhere, characterized by the presence of recognizable environmental sounds and contexts, the purpose being to invoke the listener's associations, memories, and imagination related to the soundscape.”

In the “purest” of soundscapes the contribution of the sound artist lies in finding the soundscape, making a high-quality recording of it, selecting the recordings to use, and sequencing and cross-fading the edits. Perhaps the biggest archive of such recordings is Bernie Krause’s “Wild Sanctuary,” containing over 4,500 hours of soundscapes, largely from pristine sound environments. These range from Antarctica to Madagascar to North American forests and prairies. Over half of the environments are now no longer audible in their original form.

In some cases, a soundscape artist employs technologies to bring into the human audible spectrum soundscapes that would otherwise not be accessible. Jana Winderen, for example, often uses hydrophones to record underwater soundscapes throughout the world. She then uses these recordings for installations such as “Dive,” which took place in the Park Avenue Tunnel during New York City’s 2014 “Summer Streets” festival. David Dunn recorded the sound of bark beetles (Ips confuses) living in (and destroying) the two-needle pinion trees (Pinus edulis) common throughout the American West for his CD, The Sound of Light in Trees (2006).

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Richard Lerman creates soundscapes through piezo microphones. These contact microphones are designed to sense vibrations through solid objects, transducing only structure-borne sound. Thus Lerman creates soundscapes that reflect movements in the natural world, though not the movements of sound waves. His piece Sonora includes “rain falling on the needles of fire-charred saguaro cactus, wasps spinning around in the sand, carpenter bees boring into long-dead trees, and the rustle of small, red weeds in the dry wind.”

6. Electroacoustic modifications

In the pieces just described, the recordings of natural sounds themselves are trimmed and cross-faded, but the pitch, rhythm, and timing of the original recordings are kept intact. Some composers, however, have chosen to modify their original sounds. In some cases, the original sounds always remain recognizable, and the listener’s associations with them are maintained. This is true of works by Hildegard Westerkamp and Barry Truax, two composers closely associated with the World Soundscape Project. For her Beneath the Forest Floor (1992), for example, Westerkamp took sounds primarily from an old-growth rainforest on Vancouver Island and enhanced them – creating a repeated low-pitched thumping sound that listeners might associate with rain hitting a log and high-pitched sounds of a stream and chipmunks that “rush across the stereo field in a fashion that is literally unrealistic but remarkably evocative all the same.” For Island (2000), Truax blended acoustic recordings made by the World Soundscape Project with processed versions of the same sounds to create a visit to an imaginary island,

“beginning at the shoreline, proceeding up a rapidly flowing stream, visiting a resonant cistern, climbing to the windy peak of a mountain lake, descending again through a nighttime forest of crickets, and ending at a different shoreline.”

In other pieces, the environmental sounds are taken as starting points in explorations of sound that may or may not maintain the initial recognizability or associations of the sound. This practice dates to the work of French composer Pierre Schaeffer, who in the 1940s created the idea of musique concrète, or music that takes as its raw materials concrete sound samples (as opposed to a composer’s graphical notations). Schaeffer manipulated birdsongs into resembling shortwave radio signals for L’oiseau R.A.I. (1950). Jim Fassett shaped birdsongs into an eerie three-movement piece called Symphony of the Birds (1960). More recent examples include works from British composer Jonty Harrison’s CD, Évidence matérielle (2000), including Splintering (using the sounds of wood) and Streams (using the sounds of a river, sea-shore, and rainfall).

Trevor Wishart and Jean-Claude Risset have composed works that combine original natural sounds with other sounds. Wishart combined and transformed snippets of the sounds of birds and other animals, his own vocal improvisations, and machines into an allegory about political oppression in Red Bird: A Political Prisoner’s Dream (1973-77). For his Sud (1985), Risset recorded original bird and water sounds in the Massif des Calanques along France’s Mediterranean coast and then synthesized sounds that could interact with the natural sounds in multiple ways. He also creates “cross-bred sounds of different origins … thus imprinting on

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recognisable sounds the powerful energy profile of other sounds.\textsuperscript{64} Finally, Douglas Quin’s \textit{A Polar Suite} (2011) for amplified string quartet calls for the performers to play a midi-controller called a “K-bow.” Using this bow the players play and modify sounds recorded by Quin, including those of Weddell and leopard seals, whales, and windstorms.\textsuperscript{65}

7. Use of “Found” Natural Materials

At the other end of the technological spectrum, some composers have used natural materials in their “found” or “minimally altered” state. In \textit{Child of Tree} (1975), John Cage instructs a percussionist to improvise with amplified plant materials, including a pod rattle from a Poinciana tree and a cactus, the spines of which are to be plucked. He gives a range of options for the other instruments: claves, tapping sticks, log drums, seed maracas, hyoshigi (Japanese wooden clappers), dried leaves, and twigs. Cage’s \textit{Inlets} (1977) is scored for three players, each playing four amplified and differently-sized conch shells, and a tape of burning pine cones. Out of her 2008-2009 travels in Antarctica, composer Cheryl Leonard created \textit{Antarctica: Music from the Ice}, nine compositions for natural materials and field recordings.\textsuperscript{66} Composer Steve Heitzeg has produced a wealth of music using found materials, such as acorns, fallen tree branches, stones, flower petals, and standing trees.\textsuperscript{67}

8. **Outdoor situation**

Another way for composers to connect their music with the physical world without either representation or the use of electroacoustic technology is change the context for the music—that is, to write pieces specifically for outdoor performance. Among these pieces one can distinguish between “site-specific” works, which can only be performed in one location, and “site-determined” works, which can be performed in different places.

Iannis Xenakis’s *Persephassa* is a site–determined work that was written in 1969 for the first Shiraz festival, held at the ancient desert ruins of Persepolis in Iran. The thirty-minute piece is scored for six percussionists playing a wide range of instruments, including drums, whistles, maracas, sirens, sheets of metal, and cymbals. The six percussionists are instructed to form a hexagon surrounding the audience. Two performances in June 2010 added an additional twist to the piece: six performers, three on boats and three on land, performed the piece around and on the lake in Central Park in New York City, for audience members also on rowboats and on land.

Robert Morris’s *Playing Outside* is a site-specific work that was written in 2001 to be performed outdoors in Webster Park near Rochester, New York. It is performed at various sites spread over a half-mile square within the 550-acre park. It is scored for about sixty-five musicians, including an orchestra (broken into many chamber groups), chorus, Balinese gamelan, and four improvisers. There are forty-seven sections of music within the 100-minute time span of the piece. In the score each section is given a name, instrumentation, performance site, spatial setup at the site, and starting and ending times. Much of the piece is notated aleatorically. The sections of music overlap, so it is impossible for an audience member to hear all of the music in one performance. The piece received two performances in Webster Park on September 30, 2001, and all future performances will take place in the same place.
R. Murray Schafer has constructed an enormous twelve-part musical drama called *Patria*, for which the site specification of each of the parts varies. Some of the parts may be performed indoors, while others must be performed outdoors, though the exact location is not specified. For example, the first part, *Prologue: Princess of the Stars*, is intended to be performed on a small, remote lake just before dawn. The audience and many of the musicians are situated around the perimeter of the lake, while some of the performers are in canoes on the lake. *Patria* Parts II and III may be performed in relatively conventional theaters, but *Patria XII, Epilogue: And Wolf Shall Inherit the Moon*, is an elaborate outdoor ritual lasting eight days. It has been re-enacted by a committed group of individuals who are simultaneously creators, performers, and audience members every August since 1988 at the Haliburton Forest and Wildlife Reserve in Ontario.68 These works fall in between the categories of “site-specific” and “site-determined.”

Bill Fontana is a sound artist whose works often include the retrieval of sound from one or several specific outdoor locations and their replay in another. For instance, for *Landscape Soundings* (1990) Fontana positioned microphones at sixteen locations in the Stopfenreuther Au (Danube river wetlands near the border of Austria and Hungary). For two weeks the sounds were broadcast live on seventy speakers mounted on the museums and gardens in and surrounding the Maria-Theresien-Platz in Vienna.69

9. Live Animal-human hybrid music


69 Additionally, a live feed was transmitted to and through Austrian National Radio.
Some composers have tried to make music not only (or necessarily) outdoors but rather with animals. For example, David Rothenberg, a well-trained jazz clarinetist, calls himself an “interspecies musician.” In the last decade Rothenberg has written three books about the music of other animals: *Why Birds Sing*, *Thousand Mile Song* (on whale song), and *Bug Music*. Moreover, he has published each with a CD of himself playing with the animals described, both live and in the studio using recorded sounds.\(^{70}\)

Within R. Murray Schafer’s *Epilogue: And Wolf Shall Inherit the Moon*, some of the music “is intended to and does elicit a response from animals.”\(^71\) Among such pieces is the *Aubade* for solo voice, which is not directly imitative of loon calls but, when performed over a loon-inhabited lake, does induce loons to approach and call.

Finally, a very different sort of animal-human interaction exists in the Thai Elephant Orchestra, an ensemble of up to fourteen elephants at the Thai Elephant Conservation Center in Lampang, Thailand. In the ensemble, elephants, which have long been known to respond to human music, play extra-large versions of Thai instruments. They are “conducted” by humans who allow them to improvise, only telling them when to start and stop. The project was the idea of neurologist/composer David Soldier (a.k.a. David Sulzer) and conservationist Richard Lair.\(^72\)

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71 Doolittle, “Crickets.”

Musical and Dramatic Functions

We can see from this discussion that composers have attempted to bring the natural world into their music in a wide variety of ways. The question, however, that the discussion begs is, for what artistic effect is this done?

1. Humor

One minor role served by natural sounds is mere humorous entertainment. As Emily Doolittle writes (about seventeenth- and eighteenth-century imitations, though it applies more generally), “The excuse of imitating animal sounds in part seemed to be a way of allowing normally unacceptable, noisy sounds a brief appearance in music.”73 She adds that Baroque music contained other extra-musical sounds—often from battles—and that no particular importance was attached to the fact that animal sounds came from other living species. These sounds could take over extended passages of music but were “typically placed between more standard musical passages or movements, which bear structural responsibility for the work.

Early examples of this use of animal sounds may be found in the previously mentioned Sonata representativa by Biber, as well as in the seventh movement of Telemann’s Alster Overture, titled “Die concertierenden Frösche und Krähen” (The concertizing frogs and crows). In both pieces, movements featuring noisy imitative sounds are framed by more conventional ones. A later example of humorous imitation and representation is Saint-Saëns’s Le carnival des animaux.

2. Expression

73 Doolittle, “Crickets.”
As described earlier, the imitations of the hermit thrush in Amy Beach’s *A Hermit Thrush at Eve* are chromatic and notated as cadenzas, but they are surrounded and underpinned by music that is in a more conventional, late nineteenth-century style expressive of melancholy (Figure 1.3). One element seems to be a reaction to the other, the stimulus of the birdsong having prompted a melancholic response. Many other composers who include imitations or representations of entities in the natural world do so in an attempt to express the experience of beholding those entities and perhaps to provoke a similar experience in the listener. For example, about his “Oiseaux tristes” from the piano suite *Miroirs*, Ravel wrote, “I evoke birds lost in the torpor of a very somber forest, during the hottest hours of summertime.” Of course, human beings cannot know if birds are lost, nor can a forest objectively be labeled “somber.” These are sensations that Ravel probably experienced or imagined in association with the birds, and he paints his imitations (or re-creations) of bird songs with a musical palette that might provoke the same sensations in listeners. Likewise, Tobias Picker’s *Old and Lost Rivers* for piano or orchestra is named after a road sign on Interstate 10 in Texas that marks the convergence of the Old River and the Lost River. Though the gentle, steady eighth notes are approximately imitative of the motion of the rivers, the piece’s primary effect is nostalgia.

3. Description and Narration

Many of the aforementioned “nature pieces” seek to describe a landscape or an experience within a landscape. Where a sequence of events is discernible, the music may be called “narration.” Otherwise, it may be simply “description.” Liszt coined the phrase

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“programme music” to describe narrative music written with a “programme,” a textual
description of the story that inspired the music and which the music is attempting to depict. In
Liszt’s usage, the music is to be understood according to the logic of those events, rather than
any conventional formal patterns.

There are a great number of pieces that use imitations and representations of the natural
world to narrate stories. Vivaldi published *Le quattro stagioni* (1723) with descriptive phrases
under particular passages of music. In addition, fuller sonnets more or less incorporating the
phrases were written into the score.⁷⁵ These texts highlight imitations of birds, streams, rustling
branches, gentle breezes, howling winds, thunderstorms, gnats and flies, hunts and dying prey, a
barking dog, cuckoo, turtle dove, and goldfinch, as well as representations of country folk
sleeping, dancing, sweltering, trembling, and walking on ice. The piece is program music, since
its logic is presumably bound up with the text. Likewise, Smetana gave each of the sections of
“The Moldau” from *Má Vlast* (1874) labels in the score, such as “The Springs of the Moldau,”
“Forest hunt,” and “The Moldau flows in a broad stream.” In a text that he sent to the publisher
Urbánek, Smetana explained that the piece narrated a trip along the Moldau River.⁷⁶ Underneath
the changing foreground of the music is a nearly continual flow of sixteenth notes imitating the
Moldau itself.

In Prokofiev’s *Peter and the Wolf* (1936), the orchestra tells the story of young Peter, his
grandfather and cat, a duck, a bird, and a wolf, with instruments assigned to each character. The
program in this case is not only in the score but is also narrated aloud. Richard Ayres’s *No. 42
(In the Alps)* (2008) is a faux fairy tale about a girl who survives a plane crash, is raised by goats,

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⁷⁵ See preface to Antonio Vivaldi, *Le Quattro Stagioni*, ed. Christopher Hogwood, (Kassel:
Bärenreiter, 2000), iii-vii.
and falls in love with a boy whom she never gets to meet. Like *Peter and the Wolf* the piece is narrated (either through a speaker or projected text), making the vocal and instrumental imitations of goats, cicadas, and swine unmistakable.

4. Imitation of Nature in Her Manner of Operation

John Cage, who was both a musical experimentalist and a naturalist, wrote that he had accepted “the doctrine about Art, occidental and oriental, set forth by Ananda K. Coomaraswamy in his book *The Transformation of Nature in Art*, that the function of Art is to imitate Nature in her manner of operation.” Although Cage credits Coomaraswamy with this idea, Edward James Crooks points out that it is a concept with over two thousand years of philosophy behind it. Moreover, Crooks suggests that how one imitates nature in her manner of operation might depend on one’s conception of nature.

Cage was inspired by material nature, what scholars have long called *natura naturata*. In addition to his pieces using found materials, one might cite as evidence his *Music for Carillon No. 5* (1967). For this piece Cage photographed ten wooden boards and instructed the carilloneur to read the knot shifts and grain patterns as notes. Messiaen, on the other hand, was inspired by *natura naturans*, never-changing essences, “the divine glimpsed behind a thing, not in it.” In his *Conversations with Claude Samuel*, he said, “The first idea I wanted to express, the most

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78 Crooks shows that Coomaraswamy likely took it from Thomas Aquinas’s *Commentary on Aristotle’s Politics* and *Summa theologiae*, where it appears as “ars imitatur naturam in sua operatione.” Aquinas, meanwhile, was clearly influenced by studies of Plato, Aristotle, and Plotinus. Crooks, “John Cage’s Entanglement with the Ideas of Coomaraswamy,” PhD Dissertation, University of York, 2011.

79 Ibid, 143.
important, is the existence of the truths of the Catholic faith…[This] is the first aspect of my work, the noblest, and no doubt the most useful and most valuable—perhaps the only one I won’t regret at the hour of my death.” Messiaen’s biographer Paul Griffiths writes, “Birdsongs are therefore an image of the changelessness that had always been central to [Messiaen’s] musical and religious thinking. It may not be too presumptuous to regard him as concurring in the Franciscan vision, to which he gives voice in Saint François d’Assise, of birds as presages of the agility of the resurrected. To imitate them, therefore, is to imitate the divine, the ‘unique bird of eternity’ as the Trois petites liturgies have it.”

5. Re-creating relationships with the natural world

Adams is not the only composer seeking a renewal in the human relationship with the natural world through music. François-Bernard Mâche writes that Sopiana illustrates his desire “to abolish the distinction between raw sounds and musical sounds, between nature and culture.” R. Murray Schafer, whose Patria cycle is largely immersive in natural environments, has written unequivocally, “This must be the first purpose of art. To affect [sic] a change in our existential condition.” To Schafer, this can be accomplished through his Theatre of Confluence, which includes a “wilderness setting, a ritualistic and synaesthetic form, a collaborative process, and an emphasis on provoking existential change in its participants.”

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81 Mâche, Sopiana.
82 R. Murray Schafer, Patria and the Theatre of Confluence, 87.
Just as the techniques of incorporating the natural world are often combined, so are these different functions in no way mutually exclusive. Narration is often the context for expressing an emotion or attempting to provoke one in the listener. Beethoven’s Sixth Symphony (“Pastoral”), for example, certainly has a narrative element that motivates and ties together the imitation of birds, water, and a thunderstorm already mentioned. The programme is limited to the titles of the five movements:

I. Erwachen heiterer Empfindungen bei der Ankunft auf dem Lande (Awakening of cheerful feelings upon arrival in the country): Allegro ma non troppo
II. Szene am Bach (Scene at the brook): Andante molto mosso
III. Lustiges Zusammensein der Landleute (Happy gathering of country folk): Allegro
IV. Gewitter, Sturm (Thunderstorm; Storm): Allegro
V. Hirtengesang. Frohe und dankbare Gefuehle nach dem Sturm (Shepherds' song; cheerful and thankful feelings after the storm): Allegretto

As with other programmatic music, one understands the unusual form (here, a five-movement symphony) through the narrative text. Yet mixed with concrete events (“arrival,” “scene,” “gathering,” “storm,” and “song”), the titles clearly reference “feelings.” In his sketches, Beethoven jotted down phrases expressing his ambivalence about treating the symphony as a narration of events or an expression of feelings, both of which existed in the eighteenth-century sense of a “characteristic” piece.84

84 “It is left to the listener to find out the situations…Character Symphony—or reminiscence of rural life…All painting carried too far in instrumental music loses its effect…Pastoral Symphony…Anyone that has formed any idea of rural life does not need many titles to imagine the composer’s intentions…Even without a description, the whole thing, which is feeling more than tone-painting [, will be recognized!” For the quotes see Gustav Nottebohm, Zweite Beethoveniana (Leipzig: C.F. Peters, 1887), 375. The phrase “mehr Ausdruck der Empfindung als Malerei” also appeared in the handbill for the concert of December 22, 1808, when the piece was premiered. It also appears in the autograph score. See David Wyn-Jones, Beethoven, Pastoral Symphony (Cambridge University Press: Cambridge, 1995), 1, and Wilhelm Altmann, Foreword to Symphony no. 6 by Ludwig van Beethoven (London: Eulenberg, 1942). For a description of character pieces, see F.E. Kirby, “Beethoven’s Pastoral Symphony as a ‘Sinfonia caracteristica,’” The Musical Quarterly 56/4 (1970), 605-623.
Messiaen may have composed to express the truths of the Catholic faith, but each piece of the *Catalogue d’oiseaux* narrates an avian conversation, sometimes over the course of an afternoon.\(^8^5\) Both Saint-Säens’s *Le carnaval des animaux* and Ayres’s *In the Alps* combine humor and narration throughout. A movement such as Saint-Saëns’s “The Swan” is expressive of the emotional experience of witnessing a swan gliding on water as much as it is imitative of the bird directly. Ralph Vaughan Williams’s *The Lark Ascending* (1914)—which the composer named after a poem by George Meredith, a portion of which he included in the score—could be interpreted as a loose imitation of the lark’s song, a representation of the lark’s flight, a narration of the poem, or an expression of Vaughan Williams’s feelings about any of the above.\(^8^6\)

What we have seen in the discussion so far is that composers have used a wide range of methods to try to bring the natural world into their music and that the references to the natural world may serve multiple functions in the music. Since John Luther Adams hopes to use music specifically to communicate a new relationship with the planet, our next task is to look at what, if anything, these previous musical connections have communicated about our relationship with the natural world.

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\(^8^5\) See, for instance, “L’alouette calandrelle,” which supposedly narrates events beginning at 2:00 pm and ending at 6:00 pm.

\(^8^6\) Over forty years after the premiere, Vaughan Williams’s widow Ursula wrote that the work both imitates the song and represents the flight. “He had taken a literary idea on which to build his musical thought in *The Lark Ascending* and had made the violin become both the bird's song and its flight, being, rather than illustrating, the poem from which the title was taken.” The time between the composition and the biography, as well as the fact that Ursula Vaughan Williams did not meet the composer until eighteen years after the premiere, makes the usefulness of this claim uncertain. See *RVW: A Biography of Ralph Vaughan Williams* (Oxford: Oxford University Press, 1964), 156.
Nature in Music II: Ecocritical View

“Nature”

First we need to understand what we mean by “this planet,” “nature,” or “the natural world.” The concept of “nature” is rich with multiple, sometimes conflicting, meanings, and it is beyond the scope of this study to review them all. Instead let us consult the Oxford English Dictionary, which lists thirty-four uses of the word “nature” as a noun. The following are the most pertinent to this discussion:

10a. The creative and regulative power which is conceived of as operating in the material world and as the immediate cause of its phenomena.
11a. The phenomena of the physical world collectively; esp. plants, animals, and other features and products of the earth itself, as opposed to humans and human creations.
11b. In wider sense: the whole natural world, including human beings; the cosmos. Obs.

Definition 10a refers to a power over the world—what many refer to as ‘God’ and others refer to as “the laws of nature.” It seems more about physics than about people and other animate things. Definition 11a, on the other hand, includes all the phenomena of the physical world—its animals, plants, rocks, mountains, and so forth—and it opposes these phenomena to humans and human creations.

Since human beings are animals, however, this definition points to one of the conflicts inherent in our conception of nature. We consider ourselves part of nature as a result of our evolution and biological features, but our actions produce results of such a different quality and scale from the rest of the animal kingdom that we also set ourselves in opposition to nature. The schism between humans and the rest of the natural world has reached such a point that definition

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11b, which unites us, is considered “obsolete.” One reason for widespread use of natural sounds and imagery in music, however, is that we find something of ourselves reflected elsewhere in the natural world and seek to bridge this gap.

In this dissertation, where I look at the relationship between humans and the rest of the Earth in the music of John Luther Adams, I will use the following terms and phrases interchangeably to refer to definition 11a above: “the non-human natural world,” “the natural world,” “nature,” and “the planet.”

**Human Relationships with Nature**

Now let us approach the subject of present-day human relationships with nature. Clearly, each individual has a different relationship, and for many, the relationship is complex and changing. Religion, geography, and cultural history profoundly shape it. Rather than try to limit the human experience of nature to one relationship, perhaps it is meaningful, instead, simply to point out numerous oppositions that find expression in Western religion, political discourse, and all of the arts:

- Nature as the animal world, of which we are members, vs.
- Nature from which we feel separate, due to our physical and psychological endowments;
- Nature as “home,” as a set of forces that we try to (re-)align ourselves with, vs.
- Nature as a force to conquer;
- Nature, over which we have been given “dominion,” vs.
- Nature, that we have been entrusted to protect;
Nature as a bountiful giver; vs.

Nature that is fragile, and that we have poisoned and despoiled;

Nature that must be tamed and cultivated, vs.

Nature whose wildness is to be cherished;

Nature that is beautiful, vs.

Nature that is foreboding;

Nature that cares for us, vs.

Nature that is cold-hearted.

**Ecomusicology**

With these oppositions in mind, a growing number of musicologists have begun to address the ecological, philosophical, and musicological issues raised by pieces of music that touch upon the non-human natural world. Writing in the *Grove Dictionary of American Music*, Aaron Allen defines “ecomusicology” as “the study of music, culture, and nature in all the complexities of those terms.” Ecomusicology is closely related to the study of biomusic, or the linkages between music of all species. It is a little more distantly related to zoomusicology, or the study of the musical aspects of sound communication specifically among other animals. Ecomusicology is also related to, but distinct from, acoustic ecology, the field started by R. Murray Schafer in the 1960s that looks at how we affect and are affected by the sonic landscape (“soundscape”).

Interest in ecomusicology has paralleled interest in the natural environment within many disciplines as a result of growing awareness of the threats to both human and non-human life
posed by human overpopulation, resource and habitat depletion, air and water pollution, and climate change. Whereas ecomusicology started to cohere in the 2000s, “ecocriticism,” synonymous with “literary ecocriticism,” dates back to the 1970s. Literary ecocritics study the many relationships of literature and the natural environment, asking questions such as how nature is represented in a work, how the concept of wilderness has changed over time, and how the environmental crisis has entered contemporary literature. Ecomusicology, or “ecocritical musicology,” continues the trend of musicological scholarship employing literary methodologies.

Beyond their prefixes, what links many eco-analyses is the belief that the source of, and solutions to, our environmental problems are not only technological. Not only do we need more efficient cars, for example, we need to rethink the kind of cities that we live in. A different way of thinking about the land may lie at the base of that change. Not only do we need to find ways to re-use and recycle our resources, we need to rethink our attachment to material items. As historian Donald Worster has written, the physical and natural sciences can identify our problems and sometimes come up with solutions, but it can rarely answer the “why” questions.

Natural science cannot by itself fathom the sources of the crisis it has identified, for the sources lie not in the nature that scientists study but in the human nature, and, especially, in the human culture that historians and other humanists have made their study.

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This dissertation is one of a small but growing number that emerge from an
ecomusicological viewpoint. It is the first dissertation to approach the music of John Luther
Adams in this way.  

Deep Ecology and a Disclaimer

Although John Luther Adams writes that he never intended his works “as pure
environmental statements,” the American nature writer Barry Lopez has called Adams’s artistic
vision, “civic.” Indeed, Adams’s statements seem to reflect the beliefs of Deep ecology, a
moral and political philosophy that seeks to put human beings in a large environmental context.
Deep ecology distinguishes itself from anthropocentrism, or the belief that human beings—
implicitly, present-day human beings—have a special importance in the universe that entitles
them to preferential access to natural resources, including other animal life. Deep ecologists
oppose the widely held capitalist view of the environment as consisting merely of natural
resources for human use. The philosophical movement also distinguishes itself from
anthropocentric environmentalism, which attempts to preserve the environment purely for the
sake of human health and well-being. Deep ecologists believe that nonhuman life forms have
value in themselves, irrespective of their usefulness for human beings. They believe that richness
and diversity of life forms are also values, which humans have no right to diminish except as
necessary to satisfy vital needs.

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93 Robert Esler’s dissertation included discussion of his experience of playing Adams’s Strange
and Sacred Noise outside (“A Phenomenological Approach to Contemporary Music
95 Barry Lopez, back cover review of Adams, Winter Music.
96 Bill Devall and George Sessions, Deep Ecology: Living as if Nature Mattered (Layton, UT:
Gibbs Smith, 1985), 69-77.
Ecocriticism is often (but not always) made from the ethical perspective of Deep ecology. Ecocritics seem to believe that by pointing out how our relationship with the natural world manifests itself in our cultural texts, we can better understand and provide solutions for root causes of our environmental crises. In other words, there is a normative bent to much ecocriticism.

I owe the reader an acknowledgement that I have sympathy for the principles of Deep ecology. I have attempted, however, to write this paper with a critical eye and ear. Specifically, I have sought to understand how pieces of music might realistically function in the creation of a new vision of our relationship with the non-human natural world.

**What Music Can Communicate About Human Relationships With Nature**

Now let us use ecocritical analyses to see what kinds of relationship with the natural world (if any) may be communicated in musical works.

**Ferde Grofé’s Grand Canyon Suite**

Brooks Toliver has written a very convincing analysis of Ferde Grofé’s orchestral landscape, *Grand Canyon Suite* (1929—1931). Grofé spent time in Arizona between 1917 and 1926 on various business and pleasure trips. In 1938 he wrote that the experience had filled his heart with “enduring love and lasting gratitude” for Arizona and had inspired him to “put into

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music what [he] felt about the state and its wonders of Nature.°

The five movements of the suite are:

I. “Sunrise”
II. “The Painted Desert”
III. “On the Trail”
IV. “Sunset”
V. “Cloudburst”

Toliver makes many strong points about the piece, of which I will stress three. First, the music is generic “landscape” music. Nothing in the music actually originates from the sounds of the canyon or the surrounding area or distinguishes it from the sounds of another landscape. Native Americans had lived around the Grand Canyon for centuries, but there is no mention of their music anywhere in the suite. When Grofé imitates a bird in the music at m. 17 of “Sunrise,” it is not identifiable by its song. In fact, much of the music seems borrowed. The opening of “Sunrise” resembles sunrises in Debussy’s La Mer and Ravel’s Daphnis et Chloé. The music of the donkey in “On the Trail,” is remarkably similar to the music of the broom in Dukas’s L’apprenti sorcier. The call of the horn in “Sunset” is eerily similar to Siegfried’s horn leitmotif in Wagner’s Der Ring des Nibelungen. Even the storm followed by a happy clearing of the skies near the end of the piece follows a scheme made well-known in Beethoven’s “Pastoral” Symphony. Toliver writes about this controlled, “orchestrated” representation of the canyon:

These moments jar us from the illusion of an autonomous, self-representing canyon, suggesting instead an environment subject to human control. . . . This sort of concocted


°° This is my detail. Toliver (354) suggests that the flute is supposed to be imitating a canyon wren. I think this representation is much more generic than the downward spiraling song of the canyon wren.

°°° Beethoven may have borrowed the idea himself from Justin Heinrich Knecht’s Le portrait musical de la nature. According to David Wyn-Jones, the nineteenth-century historian François-Joseph Fétis was the first to draw this comparison. Wyn-Jones, Beethoven, Pastoral Symphony, 18.
intimacy is precisely what Grofé accomplishes in pairing a place-specific program with nonspecific music; the latter’s familiar sound allowed listeners the impression of knowing an environment most of them would never more than visit.\footnote{101}{Toliver, “Eco-ing in the Canyon,” 344 and 348.}

A second point Toliver stresses is that Grofé seems to encourage a \textit{visual} response. Grofé wrote a complete programme for the piece that appears in the score, and the titles conjure up visual images. The initial title was even “Five Pictures of the Grand Canyon.”\footnote{102}{Toliver (ibid, 338) cites the original jazz charts possessed by the Paul Whiteman Orchestra that premiered the piece, as well as the reviews for the Chicago premiere.} This visual aspect of the music suggests to Toliver that Grofé emulates “overlook” landscape paintings of the nineteenth century. This type of work suggests distance from, rather than engagement with, a wilderness, as well as a natural world that is contained by the “downward gaze” of the artist and viewer.

This leads to the third point: the natural world presented in Grofé’s suite is not only contained but also musically subservient. Toliver gives several examples. In “Sunrise,” after we hear a (generic) imitation of a bird singing on the piccolo, an English horn enters with the bird’s initial phrase. It then transmutes that phrase, and the piccolo repeats the transmutation. Since the piccolo is associated with birds (especially at sunrise) and the English horn has the connotation of a shepherd’s song, or \textit{ranz des vaches}, the interplay can be interpreted as Bird sings – Man improves on bird’s song – Bird sings back man’s improvements. In “On the Trail,” a burro melody played in the woodwinds begins in 6/8 meter. It is identified by numerous imitations of braying. After we have heard it several times, a cowboy melody played on the French horn signifies a cowboy’s entrance; in case the cowboy is not obvious, Grofé spells it out in the
programme. The cowboy’s melody in 4/4 time clashes with the ongoing burro melody in 6/8, and the burro melody eventually becomes accompaniment for the cowboy melody, which is taken up by the overpowering string section. The cowboy theme then disappears. When it returns triumphantly at the end of “Cloudburst,” the “Grand Canyon” suite ends with an unmistakable reference not to the canyon itself but to men whose job it is to domesticate animals. What all of this communicates to Toliver is an over-simplification of the natural world, which supports and facilitates human domination of nature:

Art is a tapestry whose surface depicts untamed nature, but whose weave encodes domination. Nature is thus spun from the very fabric of conquest, and the result is a fantasy much like that provided by the National Park Service. It is the fantasy of a wilderness seemingly enhanced, rather than diminished, by the act of controlling it.

Nightingale song

Let us return to birdsongs specifically and look at what imitations of them have communicated. Nightingales have been invoked in countless songs and instrumental pieces due to their relatively unique habit of singing at night. Most nightingale imitations, however, exhibit none of the vocal complexity of true nightingale songs. Common nightingales (Luscinia megarhyncos) possess extraordinarily large song repertoires, often containing over two hundred songs comprised of over one thousand phonetically different elements. They typically sing

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103 In addition, in a piano score published shortly after the premiere, lyrics by Gus Kahn overlay the cowboy melody, although Toliver is not certain that Grofé authorized them (Toliver, ibid, footnote 68).
104 Toliver, ibid, 340.
their songs with astounding variety, interspersing fifty different song types before returning to one.

The nightingale in the second movement of Beethoven’s “Pastoral” Symphony is a typically stylized example (Figure 1.2); it sings two notes in a gradually accelerated trill. It is so unrelated to an actual nightingale’s song that it is no wonder Beethoven had to label it in the score. Emily Doolittle writes about the nightingale, cuckoo, and quail that appear in Beethoven’s cadenza, “These are stylized imitations, recognizable as a representation of their issuing animal, but sufficiently smoothed and altered to sound unexceptionably like human music, too. Their function is to assist the narrative, rather than to introduce birds as creators of music.”

The nightingale in François Couperin’s harpsichord piece Le rossignol-en-amour is a particularly melodious and tonal one that sings with repeats, octave displacements, and occasional notes inégales. The nightingale in Granados’s piano piece (and, later, aria) “La maja y el ruiseñor” is a little less stylized but still unrealistic.

In contrast to the communion with nature that exists on the surface of these pieces, radical simplification of a bird’s song places a listener’s emphasis on human expression and narration rather than on the natural world. There are also songs by Schubert, Brahms, Tchaikovsky, Alabiev, Hahn, and others, which make no attempt to imitate the nightingale; instead, the poet addresses a nightingale and identifies his nighttime thoughts with the bird’s song. Typically these songs reveal a lot about the poet but little about the bird.

106 Doolittle, “Crickets.”
As mentioned earlier, Olivier Messiaen’s music marked a change in how accurately birds were represented and in the structural importance given to their song. In Messiaen's preface to the score of *Réveil des oiseaux* for chamber orchestra and solo piano, he wrote, “There is nothing but birdsongs in this work. All were heard in the forest and are perfectly authentic.” In his piece “La Bouscarle” (Cetti’s warbler) from the *Catalogue d’oiseaux*, Messiaen imitates a nightingale. Here is an imitation that finally shows some of the astounding melodic and rhythmic variety of nightingales. Messiaen’s nightingale has eleven different vocalizations. While my impression is that common nightingales use more pure tones than Messiaen’s imitations, Messiaen captures some of their virtuosity. Moreover, as is the case in each of the pieces in the *Catalogue*, multiple birds are imitated in “La Bouscarle.” Placing the nightingales in their natural aural context adds to the listener’s sense of authentic representation. We might ask, do

Figure 1.5. Nightingale from Olivier Messiaen's “La Bouscarle” (*Catalogue d’oiseaux*).

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Messiaen’s imitations communicate a bird-centric perspective any more than the earlier works so clearly focused on the human experience of nature?

In an interview with Antoine Goléa, Messiaen explained his use of birdsongs this way:

It is in a spirit of no confidence in myself, since I belong to this species (I mean the human species), that I have taken birdsongs as a model. If you want symbols, we can further say that the bird is the symbol of freedom. . . . Despite my deep admiration for the folklore of the world, I doubt that one can find in any human music, however inspired, melodies and rhythms that have the sovereign freedom of birdsong.108

The “sovereign freedom” Messiaen found in birdsongs is likely closely related to his view of birds as symbols of eternity. Yet even Messiaen’s pieces fix birdsongs in a limited number of iterations, as one might fix a dead animal in formaldehyde for observation. The musical freedom of a nightingale is not easily preserved in a work that tries to capture it. It seems possible that even pieces that imitate the non-human natural world “authentically” may undermine what they try to extol.

In his book Aesthetic Theory, Theodor Adorno writes that nature and art are fundamentally opposed and that when we take a studied, or objectifying, approach to nature—whether in a natural park or an artwork—we rob it of its essence:

The concept of natural beauty rubs on a wound, and little is needed to prompt one to associate this wound with the violence that the artwork—a pure artifact—inflicts on nature. Wholly artifactual, the artwork seems to be the opposite of what is not made, nature. . . . Through its duplication in art, what appears in nature is robbed of its being-in-itself, in which the experience of nature is fulfilled . . . Planned visits to famous views, to the landmarks of natural beauty, are mostly futile. Nature's eloquence is damaged by the objectification that is the result of studied observation, and ultimately something of this holds true as well for artworks.109

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108 In Antoine Goléa, *Rencontres avec Olivier Messiaen* (Paris: Slatkine, 1984), 234. That freedom was precisely what made Hanslick state that birdsong is not music.

Moreover, Adorno writes, any attempt to reconnect to nature through naturalistic art is doomed to fail, because it appropriates that which it attempts to celebrate: “All naturalistic art is only deceptively close to nature, because, analogous to industry, it relegates nature to raw material.” Thus, when a composer uses birdsong in a composition, he risks communicating a characteristically anthropocentric sense of control over the source, no matter how authentically he replicates it. It is analogous to what we do to a landscape by turning it into a natural park crossed with scenic byways and overlooks: in the words of Alison Byerly, we have “removed it from the realm of nature and designated it a legitimate object of artistic consumption.” This transformation may be unintentional, but it is communicated nonetheless.

In The World as Will and Idea (1818—44), Arthur Schopenhauer argued that music, too, suffers when it tries to replicate the natural world. Music, according to Schopenhauer,

gives the inmost kernel which precedes all form, or the heart of things…The unutterable depth of all music—by virtue of which it drifts over and beyond us as a paradise familiar yet ever remote, comprehensible and yet so inexplicable—rests on its echoing all the emotions of our inmost nature, but entirely without reality and far removed from its pain.

Music related to something with a physical manifestation in the world, therefore, “must have proceeded from the direct knowledge of the nature of the world . . . and must not be an imitation produced with conscious intention by means of concepts; otherwise the music does not express the inner nature, the will itself, but merely imitates its phenomenon inadequately.”

The pieces I have examined to show how music can communicate a relationship to the natural world use the traditional techniques of imitation and representation. It would seem that

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110 Ibid, 86.
113 Ibid.
these pieces are doomed to fail both music (Schopenhauer) and nature (Adorno). Certainly some pieces using other techniques described earlier (found materials, outside situation, etc.) may avoid the critiques of Adorno and Schopenhauer, and we will touch on some of these pieces as we examine Adams’s music in detail. What we can say now is that if Adams wants to recreate our relationship with nature in his music, one challenge he faces is incorporating the non-human natural world into his music while preserving nature’s autonomy and music’s expressive potential. Instead of a process of making music from nature, whereby natural sonic material is captured or improved, Adams must find a way to make music with nature, such that our perception of the beauty in his work increases our perception of the beauty and autonomy of the non-human natural world.

Analytical Model

The Tripartite Approach

Because of the semiological implications of Adams’s challenge and the varied nature of his solutions, the analytical approach taken in this dissertation is one put forward by Jean-Jacques Nattiez in Music and Discourse, which he derived largely from the work of Ferdinand de Saussure and Charles Sanders Peirce.\textsuperscript{114} To Nattiez, “the musical work is not merely what we used to call the ‘text;’ it is not merely a whole composed of ‘structures’. . . . Rather, the work is also constituted by the procedures that have engendered it (acts of composition) and the procedures to which it gives rise: acts of interpretation and perception.”\textsuperscript{115} Nattiez calls these two dimensions the “poietic” and the “esthesic.” The score to which they relate may be called the

\textsuperscript{114} Nattiez consistently credits his instructor Jean Molino with much of his work as well.
\textsuperscript{115} Nattiez, Music and Discourse, ix.
“trace” or the “neutral,” “material,” or “immanent” level. Analysis of musical works takes place at these levels as follows:

**Poietic:** The poietic dimension includes the creator’s deliberations, techniques, rules, and production. Analysis at this level is centered on “the link among the composer’s intentions, his creative procedures, his mental schemas, and the result of this collection of strategies; that is, the components that go into the work’s material embodiment.”

**Trace:** “The symbolic form is embodied physically and materially in the form of a trace accessible to the five senses,” writes Nattiez. Analysis at this level includes conventional score analysis.

**Esthesic:** Nattiez writes that perceivers of a symbolic form “construct meaning” in an “active perceptual process.” The esthesic level is where “enjoying, contemplating or reading a work, musical performance, as well as scientific and analytical approaches take place.” Moreover, Nattiez is concerned with “not merely the artificially attentive hearing of a musicologist, but the description of perceptive behaviors within a given population of listeners; that is, how this or that aspect of sonorous reality is captured by their perceptive strategies.”

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116 Nattiez credits Étienne Gilson with the term “poietic,” Paul Valéry with the term “esthesic,” and Jean Molino with the terms “neutral” and “material.” Ibid, 12-13.
118 Ibid, 92.
119 Ibid, 12.
120 Ibid.
121 Ibid.
122 Ibid, 92.
The trace is what is most conventionally analyzed as a “message” according to the classic schema for communication:

Producer \(\rightarrow\) Message \(\rightarrow\) Receiver

Nattiez suggests, however, a different schema:\(^{123}\)

Poietic Process \(\rightarrow\) Trace \(\leftarrow\) Esthesic Process

Producer \(\rightarrow\) Trace \(\leftarrow\) Receiver

The implication of this framework is that a piece of music is not a simple transmission vehicle between a composer and a listener but rather the result of a process of creation and a point of departure for an active perceptual process that “reconstructs a ‘message.’”\(^{124}\) This method is useful for the project at hand because it looks at the musical work in the same terms as Adams—that is, as having implications beyond its mere sound.

The stakes offered by semiology are these: that recognizing, elaborating, and articulating the three relatively autonomous levels (poietic, neutral, and esthesic) facilitates knowledge of all processes unleashed by the musical work, from the moment of the work’s conception, passing through its “writing down,” to its performance. In short, semiology makes knowledge possible of the phenomenon we know under the name “music,” in its totality.\(^{125}\)

**Typology of Listening**

Nattiez’s tripartite model will provide the general structure for the analysis of each piece by Adams examined in this dissertation. Whereas the character of the discussion at the poietic and neutral levels will be familiar for most readers, I believe there is little agreement about analysis at the esthesic level. In fact, it is disagreement at this level that lies at the heart of the debate between representationalists like Peter Kivy and structuralists like Roger Scruton. The

\(^{123}\) Ibid, 17.
\(^{124}\) Ibid, 17.
\(^{125}\) Ibid, 92.
reason Kivy writes about music “appreciation” and Scruton music “understanding”\textsuperscript{126} is that Kivy is describing an experience of listening that is open to a broader array of information than Scruton’s. Rather than claim one or the other types of listening to be the valid one, I would like to present a typological model of listening that incorporates both.

Many other writers have created typological models of listening. Some base their typologies only on the quality of the listener’s attention.\textsuperscript{127} Others also include in their analysis information about the sounds themselves\textsuperscript{128} or where they are heard.\textsuperscript{129} Still others stress the listener’s process of creating meaning from the music.\textsuperscript{130}

It is my suspicion that, although we would like to generalize from our individual experiences, listening processes vary, depending on natural or acquired sensitivities. I also think a single individual’s listening process may vary over short periods of time, depending on the auditory event and the listener’s mood. I have consulted the work of some other writers, but my model is largely based on self-examination. Its resemblance to other typologies makes me think it is widely applicable to at least a certain extent.

Below I outline seven “types” of listening. I intend this typology to relate to music and nonmusical sounds but not to spoken language. It applies to the experience of auditory events as

\textsuperscript{126} Scruton, \textit{Aesthetics of Music}, 118-138. For example, “I have argued that music is not representational, since thoughts about a subject are never essential to the understanding of the music.” (138)


short as a clap of thunder and as long as a symphony.\footnote{In this list (but not elsewhere in this dissertation) I use “sound” and “music” interchangeably. I think the definition of music as “organized sound” is adequate for most purposes. I discuss this point further in the chapter on The Place Where You Go to Listen.} I have listed the simplest, most widely available types first (1-2), then three less simple but still widely available types (3-5), and finally more complex types (6-7). By “complex” I only mean that the listening involves analytical thinking processes. Although a listener may progress through these seven types sequentially during the course of one auditory event, only the first type is necessary, and during an auditory event it must be first. Types 2 through 7 may follow in any order. It is possible that listeners do not engage in all seven types because they are incapable of doing so, because they are disinclined at a given moment, or because the stimuli in the event are insufficient to cause all of these responses.

Under each listening type, I attempt to provide a definition, giving details and examples where necessary. I also list the capabilities that the listener must have to experience this type of listening and the range of emotional outcomes that may result. It is possible that listening types occur in rapid alternation, leading to what seems like a cumulative emotional response. The purpose of this typology is to assist in teasing apart that response.

1. Physical Perception

   • Definition: The listener shifts awareness to the presence of a sound.\footnote{It is this awareness that delineates listening from hearing.}
   
   • Required capability: Normal human auditory functioning.
   
   • Emotional response: Very little, other than a sensation of alertness. If the sound is unexpected or unexpectedly loud, the listener may experience the discomfort of surprise.\footnote{In this list (but not elsewhere in this dissertation) I use “sound” and “music” interchangeably. I think the definition of music as “organized sound” is adequate for most purposes. I discuss this point further in the chapter on The Place Where You Go to Listen.}
2. **Source Perception**

- **Definition**: The listener attempts to determine the direction from which the sound is coming and the source of the sound (e.g., instrument, body of water, or animal)

- **Required capability**: Normal human auditory functioning is adequate for general identification. Specialized training in identifying individual elements within classes of sounds (such as birdsongs or instruments) may lend further precision.

- **Emotional response**: Widely variable, depending on the listener’s success in determining the source and preexisting relationship to sounds of that source.

3. **Musical Perception**

- **Definition**: The listener develops a non-verbal understanding and awareness of musical parameters such as pitch, texture, harmony, timbre, rhythm, and form. Without any formal analysis of the sounds, the listener “follows” the music.

- **Required capability**: A sensitivity to sound that is sufficient to aurally delineate the elements.

- **Emotional response**: The emotions that accompany sensory awareness and focus.

4. **Emotional Listening**

- **Definition**: The listener opens himself to the emotional expression of the musical argument.

- **Required capability**: Musical Perception (type 3) and emotional availability. Familiarity with the style of music and its range of expression will increase the chance that the perceived expression is one perceived by others familiar with the style.

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133 It is possible there are other unmediated emotional responses, but I can think of none.
• *Emotional response:* A heightened state of emotion, but not necessarily the same
emotions that one perceives in the music.\(^{134}\)

5. **Aesthetic Judgment**

• *Definition:* The listener evaluates the sounds using many possible criteria, including (but
not limited to) the meeting of expectations, similarity to other pieces of music, degree of
novelty, and amount of pleasant feelings experienced while listening.

• *Required capability:* The capacity to judge according to the criteria used.

• *Emotional response:* A wide spectrum, from great satisfaction to great dissatisfaction or
confusion.

6. **Musical Analysis**

• *Definition:* The listener deconstructs the sound mass along the lines of musical analysis.
Some (certainly not all) of the questions that the listener attempts to answer are listed
below in non-mutually-exclusive categories:

**PITCH**

Are the sounds generally situated “high” or “low”?

Are the sounds moving “up” or “down”?

What is the set of frequencies that are used?

**TEXTURE**

Does an audible and cohesive sequence of pitches (a melody) stand out?

Is the music monophonic, homophonic, or polyphonic?

What kind of relationships are there between voices (imitation,
inversion, augmentation, diminution etc.)?

\(^{134}\) For example, listening to Mimi and Rodolfo fall in love in Act I of Puccini’s opera *La
Bohème*, I can be moved by their instant infatuation without feeling as if I am falling in love.
How are pitches divided between different timbres?

HARMONY

Does the combination of pitches take on a logical coherence?

Do the sounds seem to be leading somewhere, centered on one pitch or group of pitches?

At any one moment, how far is the music from that center?

VOLUME

How loud are the sounds?

How does the loudness vary over time?

RHYTHM

Is there a regular beat?

How are the beats grouped?

What makes the beat groupings audible?

FORM

How does the sound mass heard at any one moment relate to the sounds heard at an earlier moment, and does it predict the sounds to come?

PERFORMANCE ANALYSIS

How is the performer affecting all of these parameters?

• **Required capability**: Ability to analyze musical parameters aurally. Where relevant, the ability to separate the piece as notated in the score from the contribution of a performer.

• **Emotional response**: The spectrum from interest or excitement through boredom and irritation.

7. **Semantic-Comparative Listening**
• Definition: The listener compares the music to something else, searching for and deciphering meanings in the sounds that are expressed in nonmusical terms. The listener may come to this type of listening by considering texts or other indications of the composer’s intentions, as well as knowledge about the music’s possible connotations. Alternatively, the listener may begin with structures found in the music and seek extramusical homologies.

• Required capability: Ability to listen metaphorically. Knowledge of the composer’s intentions and musical connotations may also be necessary.

• Emotional response: A wide range, often along the spectrum from confusion or irritation to the satisfaction of understanding.

It is my belief that only types 3 and 4 may occur simultaneously. I postulate that Emotional Listening, in fact, requires Musical Perception, though the opposite does not hold. I believe that Musical Perception is not simultaneously compatible with Musical Analysis or Semantic-Comparative Listening. One can either be fully absorbed in the music, or one can analyze it, but both cannot occur in the same moment. I believe many trained listeners rapidly alternate between these types of listening.

I have outlined what I believe to be the initial emotional spectrum provoked by each type of listening. One can, however, have emotional responses to the initial emotional responses. Take, for instance, the example of a pianist at a competition hearing another competitor play exceptionally well. I would suggest that the initial emotional response to the quality of playing might be along the emotional spectrums prescribed by Emotional Listening or Aesthetic Judgment, while an unpleasant feeling may come just afterwards as a reaction to that response.
Finally, it is worth asking at what level of listening Adams’s music could reshape our relationship with the planet. Clearly, if a composer has a “message” that he wants a listener to receive, he might want to offer material for their Semantic-Comparative Listening. I want to suggest over the course of this dissertation, however, that Adams thinks the possibilities go beyond this level. I believe, in fact, that some of his music is better understood at the levels of Musical Perception and Emotional Listening, which even a structuralist could engage without hesitation.

**The Six Pieces Analyzed in This Study**

For this dissertation, I have chosen to look at six of Adams’s pieces in chronological order of composition, devoting one chapter to each piece. The pieces are markedly different from each other, but the trajectory between them is clear. I consider these works to be broadly representative of the different approaches that Adams has taken to composition and to relating music to the natural world.

*songbirdsongs* (1974-79, rev. 2009) is a piece for piccolos and percussion in nine movements. Each of the movements features imitations (Adams calls them “free translations”) of the songs of one to three species of birds, linked through an indeterminate musical structure.

*Earth and the Great Weather: A Sonic Geography of the Arctic* (1990-93) is a concert-length work for re-tuned strings using just intonation and digital delays, percussion quartet, narrators in four languages, four solo singers, and recorded environmental sounds. This sonic portrait, or “sonic geography,” of the Arctic National Wildlife Refuge (ANWR) is in ten movements: three percussion quartets based on Native Alaskan dance music and seven “Arctic Litanies,” in which the speakers intone the names of places, plants, animals, and natural forces in ANWR, usually
over a texture of string harmonics. The piece is a sonic representation of a journey through the physical and cultural landscape between the Arctic coast and the Brooks Range.

*In the White Silence* (1998) for string quartet, celesta, harp, vibraphones, and string orchestra is another concert-length work. On the surface, it has the least direct connection to the natural world of the six pieces analyzed here. In the 1990s Adams moved away from writing music about a particular place and towards composing “a musical landscape with an essential coherence in some way equivalent to the wholeness of a real place.”

*Strange and Sacred Noise* (1991-1998) is a work in six movements for percussion quartet, which was inspired by Adams’s experience of ice breaking on the Yukon River in the early spring. Each movement is based on a particular geometrical fractal or a kind of wave motion. Adams does not so much “represent” these mathematical phenomena as find a sound medium and structure through which the fractals can be directly expressed.

*The Place Where You Go to Listen* (2004-2006) is a permanent installation in The Museum of the North in Fairbanks, Alaska. It is a specially designed room in which data streams tracking normally unheard natural phenomena—seismic activity, the *aurora borealis*, cloud cover and visibility, and the movements of the sun and moon—are transformed into four distinct streams of electronic sound through a Max/MSP patch Adams and his collaborators created. This creates a richly textured electronic sound environment that produces continually different music twenty-four hours a day, each day of the year.

*Inuksuit* (2009) is a work scored for nine to ninety-nine percussionists. Like *songbirdsongs*, it is constructed in an indeterminate form. Named after the stone structures placed by the Inuit in

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Arctic landscapes, *Inuksuit* is Adams’s first piece composed specifically for outdoor performance.

In this dissertation, I examine these six pieces in light of Adams’s challenge stated at the beginning of chapter. Throughout the paper I look at both the techniques that Adams uses to connect the natural world to his music and how this connection functions. I examine both the aesthetic challenges that each piece presents and the ecocritical issues that it confronts. Each piece requires a different degree of emphasis on each of the semiological levels of analysis.Where a complete score is available (*Earth and the Great Weather, In the White Silence, Strange and Sacred Noise*), there will be thorough score analysis. Where analysis of the immanent level is limited by the total lack of a score (*The Place Where You Go to Listen*) or the impossibility of a definitive version of it (*songbirdsongs, Inuksuit*), the creative process—as revealed in Adams’s notes, writings, and personal communications—and the esthesic process will have more weight. It is my hope that in the end, the reader will have an enriched understanding not only of Adams’s work but also of the definition of music and what its subject matter is; the relationship of music and the non-human natural world; the relationship of a composer to his source material, compositional process, performers, and audience; and the many ways in which we listen.

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136 Early in the project, I interviewed other listeners regarding their impressions of the music, but ultimately I decided to consider only my own listening responses. I have tried to listen to each piece repeatedly and with different types of listening.
CHAPTER 2. *SONGBIRDSONGS*: MUSIC AS TRANSLATION

Beginnings

One day in the summer of 1973, the twenty-year-old John Luther Adams was walking down a country road in Georgia with his girlfriend Margrit von Braun. The couple had recently returned to Georgia from Los Angeles. Margrit wanted a horse, and by chance they saw a sign advertising “horses, mules, and ponies.” The couple tracked down the sign’s owner, J. Waymon Stokes, and before long, Margrit had a horse, Adams had a new job as a farm hand, and the couple had a new home on the farm.

The woods around the Stokes farm were populated by many species of birds, and Adams took it upon himself to learn their sonic identities. At dawn and sunset, before and after his daily chores of mending fences, caring for livestock, and the like, Adams explored those woods, taking notes of what he heard. With the help of a recording of birdsongs and some field guides, he learned to identify many species. Two things he avoided, however, were notating songs from his recordings and listening to Messiaen. Over several years Adams gradually developed his notations into *songbirdsongs*, the piece that he claims as the first in his own compositional voice.

As detailed in chapter 1 of this dissertation, birdsong imitation has a very long history in Western music. What makes *songbirdsongs* unique is Adams's attention not only to the songs but also to the birds' singing behavior. In his preface to the work, Adams writes:

This music is not literal transcription. It is translation. Not imitation, but evocation. My concern is not with precise details of pitch and meter, for too much precision can deafen us to such things as birds and music. I listen for other, less tangible nuances. These melodies and rhythms, then, are not so much constructed artifacts as they are spontaneous affirmations... No one has yet explained why the free songs of birds are so simply
beautiful. . . Beyond the realm of ideas and emotions, language and sense, we just may hear something of their essence.

Since one of the challenges of Adams’s goal to “re-imagine . . . our relationships with this planet” is to find ways to create music with the natural world without diminishing nature’s autonomous beauty in the perception of the listener, it is worthwhile examining Adams's process of “translation” in detail.

In the spring of 1974 Adams began making field notations of birdsongs on small 3.5” x 5” notecards. Figures 2.1-4 reproduce several examples of these. Adams often notated several birds on a card, although he did not always hear the birds at the same time. For example, in Figure 2.3 three birds are notated on the same card, though it seems clear that at least the field sparrow and red-eyed vireo were notated on different occasions (May 5, 9:00-10:00 a.m. and May 6, 7:30-8:00 a.m.).

The identity of the notated birds is not always recorded, most likely because they were obvious to Adams. These identities, however, can often be deduced. For example, a comparison of the labeled eastern towhee songs in Figure 2.1 with the unlabeled songs in Figure 2.2 reveals that the latter are also likely eastern towhee songs. Similar comparisons can confirm the presence of tufted titmouse songs in Figure 2.1 and red-eyed vireo songs in Figure 2.4.

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1 John Luther Adams, sketches for *songbirdsongs*, 1974-1979, Box 2 / Folder 1, Adams archive, Fairbanks, Alaska.
Figure 2.1. Field notations of two eastern towhee songs, followed by two unlabeled tufted titmouse songs.
Figure 2.2. Field notations of red-winged blackbird, chuck-will's-widow, and unlabeled eastern towhee songs.
Figure 2.3. Field notations of field sparrow, northern bobwhite, and red-eyed vireo songs.
In addition to the time, date, and identity of the birds, Adams made other notations on the cards. For example, next to the unlabeled tufted titmouse syllables in Figure 2.1, Adams wrote “3-7x,” “6-8” and “rest.” He notated not only the notes but also the number of times a titmouse usually repeats this syllable (often transliterated as “peter”), as well as the timing of the song.\(^2\) Additionally, he wrote “w/ water music,” likely indicating either that he heard these songs next to a water source or that he was already thinking about how to set the songs in a piece of music.

The tufted titmouse has between five and ten syllables like this, each of which he will sing repeatedly before switching to another.\(^3\) In the case of the red-eyed vireo, individuals can

\(^2\) I use the term “syllable” to indicate a short, repeatable fragment of bird sound, several of which make a “song.” I use the term “phrase” to indicate a musical idea by Adams.

sing up to 30-40 syllables. Adams tried to notate this variety. For many of the songs he also tried to indicate dynamics and inflections, as in those of the unlabeled tufted titmouse (Figure 2.1) and the northern bobwhite (Figure 2.3).

Once Adams had these field notations, containing some indications of variety, repetition, timing, and inflection of songs, he faced many questions as he began to make pieces out of them:

- What kinds of instruments would he use?
- How many pieces would there be?
- Would each piece feature one songbird or several?
- How many players would there be for each piece?
- What kinds of instructions would be given to the players?
- Would the pieces simply imitate the birdsongs?

An early, undated compositional journal entry indicates some of the ideas that guided him through this process. He wrote:

> Use all birdsongs and calls, not just the pretty “musical” ones. Often the “ugly” ones are richer and more complex. They are almost always wilder. . . . And the sound of the place, too. Songbirds are more like accents than the center. Remember: Translation is the thing. Forget transcription.⁵

Although Adams did try to faithfully record the songs in the field, he knew that exact replication of birdsong is impossible on a human instrument. Birds use notes located between those that are used in common Western scales. Although they often sing quite rhythmically, they do not necessarily follow a consistent beat. They can sing higher than piccolos and, using their multiple voiceboxes, can produce more simultaneous timbres than any human instrument can play. Moreover, what would be the point of a piece of music that only aimed to reproduce a few

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⁵ Adams, Box 2 / Folder 1, Adams archive.
selected sounds exactly as they were once heard in the wild? Wild utterances are spontaneous events; abstraction and replication can strip them of their meanings. Even Messiaen, the great ornithologist who had incorporated so many birdsongs into his music, wrote, “It is ridiculously servile to copy nature.... Melodies of the “bird” genre will be transcription, transformation, and interpretation of the volleys and trills of our little servants of immaterial joy.”6 Adams, though, needed to find his own process of “translation.”

From the beginning, Adams chose to score most of the birdsongs for piccolo, since, among Western instruments, its timbre and register most closely resembles birds’ voices. The technique of flutter-tonguing also allowed Adams to approximate the sound of certain bird trills, such as that which the wood thrush uses to end its songs. To the piccolos Adams added percussion instruments, which create the sound of the place in which the birds are the “accents.”

To understand Adams’s process of creating music out of the birdsongs, it is essential to know something about the singing habits of the birds he was “translating.” Take the wood thrush, for example. In The Singing Life of Birds, Donald Kroodsma explains that the wood thrush sings a three-part song: an introductory bup-bup-bup repeated on a single pitch, a whistle that often sounds like an arpeggiated chord, and a flourish including a trill.7 Additionally, the wood thrush maximizes variety in its singing. Each individual has a repertoire of whistles and flourishes that he continually recombines, so that he never sings the same song—and rarely the same whistle or flourish—back-to-back. This avoidance of direct repetition even carries over to duets. Thus when two neighboring wood thrushes that share song elements sing back and forth, each actively avoids using any shared element that his neighbor just used.

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7 Kroodsma, Singing Life of Birds, 237-254.
Figure 2.5 shows Adams’s pencil sketch of the first piece of *songbirdsongs* that Adams completed, “Wood Thrush.” Looking at the sketch, we see that Adams notates the variety in the wood thrush's song. Rather than selecting only one or two of the songs he heard, he presents the piccolo player with seventeen songs, each of which has the three-part structure of introduction, whistle, and trill. The timing of each song is indicated by Adams’s instruction that “Each song should be 1 ½ to 2 seconds long” and sung at the rate of “10 to 15 per minute.” Adams conveys the wood thrush’s characteristic non-repetition to the player with the instruction to perform the songs “usually without repetition.” He also asks the player to play with “free intonation and inflection,” and he asks for bamboo wind chimes as an accompaniment.
Figure 2.5. Pencil sketch of “Wood Thrush.” Text: “Each song should be 1½ to 2 seconds long. Songs may be sung in any order – 10 to 15 per minute – usually without successive repetition. The songs are not in equal temperament, nor are they strictly metered. They should have the free intonation and inflection of birdsong.”
In this first sketch we can see many of the characteristics of *songbirdsongs* that would remain throughout its several transformations:

a) faithful reproduction of the songs heard in the wild;

b) an open-ended form that attempts to preserve the variety and singing behavior of the birds; and

c) scoring for piccolo and percussion.

Originally all of the pieces in *songbirdsongs* were, like “Wood Thrush,” settings of the songs of one species. The pieces were set for one piccolo player and one percussionist, and the percussion parts, as in “Wood Thrush,” were simple enough to be notated on the same page as the piccolo part. Figure 2.6 shows the first draft in pen of “Field Sparrow,” which can be compared to the field notations of the same bird (Figure 2.3). The instructions to the performer are different than in “Wood Thrush,” as the singing behavior of the two birds is different. A field sparrow typically has a repertoire of more complex morning songs and simpler daytime songs. The songs here, having different syllables, appear to be morning songs. Adams’s instruction to the performer to play one song “for a while; then the other” seems to reflect his having heard one or more individuals alternating between two similar morning songs. Interestingly, Adams included phrases consisting entirely of rests, in order to indicate that silence between utterances was important. He also included within the score the time and date when the bird’s song was transcribed, as if to emphasize the individuality of the bird that he heard.

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8 Kroodsma, *Singing Life of Birds*, 368.
Figure 2.6. Pen sketch of “Field Sparrow.” This piece was later incorporated into “Morningfieldsong.”
The earliest performance of pieces of *songbirdsongs* was by flutist Anne McFarland and percussionist Alan Balter at Georgia State University on April 7, 1975. The two played “Wood Thrush,” “Meadowlark,” “White-throated Sparrow,” “Redwing,” and “Carolina Wren.” McFarland and Adams himself performed a large set of the songs at a Unitarian Universalist Church in Atlanta in June, 1976. The program included the following fourteen songs, each featuring one species of bird:

- Wood Thrush
- Field Sparrow
- Redwing
- Cardinal
- Hooded Warbler
- Wood Pewee
- Song Sparrow
- Northern Oriole
- Louisiana Waterthrush
- Savannah Sparrow
- Mourning Dove
- Black-throated Green Warbler
- Carolina Wren
- Hermit Thrush

Programs from 1975-1978 featured different subsets of the songs. Adams has always considered the pieces within *songbirdsongs* to be modular, capable of being performed in many different subsets and orders. In addition, he was continually revising and adding to the collection. By August 1978, Adams had amassed over thirty-five songs.  

Two significant conceptual changes occurred in 1978-79. First, Adams began to conceive of larger performing forces for the piece. A performance in April 1978 at the Hambidge Center, an arts retreat in Rabun Gap, Georgia, featured four performers—two piccolo players and two percussionists. Second, shortly before the piece was recorded for Opus One Records in 1979, Adams began to group the songs of different species of birds within a single, renamed piece. For

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9 John Luther Adams, letter to Peter Christ, August 17, 1978, Box 2 / Folder 7, Adams archive.
instance, the song sparrow and field sparrow were juxtaposed within a piece called "Morningfieldsong."

The recording for Opus One\textsuperscript{10} featured two piccolo players and four percussionists; this has remained the scoring of the piece through the present day.\textsuperscript{11} The recording also solidified the formal structure shown in Table 2-1. Note that many of the birds that Adams set earlier were cut for this version.

<table>
<thead>
<tr>
<th>Title</th>
<th>Featured Birds</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Wood Thrush&quot;</td>
<td>wood thrush</td>
</tr>
<tr>
<td>&quot;Morningfieldsong&quot;</td>
<td>song sparrow, field sparrow</td>
</tr>
<tr>
<td>&quot;Meadowdance&quot;</td>
<td>eastern meadowlark, red-winged blackbird</td>
</tr>
<tr>
<td>&quot;August Voices&quot;</td>
<td>pine warbler, red-eyed vireo, purple martin</td>
</tr>
<tr>
<td>&quot;Mourning Dove&quot;</td>
<td>mourning dove</td>
</tr>
<tr>
<td>&quot;Apple Blossom Round&quot;</td>
<td>northern orioles\textsuperscript{12}</td>
</tr>
<tr>
<td>&quot;Notquitespringdawn&quot;</td>
<td>eastern towhee, American robin</td>
</tr>
<tr>
<td>&quot;Joyful Noise&quot;</td>
<td>northern cardinal, Carolina wren, tufted titmouse</td>
</tr>
<tr>
<td>&quot;Evensong&quot;</td>
<td>hermit thrush, Swainson's thrush, varied thrush, ruffed grouse</td>
</tr>
</tbody>
</table>

Table 2-1. Form of \textit{songbirdsongs} since the 1979 recording on Opus One Records.

In 1980, a year after the recording for Opus One, five of the songs ("Morningfieldsong," "Apple Blossom Round," "Meadowdance," "Joyful Noise," and "Evensong") were reproduced in their penned form and distributed by Alry Publications in Denver, Colorado. Adams says in the performance notes to the published edition that the songs may be performed by "two to five players," but in the notes to each piece, it is clear that his preference is for the ensemble size used


\textsuperscript{11} See footnote 20 in this chapter.

\textsuperscript{12} At the time that \textit{songbirdsongs} was written, both Baltimore orioles and Bullock's orioles were called "northern orioles." The two actually have different coloration and singing patterns. See Alvaro Jaramillo and Peter Burke, \textit{New World Blackbirds: The Icterids}, (Princeton: Princeton University, 1999), 199. Given that Adams was in the eastern United States, whereas Bullock's orioles are only found in the western part of the country, the “northern orioles” Adams heard were most likely Baltimore orioles.
in the recording. In 2006-2009, the piece was significantly revised again, although the structure shown in Table 2-1 remained the same. The latest edition of the score is available through Adams’s publishing company, Taiga Press. A recording of the new version is available on Mode records.  

**Final Version**

There is no score, *per se*, for *songbirdsongs*. Instead, there is a folio that contains the following: a) performance notes that apply to the whole work; b) an event “map” for each piece that shows the relative order of events for the different players; and c) parts for each instrument, consisting of a collection of unordered phrases for each piece. In the general performance notes (Figure 2.7) Adams expands on the original performance instructions for “Wood Thrush” (Figure 2.5). As before, Adams conveys the importance of silences and avoiding “sing-song patterns and square phrasing.” Encouraging the players to find a balance between “sensitively playing with the other musicians and ignoring them,” Adams essentially instructs them to time their playing as birds would, rather than to base it on a predetermined meter and contrapuntal structure. By instructing the players to surround the audience “wherever possible,” he encourages a spatial arrangement that brings audience and performers into a more natural acoustic context than a typical concert hall setting.

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Performance Notes

This music should be played with the free intonation and inflection of bird songs, not in exact temperament. Time should also be free and fluid. Metronome markings are given only as general guidelines.

The sequence of phrases on the page does not necessarily imply the sequence of events in performance. You are free to choose when and for how long to play each phrase, within the broad guidelines provided for each piece.

The appropriate pacing will become apparent by listening carefully to the music of the moment. Try and play mindlessly, shaping the music as it unfolds. Don't be afraid of silences! They are essential to this music.

Take care to avoid pre-conceived plans, sing-song patterns and square phrasing. The alternation of phrases and rests should not become too regular. Generally, pauses should be one to three times as long as the phrase just played.

In these songs, counterpoint arises as an informal, spontaneous cross-play between parts. This requires a paradoxical balance between sensitively playing with the other musicians and ignoring them - (or at least not being overly influenced by them).

Wherever possible, this music should be performed surrounding the audience. It can also be effective for musicians to rove around and among the listeners.

Each performance will vary in length, but generally the individual pieces should be from two to seven minutes long.

In all parts: Accidentals apply only for the numbered phrase in which they occur.

For the Piccolos:

\[ \text{always means fluttbertongue.} \]

\[ \text{indicates a slide with embouchure and tilting the instrument – not a fingered glissando.} \]

Figure 2.7. Performance notes to the most recent edition of *songbiridsongs*.

Table 2-2 contains the first two phrases of each instrumental part in “Wood Thrush,” the first piece in the complete set. The piccolo I phrases are slightly changed in order and notation
but essentially identical to the earlier sketch. To construct the piccolo II part, Adams has taken each of the piccolo I phrases from the original version and inverted it. This construction, combined with the instructions to the performers not to immediately repeat phrases, ensures that the two piccolos will interact like duetting wood thrushes—full of variety and never repeating themselves or each other. Although the piccolo II part is derived and not purely “authentic,” it allows Adams to recreate the singing behavior of wood thrushes quite authentically.

Table 2-2. The first two phrases of each part in “Wood Thrush,” songbirdsongs. Piccolo II is the inversion of piccolo I. Celesta is the inversion of xylophone. Xylophone and celesta echo the contour of the piccolos. Missing phrases “2” in piccolo II and xylophone are measured rests.
1. Wood Thrush
This was my first setting of birdsong. It dates from spring 1974. I was living in an old farmhouse in Georgia. Each morning before dawn, and again at dusk, haunting, liquid music reverberated through the cool air. As I walked among oaks, dogwoods, poplars and sycamores, now and then I would catch a glimpse of the singers, always deeper in the woods. I listened carefully to these phrases for weeks before trying to write them down. Even now, it’s impossible to articulate the feelings that the song of the Wood Thrush stirs in me.

Bamboo Wind Chimes/Celesta
Begin the piece, playing Bamboo Wind Chimes, very gently. Anytime after Piccolo I has played two phrases, begin playing Celesta, with phrase #1. From then on, Celesta phrases and rests may be played in any order. A phrase may be repeated, but not immediately following itself. Between Celesta phrases, return to Wind Chimes. End anytime after Piccolo I.

Piccolo I
Begin 15 to 30 seconds after the Wind Chimes, playing phrase #1. From then on, phrases and rests may be played in any order. A phrase may be repeated, but not immediately following itself. End before the other players, with phrase #3.

Bamboo Wind Chimes/Xylophone
After Piccolo I enters, begin playing Bamboo Wind Chimes. After Piccolo II has played two phrases, begin playing Xylophone, with phrase #1. From then on, phrases and rests may be played in any order. A phrase may be repeated, but not immediately following itself. Between Xylophone phrases, return to Wind Chimes. After Piccolo II has finished, end the piece with phrase #1, followed by gently fading Wind Chimes.

Piccolo II
After the Celesta has played two phrases, enter playing phrase #1. From then on, phrases and rests may be played in any order. A phrase may be repeated, but not immediately following itself. End with phrase #3, anytime after the Celesta has finished.
The celesta and xylophone parts echo the wood thrush songs. The xylophone shadows the up-down-up motions of piccolo I’s phrases, though at a slower tempo and without trills. The celesta shadows piccolo II’s phrases, often resulting in an exact inversion of the xylophone’s phrases.\footnote{The first phrase of the celesta (shown here for consistency) is the only one that does not exactly invert the corresponding phrase in the xylophone, the first and last intervals having been altered.}

Figure 2.8 is the event map for “Wood Thrush.” Only the most general guidance is given to the performers: the bamboo wind chimes should sound throughout the piece; the other instruments should begin and end in the order, piccolo I, celesta, piccolo II, and xylophone; each performer should start with the first phrase on his or her part after the preceding player has played two phrases; and no phrase should be repeated immediately after itself. Otherwise, Adams leaves it up to the players to determine the order and timing of their phrases. As a result, the songs of the wood thrush seem fresh and alive, and the performers preserve the songs’ natural freedom and ineffable beauty.

Each of the pieces in *songbirdsongs* includes the vocalizations of one to four species of birds. All of the pieces have an indeterminate moment-to-moment structure, but each piece contains different performance rules that depend on the variety or repetition in the featured birds’ singing. Table 2-3 juxtaposes the natural history and ethology of the birds with the design of each piece. In general, those birds with more variety in their singing—like the wood thrush, hermit thrush, and red-eyed vireo—are represented with more different phrases, and the birds with a smaller repertoire, like the red-winged blackbird, field sparrow, and mourning dove—are represented with fewer phrases.
<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wood Thrush</strong></td>
<td>wood thrush, bamboo wind chimes, celesta, xylophone</td>
<td>Eastern range.</td>
<td>“soft bup bup bup at the song's beginning… the loud whistled prelude and the softer fluty flourish.”</td>
<td>Never sings the same song back-to-back; rarely repeats neighbor.</td>
<td>Piccolo I and II. Piccolo II plays the inverse of piccolo I. Xylophone echoes the contour of piccolo I. Celesta plays the inverse of xylophone. Piccolo II and temple blocks</td>
<td>17 phrases. A phrase may not be repeated directly after itself.</td>
</tr>
<tr>
<td><strong>Morningfieldsong</strong></td>
<td>field sparrow, 2 piccolos, 5 temple blocks, 4 high bongos</td>
<td>Western range.</td>
<td>“begin slowly and speed up towards the end … consisting of four parts.”</td>
<td>Fixed repertoire.</td>
<td>Piccolo I and high bongos</td>
<td>5 phrases. Identical parts for two instruments.</td>
</tr>
<tr>
<td><strong>Meadowdance</strong></td>
<td>red-winged blackbird, maracas, sizzle cymbal</td>
<td>Western range.</td>
<td>“The 1-second song starts with an abrupt note that turns into a musical trill.”</td>
<td>Fixed repertoire.</td>
<td>Piccolo II</td>
<td>4 phrases. Each phrase played 2-5 times.</td>
</tr>
<tr>
<td><strong>Auguest Voices</strong></td>
<td>pine warbler, 2 piccolos, orchestral bells, 2 xylophones, tam-tam, cymbals, vibraphone</td>
<td>Eastern pine forests.</td>
<td>“a musical trill.”</td>
<td>Piccolo II and orchestral bells start with pine warbler.</td>
<td>Possess more than one song; may alternate songs.</td>
<td>2 phrases.</td>
</tr>
<tr>
<td><strong>Mourning Dove</strong></td>
<td>mourning dove</td>
<td>Eastern and Central range, prefers nesting in human-provided habitat.</td>
<td>“a broken series of slurred notes. Each phrase [syllable] usually ends in either a downsarl or an upsing.”</td>
<td>Each male has 30-40 songs. Neighboring males don't share songs.</td>
<td>Piccolo I starts with red-eyed vireo.</td>
<td>19 different phrases.</td>
</tr>
<tr>
<td><strong>Apple Blossom Round</strong></td>
<td>Baltimore (northern) oriole</td>
<td>Eastern and Central range.</td>
<td>“a series of rich whistled notes interspersed with rattles.”</td>
<td>Not well studied. Individuals may have multiple songs.</td>
<td>Xylophone enters with purple martin. Towards the end all instruments are playing purple martin.</td>
<td>3 different kinds of phrases, some repeatable.</td>
</tr>
</tbody>
</table>

**Legend:**
- **Piccolo I and II:** Both males and females sing.
- **Piccolo I and high bongos:** Individuals may sing up to 100 different versions, often repeating one version many times.
- **Piccolo II:** Individuals share songs.
- **Piccolo I starts with red-eyed vireo:** Each male has 30-40 songs. Neighboring males don't share songs.
- **Xylophone enters with purple martin:** Towards the end all instruments are playing purple martin.
<table>
<thead>
<tr>
<th><strong>Notquite springdawn</strong></th>
<th>eastern towhee</th>
<th>Eastern range. Forest edges and dense shrubs.</th>
<th>“A loud <em>drink-your-teevee!</em> lasting about 1 second. The first note (<em>drink</em>) is sharp and metallic, and the final note (<em>tea</em>) is a musical trill.”&lt;sup&gt;26&lt;/sup&gt;</th>
<th>Piccolo I</th>
<th>12 phrases. May not repeat a phrase immediately.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 piccolos, 4 triangles, vibraphone</td>
<td>American robin</td>
<td>Wide habitat.</td>
<td>“A string of 10 or so clear whistles assembled from a few often-repeated syllables, and often described as <em>cheerily,</em> <em>cheer up,</em> <em>cheer up,</em> <em>cheerily,</em> <em>cheer up.</em> The syllables rise and fall in pitch but are delivered at a steady rhythm.”&lt;sup&gt;26&lt;/sup&gt;</td>
<td>Piccolo II</td>
<td>Free combination of 9 song fragments, as well as calls.</td>
</tr>
<tr>
<td>4 triangles, vibraphone</td>
<td><strong>Joyful Noise</strong></td>
<td>Carolina wren</td>
<td>Eastern range. Dense shrub.</td>
<td>Sings one song repeatedly before switching to another. The song itself is reiterative. The female also sings.&lt;sup&gt;9&lt;/sup&gt;</td>
<td>Piccolo I starts and ends with wren.</td>
</tr>
<tr>
<td>2 piccolos, low whip, high whip, timpani, crotales, bass drum</td>
<td>tufted titmouse</td>
<td>Eastern range.</td>
<td>“A fast-repeated, clear whistle; <em>peter-peter-peter.</em> The birds repeat this up to 11 times in succession.”&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Piccolo II starts with titmouse. Piccolo I plays titmouse in the middle.</td>
<td>7 different phrases. One phrase is repeated several times before switching to a new one.</td>
</tr>
<tr>
<td></td>
<td>northern cardinal</td>
<td>Eastern range.</td>
<td>“A loud string of clear down-slurred or two-parted whistles, often speeding up and ending in a slow trill. The songs typically last 2 to 3 seconds.”&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Timpani throughout. Crotales towards the end. Piccolo II moves to cardinal.</td>
<td>9 different phrases. One phrase is repeated several times before switching to a new one.</td>
</tr>
<tr>
<td></td>
<td>varied thrush</td>
<td>Pacific Northwestern forests.</td>
<td>“Strong whistled tone on a single pitch, usually buzzy in quality.”&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Bowed crotales and optional xylophone</td>
<td>7 phrases.</td>
</tr>
<tr>
<td></td>
<td>ruffed grouse</td>
<td>Northern range.</td>
<td>“Male drums with wings to produce a series of deep thumping sounds that increase in tempo.”&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Log drum</td>
<td>1 phrase.</td>
</tr>
<tr>
<td></td>
<td><strong>Evensong</strong></td>
<td>varied thrush</td>
<td>Pacific Northwestern forests.</td>
<td>“Strong whistled tone on a single pitch, usually buzzy in quality.”&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Bowed crotales and optional xylophone</td>
</tr>
<tr>
<td>2 piccolos, brass wind chimes, celesta, log drum, tubular bells, bowed crotales, optional violin and xylophone</td>
<td>ruffed grouse</td>
<td>Northern range.</td>
<td>“Male drums with wings to produce a series of deep thumping sounds that increase in tempo.”&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Log drum</td>
<td>1 phrase.</td>
</tr>
</tbody>
</table>
hermit thrush  Wide range.  Nest in Northern and Western forests.  “a melodious, fluty warble, mostly on one pitch, starting with a clear whistled note.” Successive songs are organized for maximal contrast. One of the last songbirds in the evening.

|                  | Piccolo I and optional violin | 9 phrases. |

Table 2-3. Life history, ethology, and musical setting of birds in *songbirdsongs*.

4 Taken from Cornell Lab of Ornithology, www.bna.birds.cornell.edu (accessed November 11, 2010).

The second piece, “Morningfieldsong,” features the field sparrow and song sparrow. In contrast to the wood thrush, both of these birds have a fixed repertoire of songs, although Figure 2.9 shows that Adams has included more songs of the field sparrow than in his original sketch (Figure 2.6). Moreover, individuals in both species may share songs in common with neighbors and may use these shared songs to match each other in duets. Adams assigns the songs of the field sparrow to both piccolo II and temple blocks and the songs of the song sparrow to both piccolo I and high bongos. All the musicians are free to play their assigned phrases in any order they choose. In this way Adams creates the impression of spontaneous duets of shared songs in each species.

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**morningfieldsong**

Light and delicate

1. **Piccolo II**

   (Field Sparrow)

   © 2008 Tāiga Press

   Notes:

   Slur and slide to grace note, but don't re-attack.

   detached, but not staccato.

   etc.

   Figure 2.9. Field sparrow part from “Morningfieldsong,” *songbirdsongs.*
When Adams pairs birds within a piece, he is careful to create pairings that are true to the birds’ natural habitats. For instance, the third piece, “Meadowdance,” features the red-winged blackbird and the eastern meadowlark, both of which inhabit North American meadows and grasslands. The maracas and sizzle cymbal that provide background in this piece possibly imitate a chorus of cicadas.

The fourth piece, “August Voices,” groups the red-eyed vireo (Figures 2.3 and 2.4), the pine warbler, and the purple martin. Among the songs of these birds, Adams has interpolated a figure marked “like cascading spirals of flight” (Figure 2.10), played on both piccolo and vibraphone. This figure, intended to evoke the swirling motion of a flock of purple martins, is the only music for the piccolos in *songbirdsongs* that is not derived from birdsong.

The fifth piece, “Mourning Dove,” is the only one in which piccolos are not used. Adams replaces them with three ocarinas—ancient, usually ceramic wind instruments that more closely approach the haunting sound of the mourning dove.¹⁶

“Apple Blossom Round,” the sixth piece, features the songs of Baltimore orioles. Individuals of this species do not normally share songs,¹⁷ but Adams recalls that the character of the oriole phrases (Figure 2.11) suggested to him the setting of an energetic canon, a musical possibility he could not resist.¹⁸ In writing the same music for all four musicians, Adams used some artistic license, but the indeterminate structure still maintains a wonderful sense of freedom in the oriole songs.

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¹⁶ One of the percussionists must play the third ocarina.
¹⁷ Jaramillo and Burke, *New World Blackbirds*, 199.
(Purple Martin)
... like cascading spirals of flight ...
\[ \text{d} = \text{ca. 132} \]

Vibraphone (motor off)
1. allow all sounds to vibrate
2.
3.
4.
5.
6.
7.
8.
9.

Phrases and rests #1 - 9 may be freely combined in any sequence. On repetitions, phrases #1, 3, 5, 7, 9 may be broken off at any point.

Figure 2.10. Purple martin flight figures from “August voices,” *songbirdsongs*. 
apple blossom round

With circular energy
\( \frac{q}{T} = 126 - 144 \)

1. 

If repeated, this phrase may be broken off at any point.

2. 

3. 

4. 

Figure 2.11. Baltimore oriole phrases from “Apple Blossom Round,” *songbirdsongs.*
Phrases 1-4 may be freely combined in any sequence, without pauses between them, to form a variety of longer songs. 
※ = a point at which a phrase may be broken off.

Figure 2.12. American robin phrases from “Notquitespringdawn,” *songbirdsongs*. 
In the seventh piece, “Notquitespringdawn,” Adams captures the continual improvisation of the robin’s song. American robins typically sing a string of approximately ten clear syllables, each of which has from two to four notes.\textsuperscript{19} Using three triplet sixteenth notes to represent a syllable, Adams gives piccolo II four different phrases of two or three syllables each and indicates where they may be repeated, connected, or broken off to create a robin’s song (Figure 2.12). He also notates robin \textit{calls}—often single-note trills—for the same piccolo, fulfilling his mission to use more than just the “pretty” songs. The piece also features the songs of the eastern towhee, another songbird heard in the early spring, singing some of the songs notated in Figures 2.1 and 2.2.

“Joyful Noise,” the eighth piece, features the Carolina wren, northern cardinal, and tufted titmouse. In all three species the males possess a repertoire of several internally repetitive songs, each of which they sing several times before switching to another. To accommodate these singing traits, Adams notates the birds’ syllables, indicating that each should be repeated a certain number of times to create a song, and he instructs the musicians to repeat a song “2 to 5 times” before switching to a new one (Figure 2.13). The combination of these three species together indeed creates an energetic cacophony, or “joyful noise.”

The ninth piece, “Evensong,” features the songs of birds that sing past sunset, including the varied thrush, Swainson’s thrush, and hermit thrush. The male ruffed grouse, which makes sounds by thumping its wings towards its chest, is also represented.

Figure 2.13. Carolina wren and tufted titmouse phrases from “Joyful Noise,” *songbirdsongs.*
Adams calls the nine parts of *songbirdsongs* “pieces” rather than “movements” to indicate that they may be performed alone, independent of the set, or in a different order from that which is in the score. In this way the flexibility of the entire work is similar to the flexibility permeating each piece. But the logic and beauty of the order of the pieces in the score is powerful. All of the first eight songs are based on birds that nest in the American Southeast, and “Wood Thrush” was the first piece of *songbirdsongs* that Adams completed. The ninth piece, “Evensong,” uses the songs of birds that nest in the far North, which Adams only heard after he traveled to Alaska for the first time in 1975. In addition, wood thrushes sing before dawn, and hermit thrushes are one of the last songbirds to stop singing after sunset. *Songbirdsongs*, as it is presented in the score, therefore follow the trajectory of Adams’s life as well as the course of a day.

The piccolos and ocarinas consistently play birdsongs throughout *songbirdsongs*. Sometimes the percussion instruments also play birdsongs; at other times they serve other functions, like creating ambience or adding an energetic rhythm to the music. For instance, Adams starts “Wood Thrush” with bamboo wind chimes and ends “Evensong” with brass wind chimes, both of which create an aura of magic that gently eases the music out of and back into silence. The maracas and sizzle cymbals in “Meadowdance,” the tam-tam and cymbals in “August Voices,” and the marimbas in “Mourning Dove” play a similar ambient role. As the celesta and xylophone gently echo the wood thrush in the first piece, the triangles and vibraphones echo the robin and towhee in “Notquitespringdawn,” and the celesta and chimes

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20 The instrumental requirements are also different for each piece, ranging from two piccolos and two percussionists in “Wood Thrush,” to two piccolos, four percussionists, and optional violin and additional percussion in “Evensong.” Adams’s reasoning for this is again that the pieces do not need to be performed as a set. However, a complete performance of *songbirdsongs* requires at least two piccoloists and three percussionists. This arrangement requires the percussionists to redistribute the parts in “Evensong.”
echo the thrushes in “Evensong.” The bass drum and whips emphasize the repetitiveness of the Carolina wren, northern cardinal, and tufted titmouse in “Joyful Noise.” The percussion plays melodic duets in “Morningfieldsong,” “August Voices,” “Apple Blossom Spring Round,” and “Joyful Noise.” Only in “Evensong” is a bird species represented only by percussion—the varied thrush by crotales (and optional violin) and the non-singing ruffed grouse by log drum.

Regardless of the percussion’s role in each piece, birdsongs are consistently in the foreground of *songbirdsongs*. As we saw in chapter 1, many settings of birdsongs by previous composers use birds as part of a larger human–centered drama. The text that accompanies Vivaldi’s *Four Seasons*, Beethoven’s Symphony No. 6, and Grofè’s *Grand Canyon Suite*, for example, all highlight the human experience of natural settings. In *songbirdsongs* Adams’s attentiveness to every aspect of the birds’ singing behavior communicates that this drama is about what the birds actually do, as told in their language, rather than what they seem to be telling us. In this sense, the piece is ecocentric rather than anthropocentric.

Sure enough, composers like Beach, Bartók, and Messiaen, by virtue of their care in transcription, treat birdsongs as more than humorous, spiritual or narrative symbols alone, and both Rautavaara and François-Bernard Mâche have integrated instrumental writing and birdsong recordings in a way that highlights the musicality of the birdsong.21 All of these composers, however, “freeze” their birdsongs in a limited number of iterations. In contrast, Adams’s attention to the ethology of the birds he translates allows him to notate the songs in an indeterminate form that actually preserves what Messiaen called birds’ “sovereign freedom.”22

Adams also gives the performers considerable freedom within a mobile, or polyvalent, structure. With *songbirdsongs* Adams creates a kinetic interpretation of the precept “to imitate

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21 See chapter 1 of this dissertation for more description of these pieces.
22 In Goléa, *Rencontres avec Olivier Messiaen*, 234.
nature in her manner of operation,” where nature's “manner of operation” is the singing behavior of the birds, which the performers emulate to create music in real time.

Adams writes in the preface to the score:

If I have abdicated the position of Composer (with a capital “C”), it is because, like e.e. cummings: “I’d rather learn from one bird how to sing than teach ten-thousand stars how not to dance.” After all, what do we really create but answers to Creation?

Indeed, Adams has, in many ways, surrendered control over the piece to both his sources (the birds) and his performers, producing no more nor less than “answers to Creation.” This much is perceptible at the levels of the creative (poietic) process and the score (the “trace” in Nattiez’s language). At the esthetic level the piece offers a wealth of meanings. The title of the work and the layout encourage the listener to look for semantic (representational) meanings, and the use of the piccolo connotation for birds makes it easy to find them. A structuralist like Roger Scruton might say that the music simply points to the birds and says, “Here is the song of a wood thrush” without being able to say anything about it, but I would disagree. Listening to “Wood Thrush,” I do not hear one wood thrush song but many. I do not just notice the songs; I hear how one follows another and how the thrushes interact with each other. The music does, in fact, allow the representation to take on a predicate. It says (especially on repeated hearings of the piece), “The song of a wood thrush follows certain rules: there are many whistles and flourishes; a whistle is never replicated in close succession…”

The music, moreover, is not only a lesson in avian song ethology. From beginning to end, Adams narrates a journey through nine condensed sound worlds to which listeners may have a wealth of emotional reactions. Some of the sounds move me deeply because the birdsongs call up places and times where I have heard them before. In other pieces (“Wood Thrush,” “Morningfieldsong,” “August Voices,” “Apple Blossom Round,” “Joyful Noise”) I cannot help
but feel joy at the interaction between duetting parts. After a performance of *songbirdsongs*, I am left in wonderment at the beauty and variety of the birdsongs and with appreciation for the creativity and spontaneity of the birds and performers alike. That is, the work’s indeterminate structure allows a listener to sense that both the birds and the performers have agency within its creation. This feature of *songbirdsongs*, as much or more than its authenticity of pitches, rhythms, and timbres, makes the work one that recreates our relationship with the natural world. *Songbirdsongs* is ultimately an optimistic piece. Within the confines of the performance space, it presents a relationship between human and other beings that is more peaceful and respectful than what the ideology of anthropocentrism has produced. Whereas many pieces that incorporate the sounds of nature may merely remind us of our estrangement from the non-human natural world, *songbirdsongs* reintroduces listeners and performers alike to the biosphere and invites us to ponder and emulate interaction with its other inhabitants. Into the music it gently invites what Messiaen called birds’ “freedom,” what Adorno called nature’s “being-in-itself,” and what others have simply called “wilderness.”
CHAPTER 3. EARTH AND THE GREAT WEATHER: MUSIC AS SONIC GEOGRAPHY

Introduction

John Luther Adams first visited Alaska in 1975. He recalls that the “sprawling distances, unbroken silences, and incredible qualities of light” made a profound impact on him.¹ He returned the next two summers to work as a wilderness guide on outings throughout the state, from the rainforest of southern Alaska to the Arctic Coastal Plain in northeastern Alaska. He also worked for the Alaska Coalition, a political organization that was fighting for the preservation of the land between the Brooks Range and the Arctic Coastal Plain.² After Adams and his first wife, Margrit von Braun, parted ways in 1978, he moved from Idaho to Alaska and continued to work on land preservation as director of the Northern Alaska Environmental Center.

In 1980 President Jimmy Carter signed into law the Alaska National Interest Lands Conservation Act, a culmination of decades of work by many environmental organizations. The law protected eighteen million acres of land in northeastern Alaska—thereafter called the Arctic National Wildlife Refuge (ANWR)—by designating it as wilderness area under minimal management. The law left, however, one and a half million acres of the coastal plain open to possible resource extraction, subject to mandated studies and Congressional authorization. Leaving this area (the “1002 area”) without permanent protection was the compromise Adams and other environmentalists had to make to get the law passed.

¹ Gayle Young, “Sonic Geography of the Arctic: An Interview with John Luther Adams,” Musicworks 70 (Spring 1998): 38.
² The mountains in the Brooks Range stretch across northern Alaska from west to east.
Shortly thereafter, Adams left his environmental day job and devoted himself more completely to music. He wrote in *Winter Music* that he left “with the feeling that someone else could carry on my part in it, but that no one else could make my music.” Still, ANWR has remained an important part of his life in Alaska. He met his second wife, Cynthia Marquette, through the Alaska Coalition, and the two of them have taken trips together into ANWR for many years. As a composer, Adams has drawn inspiration from ANWR throughout his career.

During the 1980s Adams served as timpanist and principal percussionist in the Fairbanks Symphony and the Arctic Chamber Orchestra. These two groups also premiered some of the works he wrote during the time. *A Northern Suite* (1979-81), which Adams calls “five tone-paintings for chamber orchestra,” features the sounds of the Swainson’s thrush, hermit thrush, varied thrush, and ruffed grouse—sounds that he also used in *songbirdsongs*, though here they are set more statically. In the orchestral setting Adams seems more concerned with landscapes punctuated by birdsongs than with the birdsongs themselves.

*Forest Without Leaves* (1982-84), a cantata for chorus and chamber orchestra based on the poetry of John Haines, is Adams’s most political work. Each of its seven movements describes a different landscape. The first describes an urban “forest of wires and twisted steel” where “the seasons are of rust and renewal.” The third describes a lonely farmhouse, a stone wall, and a “people of dust” enduring the funerals of their children. The fifth describes the sharp passing of the seasons, which bring life and death. Unlike most of his earlier works inspired by the natural world, the landscapes of *Forest Without Leaves* include people. Going beyond tone

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paintings of the natural world, Adams and Haines describe the human interaction with the natural world “from pre-history” to “post-apocalypse.”

One way in which people interact with their natural surroundings is by giving them names. The second movement of Forest Without Leaves begins with the words, “This earth written over with words, with names, and the names come out of the ground, the words like spoken seeds.” Five years later this abundance of names would take on new importance in a work celebrating the Arctic National Wildlife Refuge.

Throughout his first decade in Alaska, Adams came to know many Alaskan Native Americans and their music. He also began to collaborate with them on artistic projects. For a television series called “Make Prayers to the Raven” about the Koyukon Athabascan people, Adams composed original music and arranged two songs written by a Koyukon elder. For a film about the geese that nest on the Yukon and Kuskokwim river deltas, Adams wrote a score that incorporated indigenous Yup’ik songs. Perhaps most significantly, Adams collaborated with the writer Barry Lopez on a theatrical work called Giving Birth to Thunder, Sleeping with his Daughter: Coyote Builds North America (1986-90). The work is based on the story of Old Man Coyote, an archetype who appears under different guises in the stories of many native cultures. The piece is scored for clarinet, violin, double bass, percussion quartet, and storyteller. Included in the score are five excerptable percussion quartets that show the influences of Cage, Harrison, rock and roll, and Native American music.

5 Ibid, 15.
6 These quartets were actually Adams’s third work for percussion ensemble. They were preceded by Always very soft for fingered percussion trio (1973) and Green Corn Dance, a sextet (1976). Although the latter predated Adams’s move to Alaska, it reveals the early influence of Native American (Plains Indian) drumming on Adams’s work.
Thus, over the course of about ten years in Alaska, Adams became increasingly interested in the idea of “place” and its relationship to the people who inhabit it – their names for it, their stories, and their music. He began to see landscape not as something viewed from a removed position but rather in Barry Lopez’s words, as “the culture that contains all human cultures.” And he began to use the idea of “sonic geography” as a touchstone for his composition. To Adams this phrase describes “a region that exists somewhere between place and culture, between human imagination and the world around us.”

In 1989 New American Radio commissioned Adams to write a thirty-minute piece around the idea of “narrative.” Adams chose to write a narrative of a place with which he had developed a relationship— the Arctic National Wildlife Refuge. One way in which he structured the narrative was through the use of natural sounds recorded in and near ANWR. He included the sounds of wind blowing across the Arctic Coastal Plain; loons, cranes, and swans calling; and calving glaciers.

Adams also took Aeolian harps into ANWR and recorded them with various tunings. When set outside, this instrument, named for Aeolus, the ancient Greek god of the wind, is “played” by the wind. It is essentially a wooden box with soundholes and ten to twelve strings strung across a sounding board – much like a guitar or violin. Unlike other stringed instruments, however, the strings are only intended to sound harmonics, not fundamentals. When air blows across one of the strings, it sheds eddies on both sides of the string. When the frequency of the

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7 Lopez has used this phrase for many years. See, for example, Nicholas O’Connell, *At the Field’s End: Interviews with 22 Pacific Northwest Writers* (Seattle: Madrona Publishers, 1987), 15.
oscillation of the air matches one of the string’s natural frequencies, an Aeolian tone results. The
closer the air oscillates, the higher the harmonic that sounds.⁹

Adams realized that he also wanted to include the deep experience of the Iñupiat peoples who
inhabit the region of ANWR north of the Brooks Range to the Arctic.¹⁰ Perhaps inspired by
the text of the second movement of *Forest Without Leaves*, he had the idea to use a litany of their
names for places in ANWR to create a narrative thread. To collect Native Alaskan names, he
consulted Donald J. Orth’s *Dictionary of Alaska Place Names*; early twentieth-century explorer
Knud Rasmussen’s *Across Arctic America: Narrative of the Fifth Thule Expedition*; the Alaska
Native Language Center in Fairbanks; his Native Alaskan friends; and various assessments of the
cultural and natural resources of the region.¹¹ In those assessments, he came across the place
with the Iñupiaq name “Naalagiagvik,” which means “The Place Where You Go to Listen.”

Naalagiagvik is a short stretch of land along the Arctic Ocean in ANWR about five miles
west of the town of Kaktovik.¹² According to an Iñupiat myth, a particularly attuned old woman
used to go to Naalagiagvik to listen to the winds, waves, and animals, whose languages she could

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/music/46545 (accessed October 24, 2014).
¹⁰ “Iñupiat” refers to the people of this region and their culture. “Iñupiaq” is their language.
October 24, 2014); Knud Rasmussen, *Across Arctic America: Narrative of the Fifth Thule
Expedition* (New York: G.P. Putnam’s Sons, 1927); Pedersen, Sverre, Michael Coffing, and Jane
109, (Fairbanks, AK: Alaska Department of Fish and Game, Division of Subsistence, December
2014); Jon Nielson, *Beaufort Sea Study—Historic and Subsistence Site Inventory: A Preliminary
Cultural Resource Assessment* (Barrow, AK: North Slope Borough, December, 1977),
(accessed October 24, 2014).
¹² Naalagiagvik is on Arey Island. Kaktovik is on Barter Island. Both islands lie just off the
mainland.
decipher. Adams initially had the idea that this mythical woman from whom the place got its name would be a central character in the piece and that her journey would constitute its narrative thread. He ultimately abandoned the idea of making her a character but decided to keep the arc of her journey hidden in the piece itself.\footnote{Adams, conversation with the author, May 24, 2010.} As he worked on the initial radio version of the piece, he wrote a story about the woman, which is included in his book *Winter Music*.

In addition to the Iñupiat names, Adams included recordings of one-handed frame drumming in the work. This drumming is the primary accompaniment for Iñupiat songs and dances, many of which are centered on hunting and other interactions with the natural world. Finally, at some point in the process of creating the work, Adams came across a poem by the early twentieth-century Iglulik shaman, Uvavnuk:\footnote{The Iglulik are a group of Iñupiaq-speaking peoples located in the Canadian Northwest territories.}

> The great sea has set me adrift.  
> It moves me like the weed in a great river.  
> Earth and the great weather move me,  
> have carried me away and moved my inward parts with joy.

Adams conflated the speaker in the poem with the mythical woman at Naalagiagvik and included the poem in the work. From the poem he also got the piece’s name: *Earth and the Great Weather: A Sonic Geography of the Arctic. Earth*, as it was performed on the radio, thus included the sounds of Aeolian harps, winds, thunder, ice, birds, Iñupiat one-handed frame drums, and speakers intoning names of places, plants, birds, and other animals in English, Iñupiaq, and Latin, as well as Uvavnuk’s poem.

In 1990, Adams received a commission from the Alaska Festival of Native Arts in Fairbanks. Realizing that *Earth and the Great Weather* could be developed into a much larger
piece, he quit his day job working for public radio (on the advice of Lou Harrison) and devoted himself full-time to composing.

Out of the recordings of Aeolian harps Adams developed seven movements for speakers, recorded natural sounds, and four string instruments (violin, viola, cello, and double bass). Since the speakers slowly intone names throughout these movements, Adams calls them “Arctic Litanies.” To recreate the sound of Aeolian harps, the four instruments are justly tuned. The lowest string on the double bass is tuned to a D at about 36.67 Hz. All of the other strings in the ensemble are tuned to this D (the first harmonic) or to harmonics 3, 5, 7, 9, 11, 13, or 15 above it. These eight harmonics are shown in Figure 3.1. Moreover, since there are sixteen strings in the ensemble, each of these first eight odd-numbered harmonics is doubled in the tuning of the instruments, as can be seen in the first column of Figure 3.2 (though in some cases there are octave displacements). Then each player plays seven harmonics on each of these retuned strings, reaching up to the 105th harmonic of the fundamental (the seventh harmonic of the fifteenth harmonic). Figure 3.2 and Table 3-1 show the complete gamut as pitches and harmonic numbers, respectively. In Earth, the strings play almost exclusively open strings and harmonics, again to resemble the sounds of Aeolian harps.

In order to create the impression of sixteen string players from only four, each of the string instruments is fitted with a microphone, which feeds the sound of the instrument into a chain of three digital delays. Each instrument is then played through a loudspeaker in real time at three delays, which vary from 1.125 to 32 seconds. The delays are uniform across the

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15 Aeolian harp strings are actually all tuned to the same pitch, but each string has a different diameter, causing it to sound different harmonics.

16 Adams avoids the even-numbered harmonics to avoid octave doublings.

17 An additional harmonic must be played on the Bass II, III, and IV strings, although the additional harmonics listed for the cello appears to be a mistake in the score.

18 The only exceptions are a few stopped tones and artificial harmonics in the first movement.
instruments in each movement and are notated in the score at the beginning of each movement. Because of the precise indications for the delays, performance of the Arctic Litanies requires use of a click track – either by the players or the conductor.

![Harmonic series](image)

Figure 3.1. Harmonic series on the fundamental of *Earth and the Great Weather*. Since Adams only used the first eight odd-numbered harmonics, the harmonics in small type were not used.

In the enlarged *Earth and the Great Weather*, Adams expanded the languages of the speakers in the Arctic Litanies to include Gwich’in, which is spoken by the Athabascan people who live on the southern and eastern sides of the Brooks Range. Every Litany contains names in English as well as Inupiaq, Gwich’in, or both. Latin is also added in two of the Litanies. In addition, Adams expanded the original idea of “narrative” to create an aural journey. Over the course of the expanded version, the Litanies describe places that a traveler would see if she started at Naalagiagvik on the Arctic Coast, proceeded southwards over the Brooks Range, entered Gwich’in territory, and then circled back to a place on the coast called Pattaqtuq, or “Where the Waves Splash, Hitting Again and Again” (Figure 3.3).
Figure 3.2. Tuning chart for Earth and the Great Weather. All strings are tuned to the first eight odd-numbered harmonics in the overtone series of the D played on the bass IV string, or their
octave equivalents. Throughout the piece the strings are assigned to play the first seven harmonics of these harmonics. Note: There appears to be an extra bass clef in the chart for the bass III string, and the ninth harmonics listed for the cello I and II strings are not actually used in this piece. “Aeolian Dreams” is Adams’s name for the string parts of the “Arctic Litanies” (although these are not intended to be performed without the accompanying texts).

HARMONIC (relative to the fundamental)

<table>
<thead>
<tr>
<th>STRING</th>
<th>Violin I</th>
<th>Violin II</th>
<th>Violin III</th>
<th>Violin IV</th>
<th>Viola I</th>
<th>Viola II</th>
<th>Viola III</th>
<th>Viola IV</th>
<th>Cello I</th>
<th>Cello II</th>
<th>Cello III</th>
<th>Cello IV</th>
<th>Bass I</th>
<th>Bass II</th>
<th>Bass III</th>
<th>Bass IV</th>
</tr>
</thead>
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<td></td>
<td>15</td>
<td>11</td>
<td>7</td>
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<td>13</td>
<td>9</td>
<td>5</td>
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<td>11</td>
<td>15</td>
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<td>7</td>
<td>9</td>
<td>3</td>
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<td></td>
<td>45</td>
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<td>9</td>
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<td>27</td>
<td>15</td>
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<td>3</td>
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<td></td>
<td>60</td>
<td>44</td>
<td>28</td>
<td>12</td>
<td>52</td>
<td>36</td>
<td>25</td>
<td>4</td>
<td>44</td>
<td>60</td>
<td>25</td>
<td>28</td>
<td>36</td>
<td>4</td>
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<td>35</td>
<td>15</td>
<td>65</td>
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<td>78</td>
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<td>91</td>
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<td>35</td>
<td>7</td>
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<td>49</td>
<td>63</td>
<td>7</td>
<td>35</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 3-1. A different view of the tuning system for *Earth and the Great Weather*. All notes are shown by their position in the harmonic series of the fundamental (here labeled “1”). In some cases harmonics are octave-displaced to accommodate the ranges of the instruments.
Scattered between the Arctic Litanies are three movements for percussion quartet. The score instructs the percussionists to play “the largest possible array of tom-toms and bass drums.” Adams structures the first and last quartets around the 2+3, 2+2+3, and 2+2+2+3 patterns of Iñupiat drumming. All the quartets feature unison playing and the first two feature gradual acceleration, both of which are also important elements of Eskimo drumming. Adams

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writes in the score that the drum quartets are “inspired by the elemental power of natural forces in the Arctic, and by the ecstatic energy of Alaska Native drumming and dancing.”

_Earth and the Great Weather: A Sonic Geography of the Arctic_ was premiered in Fairbanks in its expanded version in February, 1993. From 1993 to 1996 Adams was the resident composer with the Anchorage Symphony and Anchorage Opera through a grant from Meet the Composer. As part of this residency, Anchorage Opera performed _Earth and the Great Weather_ in 1995. Although the piece is definitively not an opera, it was semi-staged with visual elements, including the speakers, dancers, a set, and film projections of ANWR.

In 2000, _Earth_ received another performance at the Almeida Opera Festival in London. By that time, Adams had decided that the aural space between the strings and the speakers was too great, so he added a choir of four voices that are also fed through delay lines to create the sound of 16 voices. These voices are generally used to reinforce the harmony of the strings and the words of the speakers rather than to introduce new melodic lines.

The completed _Earth and the Great Weather_ thus includes the following sonic elements:

- Recorded natural sounds
- Violin, viola, cello, and double bass, retuned and played with three digital delays
- A choir of two sopranos, alto, and bass
- Voices speaking in Iñupiaq, Gwich’in, English, and Latin
- An array of tom-toms and bass drums

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The Music

In this work, I aspire to move beyond simple landscape painting in music, toward a music which, in a very real sense, is landscape—a music which creates its own inherently sonic presence and sense of place. I hope to take the listener on an extended journey through strange and beautiful landscapes, embracing places both imaginary and real.

Indigenous peoples have long understood the extraordinary powers of certain landscapes. For those of us who have lost or forgotten our intimate connections with such places, the Arctic is a vast and enduring geography of hope. Somewhere out in that far country of imagination and desire lie the roots of my own faith.23

Table 3-2 is a broad schematic outline of *Earth and the Great Weather*. The work is in ten movements—seven Arctic Litanies and three drum quartets—each of which is given a descriptive title. Most of the movements contain one of the following relationships of music to the natural world described in the first chapter of this dissertation: direct imitation, approximate imitation, or representation. In the Arctic Litanies, the referents for these imitations and representations are generally found in the titles of the movements and in the spoken names, as well as sometimes in the score itself. For instance, the music of the third movement, “Pointed Mountains Scattered All Around,” is a sonic representation of mountains; its texts describe many views of mountains, and the score also contains a visual representation of mountains.

Further clarifying the representations are recorded sounds that appear between all of the movements (except between the second and third) and sound through parts of the Litanies. These sounds are the aural landmarks for this sonic journey. They continually remind listeners where they have been and where they are going in ANWR. The combination of the recorded sounds, movement titles, spoken names, and sonic representations direct the listener’s aural journey from Naalagiagvik into the Brooks Range and back down to the Arctic Coastal Plain at Pattaktuq.

### Table 3-2. Schematic map of the sonic journey depicted in *Earth and the Great Weather*.

The listener progresses down the left side of the page from the Arctic Coast in “The Place Where You Go to Listen,” over the Brooks Range (“Pointed Mountains Scattered All Around”) and into Gwich’in territory during the first half of the piece. In the second half of the piece the listener returns to the Arctic Coast via the River With No Willows, finally arriving at “Where the Waves Splash, Again and Again.” Also shown are the subject of the texts and the languages in which they are intoned, recorded sounds, and musical imitations and representations. Abbreviations used: E=English, G=Gwich’in, I=Iñupiaq, L=Latin. Palindrome features of the music are highlighted in the shaded area.

<table>
<thead>
<tr>
<th>MVT</th>
<th>TITLE</th>
<th>LANG.</th>
<th>NATURAL SOUND OR [RELATIONSHIP TO NATURAL WORLD]</th>
<th>SHARED</th>
<th>LANG.</th>
<th>TEXT</th>
<th>TITLE</th>
<th>MVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>“The Place Where You Go to Listen”</td>
<td>I, E</td>
<td>Strong wind</td>
<td>Waves splashing</td>
<td>I, E</td>
<td>Pattaqtuq</td>
<td>“Where the Waves Splash, Hitting Again and Again”</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Naalagiagvik</td>
<td>I, E</td>
<td>Poem at the beginning of I repeated at the end of IX</td>
<td>Wind and waves</td>
<td>Wind</td>
<td>Poem at the beginning of I repeated at the end of IX</td>
<td>Wind and waves</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>“Drums of Winter”</td>
<td>I, E</td>
<td>IX is a palindrome of II</td>
<td>Waves splashing, loons calling. Then glaciers calving.</td>
<td>I, G, E, L</td>
<td>Birds</td>
<td>“One That Stays All Winter”</td>
<td>VIII</td>
</tr>
<tr>
<td></td>
<td>Mountains, rivers, pastures</td>
<td>G, E</td>
<td>[Approximate imitation of glaciers calving]</td>
<td>[Direct imitation of seabirds]</td>
<td>L, G, E, L</td>
<td>Birds</td>
<td>“One That Stays All Winter”</td>
<td>VIII</td>
</tr>
<tr>
<td>III</td>
<td>“Pointed Mountains Scattered All Around”</td>
<td>I, E</td>
<td>[Representation of mountains]</td>
<td>[Approximate imitation of flowing water]</td>
<td>I, G, E, L</td>
<td>Plants</td>
<td>“River With No Willows”</td>
<td>VII</td>
</tr>
<tr>
<td></td>
<td>Mountains, rivers, pastures</td>
<td>G, E</td>
<td>[Representation of mountains]</td>
<td>[Approximate imitation of flowing water]</td>
<td>I, G, E, L</td>
<td>Plants</td>
<td>“River With No Willows”</td>
<td>VII</td>
</tr>
<tr>
<td>IV</td>
<td>“The Circle of Suns and Moons”</td>
<td>I, G, E</td>
<td>[Representation of cycling suns and moons]</td>
<td>[Approximate imitation of flowing water]</td>
<td>I, G, E, L</td>
<td>Plants</td>
<td>“River With No Willows”</td>
<td>VII</td>
</tr>
<tr>
<td></td>
<td>Times of year</td>
<td>I, G, E</td>
<td>[Approximate imitation of winds]</td>
<td>[Approximate imitation of thunder]</td>
<td>I, G, E, L</td>
<td>Plants</td>
<td>“River With No Willows”</td>
<td>VII</td>
</tr>
<tr>
<td>V</td>
<td>“The Circle of Winds”</td>
<td>I, G, E</td>
<td>[Approximate imitation of winds]</td>
<td>[Approximate imitation of thunder]</td>
<td>I, G, E, L</td>
<td>Plants</td>
<td>“River With No Willows”</td>
<td>VII</td>
</tr>
<tr>
<td></td>
<td>Winds</td>
<td>I, G, E</td>
<td>[Approximate imitation of winds]</td>
<td>[Approximate imitation of thunder]</td>
<td>I, G, E, L</td>
<td>Plants</td>
<td>“River With No Willows”</td>
<td>VII</td>
</tr>
<tr>
<td></td>
<td>Thunder</td>
<td>Thunder</td>
<td>Thunder</td>
<td>Thunder</td>
<td>Thunder</td>
<td>Thunder</td>
<td>Thunder</td>
<td>Thunder</td>
</tr>
</tbody>
</table>

### Arctic Coast

- **Naalagiagvik**
  - **MVT**: Various
  - **Title**: Various
  - **Text**: Various
  - **Language**: Various

### Gwich’in Lands

- **Pattaqtuq**
  - **MVT**: Various
  - **Title**: Various
  - **Text**: Various
  - **Language**: Various
The journey from Naalagiagvik to Pattaktuq is an approximate circle, and many of the natural events and phenomena described in the piece (such as the passing of the seasons or the movement of winds) are also cyclical. In order to construct “music which, in a very real sense, is landscape,” Adams employs large and small-scale palindromes in the music.

I have organized Table 3-2 to show the approximate geographical route described sonically in the music. The table also shows that the music is symmetrical around the connection of movements V and VI. For example, a poem is spoken at the beginning and near the end of Earth, though not in exactly the same way. Movements III and VIII both use glissandi on all strings sequentially, though they are structured differently. The sectional organization of Movement IX is a palindrome of the organization in Movement II (though not a strict retrograde). The piece is suffused with cyclicality, but, like ANWR, the cycles do not repeat in exactly the same way.

What follows is an examination of how each of the movements of Earth and the Great Weather convey sonic geography through cyclical structures and the imitation or representation of natural phenomena.

1. The Place Where You Go to Listen

“The Place Where You Go to Listen,” the first movement of Earth and the Great Weather, is exceptional in that it features both drums and strings. The instrumental groups are, however, separated as they are elsewhere in the piece. The first part features two drums, recorded sounds, and a speaker. The second part is an Arctic Litany with strings, speakers, and chorus. The first part is not one of the three percussion quartets but rather a brief introduction to the Arctic Litany.
Figure 3.4. Beginning of “The Place Where You Go to Listen,” *Earth and the Great Weather.*
Earth and the Great Weather begins solemnly and mysteriously with the recorded sound of wind rushing over the Arctic Coastal Plain. After about thirty-five seconds, two bass drums enter (Figure 3.4). They evoke not only Native Alaskan music but also, in the context of the recorded sound, distant thunder. Above the drums, a speaker enters in m. 6 and intones the aforementioned poem by Uvavnuk in Iñupiaq. One could imagine this poem set to very colorful and joyous music, but the musical underpinning is sparse and unpitched – almost somber.

In the first nineteen bars of Earth and the Great Weather, Adams presents both the thematic material for the percussion quartets to follow and how it will be transformed. For nineteen bars, one drum (percussion III) slowly and quietly plays half notes and dotted half notes while the other (percussion IV) trills almost imperceptibly. The first four bars change time signatures every bar: 3/4, 5/4, 7/4, 9/4. Percussion III plays the following pattern: in the first bar a single dotted half note (a 3 count); in the second bar a half note plus a dotted half note (a 2+3 count); in the third bar two half notes plus a dotted half note (a 2+2+3 count); and in the fourth bar three half notes plus a dotted half note (a 2+2+2+3 count). In other words, each bar forms a rhythmic cell, and the four cells have the following number of beats: 3, 5, 7, 9. Although every strike of the drum is on the same pitch, the rhythmic cells are audible due to the last strike always lasting three beats. Using this shorthand, we can describe all of the bars in the first part of The Place Where You Go to Listen with the following number pattern:

\[3579\, 797\, 5937\, 9573\, 9753.\]

I have intentionally written these numbers in mostly groups of fours to make two observations. First, we can see that the first and last groups—if not the entire section—form a

\[24\text{ Measure 13 contains an error in the score that is fixed on the recordings of the piece: it should contain a half note and a dotted half note.}\]
palindrome. Second, looking from the third group to the end, we can see the relationship of the groups. To get from the third group (5937) to the fourth group (9573), Adams flipped the first two and the second two cells. To get to the last group, Adams rotates the inside cells. Adams borrowed this process of permuting a small set of numbers from the English tradition of “change ringing” church bells, a tradition he already employed in his very early piece, *bells*. Each bell in a choir is assigned a number, and “permuting the bells” is the process of cycling through the different possible orders of the bells by means of a “method” or algorithm.

Thus, in the first nineteen bars of music Adams sets up three important musical structures that he will use throughout the work: the use of cells consisting of varying groups of two and three beats; a gradual “outside-inside” process of transforming successive groups of cells; and a larger palindrome structure. Here the numbers 3, 5, 7, 9 indicate the number of beats per measure. In the later percussion sections, they take on expanded rhythmic meanings.

The speaker finishes Uvavnu’s poem. Shortly thereafter the drums finish, and the strings enter, beginning the Arctic Litany for strings and voices. An Iñupiaq speaker utters the name, “Naalagiagvik,” and an English speaker follows with the translation, “The Place Where You Go to Listen.” Names of places and geological features near Naalagiagvik follow. There are more names in Iñupiaq than translations in English, so the two speakers move through their lists at different paces, seemingly irrespective of one another. Some of the names are:

- You can see a long way
- Long high bluff
- Place where caribou can easily be caught
- Little creek with lots of fish

Looking from the first group to the third group, one can see that if the 7 at the beginning of the second group were replaced with a 5 and a 3, this transformative process of flipping the outside groups and then the inside groups would hold for the entire section of music. Very possibly Adams has intentionally withheld the 5 + 3 for a more complete presentation of his means of transformation in the first percussion quartet—“Drums of Winter.”
Farthest north mountains
The farthest place.\textsuperscript{26}

Meanwhile, the strings and singers introduce us to much of the tonal gamut of \textit{Earth and the Great Weather} by passing through a series of what look like root position dominant seventh chords. These chords do not function as dominant sevenths, however, but rather are the result of sounding the first four odd harmonics of the first eight odd harmonics of the fundamental D.

As explained earlier, the first eight odd harmonics of the fundamental are notated as the pitches D-A-F#-C-E-G#-B-C#, although the justly tuned strings play the harmonics more exactly than simple Western notation indicates. The double bass plays each of these notes in succession in “The Place Where You Go to Listen.” Thus, in m.1, the bass articulates a D.\textsuperscript{27} Two bars later, the cello enters with D-A fifth (this D being one of the few stopped tones in the piece). The viola and violin each enter two and four bars later, respectively, completing a D dominant seventh chord consisting of the 1\textsuperscript{st}, 3\textsuperscript{rd}, 5\textsuperscript{th}, and 7\textsuperscript{th} harmonics of the fundamental. At letter A (Figure 3.5), the double bass moves to the third harmonic, and over the next eight bars the other instruments complete the A dominant seventh chord with the 3\textsuperscript{rd}, 5\textsuperscript{th}, and 7\textsuperscript{th} harmonics of this A.\textsuperscript{28}

There are thus eight eight-bar phrases, each characterized by the emergence of a new dominant seventh harmony. Because the instruments are out of sync with each other, each dominant seventh is played as a harmony for only two bars before the players gradually shift to a new dominant seventh. In addition, each of the instruments is replayed digitally with three delays of eight measures each. This both creates the impression of a canonical structure and muddies the

\textsuperscript{26} Adams was clearly inspired by the place names that he discovered while working on \textit{Earth and the Great Weather}, as many of them became titles for later pieces of his. Examples from this list are “The Place Where You Go to Listen” and “The Farthest Place.”

\textsuperscript{27} Adams renumbers the measures at the beginning of the second section of this movement.

\textsuperscript{28} Again, there is some octave displacement to accommodate the ranges of the instruments.
transitions between chords. What would otherwise be a progression of emerging dominant seventh chords becomes a complex web of harmonics.

While each instrument consistently moves to new harmonics every eight bars, Adams creates a rhythmic acceleration through dynamics. Each phrase contains one or more dynamic swells. As shown in Table 3-3, the number of swells gradually increases with each new phrase but at a staggered pace through the four instruments. Thus, in the first phrase, all four instruments have a single eight-bar swell. In the second phrase, the violin plays two four-bar swells while the other instruments continue to play a single eight-bar swell. In the third phrase, the violin plays three $2 \frac{2}{3}$-bar swells, while the viola plays two four-bar swells and the lower instruments play a single eight-bar swell. Although the section is notated with continuous whole notes, the swells give the music a gradually accelerating hypermeter. Highlighting the impression of a gradual acceleration created by the swells is a continuous series of one or two tremolos in the three upper instruments, beginning in the fifth phrase and continuing until the end of the movement (Table 3-3). The sound is thus characterized by a mass of slowly changing harmonies that gradually shimmer with swells and tremolos.

The singing voices double the strings while singing some of the names in Iñupiaq. Unlike the strings, they are marked without any swells, probably so as to avoid giving an impression of sentiment.

As the piece is ending, the recorded sound of the wind, which was faded out after the strings entered, returns. The movement thus moves from natural sound through human sound and back to natural sound. With this sequence of events, Adams reminds listeners of the ever-present context for human existence: powerful natural forces that both give and take life in a place like the Arctic National Wildlife Refuge.
Figure 3.5. Letters A-B from the second half of “The Place Where You Go to Listen,” Earth and the Great Weather.
### Number of Swells

<table>
<thead>
<tr>
<th>Phrase</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violin</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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</tr>
<tr>
<td>Viola</td>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Cello</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Bass</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3-3. Number of hyper-rhythmic “beats,” as defined by dynamic swells, in the second half of “The Place Where You Go to Listen,” *Earth and the Great Weather*. Underlined numbers indicate phrases played with tremolos.

In “The Place Where You Go to Listen,” Adams introduces us to all of the sonic forces of *Earth and the Great Weather*. In the first section, he introduces recorded sound, poetry, percussion, and the 2+3 rhythmic structure. In the second section, he introduces the strings playing a non-functional, non-melodic musical language based on harmonics, voices intoning and singing names, and gradually accelerating hyperrhythms. The lack of sentimentality in the music language allows the deep relationship to the land expressed in the texts to emerge on its own.

### 2. Drums of Winter

“Drums of Winter” is the first of the three percussion quartets in *Earth and the Great Weather*. The quartets as a group are structured as a palindrome within the larger palindrome of the entire work. Here I will focus on the structure of “Drums of Winter,” but later in this chapter the palindrome structure of the group will become clearer.

The thematic material for “Drums of Winter” consists of rhythmic cells lasting 3, 5 (2+3), 7 (2+2+3), and 9 (2+2+2+3) pulses—like the opening of “The Place Where You Go to Listen”—
but Adams articulates them now in two contrasting contexts. He divides “Drums of Winter” into alternating sections of simple 4/4 meter and sections with complex, changing meter. The sections with 4/4 meter have polyrhythmic *divisive pulse*. That is, percussion I and II articulate the rhythmic cells in a common pattern while playing different subdivisions of the half note (percussion III and IV simply tremolo). The sections with complex meters have an *additive pulse*. That is, the four players share a common subdivision of the beat, but they group it into cells of different lengths that are repeated with a common pattern. In different ways both kinds of section sound as if they contain different, yet proportional, simultaneous tempi. Over the course of the movement, the subdivisions and quicker pulses in the two kinds of sections gradually accelerate towards a climactic finish (Table 3-4).

The movement begins quietly, gently emerging, like “The Place Where You Go to Listen,” from the recorded sounds of wind (Figure 3.6). The first eight bars are in complex meter and imply a quarter-note pulse, set to ninety beats per minute. The complex meter foreshadows the sections with additive pulse, though no underlying pulse is actually played here. As in “The Place Where You Go to Listen” percussion III begins with 10 notes articulating the beat pattern—3, 2+3, 2+2+3, and 2+2+2+3, or 3579—while percussion IV quietly plays a tremolo. The three, five, seven, and nine-beat cells will become the thematic material of the movement. As in the earlier movement, every strike of this thematic material is on the same pitch, but the pattern is audible due to the last strike always lasting three beats. Adams rotates the outside cells in m. 5-8, producing an eight-bar pattern of 3579 5397.
<table>
<thead>
<tr>
<th>SECTION</th>
<th>METER</th>
<th>M.M.</th>
<th>KIND OF SECTION</th>
<th>RHYTHMIC VALUE OF PULSE</th>
<th>NUMBER PATTERN</th>
<th>WHAT EACH NUMBER DEFINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro</td>
<td>Complex:</td>
<td>90</td>
<td>(Additive)</td>
<td>(implied)</td>
<td>3579 5397</td>
<td>Implied subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td></td>
<td>starts in 3/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Simple:4/4</td>
<td>45</td>
<td>(Divisive)</td>
<td>(Triplet quarters implied)</td>
<td>5397 3579 3759</td>
<td>Implied subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>B</td>
<td>Simple: 4/4</td>
<td>45</td>
<td>Hybrid</td>
<td>Triplet quarters, quintuplet eighths</td>
<td>3579 3759 7395</td>
<td>A group of subdivisions</td>
</tr>
<tr>
<td>C</td>
<td>Complex:</td>
<td>45</td>
<td>Additive</td>
<td></td>
<td>5397</td>
<td>Number of continuous thematic cells of 3 or 5 pulses</td>
</tr>
<tr>
<td></td>
<td>starts in 5/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Simple: 4/4</td>
<td>45</td>
<td>Divisive</td>
<td>Triplet quarters, quintuplet eighths</td>
<td>5937 9573 9753</td>
<td>Subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>E</td>
<td>Complex:</td>
<td>45</td>
<td>Additive</td>
<td></td>
<td>5937</td>
<td>Number of continuous thematic cells of 3, 5, or 7 pulses</td>
</tr>
<tr>
<td></td>
<td>starts in 7/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Simple:4/4</td>
<td>45</td>
<td>Divisive</td>
<td>Quintuplet eighths, septuplet eighths</td>
<td>9573 5937 5397 3579 3759573</td>
<td>Subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>G</td>
<td>Complex:</td>
<td>45</td>
<td>Additive</td>
<td></td>
<td>9573</td>
<td>Number of continuous thematic cells of 3.5, 7, or 9 pulses</td>
</tr>
<tr>
<td></td>
<td>starts in 9/16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Simple: 4/4</td>
<td>45</td>
<td>Divisive</td>
<td>Septuplet eighths, nonuplet 16ths</td>
<td>9753 7935 7395 3759 3579 9753 9573 5937 5397</td>
<td>Subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>I</td>
<td>Complex:</td>
<td>45</td>
<td>Hybrid</td>
<td></td>
<td>9753 3579 79355397 73955937 3759573 OVER95733759 59377395 53977935</td>
<td>Pulses in a rhythmic cell</td>
</tr>
<tr>
<td></td>
<td>starts in 9/16</td>
<td></td>
<td></td>
<td>(plus layer of 32nds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Complex:</td>
<td>45</td>
<td>Hybrid (in unison)</td>
<td></td>
<td>9753 9573 5937 5397 35779E</td>
<td>Pulses in a rhythmic cell</td>
</tr>
<tr>
<td></td>
<td>starts in 9/16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3-4. Rhythmic structure in “Drums of Winter,” *Earth and the Great Weather*. The movement consists of sections with simple meter and divisive rhythm alternating with sections of complex, changing meter and additive pulse (where pulse is the smallest rhythmic value. The larger beat does not change over the course of the movement, but through metric modulations the apparent tempo accelerates as the smallest note value quickens. Underlined groups of numbers are palindromes.

At letter A (Figure 3.6) the dynamic abruptly shifts to *fortissimo*, the time signature changes to 4/4 meter, and the implied subdivisions change to triplet quarter notes. With the faster subdivisions set to 135 beats per minute, the pace of each *bar* does not change. The simple meter
and complex subdivisions foreshadow the sections with divisive pulse, though the underlying triplet quarter subdivisions are not actually sounded. Percussion I and II play the rhythmic cells in unison, while percussion III and IV tremolo. Starting with the last beat group used in the first section (5397), the inside-outside algorithm produces the pattern 5397 3579 3759 over the course of twelve bars. The cells are even more audible because each final three-beat note is played on a lower-pitched drum.

At letter B (Figure 3.7), percussion I and II split. Percussion II continues to play with triplet quarter subdivisions, while percussion I breaks into the faster subdivision of quintuplet eighths. Whereas in the previous section larger beat patterns—but not their underlying subdivisions—were sounded, in this section (and only this section) both parts play only the underlying subdivisions. That is, this beat pattern is not articulated over subdivisions but rather manifests itself in the subdivisions directly. The pattern starts with the group 3579 and proceeds using the inside-outside algorithm to produce the pattern 3579 3759 7395. The pattern is audible because each rhythmic cell is followed by a rest. Although the 4/4 meter and the use of different subdivisions of the half note make this section look like the sections with divisive pulse, the lack of notes longer than their sounded subdivisions and different pitches to mark the end of rhythmic cells does not.

In the subsequent divisive pulse sections, percussion I and II articulate the underlying subdivisions and accent the rhythmic cells. In 4/4 meter, the half-note remains a constant forty-five beats per minute, but the subdivisions of this beat gradually accelerate from section to section, starting with triplet quarters and ending with nonuplet sixteenths. In addition, within each of these sections, the sequence of rhythmic cells in percussion I and II continues to rotate as described.
II. Drums of Winter

Figure 3.6. Beginning of “Drums of Winter,” *Earth and the Great Weather.*
Figure 3.7. Letter B, “Drums of Winter,” *Earth and the Great Weather*. 
Thus at letter D (Figure 3.9) percussion I plays quintuplet eighth subdivisions, while accenting rhythmic cells in the pattern 5937 9573 9753. This is a palindrome of the pattern at B. Percussion II plays the same pattern of rhythmic cells, structured with implied subdivisions of triplet quarters. Hence the subdivision relationship is (as at letter B) 3:5. In both instruments the end of each rhythmic cell is distinguished by a lower final note.

At letter F, percussion I and II articulate subdivisions in the relationship 5:7, as well as rhythmic cells in the pattern 9573 5937 5397 3579 3759 9573. This pattern begins with a switch of the two internal cells from the last group of D and then proceeds with internal and external rotations until the last two groups, which form a mini-palindrome.

Finally, at letter H, the last section with divisive rhythm, the two parts articulate subdivisions with the relationship 7:9. In addition, the pattern of rhythmic cells forms a giant palindrome: 7935 7395 3759 3579 9753 9573 5937 5397.

Now let us look at how the sections with additive pulse develop. At letter C (Figure 3.8) the meter begins in 5/8, and the tempo is mm. 45 to the bar. Percussion I and III begin, percussion I playing the eighth-note pulse while both parts accent the cell 2+3 (5) five times. After a bar of unaccented pulses only, they repeat this cell three times. After another break, they repeat the cell nine times. There is another break, and then they repeat the cell seven times. Thus the pattern of repetition is 5397. Percussion II and IV enter in measure 46, percussion II playing the pulses and both parts accenting the cell 3 alone. They play this cell with the same pattern of repetitions: 5, 3, 9, and 7.
Figure 3.8. Letter C, “Drums of Winter,” *Earth and the Great Weather.*
Figure 3.9. Letter D, “Drums of Winter,” Earth and the Great Weather.
Thus, whereas in the divisive pulse sections the numbers 3, 5, 9, and 7 indicated the length of adjacent rhythmic cells, in the additive pulse sections, they indicate the number of consecutive repetitions of a single kind of rhythmic cell. Each repetition of a cell is thus like a hyper-rhythmic beat. The length of the repeated cell in each of the two instrumental groups is also related by the ratio 3:5. Finally, notice that the cell 5397 was the last cell in the Introduction. Like the sections with divisive pulse, the sections with additive pulse are organizationally linked.

At letter E, the meter begins in 7/8, but the tempo remains 45 to the bar. The eighth-note pulses are therefore faster than at letter C, in the relationship 7:5. Percussion I enters with the eighth-note pulses, accenting the thematic cell 2+2+3. Percussion II and III enter later with the eighth-note pulses, accenting the thematic cells 2+3 and 3 alone, respectively. Percussion IV enters later with the cell 3 alone.\(^{29}\) All four parts play their cells with the pattern 5937, derived from an internal rotation of 5397.

At letter G, the meter begins in 9/16, but the tempo remains 45 to the bar. Thus the pulses are faster than at E, in the relationship 9:7. Percussion I enters with the sixteenth-note pulses, accenting the cell 2+2+2+3. Percussion II enters with the sixteenth-note pulse, accenting the thematic cell 2+2+3. The other parts enter with the cells 2+3 and 3, respectively, and all parts play the pattern 9573 (derived through external rotations of 5937).

\(^{29}\) Strictly speaking, in this and the remaining additive pulse sections, some of the parts actually enter earlier than I have indicated, doubling another part. I omit this from the discussion, since it has no bearing on the structure of the movement.
Figure 3.10. Letter I, “Drums of Winter,” *Earth and the Great Weather.*
At letter I, the meter is again 9/16, and percussion I and III begin with the cell 2+2+2+3 (Figure 3.10). Now, however, the cell is not repeated as in the other sections with additive pulse, but, rather, the cells are rotated as in the sections with divided pulse. The first eight cells in percussion I and III are 97533579, a mini-palindrome. Percussion II and IV enter later, also rotating through rhythmic cells, following the mini-palindrome pattern 95733759. In both parts Adams constructs several small palindromes. This section thus appears to be another hybrid of the additive and divisive pulse sections, using both a common pulse and rotation through rhythmic cells of different lengths.

Finally, at letter J (Figure 3.11) Adams brings the music to a tumultuous climax. He retains the meter of 9/16 but adds subdivisions of thirty-second notes. The cells are rotated as at letter I, but all four drums articulate the rhythmic cells in unison. And while the first few cells are transformed using the by-now-familiar rotations, the last group of cells breaks the pattern for a climactic finish: 9753 9573 5397 35779E.\(^{30}\)

\(^{30}\)E = eleven.
Figure 3.11. Letter J, “Drums of Winter,” *Earth and the Great Weather*. 
Let us now step back and try to understand the meaning of this movement’s rhythmic structure in the larger context of the piece. Whereas the Arctic Litanies guide the listener through the non-human sonic world of ANWR, the percussion quartets celebrate the music of the human inhabitants of ANWR. Íñupiat Eskimo music often includes collective and coordinated singing, dancing, and drumming. The drumming is primarily used to mark out the beat for the dancing. Beats can be grouped to sound like duple meter, but the most common beat grouping is 2+3. Complex meters that alternate between, for example, 5/8 and 7/8, are frequent. By using the sums 3, 2+3, 2+2+3, and 2+2+2+3 as determinants of the length of individual rhythmic cells, hyper-rhythmic repetitions of those cells, and intra—and inter-sectional tempo relationships, Adams manages to project Native Alaskan music throughout this original work. At the same time the music reveals Adams’s unique application of the concept of multiple simultaneous tempi, which he absorbed from Cowell’s New Musical Resources and Nancarrow’s Studies for Player Piano and would continue to use in almost all of his subsequent music.

Layered on the top of the complex rhythms are palindromes of rhythmic cells. The palindrome structure is a musical equivalent for the natural cycles in ANWR, and it permeates Earth at every level. Already I have discussed how “The Place Where You Go to Listen” emerges from natural sounds and returns to those sounds, how the first section of that movement carried the hint of a palindrome, and how Uvavnuk’s poem is read at the beginning and end of the entire work. In addition, I have discussed the circular journey of the woman at Naalagiagvik, which inspires the trajectory through Earth. In “Drums of Winter” Adams creates short and medium-length palindromes that mirror the longer palindromes extending over the piece.

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3. **Pointed Mountains Scattered All Around**

“Drums of Winter” is followed directly by “Pointed Mountains Scattered All Around”—an Arctic Litany with names in Gwich’in and English for mountains and the many things one sees on them. Specifically, the intoned names seem to describe the changing views one would experience on ascending a mountain.\(^{32}\) Here is a sampling of the names, in the order in which they appear:

- Pointed mountains scattered all around
- Pointed rock on the ridge of a mountain
- Eldest mountain
- Snowy owl mountain
- Spring water running out of the mountain
- Water running over the grass
- Lakes between the hills
- Scattered willows creek
- Caribou fence creek
- Dog salmon river
- Round whitefish run river
- Hill where you look out for animals
- The line of a caribou trail over the top
- Patches of willow where sheep pasture
- Under Cloud Mountain
- Among red mountains
- In a treeless place, only snow\(^{33}\)

One could imagine Adams writing big, forceful music to represent the mass of large, pointed mountains, but, in fact, his musical representation of the mountains seems more intended to gently capture their ascent towards and descent from the heavens. The string parts consist entirely of ascending and descending harmonic glissandi.\(^{34}\) Adams uses the connotation of

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\(^{32}\) The names are for places on the south side of the Brooks Range in the drainage of the north fork of the Chandalar River (Adams, conversation with the author, October 14, 2011).

\(^{33}\) Adams later used these last two names, “Among red mountains” and “In a treeless place, only snow,” as the titles for separate instrumental works.

\(^{34}\) Adams writes in the liner notes to the CD of *Earth and the Great Weather* that the piece is an homage to James Tenney and is structured like the opening movement of his *Glissade*. A glissade is a way of descending a scree- or glacier-covered slope by sliding on one’s buttocks.
greater and lesser sonic frequencies with “higher” and “lower” spatial locations to create a sonic metaphor for the mountains.\textsuperscript{35} Given that “higher” sounds are notated higher on a page of music, the glissandi also look like jagged peaks rising up and falling (Figure 3.12), for which reason Sabine Feisst calls this music “Augenmusik.”\textsuperscript{36}

Furthermore, Adams makes the crests of the sonic “peaks” non-aligned. In 4/4 meter, he writes cycles of glissandi that last four beats for the violin and viola, while the glissandi for the cello and double bass last 6 beats. Moreover, he puts the crests of the violin on the second beat of each measure, the viola on the third beat, the cello between the second and third or the fourth and first beats, and the bass on the second or fourth beats (Figure 3.12). Finally, the peaks are multiplied by the digital delays, which occur at four, five, and six beats. This spreads the peaks completely throughout the bar, making them “scatter all around.”

\textsuperscript{35} For more on this connotation, see chapter 1 of this dissertation.
Figure 3.12. “Pointed Mountains Scattered All Around,” *Earth and the Great Weather*. Harmonics are notated in the string parts as they approximately sound. The form of mountains is represented on the page and in the music.
In addition to the local peaks created on nearly every beat, Adams creates one giant ascending and descending peak over the course of the movement, as follows (Table 3-5). Each instrument plays four different harmonic glissandi—one on each of the four strings. Every glissando extends from the harmonic just above the open string to the harmonic nearest the bridge. The four players enter one by one with this glissando on the IV string. The glissando is repeated for ten to twenty bars. One by one the players then switch to higher-pitched glissandi that stretch the same distance on the III, II, and I strings, respectively. After the midpoint of the movement, the instruments reverse their steps, playing glissandi on the II, III, and IV strings, respectively. Each instrument’s seven glissandi thus make a single, larger rising and falling peak, as do the parts collectively.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>1234</th>
<th>2143</th>
<th>3412</th>
<th>4321</th>
<th>1234</th>
<th>2143</th>
<th>3412</th>
<th>(4321)</th>
</tr>
</thead>
<tbody>
<tr>
<td>String</td>
<td>IV</td>
<td>III</td>
<td>II</td>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
<td></td>
</tr>
</tbody>
</table>

Table 3-5. Order of glissandi in “Pointed Mountains Scattered All Around,” *Earth and the Great Weather*. Instruments are ordered violin=1, viola=2, cello=3, bass=4. Strings are ordered with Roman numerals. The group of instrumental glissandi labeled (4321) is not actually played.

The entire movement is very nearly a giant palindrome. In Table 3-5 I have assigned each instrument a number: violin is 1, viola is 2, cello is 3, and double bass is 4. Using this identification system, I have indicated the order in which the instruments play each new glissando. One can see that the absence of the group labeled “(4321)” prevents the piece from being a palindrome. In fact, one cannot create an absolute palindrome from seven groups of four unique numbers. Nevertheless, these groups and their transformations bear a very strong

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The vocal parts in this movement are assigned to the string parts as follows: Soprano I-violin, Soprano II-viola, Alto-cello, Bass-double bass. Each voice part doubles the highest notes of the glissandi in its corresponding instrument, with some octave transpositions to accommodate vocal registers. I omit further discussion of these parts because they are completely derivative.
resemblance to the patterns already seen in “The Place Where You Go to Listen” and “Drums of Winter.” Adams creates continuity between the movements by using similar formal structures, but a complete palindrome here would have put too final an ending on an internal movement in the piece.

4. The Circle of Suns and Moons

The recorded sound of a white-crowned sparrow connects “Pointed Mountains” to the next movement, “The Circle of Suns and Moons.” The birdsong emerges naturally from “Pointed Mountains,” since one could hear these birds in the Brooks Range. Their song, however, also carries “seasonal” connotations. For this reason, it is a perfect connection to the two movements at the center of Earth, which are specifically about cyclicality.

“The Circle of Suns and Moons” includes names of different times of the year, as determined by the behavior of the sun, the weather, waters, and animals. Two speakers intone names in both Inupiaq and Gwich’in, while two more speakers intone their translations in English. The Inupiaq names seem to follow the annual cycle from spring through winter, while the Gwich’in names seem to start in winter and progress through the next fall. Table 3-6 shows a sampling of the names, in the order in which they appear.

Given that suns and moons make no sounds, Adams creates representations of their cyclicality with musical cycles in the instrumental and vocal parts. The parts are distinguished from one another by both pitch and rhythm. Specifically, each instrument plays a repeating cycle of eighteen or nineteen unique pitches that ascend through the range of the instrument. The entrances are staggered, beginning with the violin and proceeding to the cello, viola, and double bass, respectively. At the end of each pitch cycle the instrument returns without pause to the
beginning of the cycle and starts again (Figure 3.13). The instruments are quite discordant with each other, the violin and cello playing something resembling a harmonic series built on A and the viola and bass playing something like a harmonic series built on F#

<table>
<thead>
<tr>
<th>INUPIAQ</th>
<th>GWICH'IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>The time when the sun finally rises above the horizon. [spring]</td>
<td>The time of the big wind. [winter]</td>
</tr>
<tr>
<td>The time of the birth of young seals.</td>
<td>The time of hard-crusted snow and freezing at night.</td>
</tr>
<tr>
<td>The time when the ice breaks up.</td>
<td>The time when the rivers begin to break up. [spring]</td>
</tr>
<tr>
<td>The time when the caribou have their young.</td>
<td>The time when all the birds are laying their eggs.</td>
</tr>
<tr>
<td>The time when all the animals are raising their young. [summer]</td>
<td>The time when the young birds begin to use their wings. [summer]</td>
</tr>
<tr>
<td>The time when the ducks begin to fly south. [fall]</td>
<td>The time when the caribou shed the velvet from their antlers.</td>
</tr>
<tr>
<td>The time when the caribou lose their antlers.</td>
<td>The time of freeze-up. [fall]</td>
</tr>
<tr>
<td>The time when the sun sets below the horizon for the winter.</td>
<td>The time when the moose gather.</td>
</tr>
<tr>
<td>The time of darkness. [winter]</td>
<td>The time of little food.</td>
</tr>
<tr>
<td>The time when there is no sun.</td>
<td>The time of the nameless moon.</td>
</tr>
</tbody>
</table>

Table 3-6. Translations of Native Alaskan names used in “The Circle of Suns and Moons,” *Earth and the Great Weather*. Seasons are added to show the cyclical organization of the names.

In addition, each part is given a single, unique note value. As may be seen in Figure 3.13, the violin plays quarter notes, the viola triplet half notes, the cello half notes, and the double bass tied triplet half notes. This creates the impression of multiple simultaneous tempi with the proportional relationship: 8:6:4:3. In addition, the digital delays set at one, two, and three measures multiply the number of staggered entrances and the sense of individual voices.\(^{38}\)

\(^{38}\) The pitch cycles wind through the vocal parts as well. In this movement, unlike most of the other litanies, the singers sing only specified vowels, such as “oo” and “uh.” Because of the wide frequency range of the cycles, each one is split between multiple voices, and even then some notes must be omitted. In addition, each instrumental line is set four times slower in the vocal parts than in the string parts.
Figure 3.13. “The Circle of Suns and Moons,” *Earth and the Great Weather*. 
The piece is in two halves. During the first half of the piece, the texts are centered on arrival, which Adams represents by the gradual entrance of more instruments. The first half consists of twelve cycles in the violin, thirteen cycles in the viola, six cycles in the cello, and four cycles in the double bass. By the midpoint of the piece, all of the instruments except the viola have dropped out one by one. At this point the recorded sound of a stream enters, and the violin returns. During the second half of the movement, the texts are centered on departure, which Adams represents by withholding the cello and double bass and by a cycle-shortening process in the upper strings: In the violin part the notes decline from nineteen to one over nineteen cycles, and in the viola part the notes decline from eighteen to one over eighteen cycles.

Cycles of different lengths take place simultaneously in the natural and physical world. The Earth rotates daily on its axis and revolves annually around the sun, creating night and day and the seasons. The moon rotates on its axis and revolves around the Earth monthly. Some plants and animals are born and die in a year; others go through cycles of activity and dormancy. Adams represents these multiple overlapping cycles with his cycles of different pitches, tempi and lengths.

5. The Circle of Winds

The sound of a stream that enters midway through “The Circle of Suns and Moons” continues through the end of that movement and into the transition to the next. The water flows inevitably like the cycles in “The Circle of Suns and Moons,” and through storms it is associated with winds, the subject of the fifth movement.

“The Circle of Winds” is structured in ABA¹ form. The A sections contain no text but are approximate imitations of swirling winds. In the B section the names of winds of many
directions are spoken and sung in Iñupiaq, Gwich’in, and English (Table 3-7). As in the previous movement, the names in each of the two native languages start at different points in a cycle. Thus, the impression of swirling winds is created by the instrumental writing in the A section, by the ternary form of the piece, by the directionality of each spoken name, and by the cycle formed by the entirety of the names. In addition, Adams uses many of the same techniques in the string parts that he used in previous Litanies: beginning with one instrument at a time, choosing a delay of one measure, repeating a phrase while adding or subtracting one note at a time, and assigning to each part a different rhythmic value (and the impression of being in a different tempo).

<table>
<thead>
<tr>
<th>IÑUPIAQ</th>
<th>GWICH‘IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>South</td>
</tr>
<tr>
<td>From the top of the world</td>
<td>Down river</td>
</tr>
<tr>
<td>North northeast</td>
<td>South southwest</td>
</tr>
<tr>
<td>Toward the ice</td>
<td>From down river</td>
</tr>
<tr>
<td>East</td>
<td>Toward the other side</td>
</tr>
<tr>
<td>From the other side</td>
<td>West northwest</td>
</tr>
<tr>
<td>Southeast</td>
<td>North northwest</td>
</tr>
<tr>
<td>From the mountains</td>
<td>Up river</td>
</tr>
<tr>
<td>South</td>
<td>North</td>
</tr>
</tbody>
</table>

Table 3-7. Translations of Native Alaskan names used in “The Circle of Winds,” *Earth and The Great Weather*.

The piece is not only in ternary form; it very nearly forms a palindrome. The music of the A section is organized in four-bar phrases, each marked by the appearance of a new note or a rearrangement of the notes already in play (Table 3-8). In the first four bars, the instruments enter—staggered from lowest to highest—with tremolos on their open IV strings (Figure 3.14). In mm. 5-8, the tremolo expands upwards to include the open III string. In mm. 9-12, the repeating figure expands to include the open II string, and in mm. 13-16, this three-pitched figure
is slightly rearranged. In mm.17-20, the open I string is added, and in mm. 21-24 this four-pitched figure is slightly rearranged.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>A₁</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ms. Strings harmonics in the order in which they are played</td>
<td>Number of swells per instrument (Vln/Vla/Vcl/Dbl)</td>
<td>Ms. String harmonic</td>
</tr>
<tr>
<td>1-4</td>
<td>IV₀</td>
<td>1111</td>
<td>41-48</td>
</tr>
<tr>
<td>5-8</td>
<td>IV₀III₀</td>
<td>4444</td>
<td>49-56</td>
</tr>
<tr>
<td>9-12</td>
<td>IV₀III₀IV₀</td>
<td>2222</td>
<td>57-64</td>
</tr>
<tr>
<td>13-16</td>
<td>IV₀III₀IV₀</td>
<td>4(1)(1)4</td>
<td>65-72</td>
</tr>
<tr>
<td>17-20</td>
<td>IV₀III₀IV₀</td>
<td>4(1)(1)4</td>
<td>73-80</td>
</tr>
<tr>
<td>21-24</td>
<td>IV₀III₀IV₀</td>
<td>1111</td>
<td>81-88</td>
</tr>
<tr>
<td>25-28</td>
<td>III₀IV₀</td>
<td>4(1)(1)4</td>
<td>116-119</td>
</tr>
<tr>
<td>29-32</td>
<td>III₀IV₀</td>
<td>2222</td>
<td>120-123</td>
</tr>
<tr>
<td>33-36</td>
<td>III₀IV₀</td>
<td>4444</td>
<td>124-127</td>
</tr>
<tr>
<td>37-40</td>
<td>I₀</td>
<td>1111</td>
<td>128-131</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>132-135</td>
</tr>
</tbody>
</table>

Table 3-8. Formal, harmonic, and rhythmic structure of “The Circle of Winds,” Earth and the Great Weather. The instruments play the same harmonic patterns, but they are consistently staggered; measure numbers are therefore indicated for the leading instruments. Roman numeral string numbers are written in the order in which they are played. () means that the last bar of the swell is silent. “A,” “B,” and A⁺ refer to the large formal divisions of the piece.
V. The Circle of Winds

Figure 3.14. Beginning of “The Circle of Winds,” *Earth and the Great Weather.*
After the midpoint of the section, the music is reversed in pattern but not in each note. In mm. 25-28, the initial note on the IV string is subtracted. After a rearrangement, the III and II strings are subtracted, leaving only single note tremolos on the open I string. These immediately lead into the B section.

Whereas the A section developed on the idea of adding and then subtracting one string at a time, all played in the same open position, the B section develops the idea of playing all of the strings in the same position and extends it through each of the harmonics (Figure 3.15). Beginning in m. 41, all of the instruments, again staggered from lowest to highest, play dotted whole notes (one note per measure) in eight-bar phrases. Each instrument begins with the second harmonic on the IV string and moves to the second harmonic on the III, II, and I strings respectively. The harmonic on the I string is tied one measure, and then the instruments descend through the same pattern. Beginning at m. 49, where the spoken voices enter, the instruments repeat the same procedure with the third harmonic of each string. The pattern repeats until the strings have cycled through the seventh harmonics on all of the strings at m. 91. The B section thus contains six eight-bar mini-palindromes in each instrumental part within a large directional form. The whole-note texture and one-measure delay help to create a relatively calm atmosphere in the strings, which allows the swirling of the spoken text to be understood.39

39 The singers double the strings in the B section insofar as their registers will allow. Again, these parts are derivative.
Figure 3.15. Beginning of the B section of “The Circle of Winds,” Earth and the Great Weather.
Figure 3.16. A\textsuperscript{1} section of “The Circle of Winds,” Earth and the Great Weather.
The A$^1$ section begins at m. 92 (Figure 3.16). It is again organized in four-bar phrases. Now the violin (which was the trailing instrument in the first two sections) enters first, followed by the viola, cello, and double bass. In mm. 92-95, each instrument begins with a tremolo on the sixth harmonic of the IV string. The figure moves to the fifth harmonic on the III and IV strings in mm. 96-99. Thus, the pitches are moving back down the harmonic ascent of the B section. In contrast to the A section, each cell of the tremolo now swoops downwards rather than upwards. In mm. 100-103, the figure moves to the fourth harmonic on the IV, III, and II strings. In mm. 104-107 the figure shifts down to the third harmonic on the IV, III, and II strings, and at mm. 108-111, the figure shifts to the second harmonic on all four strings. At m. 112 the figure returns to the open strings, and from here until the end of the movement, the string parts are a palindrome of the first twenty bars of the A section.

Adams thus matches the swirls and circles evoked by the text with symmetries or palindromes on three levels. The A section itself follows an addition and subtraction process that is symmetrical. The B section contains six mini-palindromes in each part. And the A$^1$ section contains first a symmetry with the B section and then an exact palindrome of the beginning of the A section. Furthermore, all of this is used in service of an approximate imitation of the sound of the wind.

The rhythmic organization of the A sections also contributes to the imitation of the wind. The strings convey the swirling of the wind through the combination of different subdivisions: thirty (violin), twenty-six (viola), twenty-two (cello), and eighteen (double bass) per bar. In addition, the music is written with pronounced swells of varying lengths, which creates a fluctuating hypermeter, as in “The Place Where You Go to Listen” (Table 3-8). In the first four
bars, for example, there is one four-bar swell per part. In the next four bars there are four one-bar swells per part. The swells are rarely synchronized, however, due to several factors: The entrances and phrasing of the four instruments are staggered throughout; in several phrases (i.e. mm. 13-16, 17-20, 25-28) the swell length is not uniform amongst the instruments; and the sound delays are set at one, two, and three bars. The staggered swells in sound, similar to the staggered peaks in pitch in “Pointed Mountains” and “The Circle of Suns and Moons,” add to the impression of swirling. Finally, the pattern of swells per phrase over the course of the section forms a palindrome in the A\(^1\) (and nearly so in the A) section: 142**1**241 (where * indicate phrases in which the swell length is not uniform among the instruments). In contrast, the “B” section is played almost entirely piano, which reinforces the sense that it is the calm in the middle of the storm.

The sense of swirling around, the formal symmetries, and the use of the full gamut mark the midpoint of the piece, after which the listener hears the journey back to the Arctic Circle.

6. Deep and Distant Thunder

At the end of the “The Circle of Winds,” instruments and notes gradually drop out, but, notably, there is no sense of resolution. Instead, the recorded sound of distant thunder enters, and Adams continues the sonic narrative without pause. The thunder lasts about forty seconds. When the full percussion ensemble enters, their fortissimo attacks—first widely spaced and then getting closer to one another—sound remarkably like thunder claps close at hand. As the music proceeds, however, the rhythmic complexity weakens the imitation, and “Deep and Distant Thunder,” like “Drums of Winter,” becomes more of a reaction to the energy of the natural sounds than a direct representation.
<table>
<thead>
<tr>
<th>Rehearsal Letter</th>
<th>Type Section</th>
<th>Percussion Part</th>
<th>Number Pattern</th>
<th>(Rests between)</th>
<th>Meaning of numbers</th>
<th>Note values</th>
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<td>Introduction</td>
<td>Theme I, II, IV III</td>
<td>1235321</td>
<td>-</td>
<td>(5321235)</td>
<td>Stripes per group</td>
<td>Whole note Dotted half</td>
</tr>
<tr>
<td>Fragments</td>
<td>IV II</td>
<td>22 123</td>
<td></td>
<td></td>
<td>Stripes per group</td>
<td>Dotted half Half note</td>
</tr>
<tr>
<td>A</td>
<td>Tempo canon II, IV I, III</td>
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<td>-</td>
<td>(5321235)</td>
<td>Stripes per group</td>
<td>Dotted half Half note</td>
</tr>
<tr>
<td>B</td>
<td>Wave canon I II III IV</td>
<td>5321235</td>
<td>-</td>
<td>-</td>
<td>Measures per swell (hypermeter)</td>
<td>Eighth note Triplet quarter Sixteenth note</td>
</tr>
<tr>
<td>C</td>
<td>Pulse tempo canon I II, IV I, III</td>
<td>Constant Pulse 5321235</td>
<td>-</td>
<td>1 beat</td>
<td>Stripes per group</td>
<td>Eighth note Half note Dotted quarter</td>
</tr>
<tr>
<td>D</td>
<td>Fragments IV II III I</td>
<td>5352 532122 1225 1235321</td>
<td>(121) (1235) (5321235)</td>
<td>Stripes per group</td>
<td>Dotted half Half note Half note Dotted quarter</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Tempo canon II, IV I, III</td>
<td>2153512 2153512</td>
<td>(351215) (351215)</td>
<td>Stripes per group</td>
<td>Half note Dotted quarter</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Wave canon III II I IV</td>
<td>3512153</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>Measures per swell (hypermeter)</td>
</tr>
<tr>
<td>G</td>
<td>Pulse tempo canon I IV III II I</td>
<td>Constant pulse 3512153</td>
<td>-</td>
<td>1 beat</td>
<td>Stripes per group</td>
<td>Eighth note Half tied to eighth Half note Dotted quarter</td>
</tr>
<tr>
<td>H</td>
<td>Fragments IV III II I</td>
<td>21 1331 5351 2153512</td>
<td>(3152153) (3152513)</td>
<td>Stripes per group</td>
<td>Dotted half note Half note Dotted quarter Quarter note</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Tempo canon II, IV I, III</td>
<td>2513512 2513152</td>
<td>(3152153) (3152153)</td>
<td>Stripes per group</td>
<td>Dotted quarter Quarter note</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Wave canon IV III II I</td>
<td>3152513</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>Measures per swell (hypermeter)</td>
</tr>
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<td>-</td>
<td>1 beat</td>
<td>Stripes per group</td>
<td>Eighth note Dotted half note Half + eighth Half note Dotted quarter</td>
</tr>
<tr>
<td>L</td>
<td>Fragments IV III II I</td>
<td>53335 5133 513512 25135152 5323155</td>
<td></td>
<td>Stripes per group</td>
<td>Half note Dotted quarter note Quarter note Dotted eighth note</td>
<td></td>
</tr>
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<td>M</td>
<td>Tempo Canon II, IV I, III</td>
<td>5231325, 5321325 5231325, 52321325</td>
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<td>Stripes per group</td>
<td>Quarter note Dotted eighth</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Wave canon IV III II I</td>
<td>1325231</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>Measures per swell (hypermeter)</td>
</tr>
<tr>
<td>O</td>
<td>Pulse tempo canon I IV III II I</td>
<td>Constant pulse 125231525231</td>
<td>-</td>
<td>1 beat</td>
<td>Stripes per group</td>
<td>Eighth note Half + dotted quarter Dotted half Half + Eighth Half note</td>
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<td>P</td>
<td>Fragments IV III II I</td>
<td>523132 5231325, 122325312, 1235321 5231325, 5321235, 1235321</td>
<td></td>
<td>Stripes per group</td>
<td>Dotted quarter note Quarter note Dotted eighth note Eighth note</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Tempo canon II, IV I, III</td>
<td>5321325, 1235321, 2135312</td>
<td>[1235321 5321235 3512153]</td>
<td>Stripes per group</td>
<td>Dotted eighth note Eighth note</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Wave canon IV III II I</td>
<td>1235321</td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>Measures per swell (hypermeter)</td>
</tr>
<tr>
<td>S</td>
<td>Pulse tempo canon I IV III II I</td>
<td>Constant pulse 123521325325231</td>
<td>-</td>
<td>1 beat</td>
<td>Stripes per group</td>
<td>Sixteenth note Half note Dotted Quarter Quarter Eighth</td>
</tr>
<tr>
<td>T</td>
<td>Fragments IV</td>
<td>5321325</td>
<td></td>
<td></td>
<td>Stripes per group</td>
<td>Quarter note</td>
</tr>
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</table>
Table 3-9. Rhythmic structure of “Deep and Distant Thunder,” *Earth and the Great Weather*. There are four primary types of sections: tempo canon, wave canon, pulse tempo canon, and fragments. All of the beat patterns in the tempo canon, wave canon, and pulse tempo canon sections until the final one are palindromes. The patterns in the fragments sections are questionable. Percussion parts written on the same horizontal line are played together.

Table 3-9 is an outline of the rhythmic structure of “Deep and Distant Thunder.” Like “Drums of Winter,” “Deep and Distant Thunder” is structured on numerical patterns, but here the numbers are the prime, Fibonacci numbers 1, 2, 3, and 5 instead of the sums of 0+3, 2+3, 2+2+3, and 2+2+2+3. This is because in the imaginary journey the listener is now moving through Gwich’in lands, where the smallest beat groupings are ones, not twos and threes. Also like “Drums of Winter,” “Deep and Distant Thunder” is organized into repeating patterns of sections with a constant large beat but quickening subdivisions. In “Deep and Distant Thunder,” however, there are four main types of sections instead of two.

Beginning right at the outset, percussion I, II, and IV state a “theme” consisting of groups of unison strikes in the following pattern: 1235321 (Figure 3.17). Each strike lasts a whole note. Between groups of strikes (1, 2, 3, or 5), there are rests for a complementary number of measures, where 1 and 5, as well as 2 and 3, are complements. Thus in measure 1 there is one strike, and it is followed by five measures of rest. In measures 7-8 there are two strikes, and they are followed by three measures of rest. In m. 25, percussion III, which has been playing quiet tremolos, begins the same pattern of strikes and rests, though each strike now lasts a dotted half note. This section is thus a tempo canon with a theme that is a palindrome.
In measures 38-46, while percussion III is finishing its statement of the theme, it is doubled by percussion I. Percussion II and IV hint at a different kind of section. Percussion II, in half-note strikes, plays three short fragments in a 123 pattern. Percussion IV, in dotted half note strikes, plays a 22 fragment. In Table 3-9 I call this type of section “Fragments.”

Beginning at letter A, the music starts alternating in a constant pattern of four types of section. First comes another tempo canon. It resembles the first canon in that the pattern of strikes is 1235321. Now, however, two parts (percussion II and IV) play with dotted half note beats, while two parts (percussion I and III) enter later with the pattern in half note beats. Also unlike the first tempo canon, percussion I and III conclude each group with lower-pitched strikes.

At letter B, a different type of canon, which I have labeled a “wave canon” in Table 3-9, begins (Figure 3.18). Between the four players there are now three kinds of relatively quick rhythmic values: sixteenth notes (in two instruments), eighth notes, and triplet quarters: The three parts enter in succession, each playing steady pulses which are subsumed into a larger hypermeter. That is, over the first five measures of each part, there is a swell from piano to forte and back to piano. This is followed by swells over three, two, one, two, three, and five measures. The initial 1235321 pattern has thus now been inverted to 5321235, and the meaning of each number is the relative length of each swell (hyperbeat) rather than the number of strikes per group.
VI. Deep and Distant Thunder

Figure 3.17. Beginning of “Deep and Distant Thunder,” Earth and the Great Weather.
Figure 3.18. Letter B, “Deep and Distant Thunder,” *Earth and the Great Weather.*
At letter C, another type of section begins (Figure 3.19). A steady eighth-note pulse continues in one part (percussion I), while a tempo canon is played simultaneously. Percussion II and IV play the pattern 532123521235 in half notes, while percussion I and III, beginning a little later, play the same pattern in dotted quarter notes. The pattern is again a palindrome. Unlike the initial tempo canon, however, the space separating each group of strikes (1, 2, 3, or 5) is consistently one beat. In Table 3-9 I have labeled this section a “pulse tempo canon.”

At letter D is the first section derived from mm. 38-46 (“fragments”). The section resembles a tempo canon in that the four parts seem to be in multiple simultaneous tempi. Only one part (percussion I), however, has a complete palindrome pattern of strikes (1235321). In the other parts, there are fragments of patterns. That, combined with the piano dynamic that contrasts with the other tempo canon sections, lends to this section a sort of “interlude” quality.

Over the course of the movement, the implied beats in the tempo canon sections accelerate from whole notes to eighth notes. In the pulse tempo canons the number of different simultaneous implied beats expands from two to four, while the pulse itself accelerates from eighth notes to sixteenth notes. In the wave canon sections the articulated pulses grow more dense, from three, four and eight per half note to five, six, seven, and eight. Meanwhile, the pattern of beats in each section (with the exception of some of the parts in the “fragments” sections) is always a palindrome using the numbers 1, 2, 3, and 5.

In the final section, a sort of hybrid climax beginning at letter U (Figure 3.20), all parts play in unison all the beat patterns used throughout the movement, beginning with the “theme” 1235321 and ending with an extension of 5321235 (Table 3-9). In addition, percussion I and III play a fast, articulated sixteenth-note pulse.
Figure 3.20. Letter U, “Deep and Distant Thunder,” *Earth and the Great Weather*. 
“Deep and Distant Thunder” is thus constructed with a kind of “mosaic” form, alternating between distinct types of sections that also share structural elements. In the tempo canon and pulse tempo canon sections, there are multiple simultaneous implied tempi, while each instrument executes the same pattern of “strikes per group.” In both the pulse tempo canon and wave canon sections there are articulated pulses: a common pulse in the former and multiple simultaneous ones in the latter. In the wave canon sections all the instruments execute the same pattern of “measures per hyperbeat.”

“Deep and Distant Thunder” shares with “Drums of Winter” the acceleration common to Eskimo drumming. Unlike its predecessor, it is not constructed from Iñupiat combinations of 2+3 but is rather more deeply structured by palindromes, which resonate with the cyclical aspects of the natural world found within the Arctic National Wildlife Refuge. The music is also more imitative of natural sounds, as implied by the title; in the context of the storm sounds heard at the beginning of the movement, the fortissimo percussion strikes sound like thunder claps, and the wave canons sound like rolling sheets of wind and rain.

7. River with No Willows

As soon as “Deep and Distant Thunder” comes to its climactic finish, the gentle recorded sound of candle ice (slowly melting ice columns clinking against each other) and sizzle ice (glacial ice releasing air bubbles as it melts underwater) emerges. After forty seconds of this sound, a voice enters, whispering Latin names of plants. Other voices speak names in Iñupiaq, Gwich’in, and English, and soon the strings begin playing “River with No Willows.”

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40 This alternation between patterns of waves and discreet attacks returns in later works of Adams, such as Inuksuit.
The Okpilak River, after which this movement is named, runs from the Romanzof Mountains (the highest and easternmost mountains in the Brooks Range) to the Arctic Ocean. Historically, the Okpilak River was too cold and dry for willows, though in a bit of sad irony, these days it is crowded with willows as a result of climate change.41 The text for this Arctic Litany consists of names of plants that traditionally grow in or near the river. Some of the names, which seem to be listed with no strict order, are:

- horsetail
- water sedge
- alder
- arctic rush
- black spruce
- arctic poppy
- alpine azalea
- purple mountain saxifrage
- bog blueberry
- arctic chrysanthemum

“River with No Willows” is the only Arctic Litany in which the music is not a reflection of the spoken names but rather the context in which their referents are found. That is, the plant names notwithstanding, the music for strings is an approximate imitation of the sound of the flowing river. It may also be understood as a representation of the motion of the river or the light reflecting off of it. Adams achieves this imitation REPRESENTATION WITH A GENTLE AND GRADUALLY changing two-note oscillatory figure (Figure 3.21).

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Figure 3.21. Beginning of “River with No Willows,” *Earth and the Great Weather*. Note: Based on the tuning chart, the first two notes in the violin should be labeled I₅,₄ rather than I₆,₅.
The form of the music is an interesting hybrid of a palindrome and a binary ABA\textsuperscript{1}B\textsuperscript{1} form. As can be seen in Table 3-10 two different instrumental groupings hold throughout the piece. Rhythmically, Adams aligns the violin with the cello and the viola with the double bass. In terms of pitch, however, Adams pairs the violin with the viola and the cello with the bass.

The two A sections are nearly palindromes of each other, as are the two B sections. For example, look at the music for violin and viola beginning in m. 1 (Figure 3.21). Over the course of this section, the violin leads the viola in playing the fifth and fourth harmonics on the I, II, III, and IV strings, successively. In the A\textsuperscript{1} section, the viola leads the violin as the two instruments play the same harmonics, now beginning with the IV and ending on the I string. Likewise, in the

Table 3-10. Harmonic and rhythmic structure of “River with No Willows,” Earth and the Great Weather. Roman numerals and subscripts refer to string numbers and harmonics.
B sections, the two instruments play the seventh and sixth harmonics across all the strings, first from the I string towards the IV and then from the IV string towards the I.\textsuperscript{42}

The music for cello and bass is similar to the music for violin and viola, though it differs in several ways. First, whereas the violin and viola begin each two-note oscillating figure from the upper note, the cello and bass begin from the lower note. Second, when the violin and viola play the fifth and fourth harmonics, the cello and bass play the sixth and seventh harmonics, and vice versa. Third, the cello and bass do not play the same order of strings as each other or as the violin and viola. Instead, Adams has permuted the string numbers in exactly the same way that he operated on rhythmic group length and repetitions in the percussion quartets. In the A section, for example, when the violin and viola play the strings in the order I-II-III-IV, the cello and bass play them in the order II-I-IV-III and II-I-III-IV.

Adams imitates the river with a variable flow and texture. As in the drum quartets, “The Circle of Suns and Moons,” and “The Circle of Winds,” there are always multiple subdivisions of the beat in play, creating the impression of multiple tempi. As can be seen in Table 3-10, Adams starts “River With No Willows” with subdivisions of 30 and 26 per measure in the two tempo-related groups. Each group then decelerates to slower subdivisions over the course of the section. Looking at the two A sections of the piece, one can see that they are palindromes in apparent tempo (subdivisions) as well as pitch. The first starts faster and gets slower; the second starts slower and accelerates. The same goes for the two B sections. The entire movement, in fact, is a palindrome in apparent tempo.

\textsuperscript{42} The two A sections and B sections would require small shifts in the order of some of the oscillations (from up-down to down-up, etc.) to be strict pitch palindromes, but this point is likely insignificant.
Whereas the apparent tempo fluctuates over thirty-two-bar spans, the texture fluctuates constantly. Each instrument generally plays a particular oscillation for thirty-eight beats. Since each phrase is followed by rests, the scored texture of the music continually passes from two voices (violin and cello) to four voices to two voices (viola and bass) to four voices. In performance, the textural changes are enhanced by the three digital delays, which are spaced eight measures apart.

“River with No Willows” is similar to “The Circle of Winds” in that the development of each movement relies on using the same harmonics across all the strings. In addition, both movements contain multiple (the same) simultaneous rhythmic subdivisions and fluctuating textures as a representation of “swirling.” The placement of the two movements on either side of the midpoint of Earth forms another symmetry on the sonic journey, which now continues back towards the Arctic coastline.

8. One That Stays All Winter

The real River With No Willows empties on the Arctic Coastal Plain. As Adams’s “River With No Willows” comes to an end, the recorded sound of sandhill cranes slowly emerges. At first it sounds like a single crane, but soon the sound is of hundreds or thousands of cranes gathering. The sounds signify that in the sonic journey of Earth and the Great Weather, we are now back on the Coastal Plain, where sandhill cranes breed.

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43 Only the initial figure in each of the four sections lasts twenty-four beats.
“One That Stays All Winter” is the only movement in Earth that is based on a direct imitation – that is, an imitation of a sound of definite pitch. After fifty seconds of the recorded sound of cranes, the strings enter with “seagull” glissandi – artificial harmonic glissandi that

Figure 3.22. Beginning of “One That Stays All Winter,” Earth and the Great Weather.
sound like the call of seagulls (Figure 3.22). A few measures later, the singers enter with imitations of the glissandi, and the cranes gradually fade out. After another minute and a half, a tape enters with the sound of swans. The texture is thus saturated with the recorded natural sounds and the instrumental and sung imitations. Finally, spoken voices enter with the names of arctic birds. Again, the names are in four languages – Iñupiaq, Gwich’in, English, and Latin. Some of the names, which seem to move from water birds to sedentary birds, birds of prey, and songbirds, are:

- tundra swan
- sandhill crane
- snow goose
- arctic loon
- spectacled eider
- yellow-billed loon
- horned grebe
- spotted sandpiper
- willow ptarmigan
- ruffed grouse
- golden eagle
- snowy owl
- raven
- yellow-rumped warbler
- boreal chickadee
- snow bunting

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\(^{45}\) Adams lists the tundra swan and sandhill crane first, since the listener has already heard the sounds of these birds when the speakers begin.

\(^{46}\) The references to loons are foreshadowing the recorded sounds heard after this movement.
Pitches indicate endpoints of glissandi, the top pitch corresponding to the note indicated by Roman numerals and subscripts. Arrows up or down indicate the direction of the glissandi (until the next arrow). The bass part is notated as sounded.

Table 3-11. Rhythmic and formal structure of “One That Stays All Winter,” Earth and the Great Weather. There are palindromes in pitch and in the lengths of the glissandi. Instruments are ordered violin=1, viola=2, cello=3, bass=4. The order in which the instruments change glissandi is almost a palindrome, but the group in brackets prevents it from being so completely.

Figure 3.23 and Table 3-11 show the structure of the movement. Comparison to Table 3-5 shows that “One That Stays All Winter” is similar to “Pointed Mountains Scattered All Around” in that the music for strings consists of glissandi on each string. Whereas “Pointed Mountains” began with the IV string, moved gradually to the I string, and then returned to the IV...
string, “One That Stays All Winter” does the inverse: it begins on the I string, moves to the IV string in the middle, and returns to the I string. In addition, whereas “Pointed Mountains” called for continuous glissandi, “One That Stays All Winter” involves glissandi that stop and start. At the beginning of the movement, they are downward glissandi. In the middle of the movement they go up and down, and at the end of the movement, they go upwards. Moreover, the glissandi last different lengths of time (and thus have different apparent tempi); as can be seen in Table 3-11, the instruments begin with glissandi lasting between four and seven beats, increase the length to between seven and ten beats by the middle of the movement, and return to the original length by the end of the movement.

In “One That Stays All Winter,” therefore, there are palindromes in the pitch and the length of the glissandi. The only thing that prevents the music from being a complete palindrome is the order in which the instruments change glissandi. As in Table 3-5, in Table 3-11 I have labeled each instrument with a number (violin=1, bass=4). One can see that the numbers form a palindrome with the exception of the middle group.47

The delays in “One That Stays All Winter” are short relative to the other movements: three, four, and five eighths. They add to the sense of a multitude of birds but do not blur the sections of music as much they do elsewhere in the piece.

47 Again, it is not actually possible to create a complete palindrome with seven sets of four unique entities.
8. Drums Of Fire, Drums of Stone

IX. Drums of Fire, Drums of Stone

Glacier sounds... Drums begin ca. 1:40 after end of Strings, immediately following large "boom"!

\[ \text{Driving} \]

Drums of Fire, Drums of Stone

Figure 3.24. Beginning of “Drums of Fire, Drums of Stone,” Earth and the Great Weather.
As “One That Stays All Winter” quietly fades out, the recorded sound of splashing waves enters, maintaining the listener’s sense of the coastal plain. In a prolonged interlude between movements, the hauntingly beautiful sound of loons emerges, as if echoing the cranes and swans heard moments earlier. A beautiful duet of loons plays out. As these calls fade away, the sound of calving glaciers emerges and gradually builds to the beginning of the ninth movement, “Drums of Fire, Drums of Stone.” The two natural sounds next to each other are like Apollo and Dionysus: the first lovely in its melodiousness, the second frightening in its power. Our reactions to these two sounds reflect the dual nature of our experience of the non-human natural world.

Immediately after the recorded sound of a giant piece of ice cracking, “Drums of Fire, Drums of Stone” begins with rapid-fire ensemble playing. Just as “Deep and Distant Thunder” began as an imitation of thunder claps but gradually represented thunder more in energy than in rhythm, so here the percussion emerges from the sound of calving glaciers, though it develops a rhythm quite separate from the glaciers. As mentioned earlier, the movement is a near palindrome of the first drum quartet, “Drums of Winter.” Compare Figure 3.24, the beginning of “Drums of Fire,” with Figure 3.11, the beginning of the last section of “Drums of Winter.” One sees that the latter movement starts with the same rhythmic texture that the first ends with: unison eighth-note accents with sixteenth and thirty-second note pulses in between. At a more local level, the earlier movement is based on rhythmic cells of 2 (+2+2) +3, whereas the later movement is based on groups of 3+2 (+2+2). In “Drums of Winter” the accented notes are the lower-pitched alternatives, whereas in “Drums of Fire” they are the higher-pitched ones.

But the latter movement is not an exact palindrome of the former (Table 3-12). Instead, it is more like a palindrome of the processes in the former. The pattern of rhythmic cells in the first section of “Drums of Fire” would be E977537935739537593579 if it were the palindrome of the
pattern in “Drums of Winter.” Instead, “Drums of Fire” begins like the last section (letter J) of “Drums of Winter” but at a different point in the process of cellular rotation. That is, the rhythmic cells in “Drums of Winter” begin 9753 9573…; in “Drums of Fire” they begin 9753 7935…

<table>
<thead>
<tr>
<th>SECTION</th>
<th>METER</th>
<th>M.M.</th>
<th>KIND OF PULSE</th>
<th>RHYTHMIC VALUE OF PULSE</th>
<th>NUMBER PATTERN</th>
<th>WHAT EACH NUMBER DEFINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro</td>
<td>Complex: starts in 9/16</td>
<td>↓ + ↓=45</td>
<td>Hybrid (in unison)</td>
<td>↓ (plus layer of 32nds)</td>
<td>9753 7935 7395 3759 35799753</td>
<td>Pulses in a rhythmic cell</td>
</tr>
<tr>
<td>A + B</td>
<td>Complex: starts in 9/16</td>
<td>↓ + ↓=45</td>
<td>Hybrid</td>
<td></td>
<td>95737359 59377395</td>
<td>Pulses in a rhythmic cell</td>
</tr>
<tr>
<td>C</td>
<td>Simple: 4/4</td>
<td>↓=45</td>
<td>Divisive</td>
<td>Septuplet eighths, nonplet 16ths</td>
<td>9573957395 73957935 53979357 3759979535</td>
<td>Subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>D</td>
<td>Complex: starts in 9/16</td>
<td>↓ + ↓=45</td>
<td>Additive</td>
<td></td>
<td>7935</td>
<td>Number of continuous thematic cells of 3, 5, 7, or 9 pulses</td>
</tr>
<tr>
<td>E</td>
<td>Simple: 4/4</td>
<td>↓=45</td>
<td>Divisive</td>
<td>Quintuplet eighths, septuplet eighths</td>
<td>7395 7935 3759 5397 9395 9573</td>
<td>Subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>F</td>
<td>Complex: starts in 7/8</td>
<td>↓ + ↓=45</td>
<td>Additive</td>
<td></td>
<td>7395</td>
<td>Number of continuous thematic cells of 3, 5, or 7 pulses</td>
</tr>
<tr>
<td>G</td>
<td>Simple: 4/4</td>
<td>↓=45</td>
<td>Divisive</td>
<td>Triplet quarters, quintuplet eighths</td>
<td>7395 7935 9573 5937</td>
<td>Subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>H</td>
<td>Complex: starts in 5/8</td>
<td>↓ + ↓=45</td>
<td>Additive</td>
<td></td>
<td>3759</td>
<td>Number of continuous thematic cells of 3 or 5 pulses</td>
</tr>
<tr>
<td>I</td>
<td>Simple: 4/4</td>
<td>↓=45</td>
<td>Hybrid</td>
<td>Triplet quarters, quintuplet eighths</td>
<td>3579 5397 5937</td>
<td>A group of subdivisions</td>
</tr>
<tr>
<td>J</td>
<td>Simple: 4/4</td>
<td>↓=45</td>
<td>(Divisive)</td>
<td>(Triplet quarters implied)</td>
<td>3759 3579 5397</td>
<td>Implied subdivisions in a rhythmic cell</td>
</tr>
<tr>
<td>K</td>
<td>Complex: starts in 3/4</td>
<td>↓=90</td>
<td>(Additive)</td>
<td>(implied)</td>
<td>3579 3579 3</td>
<td>Implied subdivisions in a rhythmic cell</td>
</tr>
</tbody>
</table>

Table 3-12. Rhythmic structure of “Drums of Fire, Drums of Stone,” *Earth and the Great Weather*. By section, the rhythmic structure is a palindrome of “Drums of Winter,” though the pattern of rhythmic groups in each section is not a palindrome. There is one more section in “Drums of Fire” than in “Drums of Winter” because Adams gives one section of “Drums of Fire” two letters (A and B). Underlined groups of numbers are palindromes.

By connecting the second and ninth movements so intimately, Adams ties together the three percussion movements and the entire piece into a cyclical form. Unlike the other two percussion quartets, “Drums of Fire” winds down as it comes to an end (the move from *fortissimo* to *piano* between the last two sections is the reverse of what happens between the first
two sections of “Drums of Winter”). Over the quiet last phrase, whose rhythmic pattern of 3579 recalls both the opening of “Drums of Winter” and the beginning of *Earth and the Great Weather*, a voice speaks Uvavnuk’s poem once again, now in English translation.

10. Where the Waves Splash, Hitting Again and Again

As the poem ends, the recorded sound of wind and gently splashing waves reenters. After about ten seconds the speakers and singers begin the short, final movement, “Where the Waves Splash, Hitting Again and Again.” The movement is named after a place called Pattaqtuq, which is located about seventy miles southeast of Naalaliagvik and eight miles west of the Alaska-Canada border. The names in the movement show the completion of the listener’s journey back to the Arctic Coast. They are again in Iñupiaq and English only (since the traveler has returned to the Iñupiat lands), and some of them repeat names used in “The Place Where You Go to Listen”:

- Farthest north mountains
- A deep pond at the source of the river
- Mouth of the river with no willows
- You can see a long way
- Long high bluff
- The icy reef
- The place where you go to listen
- Where the waves splash, hitting again and again

The movement is scored for voices and recorded sounds only. It is the only Arctic Litany without strings. Since there are no instruments, the singing voices are instructed to whisper only. The entire movement is like one long fade-out back into the sounds of the place, which continue after the last name is uttered.
Summary

In my discussion of Earth and the Great Weather up to this point, I have focused primarily on what Nattiez would call the “neutral” or “immanent” level of the music—the score and the sounds. I would like to conclude this chapter by asking three questions about Earth that will help us to reach a deeper understanding of the poietic and esthesic levels of meaning in the work.

Techniques

What techniques does Adams use in Earth and the Great Weather to “move beyond self-expression and beyond anthropocentric views of history, to re-imagine and re-create our relationships with this planet and all those (human and other-than-human) with whom we share it?”

In composing songbirdsongs, Adams described his task as “translation.” In composing Earth, his focus shifted from birdsong towards “a place,” and his idea of the compositional process developed from “translation” into “sonic geography.” Although Earth and the Great Weather, like songbirdsongs, was written before the essay “Beyond Expression,” it is interesting to note that his definition of sonic geography as “a region that lies somewhere between place and culture, between human imagination and the world around us” seems to foreshadow his later challenge to artists “to re-imagine and re-create our relationships with this planet...” (italics added).

49 Adams, Earth and the Great Weather, preface.
Throughout this discussion, Adams’s musical techniques of “sonic geography” have emerged. To begin, we have seen that Adams uses a wide range of quotations (recordings), imitations and representations of the natural world. Using some of Deryck Cooke’s terminology to delineate these techniques, I have pointed out that Adams uses a “direct imitation” of arctic birds in “One That Stays All Winter;” “approximate imitations” of wind (“The Circle of Winds”), thunder (“Deep and Distant Thunder”), flowing water (“River With No Willows”), and calving glaciers (“Drums of Fire, Drums of Stone”); and true representations of mountains (“Pointed Mountains Scattered All Around”) and astronomical cycles (“The Circle of Suns and Moons”). In the case of the representations, we also saw the visual resemblance of the notation in the score to mountains and ascending suns and moons.

Perhaps the most omnipresent representations are the palindromes that permeate the work. At the shortest time scale, rhythmic patterns found within many sections of the drum quartets are palindromes. At an intermediate time scale, entire movements (“Pointed Mountains Scattered All Around,” “The Circle of Winds,” “River with No Willows,” “One That Stays All Winter”) form near-palindromes. And at the longest time scale, the entire work has some characteristics of a palindrome – in the relationship of movements II and IX, III and VIII, and V and VII, as well as in the reciting of Uvavnuk’s poem at the beginning and end of the piece. As discussed, Adams uses the long-term palindrome structure to represent a sonic journey from Naalagiagvik on the Arctic Coast, through the Brooks Range and the Gwich’in lands, and back to the Arctic Coast at Pattaqtuq. At an even deeper level, the palindrome structures of Earth represent the cycles of all living and non-living matter in the Arctic National Wildlife Refuge—cycles of thawing and freezing, day and night, summer and winter, migration north and south, birth and death, creation and decomposition.
Finding sonic equivalents in the form of representations or palindromes is one way in which Adams goes “beyond self-expression.” In *songbirdsongs* we saw that he also went “beyond self-expression” by giving performers significant control over the moment-to-moment execution of each piece. In *Earth and the Great Weather* there is a degree of indeterminacy: The speakers are given a list of names and asked to intone them at their own pace within a loosely specified amount of time. Otherwise, however, the piece is largely determinate. In fact, it is the first of many pieces that Adams constructed using long-range processes or algorithms. In each movement of *Earth*, he sets into motion one or more processes, such as movement through a series of harmonics or an acceleration and deceleration through a series of implied tempi, and allows them to play out with minimal manipulation.

In *Earth and the Great Weather* the emotional content associated with specific intervals or harmonic progressions does not shape the musical progression. There are no “expressive” gestures such as half-step slurs or rubato indications. The voices—which are normally highly associated with personal expression—neither portray characters nor explicitly convey a plot or narrative. In fact, there is nothing in the harmonies, pitches, and dynamics of *Earth* that is not largely determined by a process. Such algorithmically based composition has a rigor resembling serialism, though Adams shows no need to cycle through any particular set of tones before repeating one. The use of repetition and very gradual transformations of one harmony or rhythmic state into another also resembles minimalist works, but in *Earth and the Great Weather* Adams uses a more chromatic gamut than do minimalists like Steve Reich or Philip Glass. Moreover, Adams’s use of processes is not strictly motivated by the desire to provide structural
coherence in the absence of a tonal center or the desire to hear processes that are “perceptible”\textsuperscript{50} (in many cases, Adams’s processes are not). Although these certainly form part of Adams’s motivation, it is his philosophical desire to go “beyond self-expression” that motivates his adoption of process-oriented construction. Ironically, Adams has attained this goal using both indeterminacy (in \textit{songbirdsongs}) and extreme determinacy (in \textit{Earth and the Great Weather}).

One consequence of Adams’s move towards process music is non-functional and non-directional harmonies. That is, his harmonies are not formed by a consideration of their horizontal implications within a particular tonal context but rather are the result of one or several horizontal processes that interact vertically. Adams controls the generating processes, not the harmonies in individual moments. The rhythmic contours of the music are also determined by an algorithm. Inspired by Nancarrow and Cowell, Adams uses multiple simultaneous and shifting implied tempi to create \textit{a rhythmic texture that is multidimensional, organic, and rooted in the sounds of the place} (both human and non-human sounds).

Moreover, with the shift to process-oriented construction comes compositional length. Processes take time, and Adams does not shy away from allowing them to play out. This, too, has ecological roots, which may be inferred from a passage from \textit{Winter Music}:

When Barry Lopez speaks of landscape as the culture that contains all human cultures, the word is full of rich connotations derived from a lifetime of intimate personal experience in the landscape. But for many of us landscape is something we view from a distance: within the frame of a painting or a photograph, on a television set or a movie screen, or through the window of a speeding automobile. Such encounters with place can be thought-provoking and inspiring. All too often they’re sadly superficial.

In whatever sense we understand the concept of landscape, landscape alone is no substitute for the authentic personal experience of fully being in a place. As with any true

intimacy, this takes time. We can view a landscape in a matter of seconds. But it can take a lifetime to truly know a place.\textsuperscript{51}

What makes our typical encounters with a place superficial is both their brevity and their indirectness (i.e., that they are experienced from inside a car or in front of a television). Each of the movements in \textit{Earth} takes as long as its process takes. Adams does not interfere to speed the process up. Moreover, although attempting to experience ANWR through a piece of music is clearly an indirect experience, the use of Native American names generated over the course of hundreds or thousands of years reinforces the temporal experience of the music.

Finally, in \textit{songbirdsongs} we also saw that Adams positioned the musicians around the performance space, presumably to create a more three-dimensional, complete, and “authentic” performing and listening experience. In \textit{Earth and the Great Weather}, Adams simulates space differently. Although the score states that the purpose of the three delay lines is “to create a ‘virtual’ chorus and string orchestra,” the “echo” effect of the delays also creates a sense of space.\textsuperscript{52}

\textit{Earth and the Great Weather} thus includes several new approaches to composition for Adams: the use of various types of imitation and representation, palindromes (a deep-level representation), algorithmic and long-range processes, non-functional harmonies, expanded length, and technological enhancements to the sense of space. These techniques allowed Adams to move away from self-expression altogether as he sought to create a new aesthetic of “sonic geography.”

\textsuperscript{52} Sabine Feisst, “Music as Place, Place as Music,” 30.
**Listening Separately**

What is the effect of listening to each sounding element of Earth and the Great Weather?

Early in this chapter I inventoried the sonic forces at work in *Earth and the Great Weather*, and throughout the discussion, I have described how they develop. What is still needed is a discussion of how they may be heard. Since the elements are often separated in the piece, and since I believe they are heard quite differently one from another, I will answer this question first separately and then together.

**Natural sounds**

In my discussion of *songbird songs*, I argued that Adams’s decision to imitate birdsongs in their “manner of operation” rather than in one particular iteration both preserved the birdsongs’ natural freedom and kept listeners focussed on what birds, rather than composers, do.

In *Earth and the Great Weather* Adams reproduces sounds of the natural world not only through imitation but also through more precise and technological “quotation.”

David Rothenberg is a clarinetist, composer, and sound artist who has made multiple recordings of himself playing with the sounds of other animals. Reiterating some of the problems with using the sounds of nature that I discussed in chapter 1 of this dissertation, he writes:

I have personally made plenty of use of recorded natural sound in my work, from birds, whales, water, and insects, and I can tell you there is a real peril in doing this. Quite simply, the sounds of nature do not need us. They have their place, their purpose, their sense, their certainty. What right have we to use them for our purposes? Putting them forward in themselves as music can easily be ridiculous, presumptuous, pretentious. The poet A. R. Ammons may have said it best, when he wrote, ‘Spare me Man’s redundancy.’

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I want to suggest that the recorded natural sounds in *Earth and the Great Weather* have multiple functions and thus may be heard in different ways. First, they serve to present us with the reality of the natural world, in contrast to the musical and verbal responses to it. They are the aural landmarks on listeners’ imaginary journey through ANWR. When they sound, they enable listeners to imagine their natural surroundings before hearing Adams’s musical responses to those surroundings. The sound of wind and waves at the very beginning and end of the piece locate the listener on the Arctic Coastal Plain. So do the sounds of calving glaciers, loons, cranes, and swans. Similarly, the white-crowned sparrow locates the listener in the Brooks Range, and the candle and sizzle ice locate us at the River With No Willows (specifically, in the springtime).

While narrating this journey, Adams also uses natural sounds to tell us of non-location-specific events in ANWR. The water sweep that connects “Circle of Suns and Moons” with “Circle of Winds,” for example, tells us of rain. The sounds of thunder that precede “Deep and Distant Thunder” tell us of storms.

When one hears the natural sounds as landmarks, one is engaged in a form of source perception and semantic-comparative listening. Upon hearing the natural sounds listeners determine their source and the meaning of the source for the journey through ANWR.

The music that follows these natural sounds consists of drum patterns and string sounds. In many cases, the natural sounds serve as templates or inspiration for the composed music. The sounds of cranes, swans, and loons inspire the string writing in “One Who Stays All Winter.” When

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54 Recordings of Arctic birds also inspired the orchestral writing in Einojuhani Rautavaara’s *Cantus Arcticus*, though Rautavaara’s music is very different.
one hears the natural sounds as sources of inspiration for the composed sounds, one is also engaged in semantic-comparative listening.

There is an altogether different function of the natural sounds as well. I suggest that the recorded sounds in Earth serve to stimulate a different kind of listening, something more akin to what I have called musical perception. In Winter Music Adams has written about the different qualities of human-made sounds and sounds of the non-human natural world and how listening to the latter may affect us:

Listening attentively to the music of the natural world, we encounter a different sense of time than in most human music. The rhythms are more subtle and complex. The tempos can be extreme—very much faster and very much slower than most of our music. And ultimately the music of nature leads us away from notions of tempo and rhythm to a more direct experience of the larger flow of time.

Attentive listening to natural sounds can also expand our understanding of musical meaning. Human music is generally a semantic phenomenon in which the relationships between sounds mean as much as the sounds themselves. But sounds as they occur in nature are not symbols, subjects, or objects. They represent nothing other than themselves. They simply sound. The greatest power and mystery of natural sounds lie in their immediate and non-referential nature. If we listen carefully enough we may occasionally hear them just as they are.

The voices of wind and water, the primal music of bird songs and animal cries, remind us of the power of this deeper, simpler mode of listening. Listening to the resonances of the soundscape, we rediscover those mysterious connections between the sounds we make and the larger, older world to which we belong. In time our music may come to be defined not by the symbolic strictures of musical semantics or by the limits of our inventiveness, but only by the limits of our experience listening to the world around us.55

Adams suggests that listening to the natural world is most powerful at a non-representational, non-analytic level. Sounds like flowing water and bird songs have a “different sense of time” that lets us listen free of tempo and meter. These sounds also have a different timbre and texture. By opening the listener to a new sense of time, timbre, texture and non-representational meaning, the sounds of the natural world help listeners access a simpler way of

listening—perhaps one used by our ancestors at a stage of evolution before our analytical minds became quite so active. This kind of listening can help us recreate relationships not only to the rest of the planet but also within ourselves.

Outdoors the sounds of wind and birds easily trigger the older way of listening. Indoors in the context of *Earth and the Great Weather*, it is natural to listen to those sounds semantically. When I listen to the piece, I find myself going between multiple listening modes.

**Names**

A listener’s response to the intoned names will necessarily be semantic and not truly musical. Still, we can tease out some nuances in their effects on listeners. How one listens probably depends greatly on one’s ethnic background. Iñupiat and Gwich’in listeners likely recognize the names and feel a connection to the places, things, and activities that they describe. Both groups probably also experience a range of emotions at hearing their languages included in a work of “white” art. In the last thirty years the relationship of the Iñupiat and Gwich’in peoples has suffered from disagreements about drilling in the 1002 area of ANWR.\(^56\) I can imagine that listeners of each ethnic group, hearing the other’s language in the context of this piece, may be reminded of their deep connections as well as their recent conflict.

As a listener with no knowledge of either native language, I find that each one has its unique rhythm and sound clusters. I am intrigued by the Native Alaskan sounds, though only the English translations provoke a response to the meaning of the names. Names like “tundra swan”

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\(^{56}\) The Iñupiat stand to gain monetarily from leasing their lands to oil companies, while the Gwich’in, who live off of caribou, stand to lose if the porcupine caribou herds that calve along the coastal plain are affected. See Leigh L. Thompson and Richard Gonzalez, “Environmental Disputes: Competition for Scarce Resources and Clashing Values,” in M. Bazerman, D. Messick, A. Tenbrusel, and K. Wade-Bezoni, eds., *Environment, Ethics, and Behavior: the Psychology of Environmental Valuation* (San Francisco: New Lexington Press, 1997), 75-76.
or “water sedge” evoke images of a plethora of life forms. Names like “The place where you go to listen” and “Place where caribou can easily be caught” evoke a deep, communal human relationship with the land that has developed over a very long period of time.

**Strings**

If the recorded natural sounds constitute the reality of the natural world surrounding the listener in *Earth and the Great Weather*, then the Arctic Litanies comprise a sort of human representation of that natural world. In order to create a representation that derives organically from ANWR, Adams wholly creates his gamut based on his recordings of Aeolian harps. Perhaps the most obvious approach to listening to the Litanies is semantic-comparative listening—that is, to hear the imitations and representations in the music. The imitations of winds and seabirds can certainly be heard with little effort. The imitations and representations of mountains, astronomical cycles, and the River With No Willows require more imaginative and metaphorical listening.

As explained earlier, however, the natural sounds also encourage an older, simpler, non-metaphorical listening. Since the string writing follows these sounds through most of the piece, it is possible that as one listens one brings this simpler form of listening—musical perception—back to the composed music. What one then finds in the string writing are phrases that are continually repeated and slowly modified. Whereas in a traditional piece of Western music, different instruments often play independent lines, in the Litanies every instrument plays essentially the same line; the main differences are in the timing and pitch of their onset and in their rhythmic values. These echoes in the score are multiplied in sound by the delay lines. As a result, the string texture is unified not from each part complementing the other but from
equivalence of the parts. At times the texture is like a fugue with no countersubject or episodes. In “The Circle of Suns and Moons,” for example, the process by which those lines enter at different tempi, disappear, reenter, and disappear again can be heard. At other times the lines move so quickly and the delays come so close that each part dissolves into a shimmering cloud (e.g., “Pointed Mountains Scattered Around”).

What is not effective in the Arctic Litanies is emotional listening. Probably because Adams limits the string writing to a gamut of harmonics structured by strict compositional processes, the sounds speak as colors, not as narrators. There is little sense of drama, dialogue, or oratory, likely because there is little traditional sense of “melody.” Adams would rather listeners create their own emotional response than provide one for them.

Percussion

The drum quartets are both sonic representations of powerful, destructive forces and an expression or representation of the Native Americans who live in and around ANWR. They may also be listened to in multiple ways. Each of the quartets is preceded by the natural sounds of powerful, destructive forces—strong wind, thunder, and calving glaciers. The drums, when they enter, may easily be heard as an imitation or (in the case of the wind) a logical consequent of these sounds.

But the percussion quartets sound like representations only when they begin. As they continue, they take on new meanings. To an Iñupiat listener or one familiar with Iñupiat music, the repeated use of $2+3$ ($3+2$) rhythms, acceleration, and unison drumming might be heard semantically as a representation of Iñupiaq culture. To Iñupiats and non-Iñupiats alike, the pieces can produce a visceral, emotional impact through the powers of strong rhythms, acceleration, and
sheer volume. The strong rhythms serve as a counterweight to the rhythmic ambiguity in the Litanies. The acceleration provides a sense of progression and urgency. And the association of loud sounds with destructive events adds terror. Adams says that the quartets, though not amplified, should be “almost overpowering.”

Perhaps these movements evolve from representations of the natural world into representations of our impressions of the natural world.

Finally, listening with only musical perception, the alternating sections of additive and divided pulse, the smaller beat patterns (e.g. 3579, 35799753), and the large-scale palindrome of movements II and IX draw the listener into observable form. One may not hear the cycles in their entirety, but there are enough audible shapes to the rhythms that they capture our attention.

Singers

Adams has produced two recorded versions of *Earth and the Great Weather*. The first was made in 1994 with Adams as percussionist and conductor and did not include singers. After the performance in London in 2000, which included singers in the Arctic Litanies, Adams added voices to the original recorded tracks. In preparing this analysis, I have consulted both versions, and I find the addition of the voices to be a distraction.

I think there is a stark contrast between the ways in which humans listen to sung and spoken voices. We know that people speaking may control the timbre of their voices to hide more or less of their emotions, but singing can neither be executed (well) nor heard as rationally. For reasons related to evolution, baby talk, or just its exceptionality in our lives, we hear the sound of singing as being more expressive of an emotional state than words. In the case of a dramatic performance, we project the singer’s perceived emotions onto the represented character.

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When I hear the singing voices in *Earth and the Great Weather*, therefore, I am immediately pulled into emotional listening. I imagine that the singer is feeling something, and I attempt to find what it is. Nothing in their parts, however, gives me much insight into the expression I seek. Moreover, the activation of this listening encourages me to search for expressive gestures in the strings and spoken voices, where there are none. Of course, I can try to turn off the emotional listening, but therein lies the distraction. Moreover, this was not Adams’s intention. He only wanted to thicken the texture.

The distraction is the worst in “One That Stays All Winter.” There the voices seem to imitate the strings more than the actual birds and have little timbral resemblance to either. They call my attention to the artifice of the music rather than the physical landscape through which Adams is leading me.

Fortunately, the 1994 recording is the one that remains commercially available. Fortunately as well, this is one of few missteps in Adams’s attempts to achieve the aesthetic goals that are the subject of this dissertation.

*Listening Together*

What is the experience of listening to Earth and the Great Weather in its entirety?

In an essay quoted earlier in this discussion, Adams laments “superficial” experiences of nature. One might wonder how deep the experience of listening to *Earth* can be. Is it simply a vicarious experience of ANWR? Can the piece be understood as a whole by those unfamiliar with ANWR?
I have never been to ANWR, but listening to *Earth and the Great Weather*, I am led to imagine a journey in which I experience a particular landscape and the people who inhabit it. The experience of the place is far more specific than that obtained through other place-based pieces such as Beethoven’s *Pastoral Symphony*, Ferde Grofé’s *Grand Canyon Suite*, or Messiaen’s *Des canyons aux étoiles*, even though the latter two represent experiences in particular places. Through both texts and recorded sounds, Adams saturates his work with specific references to ANWR, as well as to the Native American experience of it.

*Earth and the Great Weather* shares more features with two other American “journey” works: Harry Partch’s *U.S. Highball: A Musical Account of Slim’s Transcontinental Hobo Trip* and Steve Reich’s *Different Trains*. In both of these pieces a journey through a particular landscape (or two, in the case of *Different Trains*) is described through the use of vernacular speech. Like Partch, Adams departs from the use of twelve-tone equal temperament, creating his own gamut and featuring percussion heavily. Like Reich, Adams uses prerecorded sounds and musical technology to amplify the number of apparent voices in the texture. Both *Earth* and *Different Trains* also feature very slow changes to the harmonic texture and metric modulations. Adams, however, uses live speakers, and he neither loops the text nor uses the intonations of his speakers as an inspiration for the musical writing, as Reich does. There is also a “busi-ness” to these other pieces that is foreign to *Earth and the Great Weather*.

In Adams’s piece the natural sounds and spoken names create a geographical trajectory from the Arctic Coast to the Brooks Range and back. Along the way we perceive strong variations in the weather between storm and relative calm, as one might experience in a journey; perhaps this wild variation is what lies behind Uvavnuk’s choice of the phrase “the great

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58 And John Cage and Lou Harrison, two other models for Adams.
weather.” As listeners, however, we are not aware of motion from place to place, either within movements or between movements. In spite of the existence of speakers, there is also no consistent narrator taking us on this journey. What permeates the piece are texts that communicate a deep, communal relationship to a place and palindrome structures that continually return listeners to the places from which they began. The transient imagined journey inherent in the work’s structure is secondary to the depth of this manifested relationship.

At the beginning of “The Place Where You Go to Listen,” the voice of Uvavnuk tells us of her experience of the natural world. Each line of her poem is about how she is “moved,” “set adrift,” or “carried away” by the great sea, which I take to be the natural world, the eternal present, or perhaps a fusion of both. She uses the image of a weed flowing with a river to describe how she has yielded to a force greater than herself or humanity and found joy in it. The sparse musical underpinning of the poem allows her serene peace and respect for the awesome forces of the natural world to be fully conveyed.

As the Arctic Litanies proceed, the texts become those of a community rather than an individual. The names “Place where caribou can easily be caught” (mvt. I), “From around the bend, it is far away” (mvt. III), “The time of little food” (mvt. IV), “From the top of the world” (mvt. V), and “You can see a long way” (mvt. X) imply a community of human perceivers, hunters, and gatherers of the world around them, interactions of people and place. The names, like the music, are derived from extended processes. They give sense to the length of the music. They give sense to the use of the natural sounds, freeing them from any threat of servility in the music. Through names and sounds we get to know the places that have contributed to the

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59 Although I have not confirmed this, I would also venture to guess that the Iñupiaq and Gwich’in names for plants and birds that are translated as mundanely as “water sedge” and “tundra swan” are more rich in interactive meaning in the native languages.
community’s experience over time. In the last movement we are reminded once again of Uvavuk’s individual experience, but relative to the seventy-five minute length of the piece, her words are brief.

There is thus only a weak sense of motion and character throughout the piece. This absence of a narrating character opens the space for listeners to consider their own relationship to place. Of course not all listeners will be familiar with ANWR. When I asked Adams if one needed to know ANWR to appreciate Earth, he replied, “It's even better if you don't know the place – you can imagine your own landscape.”

Adams has challenged artists to “re-imagine” their relationships with the natural world, but in Earth and the Great Weather (and many subsequent pieces), he also allows listeners to form a relationship with a place through their imaginations. Although this relationship is indeed first experienced vicariously by imagining the relationship of Native Alaskans to ANWR, that direction of our imagination makes us question and deepen our relationship to the planet. At a deep level Earth and the Great Weather is about the role that the sonic environment plays in creating human relationships with any place, any land.

Given that speculations of oil supplies in the 1002 area have made ANWR the subject of intense political debate, and given that Adams has acted politically to protect the area, one might wonder if Earth and the Great Weather is a political piece. In fact, the name “Arctic National Wildlife Refuge” appears neither in the work’s title nor in any of the names that are spoken. A listener could easily experience Earth without knowing that it was inspired specifically by ANWR. Furthermore, Adams has never sought politically important venues for the performance of this piece. He writes clearly in Winter Music:

60 Adams, conversation with the author, May 24, 2010.
I believe the place we now call the Arctic National Wildlife Refuge is among the most sacred of places and that no amount of material wealth can justify violating or desecrating it. Still *Earth and the Great Weather* is not an intentionally political work. I composed it to celebrate a sacred place, and to invite the listener on an aural journey through its landscapes, both imaginary and real.\textsuperscript{61}

I do not doubt that Adams ultimately wants to play a role in changing actions on worldly affairs, but the internal transformation that he inspires through *Earth and the Great Weather* goes far beyond changing listeners’ perception of a single place in the world. *Earth and the Great Weather* inspires us to consider our relationship to land, to imagine a different relationship, and to find new ways of listening to the world around us.

CHAPTER 4. *IN THE WHITE SILENCE: A LANDSCAPE WITHOUT A PLACE*

Introduction

The 1990s, like the 1980s, saw Adams draw from multiple inspirations in his compositions. In works like *Five Athabascan Dances* for harp and percussion (1992-96), *Crow and Weasel* for chamber ensemble and storyteller (1993-94), and *Sauyatugvik* for two pianos and percussion (1996), he continued to combine the influence of Native American mythology and music with his predilection for drumming. At the same time, Adams was headed in a new direction, one that was set into motion by *Earth and the Great Weather*. In that work, Adams used algorithmic processes to make pitch determinations within a limited gamut. Individual movements were based on different algorithms and used different subsets of the gamut. Adams also employed multiple simultaneous tempi, gradual acceleration, and mosaic-type alternation of rhythmic patterns to create multi-dimensional rhythmic textures. Adams further structured the work by using symmetries and palindromes on multiple levels, the largest of which was representative of a round-trip physical journey through the Arctic National Wildlife Refuge.

By the time *Earth and the Great Weather* had its premiere in its expanded form, Adams was already using these new tools to create music with even less direct connection to the natural world. Rather than create an aural journey through a particular place, Adams wanted to create pieces that a listener, in some sense, could explore like a real landscape. His music was shifting from being a representation to being a metaphor. Like a landscape (or like parts of *Earth and the Great Weather*), the music tended to contain a relatively static surface with long-range processes underneath, and the ecological aspects were more hidden and subtle.
Many of the works contained a gamut restricted to the “white” notes of the piano (but played on a variety of instruments). *Dream in White on White* (1992), a seventeen-minute work in one movement for string orchestra, string quartet, and harp, was the first of these. In this piece the white key collection sounds in its entirety almost continually, thereby minimizing any sense of tonality and functional harmony throughout the piece. As in *Earth and the Great Weather*, Adams uses multiple tempi simultaneously, but the piece has no narrative or clear representation of naturally occurring entities. What provides *Dream in White on White* with variety and structure are strong changes in texture. Adams alternates between three textures to create a piece with a symmetrical ABCB\(^1\)A\(^1\) form.

A work with many similarities but also important differences is *Clouds of Forgetting, Clouds of Unknowing* (1996). This piece was inspired by a fourteenth-century Christian mystical text, *The Cloud of Unknowing*. Adams writes that the text teaches that we can achieve communion only through the Grace of divine Love. To prepare ourselves to receive this gift, we must enter a state of quiet stillness, suspended between heaven and earth. Above—between us and God—lies a “cloud of unknowing” that our understanding can never penetrate. Between ourselves and the world, we must create a “cloud of forgetting,” leaving conscious thought and desire below. In this timeless place of forgetting and unknowing, we may begin to hear that for which we are listening.\(^1\)

Adams (whose own religious beliefs seem more agnostic than Christian) also felt that “To find communion we must lose perspective. What, after all, is perspective but a way of removing ourselves from experience?”\(^2\) In order to create a work that removes a sense of perspective, therefore, Adams used the same musical material for the foreground as for the background. That material is a journey through all of the chromatic intervals of the octave, in order of increasing size. In nineteen sections, with names such as “minor seconds, rising,”

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2 Ibid.
“diminished bells,” and “clouds of sixths and sevenths,” Adams projects particular intervals through short melodic foreground fragments and simultaneous background chords. In this way, “figure becomes ground” and “ground becomes figure.”

Like *Dream in White on White*, *Clouds of Forgetting* also features multiple tempi. Various sections contain 2:3:4:5, 3:4:5:6, 4:5:6:7, and 5:6:7 tempo relationships. In addition, the sections feature a variety of textures in a palindromic ordering, as Kyle Gann has demonstrated. As in *Dream in White on White*, the music contains no references or representations. Adams’s goal was “to create—in essentially musical terms, with no external references—a wholeness of music, a sonic presence somehow equivalent to that of a vast landscape.”

From 1998 until 2000, Adams was on the faculty of the Oberlin Conservatory. While he was there, he expanded *Dream in White on White* from seventeen to seventy-five minutes and renamed the new work, *In the White Silence*. Using a restricted gamut, as in *Earth and the Great Weather* and *Dream in White on White*, and a process of linear intervallic expansion, which he had explored in *Clouds of Forgetting*, Adams created a work with new kind of ecological inspiration and connection.

The Music

*There are silences so deep you can hear the journeys of the soul, enormous footsteps downward in a freezing earth.*

- John Haines

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3 Ibid, 114.
White is not the absence of color. It is the fullness of light.
Silence is not the absence of sound. It is the presence of stillness.
As the Inuit have known for centuries, and as painters from Malevich to Ryman have shown us more recently, whiteness embraces many hues, textures and nuances.
As John Cage reminded us, silence does not literally exist. Still, in a world going deaf with human noise, silence endures as a deep and resonant metaphor.
In his Poetics of Music, Stravinsky speaks of music as a form of philosophical speculation. But music can also be a form of contemplation: the sensual reaching for the spiritual.
I aspire to music which is both rigorous in thought and sensuous in sound.
For many years now, I’ve been obsessed with the notion of music as place, and place as music. The treeless, windswept expanses of the Arctic are enduring creative touchstones for my work, and In the White Silence is an attempt to evoke an enveloping musical presence equivalent to that of a vast tundra landscape.
But I want to go beyond landscape painting with tones, beyond language, metaphor, and the extra-musical image. I want to leave the composition, the “piece” of music, for the wholeness of music.
I no longer want to be outside the music, listening to it as an object apart. I want to inhabit the music, to be fully present and listening in that immeasurable space which Malevich called ‘a desert of pure feeling.’
This work is dedicated, with love and gratitude, to the memory of my mother.

- Preface to In the White Silence (including the quote from Haines)\(^6\)

In the White Silence is scored for string orchestra, string quartet, harp, celesta, and two vibraphones. The string quartet is situated in a small arc upstage, while the string orchestra is in a wider arc downstage. The harp, celesta, and vibraphone are situated between the two string groups. Adams also instructs the string orchestra to play non-vibrato and the string quartet to play with vibrato, thus distinguishing the two groups timbrally as well as spatially.

The work consists of three distinct and recurring sections, each with a clearly defined rhythmic, timbral, and melodic texture. The first section occurs before and during Adams’s rehearsal letter A. The second section begins at letter B. The music at letter C is a slightly altered

version of the music at letter A. Another new section begins at letter D. Labeling these four types of section A, B, A¹, and C, we can show the structure of the piece as follows:⁷

ABA¹C
ABA¹C
ABA¹C
ABA¹C
ABA¹C
ABA¹

Here is the same structure, using Adams’s rehearsal letters:

<table>
<thead>
<tr>
<th>Structural letter</th>
<th>A</th>
<th>B</th>
<th>A¹</th>
<th>C</th>
<th>A</th>
<th>B</th>
<th>A¹</th>
<th>C</th>
<th>A</th>
<th>B</th>
<th>A¹</th>
<th>C</th>
<th>A</th>
<th>B</th>
<th>A¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehearsal letter</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
</tr>
</tbody>
</table>

**Sections A-D**

The A sections are characterized by sustained chords in the string orchestra, string quartet, and vibraphones and non-synchronized arpeggios in the celesta and harp. All the instruments play a single chord or arpeggio that is transposed throughout the section.

The piece begins with a chord in the string orchestra that contains the entire diatonic (white-key) collection (Figure 4.1). The vertical intervals between chord tones (measured in diatonic steps) make the symmetrical arrangement 9th-4th-6th-4th-6th-4th-9th. Both the outer ninths and the instructions to play the chord non-vibrato, pianissimo, and sul ponticello give the sonority a vast, timeless, and expressionless quality. Over the course of section A, the chord is

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⁷ Throughout this discussion, when referring to a section of music by its structural letter (A, B, A¹ or C), I put the letter in bold. References to section by rehearsal letter will be left in normal print. Thus, sections A, E, I, M, and Q are all A sections.
transposed up a diatonic step every 5 1/3 measures, until it has completed an octave ascent at m. 39.

At letter A (Figure 4.1), the string quartet and harp enter, and these two entities remain synchronized throughout the rest of section A. The string quartet, like the string orchestra, plays sustained chords containing the full diatonic gamut. The chords begin with the same bass note as the string orchestra (D) and also complete an octave ascent by diatonic steps over the course of the section. They differ from the string orchestra chords in that they are symmetrically arranged as a series of stacked fifths, although this also creates ninths between every two notes (e.g., D-A-E creates a major ninth between D and E). In addition, the chords are transposed every four measures rather than every 5 1/3 measures.

The harp gives us the first melodic—or at least foregrounded—figure of the piece. It is a series of eighth notes consisting entirely of melodic and harmonic ninths. That is, each line of the part moves by horizontal ninths, and since the left hand is in canon with the right hand at an eighth note, a string of vertical ninths is also created. Like the chord played by the string quartet, this figure makes a total of eight iterations over the course of the section, each one transposed up a diatonic step every four bars.

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8 Three of the chords in the middle of the section are stacked in alternating fourths and sixths.
Figure 4.1. Beginning of *In the White Silence*.

At letter A₁ (m. 39) the celesta and vibraphones enter. The celesta has another foregrounded figure: a white-key scale played in each hand, the two hands offset by one eighth
note. Like the harp figure, it creates seconds (ninth) horizontally and vertically. The entire figure is also transposed up the octave by diatonic steps over the course of the section. It is executed more quickly, however (quintuplet eighths), and reappears every 3 1/5 measures. Each vibraphone tremolos adjacent harmonic seconds (fourth clusters), and the two instruments are separated by a fifth. Together the vibraphones thus state the full gamut. The whole tremolo cluster is transposed at the same time as the celesta.

The opening A section reveals an important organizing feature of In the White Silence: the nested appearance of the same structural element on multiple organizational levels. The piece opens with the full white-key gamut in the string orchestra. It is the sonority of the moment, of the section, and of the piece. Within the A section, it is repeated in every string orchestra and string quartet chord, vibraphone tremolo, and harp and celesta arpeggio. Moreover, the interval of the second, which is featured prominently in the opening sonority, is projected throughout the section on multiple levels: vertically in the opening chord in the string orchestra, in the series of harmonic ninths in the foregrounded harp and celesta figures, and in the vibraphone accompaniment to the celesta; and horizontally in the linear motion of the harp and celesta within each arpeggio, as well as in the movement of one chord or arpeggio to the next in all the instruments. A common sonority and projected interval at all levels of the texture means that, as in Clouds of Forgetting, Clouds of Unknowing, the foregrounded instruments (here, the harp and celesta) are synchronized with background clouds (string quartet and vibraphones).

Similar to the multiple simultaneous projections of one interval, there are multiple implied simultaneous tempi as well. As mentioned, the orchestral chords, harp arpeggios/string quartet chords, and celesta scales/vibraphone tremolos change every 5 1/3, 4, and 3 1/5 measures, respectively. There is thus a 3:4:5 tempo relationship between these three parts. As a
result the parts form a sixteen-bar hyperrhythm, theoretically aligning vertically every sixteen bars.

In actuality, beginning at measure 44, the various instruments and instrument groups complete the eighth transposition of their individual figures and then drop out. The string orchestra finishes first and is followed sequentially by the harp, string quartet, celesta, and vibraphones. At letter B the texture changes completely (Figure 4.2). At m. 63 the score is marked “Like a hymn.” The string quartet, with the instruction “Singing” and playing with vibrato, begins a series of short melodic phrases that give the music new warmth.

The string quartet is divided into two groups that play nearly identical music with different implied meters. The cello and viola enter on the downbeat of m. 63 with a four-quarter note melodic fragment consisting of diatonic intervals 2-4-2. The cello begins on D (playing D-E-A-B), while the viola begins up a third on F (F-G-C-D). Adams stresses the melodic seconds by slurring them together. One beat later, the two violins, also separated by a third, play the same melodic fragment, but the final pitch is sustained for an extra beat, making a five-beat phrase. If one takes the phrases as rhythmic units, there is a 5:4 tempo relationship between the lower and upper instruments.

The melodic fragment changes after four bars. In m. 67 the viola and cello rotate their initial fragment, next playing E-A-B-D and G-C-D-F. The two violins follow, again beginning one beat later and extending the phrase by one beat. The first two and second two notes are again slurred, stressing an ascending fourth and third. This rotation through the initial figure continues until letter B1 (m. 79).
Like a hymn…
The string orchestra and vibraphones do not play in section B. The notes for harp and celesta in section B are the same as for the strings, but they are arranged at quicker implied
tempi. They thus form kinds of diminution canons with the strings. The harp enters in m. 66 with quintuplet quarter notes in each hand, and the celesta enters in m. 68 with sextuplet quarters (Figure 4.2). In the same way that the music for strings is divided between two groups, the harp and celesta parts for each hand are in canon, and the right hand extends the final note of each melodic fragment by a beat.

From letter B₁ (m. 79) until the end of the section, the music is more freely composed, although it follows several patterns as seen in Figure 4.3:

- The music is divided between “leader” parts (viola and cello, harp left hand, celesta left hand) and “follower” parts (two violins, harp right hand, celesta right hand).
- The leaders alternate between two rhythmic motifs: a) four quarter notes and b) four quarter notes followed by two eighths. In other words, the motifs are four or five beats. Moreover, the motif that consists of four quarter notes is always played four times, and the motif lasting five beats is always played five times.
- The followers continue to follow the leaders by one beat. They extend the final note of each phrase by one beat, thus making five- or six-beat phrases, and they play each phrase one fewer time.
- The slurred notes from letter B₁ until the end of the section consist solely of ascending seconds and thirds. These intervals thus stand out.

The length of the various phrases in the B section is thus related by the ratio 4:5:6. Similarly, the quarter notes in the strings, quintuplets in the harp, and sextuplets in the celesta make a tempo ratio of 4:5:6.
Although the B section contrasts with the A section in its textural warmth and melodic saturation, there are clear structural similarities between the two sections. Both stress small,
ascending intervals—in particular the second (the move to thirds and fourths in the B section points towards the future direction of the piece). Both sections also feature multiple instruments playing the same music at different implied tempi. In fact, just as the intervals that are highlighted expands from seconds to thirds and fourths in the B section, so does the implied tempo ratio expand from 3:4:5 to 4:5:6. The convergence of pitch and rhythm also takes on another aspect, now relating the number of times a phrase is repeated to the length of the phrase.

Because of their faster relative tempi, the celesta and harp, respectively, finish the B section before the string quartet. At letter C, the first A\textsuperscript{1} section begins (Figure 4.4). There are obvious similarities in texture to the opening music. In particular, the string orchestra and string quartet sustain long chords, while the harp and celesta play running passages. Beyond this general similarity, however, there are differences in details. The string orchestra chords are stacked symmetrically, but the intervals between notes are 9th-6th-5th-5th-5th-6th-9th. The harp and celesta play runs consisting of alternating seconds and thirds rather than all seconds, and the runs are fifteen notes in length rather than eight. Similarly, the chords in the string quartet and the tremolos in the vibraphones are stacked with the intervals 2nd-3rd-2nd-3rd-2nd-3rd-2nd.\footnote{The second chord in the section is a somewhat peculiar exception and an example of Adam using his prerogative to make subtle changes to his patterns according to his aesthetic judgment.} Because of this stacking arrangement, the sustaining chords in the string orchestra, string quartet, and vibraphones lack one note of the diatonic collection. All of the instrumental groups begin with A in the bass, and the interval of transposition between iterations of the chords and arpeggios is now a fourth—the equivalent of a second plus a third.
Figure 4.4. Letter C, *In the White Silence*. 
Unlike section A, the parts all start together at letter C but then diverge, moving at their different tempi. The string orchestra chords are stated every 8 1/3 measures, the string quartet and harp every 6 1/4 measures, and the celesta and vibraphone every five measures. This makes a hyperrhythm of twenty-five measures and a tempo relationship of 4:5:6 (string orchestra: harp and quartet: celesta and vibraphones).

The \textit{A}^1 section thus incorporates pitch and rhythmic developments introduced in the \textit{B} section. The intervals that are featured in both the foreground (harp and celesta) and background (strings) are expanded from seconds to seconds and thirds, and the tempo relationships feature the ratio of 4:5:6 rather than 3:4:5.

At the end of the \textit{A}^1 section, the instruments drop out one by one, the faster ones first and the string orchestra last. At letter D, the first \textit{C} section begins, as the celesta reenters with a new figure consisting of ascending and descending septuplets (Figure 4.5). Starting with an E, the diatonic intervals within the figure expand as the line ascends and contract as it descends, as follows: 2nd-3rd-4th-5th-6th-7th-2nd-2nd-7th-6th-5th-4th-3rd-2nd. Adams studiously avoids the octave at the top. Each figure lasts two bars, and the figure is played nine times.
Figure 4.5. Letter D, *In the White Silence*. 
At letter D₁ (m. 191) the figure continues, though the intervals change (Figure 4.6). It now starts with a third (E-G) rather than a second and expands from there. Adams repeats this pattern four times, until the intervals are again rotated at letter D₂. For most of the rest of the section, the figure changes after four repetitions. Each time it changes, the intervals rotate, so that the initial interval is steadily increased to a fourth, fifth, sixth, seventh, and finally an octave. The final pattern, beginning with an octave, is repeated eight times, creating symmetry with the opening.

Adams thus continues the compositional idea of rotating through intervals, seen already in the A, B, and A₁ sections in two ways. Within every statement of the figure, the notes follow a pattern of successively larger intervals. Additionally, over the course of the section, the intervals within the pattern rotate, so that the opening interval grows successively larger.

The string orchestra remains silent throughout section D. The other instruments, however, create a nested matrix with the celesta. Vibraphone I enters at m. 192 (Figure 4.6) with the same notes as the celesta’s first phrase, now played in sextuplet quarters. This phrase is played four times, before the vibraphone switches to the celesta’s second phrase at m. 201. The vibraphone continues to play a diminution canon with the celesta until m. 229. Vibraphone II, which enters in m. 200, and the harp, which enters in m. 208, also play diminution canons with the celesta, in quintuplet quarters and quarters, respectively. As in the B section, Adams thus has the same music played by different instruments at different implied tempi, here related by a 4:5:6:7 ratio.

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Were Adams to rotate the intervals exactly, the pattern would now be 3rd-4th-5th-6th-7th-2nd-3rd-3rd-2nd-7th-6th-5th-4th-3rd. Adams, however, switches the fifth and sixth on the descent, producing the sequence 3rd-4th-5th-6th-7th-2nd-3rd-3rd-2nd-7th-5th-6th-4th-3rd. Again Adams does not stick to the patterns dogmatically; in this case my sense is that the strict pattern produces more of a “C Major” sound than Adams wanted. He does, however, use the predicted pattern in the other instruments.
But there is more to section D than just the diminution canons. In fact, each instrument playing this ascending and descending figure in fixed rhythmic values is paired with an instrument playing the same figure in variable rhythmic values. For example, at m. 177 (Figure 4.5) the first violin of the string quartet—in a passage marked “solo”—enters with the same notes as the celesta but in expanding rhythmic values. Within a context of septuplet quarter notes, the first note is a quarter, the second a half, the third a dotted half, and so forth, until the last note of the figure’s ascent lasts a full measure. The figure’s descent then begins again with a quarter, a half, and so on. There is thus a linear rhythmic expansion coupled with the linear intervallic expansion.
Figure 4.6. Letter D₁, *In the White Silence*. 
At letter D₁ (m. 191) violin I expands the opening interval from E to G just like the celesta does.¹¹ Moreover, the violin part now begins one step further along the rhythmic expansion, beginning with a half note, continuing to a dotted half note, eventually reaching a seven-beat note, and then rotating back to a quarter note and beginning the expansion again. At letter D₂ (m. 199) the first interval in the celesta and violin I parts likewise expands to a fourth, and violin I begins with a dotted half note.

As section D progresses, violin II is paired with vibraphone I in the same way as violin I and the celesta; viola is paired with vibraphone II; and the cello is paired with the harp. There are therefore four layers in the texture. Within each layer there is an arpeggiating, percussive instrument with fixed rhythmic values paired with a “solo” bowed instrument with flexible rhythmic values.¹² The four layers are distinguished by the implied tempo of the fixed rhythm instruments.

The textural development of the entire section resembles a wave, like the A section. Here, however, the instruments are staggered so that the later the entrance, the slower the implied tempo, and the sooner the instrument leaves. The section begins and ends with the septuplet instruments (celesta and violin I), which cycle through seven rotations of the opening figure. Vibraphone I and violin II, playing sextuplets, enter later, cycle through four rotations, and end earlier. Vibraphone II and the viola cycle through two rotations, and the harp and cello cycle through only one rotation.

¹¹ On the descent, violin I plays the intervallic structure as it is “supposed” to be.
¹² It seems reasonable to call the harp a “percussive” instrument in this context, given the ictus made by its attack.
At the end of section D (the first C section), after all instruments except the celesta have dropped out, violin I reenters and plays the last “solo” line of the section, beginning with an octave and whole note. The section is thus framed by violin solos.

**Sections E-S**

In this discussion of the first A, B, A¹, and C sections of *In the White Silence*, some of the structural elements that have emerged are a linear intervallic expansion coupled with a rhythmic expansion, 3:4:5:6:7 tempo relationships, the pairing of foreground or “solo” instruments with background instruments featuring the same intervallic or pitch structure, and further nested structures throughout. We have seen none of the quotations or imitations present in *songbirdsongs* and *Earth and the Great Weather*. The A, B, A¹, and C sections cycle throughout the piece, changing in intervallic structure and some elements of rhythm, largely according to the algorithmic processes already set forth. In the discussion below I will follow each of the three types of section through the remainder of the piece. Most listeners would probably be able to hear the junctures between sections. The reader would be right to wonder, however, how much of the unfolding of these algorithms may be heard and what it all has to do with Adams’s ecological goals. I will address these questions in the last part of this chapter.

Table 4-1 is a schematic of the A and A¹ sections of *In the White Silence*. As mentioned already, the first A section (letter A) projected the interval of the second, and this was expanded to seconds and thirds in the harp and celesta at the first A¹ section (letter C). Let us look at the harp and celesta parts for the remainder of the A and A¹ sections. Both instruments continue to play arpeggios with one or two internal intervals. Moreover, as seen in Table 4-1 (“Harp/celesta melodic intervals”), these intervals continue to expand linearally: seconds (letter A), seconds and
thirds (letter C), thirds (letter E), thirds and fourths (letter G), fourths (letter I), fifths (letter K),
fifths and sixthths (letter M), sixthths (letter O), sixthths and sevenths (letter Q), sevenths (letter S),
and seconds again (letter $S_2$). Alternations of fourths and fifths are omitted, as they would only
produce octaves.

The intervals between harp and celesta arpeggios, however, do not expand in a linear way
from section to section (see Table 4-1, “Interval of transposition”). In the first $A_1$ section (letter C),
for example, the successive chords are not transposed by alternate seconds and thirds but
rather by fourths. One way to understand what Adams is doing is to view the gamut, as stated by
the harp and celesta, as a new chord in each section of the piece. The seven or eight
transpositions of the initial figure can be seen as “inversions” of this chord. In the $A$ section,
each successive transposition of the gamut is the next inversion of the chord. In the $A_1$ section,
however, each successive transposition is the second inversion of the first chord (i.e., it begins on
the third note of the first iteration). As shown in Table 4-1, this alternation of first and second
inversions continues throughout the piece, although after section I it is the $A_1$ sections that move
by one inversion at a time and the $A$ sections that move by two inversions.

Notice that the intervals of transposition in the last section (a seventh) and first section (a
second) are octave complements. Notice also that the harp/celesta figures begin section $A$ on a $D$
(mm. 23 and 39) and conclude section $S$ on a $D$ (mm. 1121 and 1126). The notes of the first
figure of section $A$ are $D$-$E$-$F$-$G$-$A$-$B$-$C$-$D$, while the notes of the last figure of section $S$ are the

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Farthest Place*, 167.
reverse, D-C-B-A-G-F-E-D. In fact, because the two sections move by octave complements and begin and end on the same pitches, section S is a pitch-class palindrome of section A.\cite{footnote14}

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<th>O</th>
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<td>F</td>
<td>D</td>
<td>B</td>
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Table 4-1. Rhythmic and intervallic structure of the A and A⁴ sections of In the White Silence.

\textsuperscript{14} The interval of transposition used at letter C is the complement of the interval used at letter Q, although the two sections do not begin and end on the same notes. The same goes for letters E and O, G and M, and I and K. The result of this pattern of transposition is a discernible process of transposition, though it does not create a complete palindrome.
Let us now look at the string parts for the remainder of the A and A₁ sections. The string orchestra and string quartet continue to play sustained, symmetrically constructed chords. Moreover, within each section the chords are consistently transposed by the same intervals as are the harp and celesta figures. The internal stacking of the chords is also related to the harp and celesta figures. For the first half of the piece—letters C, E, G, and I specifically—the vertical intervals within the string quartet continue to match the horizontal intervals played by the harp and celesta. Thus, at letter E, the string quartet chords are stacked in thirds, at letter G the internal intervals of the chords alternate between thirds and fourths, and at letter I the chords are stacked in fourths. In these sections, the string orchestra continues to be stacked symmetrically, with the one or two notes at both ends matching the notes in the string quartet. Inside the orchestral and quartet chords, however, the arrangement of notes is slightly different. This gives the full sonority a slightly richer sound, as an additional light source might illuminate a crystal more fully.

Section J is the midpoint of the piece, and many aspects of the composition rotate around this point. While the string quartet was stacked in the same intervals articulated in the harp and celesta arpeggios before letter J, in sections K, M, O and Q, it is the string orchestra that is the background match to the foreground figures. Likewise, in the second half of the piece, the string quartet is stacked in other symmetrical arrangements with tones in common with the orchestra at the outer ends of the chord. Sections A and S are symmetrically placed exceptions to this close foreground-background matching. Additionally, in the first half of the piece the chords and figures in the A sections contain the complete white-note collection, while the chords in the A₁ sections are missing a note or two. In the second half of the piece, the chords and figures in the A₁ sections are complete while those in the A sections are incomplete.
Finally, the implied tempo relationship of the parts is 3:4:5 throughout the \( A \) and \( A^1 \) sections, except in the symmetrically placed \( A^1 \) sections C and Q, where it is 4:5:6. In the latter two sections, where the time between each transposition is broadened, the harp and celesta figures consist of twice as many notes.

Let us now look at the remaining \( B \) sections. Certain key elements remain the same throughout. String quartet cello and viola are followed by string quartet violin I and II; harp left hand is followed by harp right hand; and celesta left hand is followed by celesta right hand. The “leader” parts introduce a short melodic phrase, which the “follower” parts extend. After several repetitions a new phrase is introduced, and the process repeats. In addition, there is a diminution canon between the three instrumental groups, with a tempo relationship of 4:5:6.

Table 4-2 shows the rhythmic and intervallic organization of the five \( B \) sections. Let us first examine the rhythmic structure. As mentioned earlier, section \( B \) begins with phrases of quarter notes (four beats) and then alternates between those kinds of phrases and phrases of four quarters and two eighths (five beats). Section \( R \) is structured as the opposite, beginning with alternating four- and five- beat phrases and then ending with four-beat phrases. Likewise, section \( F \) begins with phrases of four quarter notes and then alternates between phrases of three and four quarter notes, whereas section \( N \) follows the opposite pattern. Lastly, the phrases in section \( J \) are consistently three quarters and two eighths. Looking at the \( B \) sections as a whole, one can therefore see a symmetrical rhythmic structure of the five sections.

Additionally, throughout all of the \( B \) sections Adams continues to match the number of beats in each phrase with the number of times the phrase is repeated. Thus, for example, in sections \( F \) and \( N \), phrases with three beats are repeated three times each, and phrases with four beats are repeated four times.
The intervallic structure of the B sections is more teleological than the rhythmic structure. Table 4-2 shows that the melodic intervals within each phrase generally expand over the course of the B sections—a pattern that resonates with the A and A¹ sections that surround them. At letter B, the fragments contain seconds, thirds, and fourths, though seconds and thirds are particularly stressed through the use of slurs. These are the same intervals used for the harp and celesta arpeggios in the first A¹ section. The slurred intervals expand gradually from seconds and thirds (letter B), to thirds and fourths (letter F), thirds, fourths, and fifths (letter J), seconds, thirds, and fifths (letter N), and fifths, sixths, and sevenths (letter R). The pattern of expanding intervals is clear, even though note for note, the B sections are the most freely composed in the piece.

In the harmonic intervals between paired voices (e.g. cello and viola) there is also a general pattern of expanding intervals, although these intervals tend to be one step further in the expansion cycle than the melodic intervals. In section B, for example, the slurred melodic intervals are seconds and thirds, and the harmonic intervals between paired voices are thirds, fourths, and fifths. In section N the slurred melodic intervals are thirds and fourths, and the harmonic intervals are fourths, fifths, and sixths.
### SECTION B

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<td>4x</td>
<td>5x</td>
<td>4x</td>
<td>5x</td>
<td>4x</td>
<td>5x</td>
<td>4x</td>
<td>4x</td>
<td>4x</td>
<td>4x</td>
<td>4x</td>
<td>4x</td>
<td>4x</td>
<td>4x</td>
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</tr>
<tr>
<td>Melodic intervals</td>
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<td>64856</td>
<td>737</td>
<td>5567</td>
<td>737</td>
<td>64876</td>
<td>737</td>
<td>64876</td>
<td>737</td>
<td>64875</td>
<td>757</td>
<td>757</td>
<td>757</td>
<td>757</td>
<td>757</td>
</tr>
<tr>
<td>Harmonic interval</td>
<td>5</td>
<td>3/5</td>
<td>5</td>
<td>5/6</td>
<td>5</td>
<td>5</td>
<td>5/6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Starting pitch</td>
<td>D</td>
<td>C</td>
<td>E</td>
<td>D</td>
<td>F</td>
<td>E</td>
<td>G</td>
<td>F</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>A</td>
<td>G</td>
<td>F</td>
<td>E</td>
</tr>
</tbody>
</table>
Table 4-2. Rhythmic and intervallic structure of the B sections, In the White Silence. Each section is summarized in five rows, and each column represents a phrase. The first row shows the rhythmic structure of each melodic phrase of the “leader” parts (cello and viola, harp LH, celesta LH). The “follower” parts extend the last note of each phrase by a quarter note. The second row shows how many times the leaders repeat each phrase (the followers repeat it one time less). The third row shows the melodic intervals within each phrase of the lower leader and lower follower parts (e.g. cello or violin II; upper parts are similar). Bold indicates that the interval is slurred and thus stressed. The fourth row shows the harmonic interval between the two leader or the two follower parts (e.g. between viola and cello or between violin I and II). The last row indicates the starting pitch of the lower leader and lower follower parts.

There does not appear to be any single pattern of transposition throughout all the B sections. There are more localized patterns, however. In section J, which forms the middle of the piece, the starting pitches of each phrase form a palindrome that moves by descending and then ascending fifths: BEADGCFCCGDAEB. The pitch pattern in the first half of section F is reversed in the second half of section N. The first pitches in the latter half of section R descend a scale: DCBAGFE.

Finally, it is important to note that whereas sections B, F, and J feature only the string quartet, harp, and celesta, sections N and R feature the string orchestra and vibraphones/orchestral bells as well (Figure 4.7). In the first three B sections, the string quartet plays quarter notes, the harp quintuplet quarters, and the celesta sextuplet quarters, giving a 4:5:6 rhythmic relationship of the parts. At letters N and R the string quartet continues to play quarters, but the quintuplet quarters are played on the celesta and vibraphones/orchestral bells. The celesta has two voices in canon rather than four voices, and vibraphone I and orchestral bells (played by the vibraphone II player) cover the other two voices.

15 Perhaps Adams intended it as a bit of a joke that the order of flats and order of sharps lay at the center of this completely diatonic, “white note” piece.
Figure 4.7. Letter N₁, *In the White Silence*. 
The string orchestra and harp enter just before letter N\textsubscript{1} (m. 802) with triplet half notes and sextuplet quarters, respectively. From m. 802 to m. 829, the string orchestra plays a slower version of the music that the string quartet plays in mm. 805-825. In the sextuplets of the harp part, Adams fuses the two leader parts and the two follower parts into one line each. The lower part of each group (leaders/followers) is aligned with the string orchestra, and the upper part of each group is placed on alternate sextuplets. The music at letter R proceeds likewise. With these changes to the harp and string orchestra parts, the melodic texture is expanded and the rhythmic texture is enriched to include 3:4:5:6 tempo relationships.

Let us turn now to the remaining C sections. In addition to the fact that the string orchestra does not play in these sections, many features of the first C section (at letter D) remain the same through subsequent ones. First, the “percussive” instruments play a rising and falling figure with a constant note value. The notes of the phrase expand and contract intervallically. Second, for each percussive instrument playing in septuplet, sextuplet, quintuplet, and regular quarter notes, there is a string instrument that plays the same figure in expanding rhythmic values. Third, in each instrumental pair, the first melodic interval of a phrase cycles over the course of the section. The first rhythmic value of each phrase also cycles in the instruments with variable note values. Fourth, the instrumental pairs are staggered in entrance and exit, the septuplet pair always entering first and exiting last.
### SECTION D

**Starting pitch**: E  

#### Septuplets
- **Celesta**:  
  - 2nd  
  - 3rd  
  - 4th  
  - 5th  
  - 6th  
  - 7th  
  - 8ve  
- **SQ Violin I**:  
  - 2nd  
  - 3rd  
  - 4th  
  - 5th  
  - 6th  
  - 7th  
  - 8ve  
- **SOLO**:  
  - 2nd  
  - 3rd  
  - 4th  
  - 5th  

#### Sextuplets
- **Vibraphone I**:  
- **SQ Violin II**:  
  - 2nd  
  - 3rd  
  - 4th  
  - 5th  

#### Quintuplets
- **Vibraphone II**:  
- **SQ Viola**:  
  - 2nd  
  - 3rd  

#### Quarters
- **Harp (Canon)**:  
- **SQ Cello**:  
  - 2nd

### SECTION H

**Starting pitch**: F  

#### Septuplets
- **Celesta**:  
- **SQ Violin II**:  
  - 3rd  
  - 4th  
  - 5th  
  - 6th  
  - 7th  
  - 8ve  
- **4th**  
- **5th**  
- **6th**  
- **7th**  
- **8ve**

#### Sextuplets
- **Vibraphone I**:  
- **SQ Viola**:  
  - 3rd  
  - 4th  
  - 5th  
  - 6th  
  - 7th  
  - 8ve  
- **4th**  
- **5th**  
- **6th**  
- **7th**  
- **8ve**

#### Quintuplets
- **Harp (Canon)**:  
- **SQ Cello**:  
  - 3rd  
  - 4th  
  - 5th  
  - 6th  
  - 7th  
  - 8ve
<table>
<thead>
<tr>
<th>Section L</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Starting pitch</strong></td>
<td>D</td>
</tr>
<tr>
<td><strong>Septuplets</strong></td>
<td></td>
</tr>
<tr>
<td>Vibraphone I</td>
<td>† † † † † † † † † †</td>
</tr>
<tr>
<td>Viola</td>
<td>5th 6th 7th 8ve 6th 7th 8ve 7th 8ve</td>
</tr>
<tr>
<td><strong>Sextuplets</strong></td>
<td></td>
</tr>
<tr>
<td>Harp (Canon)</td>
<td>† † † † † † †</td>
</tr>
<tr>
<td>SQ Cello</td>
<td>5th 6th 7th 8ve 6th 7th 8ve</td>
</tr>
<tr>
<td><strong>Quintuplets</strong></td>
<td></td>
</tr>
<tr>
<td>Celesta (Canon)</td>
<td>† † † † †</td>
</tr>
<tr>
<td>SQ Violin I</td>
<td>5th 6th 7th 8ve</td>
</tr>
<tr>
<td><strong>Quarters</strong></td>
<td></td>
</tr>
<tr>
<td>Vibraphone II (Canon)</td>
<td>† † †</td>
</tr>
<tr>
<td>SQ Violin II</td>
<td>5th 6th 7th</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section P</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Starting pitch</strong></td>
<td>E</td>
</tr>
<tr>
<td><strong>Septuplets</strong></td>
<td></td>
</tr>
<tr>
<td>Harp (Canon)</td>
<td>† † † † † † † † † † Celesta †</td>
</tr>
<tr>
<td>SQ Cello</td>
<td>8ve 2nd 3rd 4th 5th 6th 7th 8ve 2nd</td>
</tr>
<tr>
<td>SQ Violin I</td>
<td>SOLO SOLO</td>
</tr>
<tr>
<td><strong>Sextuplets</strong></td>
<td></td>
</tr>
<tr>
<td>Celesta (Canon)</td>
<td>† † † † †</td>
</tr>
<tr>
<td>SQ Violin I</td>
<td>2nd 3rd 4th 5th 6th</td>
</tr>
<tr>
<td><strong>Quintuplets</strong></td>
<td></td>
</tr>
</tbody>
</table>
Table 4-3. Rhythmic and intervallic structure of the C sections, *In the White Silence*. Under each rehearsal letter, instruments are grouped in pairs by their underlying pulse. The instrument with a constant note value is listed first; the instrument with a variable note value is underneath. Each column with notes represents a given melodic phrase, which is generally played four times on the instrument with the constant note values and once on the instrument with the variable note values. To the right of each instrument with variable note values are the starting values for each melodic phrase. Underneath those notes are the first melodic intervals within each phrase.

<table>
<thead>
<tr>
<th>Instrument Pair</th>
<th>Rhythmic Values</th>
<th>Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibraphone I (Canon)</td>
<td>⬤ ⬤ ⬤ ⬤</td>
<td>2nd 3rd 4th 5th</td>
</tr>
<tr>
<td>SQ Violin II</td>
<td>⬤ ⬤ ⬤ ⬤</td>
<td>2nd 3rd 4th</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibraphone II (Canon)</td>
<td>⬤ ⬤ ⬤ ⬤</td>
<td>2nd 3rd 4th</td>
</tr>
<tr>
<td>SQ Viola</td>
<td>⬤ ⬤ ⬤ ⬤</td>
<td>2nd 3rd 4th</td>
</tr>
</tbody>
</table>

Each of these features is developed over the course of the piece, as can be seen in Table 4-3. First, the instrumental pairs rotate. For example, septuplets are played by celesta and violin I at letter D, celesta and violin II at letter H, vibraphone I and viola at letter L, and harp and cello at letter P. This rotation of instrumentation creates variety in sound but is only structural in that it complements the other, simultaneous rotations. Second, when the instruments attached to a given rhythmic value enter in each successive C section, they are farther along the intervallic/rhythmic rotation than in the previous C section. For example, at letter D the septuplet pair—celesta and violin I—enters with a figure that starts with an upward second, and the first rhythmic value of the violin I part is a septuplet quarter. At letter H the septuplet pair—celesta and violin II—enters with a figure that starts with an upward third, and the first rhythmic value of the violin II part is a septuplet half. At letter L vibraphone I and viola begin with a fifth and a septuplet whole (four-beat) note, and at P the harp and cello begin with an octave and a whole (seven-beat) note. The same pattern goes for the sextuplet, quintuplet, and quarter pairs.
Third, the first ascending figure played by the celesta at letter D (m. 173) is projected onto a long-range structural level. Over the course of the C sections, the initial pitch of the septuplet phrase (E) is transposed at various points so that it traces out the first figure, E-F-A-D-A-F-E.

Another notable development is in the number of voices and canons in each section. The music at letter D starts with the celesta and gradually adds one instrument at a time up to eight instruments. The harp, assigned to quarter notes, plays two lines in canon, a quarter note apart, making nine voices in the section. At letter H, the harp and vibraphone II, assigned to quintuplets and quarter notes, respectively, both play canons, giving the section a total of ten voices at its peak. At letter L, the harp, celesta, and vibraphone II, assigned to sextuplets, quintuplets, and quarters, play canons, giving the section a total of eleven voices. At letter P, the harp, celesta, vibraphone I, and vibraphone II, assigned to septuplets, sextuplets, quintuplets, and quarters, play canons, creating a total of twelve voices.

Just as the first C section (at letter D) began and ended with a violin solo over accompanying celesta, so does the last C section (at letter P) begin and end with a solo. In section P the cello plays the first solo, and the violin plays the last. In section D the first solo begins on a septuplet quarter note and the final solo begins on a septuplet whole (seven-beat) note, whereas this order is reversed in section P. In fact, the final solo is the original phrase of section D. This final phrase completes cycles of many aspects of the music: the starting pitch of the melodic phrase returns to E, the first interval of the phrase returns to a second, and the first rhythmic value in the variable-rhythm instrument returns to a quarter.
Structural Themes

Earlier in this dissertation we saw how the structural element holding *songbird songs* together is the representation of birdsongs. Moreover, in the arrangement of the songs in the score, there seems to be a narrative of the passage of a day from morning to night and of Adams’s journey from the American Southeast to Alaska. *Earth and the Great Weather* is structured as an aural representation of the journey of the woman at Naalagiagvik from the Arctic Coast to the Brooks Range and back to the Arctic Coast. In *In the White Silence*, narrative and imitation of the natural world play little or no structural role.

On the surface the piece seems to alternate between three distinct kinds of sections, each with a unique texture. Todd Tarantino has called this a “mosaic” form. In the A/A$^1$ sections, the strings and vibraphones provide a sustained and very slowly changing background, over which the celesta and harp play ascending arpeggios. The B sections, marked “Singing” and “Like a hymn,” are characterized by the warm presence of the string quartet (playing with vibrato) and more lyrical lines. The C sections contain interweaving ascending and descending arpeggios in all instruments. We saw this alternation of textures in a different form in the percussion quartets of *Earth and the Great Weather*.

At the same time that the music cycles through these three types of sections, it also rotates around a center. Letter J is the center, or “axis” of the piece in numerous ways. It comes at the midpoint of the expansion of intervals from seconds to sevenths. Before this point the horizontal figures in the harp and celesta in the A sections are generally matched vertically by the string quartet; after this point, the figures are matched by the string orchestra (Table 4-1).

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17 These sections are marked as “chorales” in *Dream in White on White*. 
Letter J is the third of the five B sections. The rhythm of the five B sections is symmetrical around it, as are certain pitch elements (Table 4-2). Finally, the opening and closing sonorities of the piece—which are the same—are nearly equidistant from J. Todd Tarantino gives the following diagram to demonstrate the symmetrical form of the piece around this section:  

ABA | C | ABA | C | ABA | C | ABA | C | ABA

While the mosaic and axial components of the form of *In the White Silence* are unmistakable and are defined by the different textures of the three sectional types, under the surface one finds that the three sectional types are actually strikingly similar to one another. In fact, *In the White Silence* is one of the first pieces that displays what Adams’s teacher James Tenney called “ergodic form,” defined as follows:

Any moment of the music is statistically equivalent to any other moment. Ergodic form is self-similar at all levels, from macrostructure to micro-topology. An entire piece of music is conceived, composed, and experienced as a single complex, evolving sonority.

The sonority in *In the White Silence* is the diatonic collection. It saturates the sonic environment at all times. In the A/A¹ sections, the collection is heard complete or nearly complete in every orchestral chord and solo arpeggio. In the B sections, the diatonic collection is heard complete or nearly complete in each instrumental group or part (i.e., viola and cello or harp left hand) in every phrase. In the C sections, the collection is not heard in every arpeggio, but as the different arpeggios are overlapped, it is almost continually sounded. The sonority is also “evolving” in the sense of being continually reordered. A linear (diatonic) intervallic expansion from seconds to sevenths unfolds throughout all the sections of the piece.

Moreover, the self-similarity of the music goes beyond the gamut and the linear intervallic expansion. First, there is self-similarity of background and foreground, local structure

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and long-range structure. In the A sections, the ear separates the chords and arpeggios into background and foreground, but they each contain the complete or near-complete collection. In addition, the chords and arpeggios are both ordered to emphasize particular intervals, and both the chords and the arpeggios are transposed by a constant interval. Thus, the background and foreground instruments are self-similar in the sum of the notes that they play at any moment and in the order in which they play them.

In the C sections, each of the four tempo layers of the texture contain both background and “solo” lines that play the same series of pitches but in different rhythms. Additionally, the ascending line of the first melodic phrase, consisting of the pitches E-F-A-D-A-F-E, is gradually projected onto the starting pitch of the subsequent phrases within the C sections. Moreover, the initial ascending and descending phrase played by the celesta at letter D contains a linear intervallic expansion from a second to a seventh and back to a second that exists at multiple structural levels: between phrases within the section, as the subsequent phrases start on a third, a fourth, and so forth; between C sections, as the septuplet instruments start further along the intervallic continuum in each section (e.g., in section H they start with a third, in section L they begin with a fifth, and so forth); and in all the A, B, and C sections throughout the piece. In fact, the initial phrase played the celesta and violin I at letter D is in many ways a microcosm of the whole piece.

A second way in which the multiple sections of the piece are self-similar is that the texture of nearly all the A, B, and C sections form a wave. That is, all but the A\textsuperscript{1} sections open with one instrument or small group of instruments. Other instruments gradually join in. The section ends when the instruments that entered in the middle exit, leaving the initial instruments and texture to complete the section.
A third aspect of the music’s self-similarity is the use of tempo canons. That is, in each section essentially the same music is stated simultaneously in multiple tempi in the different parts or instrumental groups. The use of multiple simultaneous tempi was prevalent in Earth and the Great Weather, and the percussion quartets in that piece contained tempo canons based on the Fibonacci series or sums of \(2 + 3\). In In the White Silence, however, there is an integration of pitch and rhythm based on whole number relationships. Since his days as a student at Cal Arts, when he discovered Henry Cowell’s New Musical Resources, Adams has been inspired by the idea of a “unified field theory” of music – “the integration of pitch and rhythm through the whole-number relationships of the harmonic series.”

We have seen this integration on multiple levels:

- The piece develops through intervallic expansions from seconds to sevenths in simultaneous tempi related by the ratios \(3:4:5:6:7\).
- The initial B sections (letters B, F, and J) contain relative tempi in a \(4:5:6\) ratio, but as the intervals expand through the piece, the relative tempi also expand in number to \(3:4:5:6\) (letters N, R).
- In the C sections, the solo (variable-rhythm) instrument in each pair moves along a rhythmic expansion spectrum as the intervals of each melodic phrase also expand.

Table 4-4 shows the relative tempi in each section of the piece. The table does not reveal a clear trajectory; instead, each kind of section contains its own tempo organization. In the A/A\(^1\) sections, the relative tempi are symmetrical around a center axis; that is, the relative tempi have a \(3:4:5\) relationship except for the second and penultimate sections, where the relationship is \(4:5:6\).

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In the B sections, the relative tempo relationship follows a trajectory of increasing complexity from 4:5:6 to 3:4:5:6. And in the C sections, one finds a static tempo relationship of 4:5:6:7.

| Section | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S |
| Relative Tempi | 345 | 456 | 456 | 4567 | 345 | 456 | 345 | 4567 | 345 | 456 | 345 | 4567 | 345 | 3456 | 345 | 4567 | 456 | 3456 | 345 |

Table 4–4. Relative tempi, *In the White Silence*. White blocks indicate A sections, lightly shaded blocks indicate B sections, and darkly shaded blocks indicate C sections.

**Listening to *In the White Silence***

Let us now return to the question of whether *In the White Silence* might help us to “re-imagine and re-create our relationships with this planet and all those (human and other-than-human) with whom we share it.” According to the framework given by Nattiez and Molino, much of the discussion up to now has been focused at the immanent level of meaning—what happens in the sound and the score. At the poietic level, there is less obvious evidence of the natural world in the compositional process than there was in *songbird* and *Earth and the Great Weather*. Adams did not notate or record natural sounds. Nor did he seek to represent natural sounds or places.

In the preface to the score Adams tells us that the stillness of Arctic landscapes was one inspiration for *In the White Silence*, and the relationship of that stillness to the silence of death lead him to dedicate the work to his recently deceased mother. In his book, *The Tuning of the World*, Murray Schafer has written that there is a “keynote” in all places, which is like the “tonic” or “ground” against which all other sounds are heard. At the coast it is the sound of waves crashing. To Adams, the keynote of the Arctic interior is silence. “Snow mutes the land.

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And the wind is calm more often than not. With human and animal life spread sparsely over sprawling distances, sound is the exception. The richness of hues of an Arctic whiteness was another source of inspiration. In the preface to the score of *Dream in White on White*, Adams refers specifically to Konstantin Malevich’s painting *Suprematist Composition: White on White* (1918), and in an interview with Molly Sheridan he calls *In the White Silence* “a series of Robert Ryman white paintings, a mural of multiple panels.”

Adams works these inspirations into the score in metaphorical ways. There are vast expanses of white, as a result of rests and sustained whole and half notes, particularly in the A/A¹ sections. In addition, Adams’s gamut for this piece is the diatonic collection, or the “white” keys on the piano. These aspects of the score might affect the performer and thus, indirectly, the listener.

At the esthetic level of meaning, our analysis can go in several directions. By giving the piece a colorful title like “In the White Silence,” Adams gives listeners some reason to hear the piece as a representation of something in the physical world. Adams’s listener, primed by the title, engages in semantic-comparative listening, contemplating a white Arctic landscape—or the landscape of death—and looking for similarities between the music’s sonic qualities and the landscape’s visual characteristics.

Two similarities seem relevant. First, the lack of vibrato in the string orchestra is associated with a “whiteness” of sound. That is, “white” is what Joseph Williams or Peter Kivy would call a “synaesthetic adjective,” initially a metaphor when applied to music but now owning its own musical definition: “lacking any emotional coloration (such as may be imparted

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Thus to a semantic-comparative listener, the lack of vibrato, as well as the \textit{pianissimo} volume and wide vertical and horizontal separations of much of the A/A$^1$ sections, could seem representative of an Arctic landscape. Second, in an Arctic (or any other) landscape, there are multiple processes evolving at different rates, such as the path of the sun and moon, the falling of snow, or the movement of birds in the sky. Listeners might find an analogy with the instruments and processes moving at multiple simultaneous tempi within Adams’s piece.

Although I find listening to \textit{In the White Silence} as a representation of the physical world to be a legitimate means of creating meaning, the title of the piece presents two challenges to this approach. First, it is not clear how music could represent silence. Second, the piece is called “In the White Silence,” not “The White Silence.” This implies that Adams seeks a representation of the \textit{experience} of being in an Arctic landscape more so than the landscape itself. If so, one would expect to find emotional expression and to be compensated for emotional listening.

In fact Adams writes in the preface that he is not so much describing a white landscape as presenting a musical entity that the listener can explore as one would explore a white landscape. In other words, he seeks a kind of exploration, a kind of presence in the listening process. Though the title can certainly serve as a source of contemplation, it is in the listener’s experience of the music itself that Adams wants to create an ecological experience.

Let us consider both approaches to listening by asking which aspects of the music discussed earlier in this chapter the listener actually perceives. Starting with the largest details of the piece, the distinctions between sections of \textit{In the White Silence} are probably discernible for most listeners. At each juncture, the texture thins out, a new idea begins, and the texture thickens again. The alternation of sections is repeated so many times that a listener can also probably

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26 \textit{Oxford English Dictionary}. See chapter 1 for more on synaesthetic adjectives.
appreciate the cyclical, or “mosaic” aspect of the structure. Three features of the musical texture delineate the sections strongly from one another: the relative independence of the voices, the presence of vibrato, and the direction of the lines.

The A sections begin with the string orchestra playing long sustained chords. All four string parts change chords together and by the same interval. There is no independence of the voices. The orchestra, playing *sul ponticello* and non-vibrato, lacks any sense of melody or drama. The texture is indeed like a white landscape, “cold” and still. The upward motion in the chords is barely noticed until the harp and celesta enter. Each of these projects a solo voice, independent of one another and the orchestra, despite the similarity of the materials between all the parts. The harp and celesta are like voices in the wilderness, trying to find their way as they climb ever upward. There is something very lonely about these sections in the way that the three independent parts never meet; the foreground, though originating from the same material as the background, never manages to re-unite with it.

The change when the B sections begin is striking. The orchestra drops out, and the sound of the string quartet playing short melodic phrases gives the listener relief. The vibrato and the independence of the parts make these string voices seem more sympathetic and human, as if parts of a small choir. The harp and celesta, though still independent in tempo, are now two of the voices of the choir, and the mass could almost be said to “make a joyful noise.”

The A\(^1\) sections are busier than the A sections, since all the parts start together. After they dissipate one by one, the C sections begin with the timbre of the solo percussive instruments. When the warm solo string sound returns to join them, the counterpoint becomes thicker and denser than in the other sections. The strings are less synchronized with each other, and all the

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\(^{27}\) Psalm 100 of the King James Bible includes the phrase: “Make a joyful noise unto the Lord, all ye Lands.”
parts both ascend and descend. Whereas the lines of the A and B sections, always ascending and hopeful, seem to ask questions, the up and down lines of the C section bring some sense of confusion and dissipation. Comparing his music to the “perpetually moving stasis and perpetually frozen motion” of a Pollock painting, Adams refers to the “allover texture of frozen counterpoint” in these sections.  

Thus, unlike Earth and the Great Weather, In the White Silence gives considerable room for emotional listening. In it Adams creates the journey of the soul described by John Haines (in Adams’s preface) rather than the physical journey of Earth and the Great Weather.

If I listen more analytically, I can hear other musical processes as well: the transposition of the arpeggios and chords within an A/A¹ section; the cycling back to the initial sonorities and arpeggios of each A/A¹ section; the cycling back to the opening sonority and arpeggio at the end of the piece; the continuity of interval use between A and B sections; the pairing of fixed and variable rhythm instruments in the C sections; and the recurrence of solo lines at the beginning and end of the D and P (C) sections. Many other processes, however, are too far apart or too buried in the texture to be discerned. For example, the expansion of the first interval of the arpeggios over the course of a C section is quite buried in the texture. The expansion of the same interval from one C section to another is too far apart to be perceived by most listeners. The symmetry of the rhythmic organization of the B sections is also probably spread over too great an expanse to be perceived.

In fact, although I have filled up considerable space describing the processes that unfold in the piece, on first listening, In the White Silence may come across as both repetitious and static. Adams uses the diatonic collection without the functional harmony and traditional voice

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leading that can give forward motion to tonal music. Nor is there a narrative in representations and associations that can lead the listener through the piece, as there was in *songbirdsongs* and *Earth and the Great Weather*. One would be hard-pressed to even find major musical events, events one might call “exciting.” The music is, like an Arctic landscape, “a slowly shifting singularity enlivened by surface disturbances.” It is shaped by the linear progression through the diatonic intervals of the octave, but this progression occurs over very long time spans and is often buried in a thick texture. At times one is left with few aural landmarks other than the sectional changes. When what Adams describes in his preface as “rigorous” is hidden, one must submit to the “sensuousness” of the sound itself.

Kyle Gann has written about the experience of listening to Adams’s big orchestral works of the period, *Dream in White on White*, *Clouds of Forgetting*, *Clouds of Unknowing*, *In the White Silence*, and *For Lou Harrison* (2003-4):

> At a given moment an Adams piece presents us with an image of eternity: an unchanging sonority, or a complex of repeating ostinatos. Changes of texture and sonority come, but we cannot hear them coming nor predict their arrival. The pattern of changes makes logical sense to one who analyzes the score, and thus views the music, as it were, from a great enough height to encompass the entire form; but the listener, close to the music’s surface, can only surrender to the sensuousness of the moment, reconstructing large-scale recurring patterns in memory if at all… “Rigorous in thought” and “sensuous in sound”—but not on the same scale, nor in the same way. The rigor and sensuousness are separated out, and reuniting them in the imagination becomes the mystery, the challenge of the music.

Since *In the White Silence* is constructed with long-range processes, one might ask how listening to it compares to listening to other process music. In Steve Reich’s music—*Piano*

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29 Tarantino, “Color Field Music,” 157. Tarantino considers *In the White Silence* to be one of the first of Adams’s “color field” works, which he describes with this phrase. I would add that the “white” pieces are a subset of Adams’s color field works.

30 It is not a coincidence that Adams uses the word “sensuous” to describe the music of his mentors Harold Budd, James Tenney, and Morton Feldman, as well as his own. He also often writes of the “rigor” of Cowell’s theories about the unification of pitch and rhythm.

Phase or *Music for Eighteen Musicians*, for example—an uninformed listener may not be able to articulate the underlying process, but the changes are definitely perceptible. *In the White Silence* is different; given that multiple processes are layered on top of each other at multiple implied tempi, one may not perceive the changes. One can perceive the large shifts, but the smaller ones seem to blend into a mellifluous muddle.

When I listen to *In the White Silence*, I find that at the beginning, as with any other piece of music, I seek melodies, patterns, and meaning in the textural and rhythmic shifts. But this changes over the course of the piece. By the time I have heard the sections cycle twice—say around section J—the repetitiveness and the length of the piece encourage me to stop seeking a semantic or emotional message and just try to follow the changes in sound.

Adams’s comparison to Ryman’s work is interesting. Ryman, who has created numerous works consisting of different kinds of white paint on all kinds of surfaces, has said, “I never thought of white as being a color. White could do things that other colors could not do. White has a tendency to make things visible. You can see more of the nuance.” In other words, white is the tool that draws viewers into seeing nuance of texture for Ryman, as James Turrell’s work allows viewers to see light anew and Mark Rothko’s work gives them an experience of color. All artists shape their medium in some way, but the result of some artists’ work is a viewer’s enhanced perception of the medium itself. When listeners stop looking for a message in the music, Adams’s algorithms can pull them into nothing more nor less than an enhanced musical perception, an awareness of sound.

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In the same essay about *Clouds of Forgetting* that I quoted at the beginning of the chapter, Adams writes:

John Cage once inquired of a musician trained in the classical traditions of India: “What is the purpose of music?” Her reply made a profound impression on the composer: “The purpose of music is to quiet the mind, thus rendering it susceptible to divine influences.” Of course, music can have many purposes. But in order to quiet the mind we must give up our attachment to that which is “interesting,” that which diverts and engages our intellect. We must let crumble the walls of boredom that we build between our awareness and the fullness of each moment.\(^\text{33}\)

In the previous chapter I wrote about the superficial experience of a landscape and, in Adams’s words, “the authentic personal experience of fully being in a place.”\(^\text{34}\) If one looks at a white Arctic landscape superficially, seeking something “interesting,” one may not find it. One may think that nothing is happening. If, however, one stays long enough, one can find that there is always something happening, and there are always different shades of white.

Both *Earth and the Great Weather* and *In the White Silence* are about seventy-five minutes long. In addition, both use long-range processes that create nonfunctional and nondirectional harmonies from moment-to-moment. *In the White Silence*, however, lacks the text, drama, and natural references present in *Earth and the Great Weather*. There is much less for the listener to hold on to. Listeners thus have a choice. If they seek drama that is not in the music, the music will be an uninteresting, if not irritating, experience. Adams helps listeners to choose another path, one that allows for an experience of the piece from the inside out. He presents us with a beautiful sonority—the diatonic collection—and continually turns it around, as if rotating a diamond for the pleasure of the eyes.

Adams writes that “the experience of listening is more like sitting in the same place as the wind and weather, the light and shadows slowly change. The longer we stay in one place, the


more we notice change. In the White Silence does not bring our attention directly to the beings and ecosystems with which we share the planet. What the piece can do is allow—perhaps teach—the listener to have an experience of music that is rich in a way that a deep, prolonged experience of a landscape is. If it does that, it has done a lot. We need a deeper way of experiencing the world.

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CHAPTER 5. STRANGE AND SACRED NOISE: MUSIC AS SONIC GEOMETRY

Introduction

In Winter Music, Adams writes about an experience he had in 1989:

During a period of personal crisis, I camped alone in early spring on the banks of the Yukon River, listening to the sounds of the great river breaking free from the frozen stillness of winter. The glassy tones of candle ice swirling in a whirlpool, the intricate arpeggios of melt water dripping, and the ominous rumbling and grinding of icebergs struck resonances deep within me. Immersed in these sounds and in the arresting presence of that elemental violence, my personal concerns began to seem small and inconsequential. . . Standing on the bank of a great river at breakup or near a tidewater glacier as a massive wall of ice explodes into the sea, we are confronted with the overwhelming violence of nature—a violence at once terrifying and comforting, transpersonal and purifying. ¹

The experience stirred Adams’s curiosity in the forces behind such events. As he read about chaos theory and the science of complexity, he found himself studying waves and fractals—ininitely self-similar geometric patterns that appear throughout nature in the form of snowflakes, coastlines, mountains, rivers with tributary networks, lightning, Ammonite sutures, ferns, Romanesco broccoli, and more. ² Adams the composer started to ask how these patterns themselves might sound in another context, irrespective of the ice.

In 1991 Adams got the chance to explore that question. He received a commission from Percussion Group Cincinnati, a percussion trio that had arranged the quartets from Earth and the

Great Weather for three players. Although they pushed Adams for a trio, he insisted on a quartet. Whereas his earlier percussion quartets—from Coyote Builds North America and Earth and the Great Weather—had been part of larger pieces that told a story, Adams now wanted to write a piece without a narrative. He turned to the experience on the Yukon River for inspiration. In contrast to the color field pieces that he started to write in the 1990s (Dream in White on White and In the White Silence, for example), which tended towards pan-diatonicism, subdued character, and quiet dynamics, he chose to write a piece that was largely unpitched and which oscillated from barely audible to near-deafening.

Strange and Sacred Noise premiered in 1998, the same year as In the White Silence. Adams came up with the title for the work after reading a passage from Jacques Attali. He quotes that passage in his preface to the score of Strange and Sacred Noise:\(^3\)

> Nothing essential happens in the absence of noise. . .
> in most cultures, the theme of noise lies at the origin of the religious idea. . .
> Music, then, constitutes communication with this primordial, threatening noise – prayer.
> - Jacques Attali

Noise – complex, aperiodic sound – touches and moves us in profound and mysterious ways. Strange and Sacred Noise is a celebration of noise as a metaphor for turbulent phenomena in the world around us, and a gateway to ecstatic experience.

Grounded in the elemental violence of nature and the self-similar forms of linear fractals, this music is a convergence of sonic geography and sonic geometry. Each piece in the cycle is conceived as its own distinct and separate sound world, evoking the immediacy and presence of a place.

These soundscapes are inspired by and dedicated to composers who have explored strange new worlds of sound.

- John Luther Adams\(^4\)

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\(^3\) David Herr thinks the title was also inspired by Murray Schafer’s Our Sonic Environment and the Soundscape: The Tuning of the World, where Schafer refers to the “sacred noise” of churchbells in otherwise quiet villages. David Herr, “Process in the Music of John Luther Adams: A Study of Strange and Sacred Noise,” Hampshire College (senior thesis, 2010), 4.
Unlike the other prefaces that we have examined, there is no reference here to any particular place or shared inhabitants of the Earth. Rather than representing particular places or beings, Adams says he is exploring some of the unseen, unheard natural forces around us. As in *In the White Silence*, “place” becomes a sound world that the listener can explore—a sound world inspired now by powerful natural forces and by composers who had been influential in Adams’s development.

The piece is in six movements. As can be seen in Table 5-1, Movements I, IV, V, and VI are based on fractals. Movements II and III are based on the movements of waves. In the discussion below, we will examine the relationship between the music and the physical forces and patterns, or how Adams creates this “convergence of sonic geography and sonic geometry.”

<table>
<thead>
<tr>
<th>MOVEMENT</th>
<th>I...dust into dust...</th>
<th>II. solitary and time-breaking waves</th>
<th>III. velocities crossing in phase space</th>
<th>IV. triadic iteration lattices</th>
<th>V. clusters on a quadrilateral grid</th>
<th>VI...and dust rising...</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSTRUMENTATION</td>
<td>2 snare drums, 2 field drums</td>
<td>4 tam-tams of different sizes</td>
<td>10 tom-toms and bass drums of different sizes</td>
<td>4 identical sirens</td>
<td>4 marimbas, 4 vibraphones, 4 sets of crotales/orchestral bells</td>
<td>2 snare drums, 2 field drums</td>
</tr>
<tr>
<td>GEOMETRIC INSPIRATION</td>
<td>Cantor set</td>
<td>Waves</td>
<td>Waves, phase space</td>
<td>Serpienski gasket/triangle</td>
<td>Menger sponge</td>
<td>Cantor set</td>
</tr>
<tr>
<td>MUSICAL INSPIRATION</td>
<td>James Tenney</td>
<td>Conlon Nancarrow, Peter Garland</td>
<td>Edgard Varèse, Alvin Lucier</td>
<td>Morton Feldman</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5-1. Instrumentation and inspirations for *Strange and Sacred Noise*.

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The Music

I. “…dust into dust…”

![Diagram of Cantor set](image)

Figure 5.1. Cantor set.

The first movement of Strange and Sacred Noise is based on the Cantor set, a fractal first introduced by German mathematician Georg Cantor in 1883. A common way to represent the set begins with a line segment (Figure 5.1). The middle third is removed, and the remaining two equal line segments are redrawn below the original. The middle third is then removed from each of these segments, and the process continues ad infinitum. “Cantor dust” is a multi-dimensional version of the Cantor set.

As David Herr points out, the title “…dust into dust…” is analogous to the Cantor set. It is in three parts, divided in the middle, and symmetrical on the outsides. It also likely refers to two passages from liturgical texts:

By the sweat of your brow you will eat your food until you return to the ground, since from it you were taken; for dust you are and to dust you will return. (Genesis 3:19)

Earth to earth, ashes to ashes, dust to dust (Book of Common Prayer, funeral service)

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As Adams writes, the Cantor set is, in addition to being a geometrical pattern, a model of electrical transmissions:

Originally regarded as nothing more than a mathematical curiosity, the Cantor set was later discovered to be a remarkable model of the self-similar nature of intermittent noise in electrical transmissions. Electrical transmissions contain within them periods of steady signal alternating with bursts of noise. Within this noise are minute periods of silence. The patterns of these signal/noise/silence cycles appear to remain constant, no matter how long or brief a period of time is sampled.\(^6\)

The movement is scored for piccolo snare drum, snare drum, small field drum, and large field drum. Adams uses snare drums because they are “the quintessential noise instrument.”\(^7\)

Throughout the movement Adams gives each of the players three sounds: accented *fortissimo* rolls to be played near the center of the drum head, *pianissimo* “buzz” rolls to be played near the rim, and silence. Structuring these sounds by the Cantor set, Adams creates a sounding equivalent of naturally occurring electrical transmissions, in which the *fortissimo* tremolos correspond to “signal,” the *pianissimo* buzz rolls correspond to “noise,” and the silence corresponds to itself.\(^8\)

Each page of the music contains three staves, each with three bars of music. In addition the music is in ¾ time, and Adams divides each quarter note into nine triplet thirty-second notes. Thus, Adams can represent the Cantor set itself in the score at the level of the page, stave, bar, beat, or triplet.

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\(^6\) Adams, *Strange and Sacred Noise*, preface to “…dust into dust…”

\(^7\) Ibid.

\(^8\) David Herr points out that snare drums are timbrally similar to pink noise found in electrical devices. Moreover, a drumhead vibrates in one of two kinds of modes when struck: diametric, which is more closely associated with pitch, or circular, which is associated with more undefined pitch. When a drum is struck near the center of the head, the diametric modes are set off. When a drum is struck at the rim, all of the modes vibrate. Adams therefore asks for the simulation of “noise” to be played at the rim of the drum, because this is the noisier part of the drum. Herr, “Process in the Music of John Luther Adams,” 7-8.
Figure 5.2. Beginning, “…dust into dust...”, *Strange and Sacred Noise.*
Figure 5.3. Letter B, “...dust into dust....”, *Strange and Sacred Noise*. The Cantor set may be seen at the level of the stave (percussion IV) or page (percussion III and IV).

When the piece begins, all four players are given “signal” – *fortissimo* thirty-second note triplets (Figure 5.2). Over the course of the piece these four instruments will move from signal to
noise to silence and back to signal. Beginning at letter A, Adams converts from signal to noise by creating Cantor sets at each of the levels listed above. The process does not occur simultaneously in all the parts but rather in a canon working from percussion IV up through the other parts. At letter A, percussion IV has the Cantor set at the level of the page. At letter B, percussion IV has the set at the page and stave levels, while percussion III has the set at the level of the page (Figure 5.3). At letter E, percussion IV has the set at the triplet, quarter note, bar, stave, and page levels, while percussion III, II, and I have it at successively lower levels.

In the performance notes, Adams counsels performers, “The drums should be tuned to give an ensemble sound of the broadest possible band of ‘colored’ noise. Dynamics should be balanced so that the sudden changes in a single drum part sound like a narrow-band filter being turned on and off.” In fact this is what one experiences when signal notes are sequentially dropped to become noise.

At letter F, percussion IV is “all noise”\(^9\) (all pianissimo). Once it has reached this state, it proceeds towards silence by an analogous process, eliminating noise at the level of the page, staves, bars, beats, and triplets, finally reaching a state of “all silence” at letter L. The other instruments follow suit towards “all noise” and then “all silence.”

At letter M, percussion IV begins a move back to signal, but the process is not exactly symmetrical with the first half of the movement (Figure 5.4). Instead of proceeding through noise at the extreme corners of thirty-second notes that were the last to move to silence, Adams jumps to signal, working first at the level of page, then staves, bars, beats, and triplets. At each level, he first fills the space that was omitted in the initial process. The other instruments follow suit.

\(^9\) Quotation marks mine.
Figure 5.4. Letter M, “...dust into dust...”, *Strange and Sacred Noise*. 
By letter R, percussion IV is “all signal,” as at the beginning of the movement. As Adams brings the other instruments to “all signal” as well, however, he begins to move percussion IV
towards noise again. At letter U, the final page of the movement, one can see that percussion I has just reached the level of “all signal,” while percussion II, III, and IV are all on the way towards noise again (Figure 5.5). David Herr points out that this page is the sonic equivalent of letter C.\textsuperscript{10} The last bar calls for all instruments to play fortissimo signal.

In the first few minutes of “…dust into dust…” Adams sounds the Cantor set fractal at the level of the page, stave, bar, beat, and triplet. Over the course of the whole piece, “…dust into dust…” becomes like the Cantor set at a more structural level. It is divided into three sections with three different processes: signal to noise, noise to silence, and silence back to noise. Moreover, the canon of four parts gives the piece greater depth and complexity than the two-dimensional fractal.

\textit{II. “solitary and time-breaking waves”}

The second movement of \textit{Strange and Sacred Noise} is a piece that models wave convergence rather than sonic geometry. As Adams writes, it “echoes the natural phenomenon in which waves of varying periods converge to form a single, massive soliton, or solitary wave.”\textsuperscript{11}

“Solitary and time-breaking waves” is scored for four tam-tams ranging in size from small to very large. It was inspired by \textit{Koan: Having Never Written a Note for Percussion}, a piece by Adams’s teacher James Tenney that consists of a single crescendo and decrescendo roll on an unspecified instrument lasting ten to twenty minutes. It is one of Tenney’s \textit{Postal Pieces}, which he was working on during Adams’s first year at CalArts. In Adams’s piece all four tam-tams make crescendo and decrescendo rolls whose lengths and peaks vary (Table 5-2). The four

\textsuperscript{10} Herr, “Process in the Music of John Luther Adams,” 16.

\textsuperscript{11} Adams, \textit{Strange and Sacred Noise}, preface to “solitary and time-breaking waves.”
parts all start and end *pppp*. Over the course of the piece, percussion I makes seven equally long crescendi that peak at increasing dynamic levels until m. 53 (Figure 5.6). From that fourth peak until the end of the piece, the peaks reduce in size. Percussion II, III, and IV do the same but with only five, three, and one dynamic waves, respectively. At m. 53 the four parts converge, and the music is symmetrical around this point.

<table>
<thead>
<tr>
<th>Part</th>
<th># of waves</th>
<th>Starting dynamic</th>
<th>Dynamic peak of each wave</th>
<th>Ending dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>7</td>
<td><em>pppp</em></td>
<td><em>f</em></td>
<td><em>ff</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>fff</em></td>
<td><em>ffff</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>fff</em></td>
<td><em>fff</em></td>
</tr>
<tr>
<td>II</td>
<td>5</td>
<td><em>pppp</em></td>
<td><em>ff</em></td>
<td><em>fff</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>fff</em></td>
<td><em>ffff</em></td>
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<td></td>
<td></td>
<td></td>
<td><em>fff</em></td>
<td><em>fff</em></td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td><em>pppp</em></td>
<td><em>fff</em></td>
<td><em>fff</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>fff</em></td>
<td><em>fff</em></td>
</tr>
<tr>
<td>IV</td>
<td>1</td>
<td><em>pppp</em></td>
<td><em>fff</em></td>
<td><em>fff</em></td>
</tr>
</tbody>
</table>

Table 5-2. Dynamic structure, “solitary and time-breaking waves,” *Strange and Sacred Noise*. The waves all begin *pppp* but crest at different dynamic levels. The four parts converge at *ffff* at m. 53.

The single long crescendo and decrescendo in percussion IV means that its part is essentially a performance of *Koan*. As David Herr points out, the entire piece “can be thought of as one iteration of *Koan* with several smaller iterations of the same piece being built on top of it.”

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Figure 5.6. Climax, “solitary and time-breaking waves” (m. 53).
III. “velocities crossing in phase-space”

The third movement of Strange and Sacred Noise is modeled on the motion of waves and, more specifically, motion within a phase space. In mathematics, a phase space is “the space of all possible states of a physical system.”\(^{13}\) Each possible state of the system corresponds to one unique point in the phase space. A phase space is often multi-dimensional, and every parameter of the system is represented by an axis. Adams’s piece is a phase space containing the parameters of velocity, amplitude (volume), and pitch. These three dimensions are in near-constant fluctuation.

The movement is scored for four drummers playing six tom-toms and four bass drums. It is in 4/4 time. It begins with all four drummers—on drums of all sizes—playing sixteenth notes in \(fff\) unison. After four bars, all of the instruments begin a gradual process of slowing down and growing quieter. The process proceeds, however, at a different pace for the four instruments. Percussion I changes the quickest, slowing down to notes lasting fifteen beats each and played \(mp\) at m. 31. No sooner does it reach that point than it is instructed to make an accelerando and crescendo in order to return to \(fff\) sixteenth notes in m. 57. The complete cycle for percussion I thus takes about fifty-two bars (209.71 beats to be precise). Percussion I repeats this cycle six more times. The troughs get quieter until the fourth trough at m. 188, which is marked \(ppp\). The troughs then become successively louder until the end of the piece.

Meanwhile, percussion II, III, and IV are given the same instructions, but their cycles progress more slowly. They complete five, three, and one such cycles over the course of the piece.

piece (Table 5-3). The movement is thus a “temporal canon of continuous acceleration and deceleration.”

As in “solitary and time-breaking waves,” the movement uses cycles related by proportions of 1, 3, 5, and 7. Unlike the second movement, however, the cycles here are in both dynamics and tempo, and the dynamic cycles start loudly, trough in the middle, and return to fff. Just as the waves in the second movement increase into the middle of the piece, here the waves trough at quieter levels until m. 188, when all four instruments reach ppp (Figure 5.7).

Moreover, between the beginning and the middle of the piece, there is a downward shift in the pitch of the upper three percussion instruments. Adams times these shifts to occur at the crest of waves, which helps to mark these peaks for the listener. As can be seen in Table 5-3, the instruments recover from this shift unevenly, leaving the whole piece slightly lower in pitch at the end than at the beginning.

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14 Adams, Strange and Sacred Noise, preface to “velocities crossing in phase- space.”
Figure 5.7. Trough, “velocities crossing in phase-space,” *Strange and Sacred Noise*. 
Table 5-3. Dynamic structure, “velocities crossing in phase-space,” *Strange and Sacred Noise*. Each wave starts quickly and at **fff** and troughs quietly and slowly.

In chapter 1 I mentioned the influence of both James Tenney and Henry Cowell on Adams’s work. Whereas the relative simplicity of the concept driving the piece shows the influence of Tenney, Cowell’s influence is filtered through Conlon Nancarrow, whose *Canon X* Adams describes as a model for the movement.\(^{15}\) Nancarrow, like Adams, was inspired by Cowell’s book *New Musical Resources*. Nancarrow put Cowell’s ideas about more complex rhythmic relationships in music to work in pieces for player piano that he called “Studies,” nearly all of which use multiple simultaneous tempi. In some of the studies, there is acceleration and deceleration as well. Study 21 (“Canon X”) is a canon in which one part accelerates while the other decelerates, and the two parts cross in the middle.\(^{16}\)

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\(^{15}\) Ibid. Adams also credits *Meditation on Thunder* by Peter Garland.

IV. “triadic iteration lattices”

In the fourth movement Adams returns to sounding fractals – here the Serpienski triangle (also called the “Serpienski gasket”). This fractal (Figure 5.8) results from shrinking a triangle down to one-fourth its size (one-half the height and width) three times and inserting all three smaller triangles into the original so that they touch at corners. A triangular hole of one-fourth the original space remains between the three smaller triangles. The process is then repeated within each of the three smaller triangles. The fractal in essence divides a three-sided structure into a four-part entity.

“Triadic iteration lattices” is scored for four identical sirens and is dedicated to Edgard Varèse and Alvin Lucier. Adams converts the fractal into music at multiple levels. At the smallest level, Adams represents an isosceles triangle by a phrase that begins quietly, makes a crescendo, and then returns back to its starting dynamic in the same amount of time (Figure 5.9). All the parts begin with such triangular sixteen-bar phrases that start pp and crescendo to ff, but over the course of the movement the phrases shrink to eight bars and four bars (the shorter phrases spanning a proportional dynamic difference). The original phrase thus has the same 4:1 size relationship to the shortest phrase that the outer triangle in the fractal has to its inner

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17 Varèse’s *Amériques* and *Ionisation* were the first major Western musical works to use sirens, and *Ionisation* was also the first piece of Western art music written for percussion alone. Lucier has composed with pure wave oscillators similar to sirens.
components. On a larger scale, like a triangle the movement is structured in three sections, of which the middle section divides into three more parts (Table 5-4).

<table>
<thead>
<tr>
<th>Section</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Measures</td>
<td>1-56</td>
<td>41-68</td>
<td>69-108</td>
</tr>
<tr>
<td></td>
<td>69-108</td>
<td>93-164</td>
<td>149-188</td>
</tr>
<tr>
<td></td>
<td>93-164</td>
<td>149-188</td>
<td>189-236</td>
</tr>
<tr>
<td></td>
<td>189-236</td>
<td>221-256</td>
<td></td>
</tr>
<tr>
<td>Smallest phrase</td>
<td>16</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Lattice forms</td>
<td>Symmetrical canon forming a palindrome</td>
<td>Symmetrical canon forming a palindrome</td>
<td>Canon</td>
</tr>
<tr>
<td></td>
<td>Mirrors (Retrograde inversions)</td>
<td>Retrogrades</td>
<td>Mirror (Retrograde inversion)</td>
</tr>
<tr>
<td></td>
<td>Canon</td>
<td></td>
<td></td>
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</table>

Table 5-4. Structure of “triadic iteration lattices,” *Strange and Sacred Noise*. Measure numbers in italics are phrases that begin before the previous phrase has ended.

**Section I**

The first section of the movement is in two parts. In m. 1, percussion IV begins a sixteen-bar phrase: an eight-bar crescendo from *pp* to *ff* and an eight-bar diminuendo back to *pp*. After sixteen bars, percussion III enters with the same phrase. Eight bars later percussion II enters with the same phrase (m. 25), and sixteen bars later percussion I enters with the same phrase (m. 41). This first part of the section is thus a symmetrical canon, with sixteen-, eight-, and sixteen-bar separations between each instrument’s entrance. That is, the music is a palindrome.
Figure 5.9. Schematic of “triadic iteration lattices,” Strange and Sacred Noise. The four percussion parts are stacked on top of each other. Measure numbers run across the top of each system. The diagonal lines represent siren phrases that crescendo and decrescendo, with the height of each line proportional to its increase in dynamics and the width of each line proportional to its length. Numbers next to these lines are measures in length.

The entrance of percussion I at m. 41 also marks the beginning of the second part of the section, thus overlapping the first part. Again, there is a symmetrical canon of the four instruments, but now each of the phrases is separated by only four bars. We therefore already see several ways in which Adams attempts to sound the Serpienski gasket in this first section. He introduces dynamic shapes that look like triangles. He also introduces the 4:1 proportion via the 16:8:4 time distances between canon entrances. And to represent the multiple levels of the fractal, he brings in palindromes and overlapping phrases – which give sense to the use of “lattices” in the movement’s title.

Section II

The second section of the movement is divided into three parts, delineated by the size of the smallest phrases they contain. In what I call Part “A,” each sixteen-bar phrase is now subdivided into eight-bar phrases. At m. 69 percussion I re-enters with another sixteen-bar
“triangle.” Simultaneously percussion IV subdivides the triangle into two eight-bar triangles. In the next phrase (m. 85) percussion III plays a sixteen-bar triangle that percussion II subdivides. A repeat of mm. 69-84 begins in m. 93, now overlapping with the previous phrase. Moreover, percussion IV is also connected to percussion II by means of a canon in which percussion IV leads by sixteen bars (mm. 69-133).

Part “B” of the second section is the middle of the movement and the most intense section as well. At two points all four instruments reach a dynamic of *fortissimo* (m. 133 and m. 149). Here the fractalization process goes further, as the initial sixteen-bar phrase is broken into two eight-bar phrases, four four-bar phrases, and hybrid-length phrases. In mm. 93-148 (thus overlapping Part A), percussion I plays a combination of sixteen- and four-bar phrases that finds its mirror (retrograde inversion) slightly offset in percussion IV (mm. 109-164). At the same time, percussion II (mm. 109-148) plays a combination of two eight-bar phrases, an eight-bar half-phrase, and a hybrid 6-2-2-6 phrase, the mirror of which is simultaneously played by percussion III.

Part “C” begins in m. 149 and thus overlaps Part B. Here the smallest phrase is again eight bars. Percussion III plays a sixteen-bar phrase ending at a third climax at m. 165, holds *fortissimo* for eight bars, and then plays two eight-bar phrases. Percussion II plays the retrograde: first two eight-bar phrases and then a sixteen-bar phrase. Meanwhile, beginning at m. 165, percussion I subdivides the sixteen-bar phrase of percussion IV into two eight-bar phrases.

In this second section of the piece, therefore, Adams introduces fractals of his original sixteen-bar crescendo-diminuendo, reducing the size of the phrase first to eight and then to four bars. He also continues to overlap phrases and expands the meaning of “lattices” to encompass retrogrades and retrograde inversions.
Section III

The final section of the movement begins in m. 189 and is characterized by a return to sixteen-bar phrases. The section is divided into two parts. The first part is symmetrical by retrograde inversion: percussion IV (mm. 189-204), III (mm. 197-220), II (mm. 205-228), and I (mm. 221-236) can be flipped upside down and read identically in reverse.

The second part of the section, mm. 221-264, is an imperfect canon. Beginning with percussion I at m. 221 (thus overlapping the previous part), each player enters with twenty-four-bar crescendo-diminuendo-crescendo phrases and sustains the final fortissimo until the end of the piece (m. 261). Percussion II, which begins this last part with percussion I at m. 221, has a four-bar sustain at the end of the first crescendo, so that it reaches the final climax four bars later. Percussion III and IV enter in m. 229 and m. 233 so that they reach the final climax eight and twelve bars after percussion I, which produces a perfectly staggered ascent to the ultimate fortissimo.

Looking now at the movement’s title, we can understand “triadic” to refer to the three-part structure of the movement, the triangular shape of each phrase, and, since sirens are pitched, to musical triads coming and going as the individual sirens rise and fall. The overlap of sections, as well as the use of canons, palindromes, retrogrades, and mirrors (retrograde inversions), create “lattices” of the siren phrases.
The fifth movement of *Strange and Sacred Noise*, “clusters on a quadrilateral grid,” is based on the Menger sponge fractal, which is, in turn, based on the Cantor set. As we saw earlier, the Cantor set is derived from one-dimensional lines. The same process of dividing a line into
equal thirds and removing the central one can also be applied to two-dimensional spaces, in which case a square is divided into nine equal squares, from which the one at the center is removed. When the process is repeated ad infinitum inside each of the smaller squares, a fractal called the “Serpienski carpet” is created. If the process is applied to a three-dimensional cube, one produces a “Menger sponge” (Figure 5.10).

Running twenty-seven minutes, “clusters” is significantly longer than the other movements in Strange and Sacred Noise. One reason for this is that to sound the fractal Adams needs to create three musical dimensions in which he can work. To create a Cantor set in rhythm, Adams sets up each page of the score in a fashion similar to “…dust into dust…”: three systems of music, with nine bars of music per system, in ¾ time. To create a Cantor set along the pitch dimension, Adams scores the movement for pitched percussion and establishes a vertical tone cluster from which he can remove thirds. The third dimension of the fractal is in the overall structure of the movement.

<table>
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<th>SECTION</th>
<th>I</th>
<th>II</th>
<th>III</th>
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<tr>
<td>TEMPO</td>
<td>72</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td>PITCH DEVELOPMENT</td>
<td>[Saturation]-Removing thirds from inside out – [Silence]</td>
<td>[Saturation]-Returning thirds from inside out – [Saturation]</td>
<td>[Saturation]-Returning thirds from inside out – [Saturation]</td>
</tr>
<tr>
<td>INSTRUMENTATION</td>
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<td>Vibraphones</td>
<td>Orchestral bells</td>
</tr>
<tr>
<td>TEXTURE</td>
<td>pianissimo tremolos</td>
<td>fortissimo chords</td>
<td>fortissimo tremolos, chords, scales</td>
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</tbody>
</table>

Table 5-5. Structure of “clusters on a quadrilateral grid,” Strange and Sacred Noise. States in brackets are implied endpoints but are not actually heard. Section II is put in bold to highlight its fractal position as a palindrome within a palindrome.
Figure 5.11. Pitch and rhythmical reduction of the first section of “clusters on a quadrilateral grid,” Strange and Sacred Noise. The top system shows the gamut and its two primary divisions. Each labeled group of the lower three systems is a page, with bar lines representing staves and numbers below chords indicating measure lengths.
“Clusters” is in three sections (Table 5-5). The first section is scored for four marimbas playing pianissimo tremolos. The first page of the score establishes the pitch gamut to be a cluster from A2 to B4 (Figure 5.11). This gamut contains twenty-seven tones. Throughout the movement Adams alternates between two different first-level divisions of this gamut. On the first page of the score, Adams uses a division that I will call “Division 0” or “D-0”, in which the upper third consists of eight tones, the middle third consists of twelve tones, and the bottom third consists of seven tones (Figure 5.12). On this page the outer two-thirds are played in staves one and three and the inner third is played in stave two. Adams thus begins with a two-dimensional Cantor set of time and pitch, both at the first level of division.

At letter A, the outer two staves contain the same clusters as on the first page. On the inner stave, Adams now uses the other division of the gamut, which I call “Division 1” or “D-1” (Figure 5.13). This is an equal division, in which the outer, inner, and lower thirds all contain nine pitches (Figure 5.11). Furthermore, Adams divides the inner stave into three groups of three bars. The chords in the outer three bars of the middle stave contain the outer halves of the outer thirds of D-1, while the chords in the middle three bars of the middle stave contain the inner halves of the outer thirds of D-1. On this page, therefore, Adams divides time at the level of the stave, while the division of the pitch gamut is an alternate way of expressing the first level Cantor set division.
Figure 5.12. Beginning of “clusters on a quadrilateral grid,” *Strange and Sacred Noise.*
At letter B (Figure 5.14), the first and third staves continue to be made from D-0, and the second stave is made from D-1. Staves one and three are divided into three sections of three bars each, and the inner third is divided into three single bars. In the outer six bars of stave one, the outer thirds of D-0 are played. The inner three bars again consist of a symmetrical arrangement. The outer two bars contain D-0 minus the inner third of each third. The inner bar contains the inner third of D-0 minus its inner third. Stave two is divided into three groups of three bars. The outer two groups feature the outer halves of the outer thirds of D-1 (as we saw in mm. 37-39 and 43-45). The inner three bars feature the outer thirds of D-1 minus their inner thirds. On this page, therefore, Adams works with the Cantor set at the third level of time division (bars) and at the second level of pitch division (removing a third from a third).
Figure 5.14. Letter B, “clusters on a quadrilateral grid,” *Strange and Sacred Noise*.

At letter C Adams continues as above. He uses the D-0 division of the pitch gamut in the outer stave and the D-1 division on the inner stave. He divides time as far as the level of the beat,
and he divides pitch to create Cantor sets at the third level (removing inner thirds of thirds of thirds).

Since the size of Adams’s gamut cluster allows pitch division to go no further, at letter D he returns to the opening time and pitch divisions; the fifth page of the score (letter D) is identical to the first page. For the remainder of the first section of the piece, Adams now inverts the Cantor set with regards to pitch, leaving inner thirds while subtracting outer thirds. At letter E therefore, the middle stave contains the inner third of D-1, while the outer staves contain nothing. He is now back to the Cantor set at the first level of division for both time and pitch. At letter F (Figure 5.15), the outer staves contain the inner third of the outer thirds of D-0. The inner stave contains the inner third of D-1 (m. 172-174 and 178-180) alternating with D-1 minus the outer thirds of the outer thirds (m. 175-177). Adams is therefore working on the second level divisions of both time and pitch. Letter G continues likewise.

From letter D to letter G Adams thus makes positive space what had been negative space in both time and pitch in the first half of the section. He refills the cluster, working from the inside out. The process is very similar to what he did in the latter half of “…dust into dust…” once the initial saturated texture had been reduced to silence.
Figure 5.15. Letter F, “clusters on a quadrilateral grid,” *Strange and Sacred Noise.*
Figure 5.16. Letter H, “clusters on a quadrilateral grid,” *Strange and Sacred Noise.*
The second section of “clusters” (beginning at rehearsal H) is divided into two halves which I will call parts “A” and “B.” Part A is scored for vibraphones. It is the first section of the movement (letters A to G) played at twice the speed and as fortissimo solid clusters. In addition, because of the range of the vibraphone, the music is transposed up an octave (Figure 5.16). Part B (beginning at rehearsal P) is a retrograde of Part A. It is still played fortissimo but on orchestral bells or crotales and as clusters, scales, or tremolos. Finally, the third section of “clusters” (beginning at letter X) is a retrograde of the first section, again played quietly on marimba.

“Clusters” is thus symmetrical in pitch and rhythm (and approximately so in texture) over the course of the movement. We have seen how Adams creates a Cantor set division of the pitch gamut and the timing of harmonic changes on every page, making each page like a two-dimensional plane of the Menger sponge. The coup de maître of “clusters” is that the second section is a sped up version of the combined outer sections, lasting one third of the time of the entire movement and forming a sort of fractal of the entire movement itself. With this third dimension “clusters” resembles the Menger sponge. The length of time required to develop this third dimension, as well as the preponderance of quiet, slowly changing, gently dissonant chords in the outer sections, shows the influence of Morton Feldman, to whom the movement is dedicated.
VI. “...and dust rising...”

...and dust rising...

Precise and unwavering
($i = 60$)

Figure 5.17. Beginning, “...and dust rising...”, Strange and Sacred Noise.
The final movement of *Strange and Sacred Noise* is, like the first movement, based on the Cantor set. It is scored for the identical instrumentation as “…dust into dust…” and follows the same rhythmic and visual template (three staves per page, three bars per stave, in \( \frac{3}{4} \) time, with triplet thirty-second subdivisions). It is also, like the first movement, a canon, though here the leader is percussion I rather than percussion IV.

<table>
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<tr>
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<th>Trajectory</th>
<th>Means</th>
<th>Relation to first movement</th>
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<tr>
<td><strong>…DUST INTO DUST...</strong></td>
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<td></td>
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<tr>
<td>Beginning➔E</td>
<td>SIGNAL➔</td>
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<td>Retrograde of F➔K</td>
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<td>NOISE➔</td>
<td>Subtraction inside out</td>
<td>Retrograde of L➔Q</td>
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<tr>
<td>L➔Q</td>
<td>SILENCE➔</td>
<td>Abrupt shift; Addition inside out</td>
<td>Retrograde of Beginning➔E</td>
</tr>
<tr>
<td>R➔U</td>
<td>SIGNAL➔ [NOISE]</td>
<td>Subtraction inside out</td>
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<thead>
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<td><strong>…AND DUST RISING...</strong></td>
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<td>[SILENCE]➔ NOISE</td>
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<tr>
<td>R➔T</td>
<td>SIGNAL</td>
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Table 5-6. Structure of the first and last movements of *Strange and Sacred Noise*. Items in brackets are endpoints that are not actually heard. Since the four instruments are in canon in both pieces, these rehearsal letters track the leading instruments: percussion IV in “…dust into dust…” and percussion I in “…and dust rising…” The bottom row shows the relationship of percussion IV in “…dust into dust…” to percussion I in “…and dust rising…”

The overall structure of the two movements is shown in Table 5-6. Percussion I begins with noise in the “corners,” the outside subdivisions of the triplet, quarter note, bar, stave, and page (Figure 5.17). From here, it gradually fills in each of these levels, moving from triplet to page. One by one, the other instruments enter with the same music. By letter E all the instruments have entered, and percussion I is all noise (Figure 5.18). Percussion I has traced a
The movement begins in an opposite fashion from “…dust into dust…” and yet is completely derived from it.

Figure 5.18. Letter E, “…and dust rising…”, *Strange and Sacred Noise*.

Because all of the percussion parts are in canon, this is not a retrograde of the complete score.
At letter F percussion I begins a move back to silence through signal. It is tracing, in fact, another retrograde of a portion of “…dust into dust…”, this time letters L through Q. Percussion I reaches silence at letter K and then re-enters again in the middle of a transition from noise to signal. Here it plays a retrograde of the beginning until letter E from “…dust into dust…” It reaches full signal at letter Q and remains with the signal until the end of the movement, while the other players join it one by one. Whereas at the end of “…dust into dust…” percussion IV begins to fade again, here the insistence of percussion I on blasting signal gives the piece a definitive ending.

Summary

Now that we have looked at the structure of each individual piece within Strange and Sacred Noise, it is time to examine the position of the work as a whole in the context of Adams’s oeuvre and to ask whether Adams is successful at reaching the aesthetic goals he sets for himself.

On first glance it is striking that Strange and Sacred Noise was premiered in 1998, the same year as In the White Silence. One piece seems to have nothing to do with the other. In the White Silence is scored for instruments with gentle timbres never playing louder than mf. It is inspired by the whiteness and silence of the Arctic and, on the basis of its pan-diatonicism, might be called “sentimental.” Strange and Sacred Noise is a piece for percussion alone—largely unpitched—that frequently touches the threshold of volume tolerability. It is inspired by powerful forces of nature, including the sounds of ice breaking, fractal geometry, and wave theory. On the basis of its rigid structures, total lack of melody, and “noisy” timbres, one might call it “intellectual.” In an interview, Adams had this to say about the contrast in his output:
For years I’ve felt that there are two, apparently opposite, sides to my work. There’s this very spacious, beautiful, suspended-time atmosphere, and then there’s this muscular, almost violent side. In part, I think that did grow out of my own experience of living in the subarctic for most of my life. It’s dark all winter, and it’s light all summer.19

In spite of the stark contrasts between the two pieces, however, under the surface there are some illuminating similarities. Let us compare some of the main features of Strange and Sacred Noise with those of In the White Silence and the other compositions that we have already examined.

**Musical Algorithms and Cycles**

In Strange and Sacred Noise, as in Earth and the Great Weather and In the White Silence, Adams uses algorithmic, long-range processes. Although he determines the parameters of the processes, his judgment is largely neutralized once they are set up. In “solitary and time-breaking waves,” one algorithm structures the entire movement. Other movements, though still cohesive, contain processes moving in different directions, and Adams determines the connections between them. For instance, in “…dust into dust…” the process of sounding the Cantor set—converting, in canon, the inner thirds of successively smaller lengths of signal into noise, and then converting the noise likewise into silence—begins on the second page and proceeds systematically until percussion IV has reached complete silence (letter L). At that point, however, Adams makes the choice to return to signal not by means of a palindrome (which would move back through noise from the “corners” of the page) but directly, by adding back signal to the inner thirds.

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Strange and Sacred Noise also contains cycles and palindromes like Earth and the Great Weather and In the White Silence. As noted, the work begins and ends with the Cantor set. The last movement, in fact, contains retrograde fragments of the first movement. “Solitary and time-breaking waves,” “velocities crossing in phase-space,” and “clusters on a quadrilateral grid” are nearly complete palindromes, and “clusters” contains an inner near-palindrome as well. “Triadic iteration lattices” contains many smaller scale retrogrades and retrograde inversions. Whereas the symmetrical structures could be interpreted as a representation of the cyclical journey in Earth and the Great Weather, here they serve to accentuate the wave and fractal structure of each movement. Moreover, Strange and Sacred Noise as a whole is roughly symmetrical, like each of the fractals that it attempts to sound.

Multiple Simultaneous Tempi and Integration of Rhythm and Pitch

The use of multiple simultaneous tempi is a feature throughout Earth and the Great Weather, manifested as the same patterns played in different subdivisions and/or with dynamic swells of different lengths. In In the White Silence the instruments have 3:4:5, 3:4:5:6, 4:5:6, or 4:5:6:7 tempo relationships in each section. In “solitary and time-breaking waves” and “velocities crossing in phase space” Adams uses simultaneous 1:3:5:7 tempo relationships, manifested by the varying lengths of dynamic swells. In “velocities crossing in phase space” the dynamic swells are complemented by accelerandi and decelerandi.

Additionally, in In the White Silence, Adams integrates rhythm and pitch in many ways. In the “C” sections, for example, the note values of the “solo” instruments expand and contract along with the size of their melodic intervals. In Strange and Sacred Noise, Adams uses pitched instruments in “triadic iteration lattices” and “clusters on a quadrilateral grid.” In “triadic
iteration lattices” the rhythm is determined by the length of each phrase, which is itself determined by a rise and fall in pitch (and volume). In “clusters” Adams creates a three-dimensional Menger sponge in pitch (by subtracting tones from a tone cluster), rhythm (through the timing of pitch changes), and formal structure (by inserting a sped-up version of the outer two sections in the middle of the piece).

**Ergodic Form and Fractals**

Adams has written that he is “especially taken with [James Tenney’s] concept of ‘ergodic’ form – an entire piece conceived and perceived as a single sound.” In *In the White Silence* we saw this concept in the “A” sections, where one could find the diatonic gamut sounded in the background string and vibraphone chords as well as in each arpeggio in the foreground harp and celesta. In the “C” sections we saw Adams employ Tenney’s idea that “ergodic form is self-similar at all levels, from macrostructure to micro-topology”: each individual arpeggio cycles through intervals, just as the first interval of successive arpeggios in any instrument cycles over the course of a section.

*Strange and Sacred Noise* makes it clear that Tenney’s idea is essentially one of creating fractals. In the “dust” movements, Adams’s creation of Cantor sets at the level of the page, stave, bar, beat, and triplet is both fractal and ergodic. The same could be said about “clusters on a quadrilateral grid,” where the middle section is a nested version of the outer sections. In *In the White Silence* the combination of a limited gamut, self-similarity, and long-range processes gives the music a slowly shifting quality, like the white icy landscape of the Arctic. In *Strange and Sacred Noise*  

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Sacred Noise, the self-similarity stands for nothing but itself. Adams merely translates the fractals into sound.\textsuperscript{22}

\textbf{Beyond Representation of Physical Entities.}

If Adams wants to “re-imagine and re-create our relationships with this planet and all those…with whom we share it”\textsuperscript{23} through his music, one might think he needs a way to represent the planet and its other beings musically. In \textit{songbirdsongs} and \textit{Earth and the Great Weather} we saw Adams use direct and approximate imitations of natural sounds, as well as musical depictions of unsounded entities like mountains and astronomical cycles, in order to represent birds and an Arctic journey. \textit{In the White Silence} can be understood as a representation of an Arctic landscape, a representation of the experience of being in an Arctic landscape, or simply (as Adams wished) a non-representational landscape for the ears.

In \textit{Strange and Sacred Noise} one might say Adams creates representations of fractals and waves. There are two problems with this interpretation, however. First, according to Deryck Cooke, a representation “uses sounds which have an effect on the ear similar to that which the appearance of the object has on the eye.”\textsuperscript{24} In actuality, however, we do not see fractals. Fractals are patterns, which we see expressed in a substance with mass, such as a crystal. We may also convert the fractal pattern into some visible form on a paper or computer screen, but then we are seeing our representation of it. Likewise, waves are disturbances or oscillations. We see them

\textsuperscript{22} Perhaps the ergodic form works as well as it does for \textit{In the White Silence} precisely because ice and snowflakes are commonly fractals.
\textsuperscript{23} Adams, \textit{Winter Music}, 128.
\textsuperscript{24} Deryck Cooke, \textit{Language of Music}, 3-4.
acting through some substance.\textsuperscript{25} If we were to represent either fractals or waves musically, we would have to represent them acting on a certain substance, at which point the representation would be of that substance, as shaped by the fractal or wave.

Second, when composers represent a physical object, the relationship between the music and the object of representation is inherently subjective. The composer chooses what qualities of the visual object to represent and how to make the musical-visual equivalences. Often the representation is made as part of a musical narrative, as in Debussy’s \textit{Préludes} for piano or Richard Strauss’s tone poems.

The sounds of \textit{Strange and Sacred Noise}, on the other hand, do not tell a story, nor are they representative of any particular substance. Although Adams was inspired by the breaking-up of the Yukon River, the music does not represent that event. Adams rather allows the music to sound the natural properties of fractals and waves, with minimal interference from his subjective judgment. As he writes, “Rather than a music of discourse, mine is a music of the sounding image.”\textsuperscript{26}

We noticed the “sounding image” in some of Adams’s earlier works as well. In the score of \textit{In the White Silence}, the use of a “white-key” gamut, whole notes, and gaping rests may be \textit{Augenmusik} for the players, augmenting the meaning given by the title and the music itself. In \textit{Earth and the Great Weather} the ascending and descending harmonics in “Pointed Mountains Scattered All Around” create both \textit{Augenmusik} for the performer and a representation of mountains for the listener. In that movement Adams uses the association between physical height and musical pitch (which is itself based on a structural isomorphism) to create a musical

\textsuperscript{25} According to quantum mechanics, light may be understood as both particle and wave. I am certainly not qualified to state whether what we see in visible light are the waves or the photons, but I believe the point that we generally see waves acting through objects is true.

\textsuperscript{26} Adams, \textit{Winter Music}, 130.
metaphor, which he reinforces with spoken place names. The precise musical structure he chooses—harmonic glissandi on one string at a time on all four string instruments—is somewhat arbitrary. One could easily imagine representing mountains with much weightier music.

The movements of Strange and Sacred Noise, however, are different from Adams’s earlier sounding images. Whereas a mountain is an irregular form with substance and no need for other embodiment, a fractal is a perfect form in search of a substance. In Strange and Sacred Noise Adams finds the musical substance in which to let the natural phenomena express themselves. We might say that “sonic geometry” is the “sounding” of the normally unheard fractals and waves rather than their “representation.” The composer’s choices are less subjective than in representation. His hand is primarily felt only when he establishes the musical template at the beginning of each movement, when he connects musical processes, and at times when he feels compelled to steer away from a problem of performance execution. Adams writes, “Although I feel free to break the symmetry at any time, I try to do so primarily in response to the physical characteristics of the instruments, or to practical realities of performance and notation, rather than to my own ideas of what should happen next.”

From the beginning of this dissertation, we have seen how Adams has continually looked for ways to remove his hand from the act of composition. To create songbirdsongs, he listened to both the songs of the birds and the implied rules with which they sang them, leaving a score that is merely a guideline for performers. In both Earth and the Great Weather and In the White Silence, he established algorithmic processes which played themselves out with little need for intervention. “If the next sound is inevitable, then it is free to stand only for itself,” he writes.

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27 Ibid, 132-133. Adams compares his acts of breaking the symmetry in his music with the “crippled symmetry” that Morton Feldman found in his own works and what Barnett Newman called “busting the geometry” in his paintings.
“Without the expectations of narrative development or ‘the element of surprise,’ both the composer and listener are free simply to listen to the music.”\textsuperscript{28} Still, though, these processes were in service – at least in part – of a representation. Adams was attempting to convey meaning to the listener.

With \textit{Strange and Sacred Noise} Adams further redefines his role as composer. He gradually becomes more of an intermediary between preexisting natural phenomena—fractals and waves—and the listener. As he wrote in \textit{Winter Music}:

Through the discipline of an overall formal symmetry, I hope to move beyond self-expression and the limits of my own imagination to a deeper awareness of the sound itself. . . In \textit{Strange and Sacred Noise} my interest was not in sending messages, but in receiving them. This is not music as communication, but music as communion. At times during the seven years in which I worked on this cycle, I wondered whether this was music at all.\textsuperscript{29}

As Adams removes himself further from the composition, he also withdraws from the listener. He is no longer “sending” or “communicating.” He is instead tuning in to what preexists and transmitting it. By converting unheard physical and visual phenomena into sound through the medium of noise, he is imitating nature in her manner of operation. In the preface to \textit{Strange and Sacred Noise} he expresses a desire that this noise will lead the listener to an “ecstatic experience.” Although like any percussion piece, a live performance is visually exciting, Adams writes, “this is not so much theater as it is ritual—a ceremony in search of a shared experience of transcendence.”\textsuperscript{30} His writing about \textit{Strange and Sacred Noise} resembles his writings about \textit{Clouds of Forgetting, Clouds of Unknowing}, which he hoped would to lead to a “contemplative experience,” one of “voluntary surrender, purposeful immersion in the fullness of a presence far

\textsuperscript{28} Ibid.
\textsuperscript{29} Ibid, 134.
\textsuperscript{30} Ibid, 136.
larger than we are,”\textsuperscript{31} and his writings about \textit{In the White Silence}, for which he reminds us that “music can also be a form of contemplation: the sensual reaching for the spiritual.”\textsuperscript{32} In addition to the long, slow pitch and rhythmic processes in those pieces, here Adams also summons noise as a musical means to a spiritual end.

\begin{quote}
Beyond the usual expressive associations of “musical” sounds, noise touches and moves us in profound ways . . . breaks down the barriers we construct between our selves and our awareness.\textsuperscript{33}
\end{quote}

Whereas in the preface to \textit{In the White Silence}, Adams states that he aspires to music “which is both rigorous in thought and sensuous in sound,” writing about \textit{Strange and Sacred Noise} Adams expresses his wish that his music “have both formal rigor and visceral impact.”\textsuperscript{34}

What remains to be determined is if Adams can achieve formal rigor, sensuousness, and visceral impact all in one piece, or, if not, whether a piece with little visceral impact (\textit{In the White Silence}) or sensuousness (\textit{Strange and Sacred Noise}) can be effective. This, then, is the time to address the listening experience of \textit{Strange and Sacred Noise}.

I typically approach music with emotional listening (among other types of listening). That is, I listen to music as if it were a language, asking myself what the composer and performer(s) are saying. Whether they are actually capable of saying anything concrete is debatable, but usually I perceive something like joy or sadness in the music, and as a result I feel more aware of an emotional presence inside myself.

As I discussed in the chapter on \textit{Earth and the Great Weather}, however, sounds of the natural world elicit a different approach. I do not expect the birds, rain, or wind to tell me anything. As I listen, I again feel more present than before, but I feel present to something other

\begin{footnotes}
\textsuperscript{31} Ibid, 111.
\textsuperscript{32} Adams, \textit{In the White Silence}, preface.
\textsuperscript{33} Ibid, 136.
\textsuperscript{34} Ibid, 134.
\end{footnotes}
than my emotions. I become aware of my surroundings. I become aware of those entities making
the sound. I am aware of myself being present and listening. I am in touch with my evolutionary
roots. I am aware of the sound without attaching meaning to it. I may have an emotional
response, but it does not come because the birds were trying to express something to me. Often I
feel an inner quiet.

If listeners approach Strange and Sacred Noise with emotional listening, they will likely
be disappointed. There are no markers of expression that would lead them to feel one thing or
another. There is nothing one might typically call “melody.” The few harmonies that are present
either seem fortuitous (as in “triadic iteration lattices”) or are repeated and altered
mechanistically (as in “clusters on a quadrilateral grid”). There is no sense of the performers
bending rhythms, timbres, or articulation for expressive effect. Moreover, unlike In the White
Silence or Earth and the Great Weather—two other “algorithmic” pieces—listeners cannot lose
themselves in warm, sensuous harmonies.35 This is not to say that there cannot be an emotional
reaction to Strange and Sacred Noise, only that it is provoked by something other than the
composer’s “expression.” In this respect the experience of listening to it is like listening to
sounds of the natural world.

In Strange and Sacred Noise there are no obvious associative elements in the music itself
as there were in songbirdsongs and Earth and the Great Weather. There are no connotations,
integrated texts or recorded sounds. Program notes—even just a picture of the relevant fractals—
could cue listeners into a semantic meaning to the music. But there is a distinction between what
a semantic cue does in this piece and what it does in any of the previous pieces analyzed. A title
such as “Pointed Mountains Scattered All Around” from Earth and the Great Weather tells the

35 With the possible exception of parts of “clusters on a quadrilateral grid.”
listener to interpret the sounds as representative of mountains (or a journey over mountains, or the scattering of light off of mountains, etc.). There might be other titles or semantic cues that could lead to interpretations of the music as representative of something entirely different. There is nothing in that music that demands that it be heard as mountains.

Seeing a picture of the Cantor set, however, cues listeners into something that is actually happening in the first and last movements of Strange and Sacred Noise, not an external reference. Because the music of these movements “sounds” this set, the listener cued by the title may better hear the division of the music into sets of threes at multiple levels.

The music, moreover, does not require listeners to make a semantic connection. The movements of Strange and Sacred Noise are not intended to “evoke” waves and fractals. They are intended to be experienced as new sound worlds, informed by the natural phenomena. As Adams writes in the preface, “Each piece in the cycle is conceived as its own distinct and separate sound world, evoking the immediacy and presence of a place.”

Reasonably keen listeners can certainly hear quite a lot of what is happening in the music without cues. What they will experience is not very different from what one experiences listening to sounds of the natural world:

**A journey of timbres.** Each movement contrasts starkly in timbre with its predecessor, as a quick glance at Table 5-1 reveals. In addition, “clusters” contains three very different timbres in its first three sections. When the snare drums return for “..and dust rising…”, there is a true sense of a journey through sounds.

**A journey of rhythms.** The first and last movements create clear groups of threes, and the speed and repetition with which they occur makes them audible, even if they are blurred somewhat by the canon of the parts. The tripartite divisions in “clusters on a quadrilateral grid,” which is also
based on the Cantor set, are more difficult to hear due to the slower tempo and the length of the piece. The rhythm of the pitch and dynamic waves in the second, third, and fourth movements is exciting, even if the sense of meter is quite weak.

**Waves of intensity.** Every movement has a clear and individual arc of intensity. Sometimes within movements there are smaller arcs. Some of the peaks are exciting and fearsome.

- “…dust into dust” starts loudly and intensely, drops to a whisper, builds back up to a climax, and then just begins to taper at the end.
- “solitary and time-breaking waves” starts from nothing, builds to a terrific climax, and then drops again to nothing. Within the larger arc there are many smaller arcs.
- “velocities crossing in phase-space” is the opposite of its predecessor. It starts loudly and quickly, drops to a hush, and then builds back to a climax, with many smaller waves in the middle.
- “triadic iteration lattices” starts quietly, builds to a climactic middle section, drops back somewhat, and then builds to a final climax before dropping back to nothing at the end.
- “clusters on a quadrilateral grid” has a high-level wave of volume and pitch that builds to the orchestral bells halfway through the piece and then fades again. Meanwhile, within each section there are lower-level waves of rhythmic intensity.
- “…and dust rising” starts from nothing and builds to a climax.

**Sonic geometry.** This is Adams’s term, but I can think of nothing better to describe the lines that I see converging and diverging when I listen to “triadic iteration lattices,” the panels of colors that I see alternating in “clusters on a quadrilateral grid,” or the positive and negative space that I see in the Cantor set movements.
When it is all over, I understand what Adams means when he writes in the preface that “each piece in the cycle is conceived as its own distinct and separate sound world, evoking the immediacy and presence of a place.” Each piece does have its own timbre, rhythm, arc, and rules. Was my experience “transcendent?” Probably not. Do I feel that my relationship with the natural world has been reimagined or recreated? Certainly not, if by “natural world” one means trees, rivers, or Arctic landscapes. But the piece does shake up my expectations of a piece of music. It helps me walk around in interesting timbral, rhythmic, and structural worlds. I experience through sound certain patterns of the world as “natural” as birds and trees. And perhaps that experience opens me up to be more aware of the planet and its other inhabitants. That, at least, seems to be what Adams hopes.
CHAPTER 6. THE PLACE WHERE YOU GO TO LISTEN: MUSIC AS SONIFICATION

Introduction

By the late 1990s the idea of setting a “place” to music had occupied Adams for two decades, but the means of realizing that concept was ever changing. In his early years, he had evoked places by “translating” birdsongs into songbirdsongs. Later, guided by the concept of “sonic geography,” he sought to evoke a place more comprehensively. In *Earth and the Great Weather* he had incorporated the sounds of the natural world through recordings, pitch material derived from Aeolian harps, and musical imitations of seagulls, rivers, calving glaciers, and storms. He also found sonic equivalents for visual elements in the landscape (as, for example, in the movement “Pointed Mountains Scattered All Around”), and he included the people of the place through the use of Inuit names and drumming patterns.

In the pieces written in the late 1990s, Adams moved away from incorporating the sounds of a place directly. *In the White Silence* and *Strange and Sacred Noise* were two different attempts at abstracting the idea of “place.” In *In the White Silence*, Adams, instead of re-creating the sound of a specific place, used slowly unfolding musical processes to convey the shifting colors of northern light and the feeling of being in an Arctic place. In *Strange and Sacred Noise*, each movement shapes noise (as produced by percussion instruments) using fractal and wave patterns. In both *In the White Silence* and *Strange and Sacred Noise* Adams no longer conceived of each piece as the means of conveying a place but rather as a musical “place” itself. Looking at
this progression, one senses Adams trying to downplay his own subjective experiences of place and seeking to reflect the natural world more objectively.

Early in 1998 *Strange and Sacred Noise* was premiered by Percussion Group Cincinnati. In the fall, Adams started a two-year guest residency at the Oberlin Conservatory, where, in November, *In the White Silence* had its premiere. It was on one of his flights between Alaska and Ohio late that year that Adams had the first moment of inspiration for *The Place Where You Go to Listen*.\(^1\) Adams described the experience to Alex Ross of *The New Yorker*:

> As we crested the central peaks of the Alaska Range, I looked down at Mt. Hayes, and all at once I was overcome by the intense love that I have for this place—an almost erotic feeling about those mountains. Over the next fifteen minutes, I found myself furiously sketching, and when I came up for air I realized, There it is. I knew that I wanted to hear the unheard, that I wanted to somehow transpose the music that is just beyond the reach of our ears into audible vibrations. I knew that it had to be its own space. And I knew that it had to be real—that I couldn’t fake this, that nothing could be recorded. It had to have the ring of truth. Actually, my original conception for ‘The Place’ was truly grandiose. I thought that it might be a piece that could be realized at any location on the earth, and that each location would have its unique sonic signature. That idea—tuning the whole world—stayed with me for a long time. But at some point I realized that I was tuning it so that *this* place, this room, on this hill, looking out over the Alaska Range, was the sweetest-sounding spot on earth.\(^2\)

*The Place Where You Go to Listen* both originates in and breaks from Adams’s earlier works. Like *Earth and the Great Weather*, it is a piece of “sonic geography” deeply connected with Alaska, but in *The Place* Adams uses a new means of connecting his music to the place: “sonification,” which he defines as “the process of mapping data with *some other meaning* into

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\(^1\) Adams has created four works with the same name. “The Place Where You Go to Listen” is the first movement of *Earth and the Great Weather*, as well as a story that Adams wrote while composing that work. *The Place Where You Go to Listen* (often abbreviated to *The Place*) is the installation that is the subject of this chapter, as well as a book that Adams wrote about it.

sound.”³ As in *Earth and the Great Weather*, *In the White Silence*, and *Strange and Sacred Noise*, Adams sets a series of musical cycles in motion, but through computer technology he allows a place itself, not human performers, to complete the cycles in real time.⁴ As in *Strange and Sacred Noise*, he uses noise to sound unheard natural phenomena, but in *The Place* he shapes the noise into tone, and the phenomena that he sounds are real-time geophysical processes of a particular place rather than generalized waves or fractals.

As was explained in the chapter on *Earth and the Great Weather*, “The Place Where You Go to Listen” is a translation of “Naalagiagvik,” the Iñupiaq name for a place on the Arctic Ocean outside of the village of Kaktovik. According to Inuit legend, an old woman would go to Naalagiagvik to listen to and understand the language of the winds, waves, and animals. *The Place Where You Go to Listen* comes out of Adams’s experience of listening to the Arctic for thirty years.

**The Installation⁵**

*The Place* is a permanent, self-enclosed sound and light installation in the Museum of the North in Fairbanks, Alaska. The Museum is a large, white, and attractively shaped building situated on the grounds of the University of Alaska-Fairbanks. From south-facing windows in the museum, one can look out over the Tanana River Valley to the Alaska Range, home of Denali

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³ John Luther Adams, *The Place Where You Go to Listen* (Middletown, CT: Wesleyan University Press, 2009), 113. See below for more on the definition of sonification.

⁴ Numerous people helped Adams in the technical implementation of *The Place*, most notably programmer Jim Altieri, seismologists Roger Hansen and Josh Stachnik, and physicists Dirk Lummerzheim, John Olson, Debi-Lee Wilkinson, and Curt Szuberla.

⁵ Adams has explained *The Place Where You Go to Listen* in some technical detail in his book, *The Place Where You Go to Listen*. The following explanation attempts to simplify certain aspects and clarify others.
National Park and Mount McKinley. The Place itself is a south-facing room situated on the second floor of the museum.

The entrance to The Place is very discreet—a white door in a white wall. On the wall is a small label that simply says “The Place Where You Go to Listen.” Once one passes through the white door, one enters a dark antechamber, which serves to insulate The Place from the sounds of the rest of the museum and to prepare listeners for what they are about to experience. The following text is printed on a backlit panel in the antechamber:

**The Place Where You Go to Listen**

We are immersed in music.

The earth beneath us, the air around us, and the sky above us are filled with vibrations. Most of these vibrations are beyond the reach of our ears.

In this room you will hear some of this music.

You will hear no familiar musical instruments or sounds of nature. Yet every sound you hear is connected directly to the natural world, here and now.

The atmosphere of sound and light changes with the movements of the sun, the rhythms of day and night. Daylight sings like a choir of bright voices. Its colors are yellow, orange, and red. The voices of night are darker. Its colors are violet, blue and cyan.

The moon rises and falls, appears and disappears, like a solo voice.

When the aurora borealis is active (even if hidden by daylight or clouds) bell-like sounds float across the ceiling.

When the earth quakes (even imperceptibly) the walls and the floor shudder and rumble like deep drums.

This music has no beginning, middle, or end. Even in moments of apparent stillness, it is always changing. But it changes at the tempo of nature. To experience its full range requires listening in day and night, winter and summer.

This is an ecosystem of sound and light that resonates with the larger world around it. When no one is here, the forces of nature continue to reverberate within this space.

But the awareness of the listener brings it to life.

*The Place Where You Go to Listen* is not complete until you are present and listening.

*The Place* itself is approximately rectangular with dimensions of 10 feet along the east and west walls and 20 feet along the north and south walls. One enters it on the west side of the room. The south wall contains five contiguous glass panels coated in multiple layers of white vinyl, which are illuminated by fiber optics mounted above and below. The only object in the
room is a single bench for visitors (Figure 6.1). Hidden in the walls and ceiling of the room are twelve main speakers, three each in the south wall, north wall, south ceiling, and north ceiling. In the east and west walls are two sub-woofers.

![Image of The Place Where You Go to Listen]

Figure 6.1. *The Place Where You Go to Listen*. Five of the twelve speakers in *The Place* are visible. Photo © by Alex Ross.

**Sound Fields**

The music of *The Place* consists of four uniquely tuned electronic sound fields (Table 6-1). Each sound field is connected to one or several natural processes that characterize the geophysical environment in Fairbanks. The “Day and Night Choirs” in *The Place* are connected to the position of the sun relative to the horizon, as well as cloud cover and visibility in Fairbanks. The “Voice of the Moon” is related to the phase of the moon and its position relative to the horizon in Fairbanks. The “Aurora Bells” are connected to the *aurora borealis* through changes in the Earth’s magnetosphere measured at five locations throughout Alaska. The “Earth Drums” are elicited by seismic activity measured at five other stations throughout Alaska.
<table>
<thead>
<tr>
<th>Sound Field</th>
<th>Pitch Universe and Tuning</th>
<th>Sounded Frequency</th>
<th>Sounded Bandwidth</th>
<th>Sounded Amplitude</th>
<th>Location in the Room</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day Choir / Night Choir</strong></td>
<td>Day Choir: a seven-octave series of equal-tempered harmonics based on a fundamental of 24.27 Hz. Night Choir: a six-octave series of equal-tempered sub-harmonics based on a fundamental of 1553.28 Hz.</td>
<td>Determined by a noise sweep that acts as an aural window on the choirs. It varies with the position of the sun above or below the horizon. As the sun’s position ranges from minus 48.6° to 48.6° over the course of half of a year, the bottom frequency of the noise sweep moves between 24.27 and 426.54 Hz.</td>
<td>Determined by cloud cover and visibility. The lower the cloud cover, the wider the noise sweep (varying from 2400 cents to 4800 cents above the bottom frequency for the primary sweep, and from 1200 to 2400 cents for the secondary sweep). The greater the visibility of the sky over Fairbanks, the narrower the bandwidths of the individual tones of the choirs. (varying from 40 cents to 60 cents for the primary sweep, and from 1 cent to 20 cents for the secondary sweep).</td>
<td>Determined by the position of the sun above or below the horizon. The higher the sun, the higher the amplitude of the Day Choir, though the amplitude of the Night Choir is rolled off in midsummer. The lower the sun, the higher the amplitude of the Night Choir.</td>
<td>Day Choir is centered on the current location of the sun. Night Choir is centered 180 degrees opposite from the Day Choir.</td>
</tr>
<tr>
<td><strong>Voice of the Moon</strong></td>
<td>A continuous narrow band of floating noise.</td>
<td>Determined by the position of the moon above or below the horizon. As the moon’s position varies from minus 53.6° to 53.6° over the course of half of a year, the bottom frequency of the noise sweep moves between 20.9 Hz and 493.5 Hz.</td>
<td>Determined by the phase of the moon, from 0 cents above the bottom frequency at the New Moon to 408 cents above at the Full Moon (a Major 3rd).</td>
<td>Determined by the position of the moon above or below the horizon. The amplitude is 0 dB at the zenith and the nadir but 6 dB at the horizon, which creates the perception of equal loudness when the moon is above horizon.</td>
<td>Centered on the current location of the moon.</td>
</tr>
<tr>
<td><strong>Aurora Bells</strong></td>
<td>Five sets of bells, each containing seven prime number harmonics (or their octave transpositions) of a fundamental frequency of 101.73 Hz.</td>
<td>Each set of bells is associated with a station and triggered by a noise sweep whose frequency range is determined by the position of a typical aurora borealis over the station, as seen from The Place. Bells range from 165.31 - 305.19 Hz for auroras at the Kaktovik station to 5289.96 - 6307.26 Hz for an aurora directly above The Place.</td>
<td>The greater the variation in magnetometer data from a running average, the narrower the bandwidth.</td>
<td>The greater the variation in magnetometer data from a running average, the greater the amplitude. Amplitude is generally reduced with distance from The Place.</td>
<td>Centered on the location of the geomagnetic fluctuation.</td>
</tr>
<tr>
<td><strong>Earth Drums</strong></td>
<td>Fluctuate within a continuous band of noise between 24.27 and 48.42 Hz.</td>
<td>Always centered at 34.28 Hz, but the precise pitches are determined by the vertical component of seismic waves that are detected.</td>
<td>Determined by proximity of seismic activity to The Place. Seismic activity at The Place has a range of 1200 cents, whereas activity 350 km away has a range of 0 cents.</td>
<td>Determined by proximity to The Place. Seismic activity from the closest station are heard at 0 dB, whereas data from the farthest station are heard at minus 6 dB.</td>
<td>Localized only on the west-east axis.</td>
</tr>
</tbody>
</table>

Table 6-1. Parameters of each of the sound fields in *The Place Where You Go to Listen.*
In *The Place*, the generation of each sound field begins as a stream of pink noise synthesized by means of a random number generator. The noise stream is sent through a bank of band-pass filters that allow only sounds within a uniquely tuned pitch universe to pass through. The geophysical processes to which the sound field is connected then determine which notes within a sound field’s pitch universe are heard at any one time. This generative sequence can be shown as follows:

- **band-pass filters**
- **noise** → **pitch universe** → **geophysical processes** → **sound field**

More detailed descriptions of the sound fields are contained in Table 6-1 and in the paragraphs that follow.

**Day Choir, Night Choir**

Daylight in Fairbanks varies dramatically over the course of the year, from three hours at the winter solstice to twenty-two hours at the summer solstice. The primary sound field of *The Place* uses changes in the sun’s position on the horizon to sound two choirs of pitches, each tuned in twelve-tone equal temperament. The pitches of the “Day Choir” are tuned to a harmonic series, and the pitches of the “Night Choir” are tuned to a sub-harmonic (inverted harmonic) series, as shown in Figure 6.2. This gives the Day Choir a major triad spread between its bottom three and a half octaves, while the Night Choir has a minor triad spread over its top two and a half octaves.

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6 Sound engineers speak of different colors of noise, depending on their frequency spectra. “White noise” has equal amounts of all frequencies. Because each higher octave contains twice as many frequencies as the octave below it, noise power rises with frequency. In “pink noise,” each higher octave is attenuated by 3 dB, giving each octave an equal amount of noise power. Thus, pink noise is perceived as equal in loudness throughout the audible range.
Adams derived the thirty-six pitches of the Day Choir as follows:

- The Earth rotates on its axis at the rate of one cycle per day, or one cycle per 86,400 seconds. This makes a fundamental Earth frequency of $\frac{1}{86,400}$ Hz.

- Since this frequency is inaudible, it is transposed by as many octaves as are necessary to put it into the range of human hearing (which is estimated to be 20-20,000 Hz). Transposing up twenty-one octaves yields the pitch 24.27 Hz (a sounding “G”). This becomes the lowest frequency of the Day Choir and The Place.

- Counting 24.27 as the first harmonic, the remaining frequencies of the Day Choir include harmonics 2-12 and 14-15 in the first four octaves within which they appear. The seven
tones of the fourth octave are repeated for the next three octaves to produce a thirty-six-toned “choir.”

Adams derived the twenty-nine pitches of the Night Choir as follows:

- Counting G at 1553 Hz as the “fundamental,” the choir includes the sub-harmonics 2-12 and 14 -15 in the octaves in which they appear. The seven tones of the fourth octave are repeated for the next two octaves down.

Adams chose to omit harmonic 13 from both choirs because he felt it clouded the sound excessively.\(^7\)

Which notes within these choirs are sounded at any moment is determined by the position of the sun above or below the horizon. A program called SunAngles, created by Curt Szuberla, tracks the movement of the sun and in turn controls the position of a sweep of pink noise. As the sun moves higher on the horizon over the course of a day or year, the sweep moves higher as well. The one sweep acts like a moving window frame on the two choirs.

The sun’s position at any given latitude at a specific time of day rises and falls by approximately 47 degrees over the course of a year. Adams decided to make a height change of 47 degrees correspond to a frequency change of two octaves (2400 cents) in the bottom frequency of the noise sweep. Dividing 2400 cents by 47 degrees reveals that the bottom of the noise sweep changes by approximately 51.06 cents/degree of sun position.\(^8\)

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\(^7\) Adams, conversation with the author, December 5, 2010.

\(^8\) Furthermore, one can calculate the daily change in the bottom frequency as follows: 94 degrees / 365 days = .26 degrees change in the sun’s position per day (at the same time of day).

51.06 cents/degree x .26 degrees/day = 13.26 cents/day (at the same time of day).
In addition, the movement of the sun controls the relative loudness of these two choirs in two ways. First, as is shown in Table 6-2, Adams directly controls the amplitude of the center of each choir. The Night Choir is loudest each day at midnight and softest each day at noon. The Day Choir is loudest each day at noon and softest at midnight, although at midday during the summer months the upper octaves of the Day Choir are attenuated to soften the brightness of the sound. The two choirs are equally present at sunrise and sunset. Second, the choirs are constructed with a concentration of tones at the top of the Day Choir and at the bottom of the Night Choir. This concentration serves to thicken each choir when it is at its loudest.

Other geophysical processes modify the Day and Night Choirs. Cloud cover determines the bandwidth of the noise sweep, which ranges from 2400 cents (two octaves) under the cloudiest skies to 4800 cents (four octaves) above the fundamental on the clearest days. Additionally, the visibility of the sky over Fairbanks determines the bandwidths of the individual tones in the Day and Night Choirs, which range from 40 cents in unlimited visibility to 60 cents in zero visibility. Thus, when the sky over Fairbanks is clear, the choirs are wide-ranging sonorities of clear tones, and on overcast and foggy days the choirs are narrower and murkier.

<table>
<thead>
<tr>
<th></th>
<th>WS 12am</th>
<th>WS Sunrise (10:58 am)</th>
<th>WS 12pm</th>
<th>WS Sunset (2:40 pm)</th>
<th>SS 12am</th>
<th>SS Sunrise (2:58 am)</th>
<th>SS 12pm</th>
<th>SS Sunset (12:48 am)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>-12 dB</td>
<td>-6 dB</td>
<td>0 dB</td>
<td>-6 dB</td>
<td>0 dB</td>
<td>-6 dB</td>
<td>-3 dB</td>
<td>-6 dB</td>
</tr>
<tr>
<td>Night</td>
<td>0 dB</td>
<td>-6 dB</td>
<td>0 dB</td>
<td>-6 dB</td>
<td>0 dB</td>
<td>-6 dB</td>
<td>-12 dB</td>
<td>-6 dB</td>
</tr>
</tbody>
</table>

Table 6-2. Relative amplitude of the center of the Day and Night Choirs at selected times of the year. The amplitude of the center of both choirs is -6 dB at any sunrise or sunset. WS: winter solstice. SS: Summer solstice. Adams, *The Place Where You Go to Listen*, 123.
The Place obtains its data on cloud cover and visibility over Fairbanks from the National Oceanic and Atmospheric Administration website, which is updated hourly.  

Finally, a secondary sweep of noise follows the same sun position-to-frequency relationship as the primary noise sweep. Although it has the same fundamental frequencies as the primary noise sweep at any time, the bandwidth of the sweep is half the width of the bandwidth of the primary sweep, and the bandwidth of the individual tones ranges from only 1 cent to 20 cents. This serves to add depth to the sound, evoking a kind of choir of human voices nested within the larger choirs.  

Because the Day and Night Choirs form both the most present and probably the most complex of the sound fields in The Place, it might be useful to form a clear picture of the sound at certain times of the year while looking at Table 6-2. At midnight on the winter solstice, the bottom frequency of the noise sweep will be 24.27 Hz, or G0 (just below the lowest note on most modern keyboards. If the night is clear, the sound field will extend four octaves above that to G4. Since it is night, the Night Choir will be louder. At the top of the Night Choir we will hear a C minor triad. Below that we will hear an increasingly murky (chromatic) clump of sub-harmonics. The Day Choir will add stress to the notes of a G Major triad in the lowest octaves and will somewhat muddy the C minor triad in the highest octave.  

In contrast, at noon on the summer solstice, the bottom frequency of the noise sweep will be 426.54, which will make the lowest pitch in the Day Choir A4 (“A 440”). On a clear day, the Day Choir will extend quite densely for three octaves to A7, though it will taper in volume in the uppermost octaves. The Night Choir will consist of a few disparate and likely inaudible tones.

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Voice of the Moon

The position of the moon above or below the horizon varies from minus 53.6 to 53.6 degrees over the course of the year in Fairbanks. The program MoonAngles tracks this movement and in turn controls the frequency of a continuous narrow band of pink noise that follows the same pitch-to-height relationship as the Day and Night Choirs (i.e., 51.06 cents/degree). This band of noise is the Voice of the Moon in The Place. Since the moon goes slightly lower on the horizon than the sun, the lowest pitch of the moon sweep is approximately 20.9 Hz, and the highest bottom frequency of the moon sweep is 493.5 Hz.\(^{10}\)

The program MoonPhases\(^ {11}\) tracks the phase of the moon, which is used to determine the bandwidth of the Voice of the Moon. The bandwidth varies from 0 cents above the bottom of the noise sweep at a new moon (i.e., silence) to 408 cents above the bottom at the full moon (a major 3\(^{rd}\)).

Perception of loudness tends to increase with pitch. In order to create the perception of equal loudness throughout the range of the moon above the horizon, Adams therefore tapers the amplitude of the Voice of the Moon from 6 dB at the horizon to 0 dB at the moon’s zenith.

Aurora Bells

Because the *aurora borealis* (“northern lights”) is only present over the highest three to six degrees of latitude on the Earth, Alaska is the best place in the United States to experience it. The source of this phenomenon is the collision of charged particles from the solar wind with the Earth’s magnetosphere. When this collision occurs, the charged particles are guided towards the

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\(^{10}\) Calculated using data provided by Adams (*The Place Where You Go to Listen*, 126) and a frequency-cents calculator. See Carl Nave, “Cents,” Georgia State University http://hyperphysics.phy-astr.gsu.edu/hbase/Music/cents.html (accessed November 1, 2014).

\(^{11}\) Szuberla also developed MoonAngles and MoonPhases.
Earth’s north and south magnetic poles. Along the way, they excite particles in the magnetosphere. When these particles return to their resting state, they release photons that cause the appearance of aurora. Therefore, the aurora are incorporated into The Place via magnetometers in five locations in Alaska that record geomagnetic fluctuations along the north-south, east-west, and vertical planes. The magnetometer data from each station trigger a unique set of justly tuned “bells” that are pitched relative to the height in the sky at which geomagnetic activity at that station would be perceived from The Place (given conditions of unlimited visibility and no mountains blocking the view).

Like the Day and Night Choirs, the Aurora Bells consist of fixed choirs of pitches that are activated by moving noise sweeps. There is a noise sweep for each magnetometer station. To determine the ranges of these noise sweeps, Adams started by determining the frequency of the “aural horizon” of The Place. That is, given the association of the sun at its lowest position on the horizon (−48.58°) with the frequency 24.27 Hz, and knowing the pitch-height relationship of 51.06 cents/degree, Adams calculated that the frequency associated with the horizon is 101.73 Hz. Theoretically, this could be the lowest possible pitch of the Aurora Bells. Since the highest frequency possible in the Day Choir is 6825 Hz (achieved on solar noon on summer solstice with a cloudless sky), Adams made this the highest theoretical pitch of the bells, associating it with maximal geomagnetic activity directly over The Place. This frequency range of 6723 Hz over the course of 90 degrees established a pitch-height relationship of 80.9 cents per degree for the Aurora Bell noise sweeps.

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12 The magnetometers are in Kaktovik, Gakona, Fort Yukon, Poker Flat, and at the University of Alaska-Fairbanks.
13 When the sun is at 0 degrees it sounds higher by 48.58 degrees x 51.06 cents/degree = 2480.89 cents. 24.27 Hz plus 2480.89 cents = 101.73 Hz
Adams and his colleagues determined the height in degrees above the horizon of the upper and lower boundaries of a typical aurora occurring at each of the five geomagnetic stations, as seen from Fairbanks. Adams combined this information with the pitch-height relationship of 80.9 cents per degree to determine the frequency range of a noise sweep for each station. The farther each magnetometer station is from The Place, the lower in the sky an aurora would be perceived, and the lower the noise sweep was set. Thus, for example, aurora over Kaktovik, the farthest station, would be seen from Fairbanks between 9.37 and 23.63 degrees above the horizon. Using the 80.9 cents/degree multiplier and adding to the 101.73 Hz horizon, these boundaries correspond to a pitch range of 157.56-306.65 Hz. Aurora directly over The Place, measured at the University of Alaska-Fairbanks (“College” station), are seen between 82.11 and 90 degrees above the horizon. These boundaries correspond to a much higher pitch range of 4704.5 Hz to 6798.9 Hz.

![Figure 6.3](image)

Figure 6.3. Approximate pitches of the harmonic series upon which the Aurora Bells of The Place Where You Go to Listen are based. The fundamental corresponds to the “aural horizon” of The Place. In the middle of the staff are the frequency ranges of the bells for each station.

To determine the pitches of the actual Aurora Bells, Adams determined the first eleven prime-numbered harmonics of the fundamental 101.73 Hz, which are shown in Figure 6.3. He
then selected a unique set of seven of those harmonics for each station. The use of prime-numbered harmonics was important because they generate non-overlapping pitch classes, allowing Adams to generate a different set of seven unique pitch classes for each bell choir. Lastly, he transposed the harmonics assigned to each station so that they were in the range of the noise sweep for that station. The results can be seen in Figure 6.4.

The magnetometer data are monitored for variations from a running average. When geomagnetic activity is low, these data cause the noise sweeps to set off low-amplitude bells throughout the full range of each station. When geomagnetic activity is elevated, these data will cause the noise sweeps to increase in amplitude and narrow in bandwidth to the upper parts of their ranges. Furthermore, the relative amplitude of the bell stations is modulated according to their distance from *The Place*. The College station is given an amplitude of 0 dB, and the Kaktovik station is given an amplitude of -6dB. The closer the geomagnetic activity is to *The Place*, therefore, the higher the frequency of the bells and the greater their amplitude.

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Figure 6.4. The Aurora Bell choirs associated with each of the five magnetometer stations used in *The Place Where You Go to Listen*. The farthest station, Kaktovik, is shown at the top; the closest station, College, is at the bottom. Next to the name of each station is the frequency range of its noise sweep. Below each bell note are its harmonic number and exact frequency. Notated pitches are approximate.
Earth Drums

Alaska is the most seismically active state; the Alaska Earthquake Information Center locates and reports about 22,000 earthquakes each year.\textsuperscript{15} Seismic activity is measured at five locations throughout Alaska and converted into low frequency drum sounds in The Place.\textsuperscript{16} The seismometers at each station measure movements along the north-south (N), east-west (E), and vertical (Z) axes. In converting this data into sound, the N and E components are combined with white noise to produce the drum sounds. The Z component modulates the pitches; the greater the Z component, the greater the pitch fluctuation. The Earth Drums fluctuate between 24.27 Hz (the fundamental frequency of The Place) and 48.42 Hz, centering at 34.28 Hz.

Both the range of pitch fluctuation and the amplitude of the drums are a function of distance from The Place to the seismic activity. The pitch fluctuations vary from one octave (1200 cents) for an earthquake near The Place to no fluctuation for an earthquake 350 km away. In addition, data from the closest station are heard at 0 dB, whereas data from the farthest station are reduced by 6 dB.

Spatial Distribution

Sounds are distributed throughout The Place in relation to where they originate in the world outside. Thus, the center of the Day Choir moves around the room each day in accordance with the movement of the sun. The center of the Night Choir is always 180 degrees opposite of the Day Choir. The center of the moon sweep also moves around the room each day.

\footnotesize
\textsuperscript{16} The seismometers are in Purkeypile, Coldfoot, Paxson, Kantishna, and at the University of Alaska-Fairbanks.
sounds of the Aurora Bells and Earth Drums are localized according to the stations at which they are detected.\footnote{Since the Earth Drums are of such low frequency that they can be heard only through the subwoofers in the east and west walls, they can be localized only along the east-west axis of \textit{The Place}.}

\textit{Visual Display}

The position of the sun above and below the horizon is also expressed visually as fields of color projected onto the glass south wall of the room (through which one would otherwise see the Alaska Range). The “Day Field” is projected from below the glass and the “Night Field” is projected from above (see Figure 6.1). In general, each day the colors of the two fields move from opposite ends of the visual spectrum towards the center of the spectrum and then reverse. As shown in Figure 6.5, when the sun is above the horizon, the hue of the Day Field moves towards yellow. When the sun is below the horizon, it moves towards red. Similarly, the Night Field moves towards cyan when the sun is above the horizon and towards violet when the sun is below the horizon.

Adams tweaks his system slightly, however, because he found that including the green portion of the spectrum turned all the panels brown. Therefore, he omits the green portion of the spectrum, and he wraps the Day Field around towards violet. Thus, over the course of the year, the Day Field moves from yellow through orange, red, and violet to midnight blue. The Night Field moves from cyan to blue to violet.
Analysis

Sonification and The Place

Before discussing The Place as music, I would like to examine The Place briefly from the point of view of sonification. The International Community for Auditory Display defines sonification as “the use of nonspeech audio to convey information.”\(^{18}\) In other words, it is the use of sound to make data more understandable. Gregory Kramer, who edited the report of the first International Conference on Auditory Display, makes a distinction within the realm of auditory display between “audification” and “sonification.” Audification is defined as “a direct translation

of a data waveform to the audible domain for purposes of monitoring and comprehension."\textsuperscript{19}

That is, the data may be frequency-shifted into the audible domain, but there is no need to drive a secondary sound-generation process. In sonification, however, the data are used “to control a sound generator for the purpose of monitoring and analysis of the data.”\textsuperscript{20} The mapping of data to sound may be simple, or there may be several mediating factors. \textit{The Place Where You Go to Listen} is an example of sonification, since between the data generation and the ultimate product is a sound generation structure consisting of pink noise and bandwidth filters.

Figure 6.6. Schematic of an auditory display system.\textsuperscript{21}

Figure 6.6 is Kramer’s schematic of an auditory display system. The system contains three essential parts: an \textit{information generator}, a \textit{communicative medium}, and an \textit{information receiver}. The information generators include both real-time data generators, such as SunAngles and MoonAngles, or previously collected data sets. The communicative medium receives the data, maps it to sound, and generates the sound. In \textit{The Place}, the pink noise generator that


\textsuperscript{20} Ibid.

\textsuperscript{21} Taken from Gregory Kramer, “An Introduction to Auditory Display,” in Kramer, \textit{Auditory Display}, 2.
produces the sound, as well as the bandwidth filters that define the tuning of each sound field, perform this function. Adams has connected the information generators and communicative mediums with a giant Max/MSP patch. Finally, the information receiver is the listener, whose importance Adams stresses on the panel in the antechamber.

Sonification has been used in a variety of different situations for monitoring and exploring data. Some examples include the “beeps” of heart monitors and personal computers, the “clicks” of Geiger counters, and alarms for safety and security. Sonification has been used on aircraft flight decks, at financial trading desks, in computerized games, and in speech output reading aids for the blind.

In describing how sound may represent data in sonification, Kramer makes use of a distinction used by psychologists and computer scientists to describe broad classes of representations. In analogical representations, some of the actual characteristics of the thing represented are captured in the sound. As Kramer says, “The relations in the representation medium are a structural homomorph of the relations in the thing being represented. They are the same sort of structure and admit the same sorts of operations (e.g., movement in a given dimension), but the representation is a simplification of the reality. In this sense, there is a directness about the representation, possibly even a one-to-one relationship between changes in the medium and changes in the thing being represented.”22 An example of analogical representation is the Geiger counter, a machine that detects ionizing radiation and produces a “click” for each particle detected. Kramer suggests that the “spatial aspect of two-dimensional maps” is another example: greater distance in reality directly translates into greater distance on the map.

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In symbolic representations, there is “a relationship between information conveying elements that does not reflect intrinsic relationships between elements of what is being represented.” Words are symbolic representations; there is no direct relationship between the sound or spelling of a word and its meaning. Alarms that are triggered by critical levels of smoke or carbon monoxide, “denotative circles and triangles on a road map, and the sound signatures and graphic logos employed by businesses” are other examples.

*The Place Where You Go to Listen* uses, for the most part, analogical representations of the natural world, although the relationship is not always one-to-one. For example, as the sun moves higher on the horizon in Fairbanks, it leads to a higher position of the noise sweep, but the noise sweep is filtered into Day and Night Choirs before the data is sonified. Likewise, there is a direct correspondence between geomagnetic activity picked up at any of the five research stations used by *The Place* and the amplitude of the Aurora Bells for that station, although relative amplitude between stations is modified based on distance from *The Place*.

The translation of cloud cover and visibility into bandwidth of the noise sweep and of the individual tones of the Day and Night Choirs follows a fairly one-to-one relationship. The spatial position of most of the sounds in the room also changes in direct relation to the location of the geophysical forces that they represent. The sound of the Day Choir traverses the room each day; each degree change in the position of the sun on the horizon translates into a degree change in the position of the center of the Day Choir. The Voice of the Moon also traverses the space in alignment with the actual moon. Each of the five Aurora Bell choirs sound in the room where the corresponding aurora would be seen from *The Place*. (The location of the Earth Drums also changes with the location of the seismic activity to which they are mapped, but since the drums

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24 Ibid.
only sound out of the sub-woofers in the east and west walls, this relationship is not strictly one-to-one).

Another way to understand how *The Place* delivers information is through linguistic analogies. In a paper entitled “Delivery of Information Through Sound,” James Ballas argues that sound delivers information in auditory displays as exclamation, deixis, simile, metaphor, and onomatopoeia. In this framework one would say that the Day and Night Choir and the Voice of the Moon use simile. That is, change in the pitch of the noise sweeps is *likened* to change in the position of the sun or moon on the horizon. In a manner similar to *Earth and the Great Weather*, Adams uses a very common—but not necessarily “natural”—visual/aural relationship, associating sound frequency with vertical placement of the sun or moon.

In fact, as the sun ascends, listeners will hear an upward shift in both the frequency range and the “brightness” (the concentration of frequencies towards the upper end of a range) of the sound field. That is because the noise sweep will move upwards and the Day Choir, which is more concentrated in the upper registers, will increase in amplitude. As was discussed in chapter 1, although “brighter light⇒brighter sound” may seem like an intrinsic relationship, this, too, is a learned association, which has turned “bright” into a “synaesthetic adjective.”

The Aurora Bells use simile, too, since an increase in the apparent height of a detected aurora causes a higher-pitched set of bells to sound. They also use exclamation, since they are triggered by changes in the data from a running average and function to grab one’s attention at moments of unusual activity. The Earth Drums similarly use exclamation, but they also use

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26 In chapter 1 I described the association of physical height and pitch frequency, as well as the use of synaesthetic adjectives as examples of metaphor in music. The difference between simile and metaphor in this context seems slight.
onomatopoeia, since they indicate an event by “imitating the sound that is typically caused by the occurrence of the event.”

**The Place and other pieces**

Adams is not the first composer to have sought to sound the Earth or some part of it. Gustav Mahler’s Third Symphony is an orchestral piece with earthly and cosmological inspiration. At least two more recent works have been attempts to bring sonification into music. Sound artists Jana Winderen and Richard Lerman have worked to “sound” different natural and urban environments. Perhaps the simplest and oldest device to sound natural forces is the Aeolian harp, which has converted the wind into music since antiquity. Because Adams advocates re-creating and re-imagining our relationship with the natural world, I briefly compare it below with some of these other pieces, programs, and instruments. From this comparison, I hope we can better understand what is unique about the vision and execution of *The Place*.

Mahler wrote of his Third Symphony as “the world, nature as a whole, which is, as it were, awakened out of unfathomable silence, to ring and resound.” Mahler was convinced that in composing this symphony he was channeling something in the universe. To his lover at the time of its composition, the soprano Anna von Mildenburg, he wrote, “Just try to imagine such a major work, literally reflecting the whole world—one is oneself only, as it were, an instrument played by the whole universe.”

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27 Ballas, “Delivery of Information,” 86.
29 Mahler to Anna von Mildenburg, July 18, 1896, in Selected Letters, 190.
Mahler’s descriptions are similar to Adams’s description of *The Place* as “a self-contained sound world in which the audible becomes inaudible.”30 Whereas *The Place* collects data streams from geophysical processes and converts them into sound, however, Mahler creates stories about the natural world in his imagination, and he tries to tell them using sounds with strong connotations. For example, in a program note for the 1897 Berlin premiere of the third movement, “What the Animals of the Forest Tell Me,” Mahler wrote that the movement illustrates “the quiet, undisturbed life of the forest before the appearance of man. Then the animals catch sight of the first human being and, although he walks calmly past them, the terrified [animals] sense that future trouble will come from him.”31 His principal musical means of communicating this story is imitation of two sounds: from the natural world, the descending fourth song of a cuckoo, and from the human world, the sound of a post horn.

When Bruno Walter visited Mahler in Steinbach am Attersee in the Austrian Alps in July, 1896, Mahler observed Walter admiring the Höllengebirge mountain. Walter later recorded Mahler’s reaction: “Mahler said: ’No need to look there any more—that’s all been used up and set to music by me,’ and he immediately began to speak of the construction of the first movement, the introduction of which bore the tentative title: *Was mir das Felsgebirg erzählt* [“What the Mountain Tells Me”].”32

To Mahler—and perhaps the Romantic artist in general—the experience of nature can be simulated in a human “re-presentation” of it. To use Adorno’s words, Mahler “relegates nature to raw material.”33 Although his love for the natural world is clear, the symphony and Mahler’s

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30 Adams, *The Place Where You Go to Listen*, 139.
statements about it communicate his belief that a deeper human experience of nature happens internally—fueled by the imagination—than through the senses. Mahler does not sound the universe as much as the universe sounds him.

In contrast, *The Place* does not re-present anything. If Mahler is an instrument, then Adams here is the instrument-maker. Rather than bring us into his own internal world full of recognizable sounds and associations, Adams has created an instrument and music that allows us to broaden our sensual experience of the natural world. Rather than expressing a timeless, human experience, Adams focuses our attention on what is happening in a specific earthly place at a specific time. As can be seen in Figure 6.7, symphonies like Mahler’s Third are ultimately the expression of an internal world, built from representations of sounds, concepts, and stories of the natural world rather than sonic mappings. *The Place* sounds the external world.

![Figure 6.7. Flow of creation in Mahler’s Symphony No. 3.](image)

A closer parallel to *The Place* can be found in attempts to sonify the *musica universalis*—the “music of the spheres” first suggested by the ancient Greek philosopher and mathematician Pythagoras. Having discovered the frequency ratios behind musical intervals, Pythagoras also suggested that the motions of celestial bodies around the Earth followed simple harmonic ratios and thereby produced sound.

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34 See Ives’s *Universe* Symphony for a piece with some resemblance.
In the late sixteenth century the German mathematician and astronomer Johannes Kepler attempted to perceive the “music of the spheres” through mathematical calculations of planetary motions. Kepler, unlike Pythagoras, understood that the planets revolve around the Sun rather than the Earth. In the first of three laws of planetary motion that he discovered beginning in 1609, he stated that planets move in elliptical motion around the sun, which occupies one focus of the ellipse. The point when a planet is farthest away from the sun is called “aphelion.” The point when a planet is closest to the sun is called “perihelion.” Planets move faster at perihelion than at aphelion.

In his book *Harmonices mundi libri* (“The Harmony of the World”), published in 1619, Kepler explains how he located harmonic ratios in the angular velocities of individual planets at aphelion and perihelion. For instance, the relationship of Jupiter’s speed in arc degrees at its aphelion to its speed at perihelion is 5/6, or the same ratio as a minor third. The same calculation for Mars is 2/3, or a perfect 5th. Kepler therefore theorized that each planet’s sound spanned the
interval specified by the ratio of its angular velocity at aphelion to its angular velocity at perihelion (Figure 6.8).

Kepler probably did not believe that the planets actually made sounds, even though he looked for harmonic relations. Nevertheless, in 1983 Willie Ruff and John Rodgers produced a recording entitled “The Harmony of the World: A Realization for the Ear of Johannes Kepler’s Astronomical Data from *Harmonices Mundi* 1619,” which sounds Kepler’s planets according to his specifications. Each planet is assigned a pitch range and register. Like Kepler, Ruff and Rodgers assigned Saturn at aphelion to G, although their G, at 24.5 Hz, is several octaves below the G written by Kepler. The pitch of Saturn at perihelion and each of the other planets at aphelion and perihelion are determined relative to this fundamental. The sound of each of Kepler’s planets is thus an oscillation between two pitches. The planets discovered after Kepler—Uranus, Neptune, and Pluto—are assigned non-pitched beats that vary in rhythmic frequency according to their aphelion/perihelion ratios.

*The Harmony of the World* includes three tracks: one that introduces the different planets one at a time, and two representing all the planets at two thirty-year periods in time: 398 A.D. to 428 A.D. and 2250 A.D. to 2280 A.D. The project speeds up the “true” celestial music approximately 788,400 times, so that it takes twenty minutes to represent thirty years of planetary motion. Since Saturn takes 29.5 years to complete its orbit, this is just enough time for all of Kepler’s planets to complete at least one full revolution. The recording is also in stereo, and the positions of the planets’ sounds in stereo change to accommodate the change in their orbit.

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35 In fact, it is the same G that Adams assigned to be the fundamental of the Day Choir in *The Place Where You Go to Listen*.

36 Similar to *The Harmony of the World* was a project by composer Paul Viotti and
Like *The Place*, *The Harmony of the World* is an electronic sonification of real data. It sounds an unheard natural process—the rotation of the planets around the sun. It is, however, completely programmed and predictable. Every playing of *The Harmony of the World* will sound the same. It does not have the flexibility to incorporate data from the natural world as it is experienced in a specific place in real time. In actuality it is not determined by the present natural world but rather by a set of previously collected data.

In 2013 Daniel Crawford, a cellist and undergraduate at the University of Minnesota, created a composition for cello based on one hundred thirty-three years of global temperature data, obtained from NASA’s Goddard Institute of Space Studies. Each note of the piece sonifies one year’s average temperature from 1880 to 2012. Crawford set the coldest year on record (1909) to the lowest note on the cello (open C), and each semitone above that corresponds to a rise of approximately 0.03 degrees Celsius in temperature. The piece begins on G#2 (104 Hz) and ends on A4 (440 Hz), reaching as high as C5 (523 Hz).

Like *The Harmony of the World*, *A Song for Our Warming Planet* uses a preexisting data series rather than real-time data. The data series, however, is highly relevant to contemporary citizens. The sonification is an analogical representation that uses simile, since there is a near one-to-one correspondence between the increase in global temperatures and the increase in pitch.\(^3^7\)

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\(^3^7\) The correspondence is not one-to-one exactly, since the change in pitch frequency between semitones increases as one ascends a musical scale. That is, the increase in frequency from the lowest note of the cello (C2) to the C# above it is about 4 Hz, but the change in frequency between A4 and the A# above it is about 6 Hz.
Crawford’s work was first featured in the online magazine of the university’s Institute of the Environment, ensia.com, and was later picked up by *The New York Times* and other mainstream publications.\(^{38}\) The video released by Ensia featuring Crawford playing the cello includes a synced graphical representation of the notes, and Crawford has made the score publically available.\(^{39}\)

*An Instrument of Our Warming Planet* might be more politically relevant than *The Place*, and its very short time span (under two minutes) has probably also contributed to its appeal. What it has in brevity, however, it lacks in artistry. There is little redeeming about it aesthetically. Every note of the piece is a quarter note, so there is one rhythm and one timbre from the beginning to the end. The line does follow an interesting trajectory, but it is interesting only in its semantic meaning. The visual display is more of the same—all science and no art. Although Crawford and his mentors at the University hope to reach a larger audience with their creation, *A Song of Our Warming Planet* feels more like a lecture than a piece of music. As part of a scientific presentation, it might make sense. Were it featured on a concert, it would be very out of place.

Apparantly, Crawford has received other musical criticism of the piece. In a subsequent interview he stated, “These critics of the music of the piece...seemed to be sort of missing the

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point that it was a means of getting across scientific data,” Crawford said. “It wasn’t necessarily a creative composition but just really rooted in the processes of nature.”

Soundscapes such as those produced by Jana Winderen and Richard Lerman provide an interesting comparison with *The Place*. Like Adams, Winderen and Lerman often try to sound the unheard, though for them the unheard is “unheard by most humans.” Winderen records underwater soundscapes that only other animals usually hear. Lerman works with piezo (contact) microphones to make audible what cannot be picked up adequately with condenser microphones. Adams, on the other hand, sounds what are normally completely unsounded processes. Moreover, many (though not all) of the soundscapes of Winderen and Lerman are “performed” as playbacks of previously recorded events, rather than as real-time generation from incoming data.

Perhaps *The Place* can be most meaningfully compared with an Aeolian harp. Like *The Place*, these instruments sound unheard processes in the natural world, in a particular place and in real time. What is different is that they lack an intermediary sound-generating step. In *The Place*, a natural process—geomagnetic activity, for instance—is transformed into a stream of data. When this data is elevated over a running average, it causes the noise sweep to set off the Aurora Bells. The function of this intermediate step is to pick up multiple data streams, some from far away, and to allow the sound that each data stream controls to be thoroughly crafted. In an Aeolian instrument, there is a simple process of transduction: the energy of the wind is converted through the instrument into audible vibrations. In other words, an Aeolian harp sounds

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41 See chapter 1.
the natural world but does not sonify it. Aeolian harps are more “pure” instruments of nature, but they are limited in scale to one natural process in one place.

In summary, there are several characteristics of The Place that are not found together in any of the other works or instruments examined here:

- The music of The Place is a sonification of natural data rather than an imagined representation.
- The Place sonifies multiple processes.
- The processes that are sonified are geophysical processes happening in real time.
- The Place can only be experienced in one specific location, and the processes that are sonified are specific to that location.
- In addition to sonifying natural processes, The Place visualizes them. 42
- The Place is not purely a scientific display but is a work of art as well. Its purpose is to allow an aesthetic experience of geophysical processes.

The Place: poiesis

We have examined some of the ways in which The Place conveys information. We have also established that The Place is fundamentally different from many other pieces that attempt to sound the unheard physical world. In understanding how The Place might re-imagine and re-create our relationships with all those with whom we share the planet, I would like to look further into Adams’s aims and process in creating The Place.

42 A thorough analysis of the light installation in The Place is beyond the scope of this paper. Suffice it to say that it bears some similarity to the “skyscape” work of light artist James Turrell. In works such as “Meeting” at P.S. 1 in New York (1986) or the Live Oak Friends Meeting House in Houston (2001), Turrell creates a space that is continually transformed by an opening of natural light. Thus, at any moment both Adams and Turrell’s works are joint creations of the artist and the natural world. Turrell’s work uses natural light, however, whereas in Adams’s work, the position of the sun (a proxy for natural light) controls a fiber optic display.
In a video produced after *The Place*, Adams says he has lost interest in “telling a story” or “painting a picture of a specific place.”^43 He invites the listener, rather, “to pay attention to this miraculous world in which we live.”^44 In his book about *The Place* Adams elaborates on his intentions for the work. He writes that he “conceived *The Place Where You Go to Listen* as a contemplative space for tuning our ears to the unheard resonances of the earth and sky.”^45 He sought to “to transpose the music that is just beyond the reach of our ears into audible vibrations”^46 with “the palpable resonance of the real.”^47 He hopes that *The Place* “may inspire the listener to new perceptions of the larger world in which we live.”^48 Finally, he writes that he wanted to “integrate [his] voice into the larger music of [Interior Alaska].”^49 In other words, Adams sought to connect himself and his listeners to the natural world by expanding their awareness of the world around them.

As has already been mentioned, *The Place Where You Go to Listen* was inspired by (and named after) “Naalagiagvik,” a place on the Arctic coast of Alaska. Adams also found inspiration for *The Place* from the Kaluli people of Papua New Guinea. The Kaluli believe that all the songs of the world are contained in the “noise” of water. When a songmaker wants to create a new song, he will often camp by a waterfall for days until he can hear the sound of his new song emerge from within the water.^50 In both the Native American myth and the Kaluli tradition, individuals hear music from within the “noise” of the world—that is, the unpitched,

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^44 Ibid.


^46 Ibid, xi.

^47 Ibid, 139.

^48 Ibid.

^49 Ibid, 105.

^50 Ibid, 4.
aperiodic sound created without intention to be musical. In *The Place Where You Go to Listen*, Adams carves out his song from noise.

Often composition is conceived as the act of taking raw materials—sounds, notes, themes, rhythms, etc.—and shaping them into a final product. In some of Adams’s earlier works, the raw materials were sounds heard in the natural world: birdsongs, seagull cries, thunderstorms, etc. Adams “translated” and shaped the sounds into the final product. In other works, the raw materials were silent phenomena for which Adams sought a sounding equivalent: mountains, fractals and waves. In converting these phenomena into musical structures, his freedom to shape the final product according to his aesthetic taste was ultimately considerable. In other works, Adams was more like the Creator, as it were, making something out of nothing.

![Figure 6.9. Flow of creation in *The Place Where You Go to Listen*.](image)

In *The Place* Adams plays a much more limited role (Figure 6.9). Instead of translator or creator, Adams is the facilitator (in a transparent, anti-Mahlerian sense) between inaudible processes and listening human beings. He selects natural processes to track, and his colleagues create or employ sensors for those processes, such as the program SunAngles or the magnetometers stationed throughout Alaska. He creates instruments—the different pitch universes associated with each geophysical process—and parameters—the conditions by which
the geophysical processes change each sound field. Ultimately, however, the music stems from a stream of unedited data. Rather than composition, Adams is engaged in sonification. From moment-to-moment *The Place* is largely free of Adams (since he has no immediate control over its sound), performers (since there are none), and even, to a certain extent, its software (since it only prescribes parameters, not outcomes). The final product is a truly joint creation of Adams and the geophysical world. Adams has made an instrument, but the natural world plays it. Adams describes the process of creating *The Place* this way:

> *The Place Where You Go to Listen* is a virtual world that resonates sympathetically with the real world. Creating this parallel world involved making maps, exploring and tuning the sonic terrain…In a sense the data streams constitute numerical maps of the geophysical forces that animate *The Place*. Using these data maps as points of departure, I devised new maps for translating the data into sound. As I listened to the sounds produced by these aural maps, I began to explore the specific features, the detailed topology of the sounding terrain. I then revised my maps to more accurately produce the sounds I heard in my mind’s ear, which, inevitably, were influenced by what I heard in the air. The process of mapping, listening, and re-mapping continued until I felt a particular sound had “the ring of truth,” resonating in a convincing way with the geophysical force from which it was derived. As the voice of each sounding element emerged, it had to be integrated into the larger ecosystem of *The Place*, in a process I came to think of as “tuning the world.”

**The Place as Music**

It is clear that *The Place Where You Go to Listen* is an example of sonification, but is it also music? Where is the line between a Geiger counter and a work of art? A definitive determination of whether *The Place* were music would require a commonly accepted definition of music. Alas, in the entry for “music” in *The New Grove Dictionary of Music*, Bruno Nettl shows that no definition of music is without controversy. Even John Blacking’s commonly used

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51 Ibid, 113. “The Tuning of the World” was the title of R. Murray Schafer’s 1977 book about the history, degradation, and repair of the sonic environment. Schafer in turn got the title from the seventeenth century writer and doctor, Dr. Robert Fludd, who published an illustration with this title in his *Utruisque Cosmi Historia*, in which the Earth forms the body of a monochord, whose string is tuned by a divine hand.
definition of music as “humanly organized sound” implies that human speech is music, and birdsong is not—a consequence with which few people would agree.\textsuperscript{52} Nettl shows that there is not even a single approach to answering the question, “What is music?”

If one consults the Oxford English Dictionary, one finds the following definition of music, which The Place would seem to fit: “Vocal or instrumental sounds put together in melodic, harmonic, or rhythmical combination, as by a composer.”\textsuperscript{53} Although Adams does not have moment-to-moment control over the sounds in The Place, in creating the work, he did determine the range, harmonic filters, and conditions for each sound field. That is, he clearly considered the “putting-together” of the different sound fields as sounds. The Place is as much music in this sense as any indeterminate piece.\textsuperscript{54} The creator of a Geiger counter also puts together sounds, but only as data—not as sounds.

Another approach to understanding “music” is to look at how what is called “music” functions cross-culturally. In The Anthropology of Music, ethnomusicologist Alan Merriam provided ten functions for music found in different cultures.\textsuperscript{55} Merriam did not argue that any one of these is a sine qua non for music, nor did he specify how many of these functions a collection of sounds must fulfill in order to be considered music. I list the functions in Table 6-3,

\begin{table}
\centering
\begin{tabular}{|l|l|}
\hline
Function & Description \\
\hline
1 & \textbf{神圣} \\
2 & \textbf{情感} \\
3 & \textbf{叙事} \\
4 & \textbf{教育} \\
5 & \textbf{游戏} \\
6 & \textbf{仪式} \\
7 & \textbf{社交} \\
8 & \textbf{信仰} \\
9 & \textbf{表达} \\
10 & \textbf{娱乐} \\
\hline
\end{tabular}
\end{table}

\textsuperscript{54} Although I consider The Place to be indeterminate, Adams points out that it is actually quite “determinate,” given its rigid prescription under many conditions (conversation with the author, March 10, 2010).
as well as my judgment on whether they are fulfilled by *The Place*, a Geiger counter, or—for comparison’s sake—Beethoven’s Symphony No. 5.

Some general observations may be made. First, whereas Beethoven’s symphony fulfills more of these functions than does *The Place*, it does not fulfill all of them. Perhaps relatively few pieces do. Second, *The Place* fulfills six out of ten functions, whereas a Geiger counter only fulfills one. Finally, the functions that *The Place* fulfills—such as aesthetic enjoyment, entertainment, and communication—seem relatively central to the purpose of music.

<table>
<thead>
<tr>
<th>Function</th>
<th>Beethoven Symphony No. 5</th>
<th><em>The Place</em></th>
<th>Geiger Counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional expression</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Aesthetic enjoyment</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Entertainment $^{56}$</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Communication</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Symbolic representation</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Physical response $^{57}$</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Enforcing conformity to social norms</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Validation of social institutions and religious rituals</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Contribution to the continuity and stability of culture</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Contribution to the integration of society</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 6-3. Alan Merriam's cross-cultural functions of music.

Given the disagreement on a single standard for “music,” Nettl suggests in *The New Grove Dictionary* that we should speak of multiple “musics,” each with its own standard. In that scenario, perhaps there is an “ecocentric music,” of which *The Place* may be an important example.

$^{56}$ By “entertainment,” Merriam means “enjoyment” rather than “pure entertainment,” the latter existing only in Western cultures.

$^{57}$ By “physical response,” Merriam means outwardly visible responses like dance, not internally felt physical reactions.
As further evidence that *The Place* is a work of art and not only science, one can point to artistic choices that Adams makes, which depart from the processes he establishes. As mentioned, in constructing the Day and Night Choirs, he omitted harmonic 13 because he didn’t like its contribution to the sound. He attenuates the amplitude of the Day Choir at midday in the summer to soften its brightness. In the construction of the color fields, he omitted green from the visual spectrum (since its presence “made the whole thing look like caca”) and tweaked the colors of the Day Field to make them more like the actual colors experienced in Alaska.\(^{58}\) Do these exceptions show that Adams uses natural processes as a resource for his artistic creation only for as long as they are convenient and that *The Place* does not escape an anthropocentric relationship with the natural world? No. In the context of the enormity of *The Place*, it seems more reasonable to view these details as artistically inspired exceptions to their rules, details which make *The Place* more aesthetically attractive. Adams writes:

*The Place* resonates with nature. But this is nature filtered through my ears. For the listener I hope this music sounds and feels natural, as though it comes directly from the earth and the sky. Yet the decisions about the timbres, tunings, harmonies and melodic curves, the dynamics, rhythms, counterpoint and musical textures were mine. Despite my desire to remove myself and invite the listener to occupy the central position, *The Place* is still a musical composition. Although I tried to minimize the evidence of my hand, I remain the composer.\(^{59}\)

*Listening to The Place*

By this point, I hope the reader is wondering, what does *The Place* actually sound like? What is the experience of being there?\(^{60}\) I visited *The Place* on several days and at different

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\(^{58}\) Adams, conversation with the author, June 23, 2011.


\(^{60}\) When I visited *The Place Where You Go to Listen*, it was not possible to hear it except in person. Since then, the Museum of the North has put four very short excerpts of it on its website. http://www.uaf.edu/museum/exhibits/galleries/the-place-where-you-go-to/ (accessed January 20, 2015).
times of day in May, 2010. It was an experience that I would gladly repeat, although as I walked into *The Place*, nothing in the sounds immediately drew me into a “re-imagined” relationship with the natural world. *The Place* contains no instruments that can replicate natural sounds like the piccolos in *songbirdsongs*. There are no recorded sounds as there were in *Earth and the Great Weather*. Unlike *Inuksuit* (the subject of the next chapter), *The Place* is not performed outdoors, where natural sounds of a landscape complement the sonic atmosphere. Unlike *In the White Silence* and *Strange and Sacred Noise*, which also lacked these aural signposts for the natural world, the sounds of *The Place* are not even made from natural materials (i.e. acoustic instruments).

In fact, nothing about the actual sound of *The Place* is natural. It is clearly synthetic, electronic sound. Whereas *The Place* is designed to connect the listener to the natural world, it sounds of machines—the very tool of our domination over the non-human natural world. Adams is aware of this paradox and explains that technology can, in fact, be used for life-affirming purposes:

> It is perhaps ironic that this imaginary world intended to celebrate our connections to the natural world could not have been created without the machine of the computer. . . . In spite of their destructive powers, we can also employ machines as creative instruments, to extend the reach of our senses and engage us with the world in new ways.\(^{61}\)

The truth is that we are accustomed to technology mediating our experience of the natural world. We fly over mountains in airplanes and take in “unnatural” vistas. On television we watch animals we would otherwise never see. We hear recordings of natural sounds in other pieces inspired by the natural world, such as Adams’s *Earth and the Great Weather*. In all of these cases, we are aware not so much of the technology itself as of the beauty and fragility of the natural world.

\(^{61}\) Ibid, 5.
The paradox in *The Place* was therefore not impossible for me to overcome. As soon as I started to do so, I became aware that I had walked into something that was ultimately much greater than myself. Moreover, I noticed the visceral impact of the sounds. They were louder than I had expected (and relentless, unlike the sounds of *Strange and Sacred Noise*). They formed a constant and strong presence coming from all directions in the room. One must either yield to them or leave.

If the visitor decides to stay and listen more, there are at least two ways to approach *The Place* (or any sonification, for that matter): One can try to understand the information in the sounds, or one can listen to the sounds as sounds. That is, one can listen semantically, or one can listen perceptively and analytically. Emotional listening is not an option, although an emotional response to semantic listening or musical perception is certainly possible. Without doubt, my first approach was to try to understand the information. As I listened, I tried to resolve the different sound fields.

The loudest and most constant sound field is the Day and Night Choirs. Together the choirs form one sound block coming from multiple directions. The Aurora Bells and Earth Drums only sounded sporadically when I was there, which made their appearance exciting. One can perceive that the Bells and Drums are spatialized in the room as in the outside world—the drums in two speakers near the floor, and the bells in the ceiling. The similarity of the drum sounds to real earthquakes (i.e., the onomatopoeia of the sound) and the tinkling of the aurora (i.e., the use of a pitch-height metaphor) was sensible to me. Still, the Bells and Drums only caught my attention briefly, after which I returned to the main sound field.

Distinguishing the Voice of the Moon from the Day and Night Choirs is challenging. The only way to do so is to hear that the moon is a continuous band of noise, whereas the Day and
Night Choirs consist of individual (but often densely clumped) tones. To me, it seemed easier to hear the distinction in the evening (when the Day Choir is more muted) than in the day, just as it is easier to see the moon at night.

Only after I had engaged in this sort of “deconstructive” listening and exhausted its possibilities did I start to listen to the sounds as sounds. Soon I noticed that the Day and Night Choirs seemed to vibrate rather than develop. Later I realized that this is a function of several factors in the generation of the sound itself. First, the sound is shaped from noise produced through a random number generator. Whereas electronic sounds produced by synthesis are unnaturally constant, sounds shaped from noise are continually changing in minute ways. Second, the constant flow in the geophysical processes that control the Choirs continually create shifts in the sounds. Third, as mentioned earlier, there are actually two noise sweeps for the Day and Night Choirs with different bandwidths. This creates the impression of choirs within choirs. Fourth, because the Choirs produce very close frequencies, there may be acoustical “beats.”

There may also be two perception-related reasons why the choirs seem to move internally. First, because the choirs move throughout the room with the changing position of the sun, it is possible that different elements in the sound become more or less audible to a listener standing in one position. Second, while the harmony of the Day and Night Choirs is rather static, it is possible that over time the listener’s attention shifts to one part of the sound or another.

As I sat and listened to this steady vibration and constant micro-variation, I was aware of a continual presence. I knew I was encountering something that had already begun and would continue after I left. I was aware that I was only getting a glimpse of long, slowly changing processes. In fifteen minutes in The Place, I could hear all of the sound fields, but I could not hear them cycling. Were I to remain for twenty-four hours in The Place, I would hear a complete
cycle of The Day and Night Choirs and the Voice of the Moon but only part of their ranges; depending on the time of the year and the weather, these daily cycles constantly change.

If I were to stay in The Place uninterrupted for a year, I would experience it through many complete cycles of events. I might get a sense of, in Kyle Gann’s words, “the logic of its nested periodicities.” I might get to know the Day Choir and the Night Choir intimately, by experiencing them in many arrangements. I would hear their subtle play of major and minor, brightness and obscurity. I would hear thirteen full moons, each one sounding a major third. Yet I would still not experience The Place in its entirety. The random number generator, the ever-changing interaction of the Voice of the Moon and the Day and Night Choirs, the modulating role of cloud cover and visibility on the Day and Night Field, and the unpredictability of the Aurora Bells and Earth Drums ensure that I could spend the rest of my life in The Place and continually experience something new.

To create a work of such infinite possibilities, Adams had to reach a new level of peace in his work and his relationship to the planet:

My life’s work has always been haunted by a sense of longing – longing for the natural world as it once was, longing for the human world as it might be. But now my work seems to have led me to a new sense of belonging – longing to experience the magical fullness of each moment just as it is, here and now.

As I listened, I had a brief sense of this “magical fullness of each moment.” I felt the same awe at the processes larger than myself that I feel looking at mountains. Do other listeners experience these emotions, too? What determines the listener’s response, and for whom is this listening experience intended?

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63 Adams, The Place Where You Go to Listen, 100.
Not many people visited *The Place* when I was there. The museum itself was not very busy. Staff members told me that many visitors to the museum come by tour bus, which means that visitors come in waves. Additionally, some visitors may not notice *The Place*. Others may not choose to enter. I observed some people enter and stay only a moment.

It is clear that the timing, duration, and frequency of visits can affect the listener. Certainly, visitors who experience *The Place* on multiple occasions can appreciate more of the installation’s richness than the casual tourist. I noticed the difference in sound between visits at midday and at 8:00 pm.\(^{64}\) I imagine that the residents of Fairbanks who can hear *The Place* at many times and in all seasons can appreciate the piece the most.

Other than timing, I think the following four factors must also greatly impact how the listener creates meaning from the experience of *The Place*:

**Presence and receptiveness.** Certainly, listeners enter with differing degrees of receptiveness to *The Place*, and their willingness to absorb it at its pace and without expectations is a large factor in their experience.

**Ability to listen analytically.** Some degree of pitch and timbre sensitivity is necessary for listeners to discriminate sound fields, variations in pitch, and the vertical and horizontal spatialization of sounds. Such discrimination is a precursor to understanding the relationship between the sounds and the geophysical world.

**Awareness of connotations.** As discussed above, certain elements in *The Place* rely on listeners’ association of sounds with metaphorical meaning, such as the association of high-pitched and brighter sounds with height on the horizon.

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\(^{64}\) The museum is open from 9:00 am to 9:00 pm during the summer.
Prior knowledge about *The Place*. Adams has written a book about the making of *The Place*, and the piece has been discussed in the popular and scholarly press. Near *The Place* within the museum is an area called the “Living Room.” In it are chairs, computers, books, and maps that allow visitors to learn more about the museum’s exhibitions. A CD-ROM about *The Place* offers some in-depth information about the piece. I did not see this room on my first visit to the museum, and I wonder how many other visitors miss it, too. Most visitors probably gather some information from the informative panel in the antechamber to *The Place*.

Visitors who come to *The Place* receptive, equipped with basic listening skills, and possessing some understanding of what the sounds of *The Place* mean in geophysical terms are likely to absorb something about the geophysical processes in Alaska. They might get a deeper sense of how those geophysical processes continually surround us, regardless of our attention to them. Through *The Place*, they might come to see the world continually in flux, like John Cage:

> It is not!, it becomes! It moves, it changes! It doesn’t wait for us to change…it is more mobile than you can imagine. You’re getting closer to this reality when you say as it “presents itself;” that means that it is not there, existing as an object. The world, the real is not an object. It is a process.  

Although *The Place Where You Go to Listen* imitates nature in her manner of operation, visiting *The Place* is not interchangeable with visiting a weather station. Even if one forgets about the information in the sounds, experiencing *The Place* on its terms can lead to a change in what Adams calls one’s “mode of awareness.” Because *The Place* generally “develops” at a shockingly slow pace (barring a massive earthquake or aurora), it quickly confronts visitors with their expectations—even more so than *In the White Silence* or *Strange and Sacred Noise*. It forces listeners to either become bored and disappointed or to slow down their listening, their


thoughts, and perhaps even their pulse. There is continual change in *The Place*, but it is a slow change and constant vibrancy that reflects both the natural processes which are sonified and the ultimate vibrational nature of all matter. As the panel in the antechamber states, *The Place* “changes at the tempo of nature.”

What happens when one slows one’s listening and (not to forget the visual display) seeing in *The Place* is that one becomes not only more aware of the geophysical world but also a more conscious individual. *The Place Where You Go to Listen* is not just a room in a museum. It is a “place” in ourselves, a more conscious state of being in the world. This conscious state is a precursor to our relating differently to that world. It is in producing a kind of listening, rather than in conveying a message through a set of sounds, that *The Place* has its deepest meaning. As Adams writes:

> “Understanding some of the science behind *The Place* can focus the listener’s attention, encouraging her to become an active participant in a dialog between this artistic world and the larger world beyond. But the primary intention of *The Place* is not to convey information. It is to provoke experience…Science translates observation into information. Art transforms observation into sensation and experience.”

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**The Role of the Listener in The Place**

The last sentence that visitors to *The Place* read before passing from the antechamber to *The Place* is, “*The Place Where You Go to Listen* is not complete until you are present and listening.” Adams is reminding us that music—and certainly sonification as music—is ultimately a means of communication. Without a recipient for that communication, it is only sound. In his book about *The Place*, Adams writes about the role and responsibility of the listener in the installation:

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67 Ibid, 106.
The idea that music depends on sound and listening might seem as self-evident as the idea that we are an inseparable part of nature. But both these simple truths challenge us to practice ecological awareness in our individual and our collective lives.\(^68\)

In other words, there is no music without listening, just like there is no “environment” without humans. “Music” and the “natural world” are two kinds of ecosystems, and we must find our places in them. In *The Place*, the two ecosystems become one, and if we find our “place” in one, we can find it in the other. If we can listen to local events and slow-moving processes, understanding their geophysical meaning while allowing the artistry of their musical sonification to move us, we can position ourselves inside a much greater whole. Adams writes:

“Listening to the multiplicity of sounds all around us, we learn to hear the marvelous harmony they create. Hearing this harmony we come to understand our place within it, how our human voices fit into the larger, endless music of the world.”\(^69\)

With *The Place*, Adams moves from “sonic geography” and “sonic geometry” to “sonic ecology.”\(^70\) He creates a musical ecosystem in which his job is to shape noise—the tone of the Earth—and the work of visitors is to listen to the planet as it actually exists:

“It’s not really the world that we need to change. It’s the quality of our *attention* to the world…The greatest challenge we face now is our own delusion. We need a new kind of romanticism, grounded more in sense and less in sensibility. While we believe in and work for change, let us rededicate ourselves to reality. Let us surrender our preconceptions and extend our perceptions. Let us engage directly and passionately with this miraculous world in which we live. Let us cherish the world not for what we want it to be, but for what it actually is. This requires honesty and a modicum of humility. It requires patience. It requires listening.”\(^71\)

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\(^{68}\) Ibid, 10.

\(^{69}\) Ibid.

\(^{70}\) Ibid, 33.

\(^{71}\) Adams, *The Place Where You Go to Listen*, 103-104.
CHAPTER 7. INUKSUIT: RE-EXPERIENCING PLACE

Introduction

If there is one thread that runs through all of John Luther Adams’s music, it is a sense of the outdoors—the weather, soundscape, topology, and biota of a place. While the Alaskan outdoors has grounded Adams as an artist and permeated all his work, his music until very recently was meant to be heard in indoor performance spaces, often far removed from the place of his inspiration. Outdoor environments, after all, present numerous obstacles to performing nuanced art music: sound diffuses as it is released into the air; coordination can be dicey when performers cannot hear each other well; ambient sounds can intrude on the music; and, of course, weather can make performances difficult for both audience and performers. Nonetheless, Adams has in recent years begun to ask the questions, what is outdoor music, and how can music, instead of representing a place or cohering like a place, deeply resonate with the place where it is actually performed?

An event that stimulated Adams’s thinking about these questions was hearing one of his works performed outdoors. Several years ago the percussionist Robert Esler, a doctoral student of Steven Schick at the University of California-San Diego, asked what it would be like to perform Strange and Sacred Noise outdoors amidst the natural “noise” of nature that inspired it. Schick himself wondered:

Would music born in the wild seem to belong there—perhaps in a musical version of Free Willy, the heroic story of a piece born in the wilderness, held for a while in the captivity of the concert hall, and released to cavort again with the moaning winds and
drifting snows? Or would the self-conscious constructions of music seem out of place among the swarming mosquitoes and patrolling grizzly?¹

To answer this question, Schick, Esler, and an array of other percussionists performed *Strange and Sacred Noise* in four different outdoor spaces: the Anza-Borrego desert near San Diego, a New England forest, the rolling farmland of Ohio, and the tundra near Adams’s home in Fairbanks, Alaska. In his dissertation, “A Phenomenological Approach to Contemporary Music Performance,” Esler wrote that the project “reifies the notion of place as a formal interpretive tool.”²

Adams and his collaborators observed several things while performing *Strange and Sacred Noise* outdoors. They noticed that the perception used in listening to Adams’s music was transposable to environmental sounds. When the piece created “silence,” the listening was so intense that the performers and listeners heard the sounds of the natural surroundings with increased clarity, as if those sounds had been intended to be part of the music. They also observed that performing outdoors gave individual elements in the music greater clarity, that percussion instruments such as triangles, snare drums, metallic instruments, and sirens worked well outdoors, and that there was something intangibly appealing for performers and listeners about hearing music outdoors.³

What might the source of that appeal be? If we use Ellen Dissanayake’s description of art as the process of “making special,”⁴ then performing a piece of music outdoors has the ability to make a context itself special by making it part of the subject. It is as if the performers perform the place as much as the music, and the audience can experience the mutual enhancement of the

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place by the music and the music by the place.

Esler nicely distinguishes between two elements of a context: “place” and “space.” A space is usually a man-made structure, whereas a place is the surroundings, such as New York City or the Anza-Borrego desert. “Space has a function, whereas place needs no function or purpose. Spaces are designed and places are found.”5 Performances occur in spaces within places. Whereas in most indoor concerts, the lack of windows, natural lighting, or unprocessed air in the space prevents experience of the place, in an outdoor performance, the space becomes the place, and the full context informs the music.

Of course, music has been performed outdoors for millennia, in situations as diverse as theatre festivals, processions, and military events. As described in chapter 1, some contemporary composers have also written pieces specifically for outdoor performance.

After hearing Strange and Sacred Noise performed outside and receiving a commission from Schick and the Banff Centre for a new percussion work, Adams decided to write a new site-determined piece that could use “music to explore the unique qualities of each performance site.”6 Several other influences came to bear on him early in the compositional process. First, other percussionists were asking Adams for a new work. Allen Otte of Percussion Group Cincinnati (which had premiered Strange and Sacred Noise) was encouraging Adams to think about moving beyond the “monochrome” form of Strange and Sacred Noise, where each movement uses one or a few closely related percussion instruments, and to write the “seminal” percussion piece of our time—the twenty-first-century equivalent of Varése’s Ionisation. J. B.

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6 Adams, email to author, September 20, 2010. Adams was inspired by the work of visual artist Robert Irwin, who has worked on “site-conditioned/determined” works since the late 1960s. According to Irwin, in such works “the sculptural response draws all of its cues (reasons for being) from its surroundings.” Robert Irwin, Being and Circumstance: Notes Toward a Conditional Art (Larkspur Landing, CA: Lapis Press, 1985), 218.
Smith, who teaches percussion at Arizona State University, was also encouraging Adams to think about writing for a very large ensemble. Second, living in Alaska, Adams was seeing the effects of climate change first hand: melting glaciers, fewer frigid days in the winter, more intense forest fires in the summer, and “drunken forests” where trees totter as the permafrost below them melts. His concerns about the effects of global patterns of environmental degradation on the planet and humanity were concrete and renewed daily.

Finally, having explored the wilderness of Alaska extensively, Adams has long been familiar with inuksuit--stone structures created by the Inuit in Arctic lands over many centuries (Figure 7.1). Inukshuk (the singular form of Inuksuit) is derived from the Inuit word inuk (human) and literally means “to act in the capacity of the human.” There are many reasons why Inuit may have erected these monuments: to indicate dangerous places, to guide hunters, to commemorate events, to communicate a personal message, or to serve as objects of veneration. To Adams, they are a symbol of humanity’s efforts to create permanence in what increasingly looks like a transient existence on this planet. They were, furthermore, a source of many and varied visual forms to a composer who has long been visually inspired. Adams decided to use them as a touchstone in the creation of his new work, Inuksuit.

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Adams wrote in Winter Music, “Form is idealized space. Sound is audible time. Form defines a context. Sound embodies the presence of the moment.” As was the case for Strange and Sacred Noise, the composition of Inuksuit began with the question of how to translate a form into audible time. In particular, Adams faced the challenge of translating the three-dimensionality of inuksuit into music. To meet this challenge he returned to the idea that employing multiple simultaneous tempi gives music depth.

Adams began to draw structures shaped like inuksuit on graph paper. Figure 7.2 shows an early sketch from March, 2008, containing two pyramid-shaped structures. Each pyramid is eight layers high, and each layer is assigned a number. The number does not correspond to the number of lines in the layer but rather to the inverse of the lengths of the lines in the layer. Thus, as one moves from the lowest-numbered layer (2) to the highest numbered layer (9), the length of the lines decreases. The number of lines in each layer is somewhat discretional. Adams aimed simply to stack the lines in structures that were self-supporting, as if they were stones in inuksuit. If one imagines that the layers in these structures are rhythmic layers in a composition, in which

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the number next to each line is the inverse of the length of each note in that layer, one can start to see where Adams was going with this. All the layers could have the same absolute tempo, but a layer with a higher number would have a quicker implied tempo.

Figure 7.3 shows two sketches for a shape other than pyramids, a form Adams called “double windows.” As in Figure 7.2, each structure is eight layers high. Sketches like these formed the basis of *Inuksuit*.

The world premiere of *Inuksuit* took place in the summer of 2009 at the Banff Centre in the Canadian Rockies. The first performance in the United States occurred at Furman University in Greenville, South Carolina in April 2010 and was followed immediately by a performance at the Round Top Festival Institute in Round Top, Texas. In 2011 the work was performed twice in New York City: at the Park Avenue Armory and in Morningside Park. I had the pleasure of playing in the performance at Furman and attending the next three performances. As of September, 2014 the piece has been performed at least fifteen more times by different ensembles throughout North America and Europe, as well as Brazil and Australia. It is undoubtedly Adams’s most often-performed work of the last few years.
Figure 7.2. Initial sketch of Inuksuit “pyramids.”
Figure 7.3. Sketch of *Inuksuit* “double windows.”
The Music

*Inuksuit* is a meditation on permanence and impermanence and on how we relate to our world in space and sound. Adams writes in the preface to the score that the piece is “haunted by the vision of the melting of the polar ice, the rising of the seas, and what may remain of humanity’s presence after the waters recede.”¹⁰ To the *New Yorker* he said, “The piece is really site-determined. It’s really all about finding the music within the place and exploring the music of the place.”¹¹

*Inuksuit* may be performed by as few as nine and as many as ninety-nine percussionists, as well as optional piccolo players. Regardless of the size of the ensemble, the performance follows the same organizational plan. The musicians are divided into three equally sized groups. Each group has five sections of music, as is shown in Figure 7.4. Group 1 begins each section of music first and is followed by Group 2 and then Group 3. The progression through the piece is seamless; for example, while Groups 2 and 3 are still on one section, Group 1 moves to the next. Additionally, within each group, the performers progress through their music largely at their own pace. There are as many different beats as there are performers. There is no conductor, though each performer attempts to listen to other members of his group for cues to move between sections. The piece is expected to last about 74 minutes.

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The piece also follows a consistent spatial choreography regardless of ensemble size. As the piece begins, the musicians disperse from a central location to their unique and preset performance locations. At nine stops along the way (including the first and final locations), each performer plays a phrase from the first section of music. By the time Group 3 finishes the first section, each group is distributed evenly around the performance space. The audience is encouraged to move around the space during the performance; there is no single location from which a listener can hear all the music or, at least, hear it all equally well. In the last section of music, Group 1 moves back towards the center of the performance space.

The size of the ensembles and the topography of the performance sites varied greatly in the first five performances of *Inuksuit*. In Canada, eighteen percussionists performed the piece twice—first in the outdoor amphitheatre at the Banff Centre and then in the mountains near
Canmore, Alberta. In the latter performance, the musicians were spread over thirty acres on both banks of the rushing Goat Creek. At Furman forty-three percussionists and seven piccolo players were situated in meadows and woods spanning about fifty-five acres and halfway encircling Furman’s “Swan Lake.” The performance began and ended just in front of an amphitheatre situated on the north side of the lake. At Round Top, ninety-seven percussionists were distributed over about forty acres, in denser woods and gardens surrounding a still creek. At the Park Avenue Armory, seventy-two percussionists and six piccolo players were distributed throughout the Armory’s 55,000 square foot Drill Hall, as well as in adjacent hallways and stairways. In Morningside Park, the ninety-nine percussionists spread out over the southern half of the thirty-acre park.

The music of *Inuksuit* progresses as shifting and overlapping blocks of sound. Each group of performers plays one of seven kinds of sounds within a section, as may be seen in the event map (Figure 7.4). For instance, the performers in Group 1 make “Breathing” sounds in the first section. Adams suggests using a bullhorn, microphone and portable speaker, horn, or trumpet to amplify the sound (a rolled tube also works). In the following four sections Group 1 plays “Calls” (on a conch shell or similar instrument), “Waves” (on a siren-like instrument), “Clangs” (on a hand bell), and “Wind” (on a triangle). Group 2 plays “Wind” in the first section (with a friction instrument like rubbed stones); “Inuksuit (rising),” “Waves,” and “Inuksuit (falling)” in the second, third, and fourth sections (all on tom-toms and bass drum); and “Wind” (on sizzle cymbal) in the fifth section. Group 3 plays in succession “Wind” (on whirled tubes); “Inuksuit (rising),” “Waves,” and “Inuksuit (falling)” (all on suspended cymbals and tam-tam); and “Birdsongs” (on orchestral bells). As indicated in the event map, Adams suggests that Group 3 may be supplemented with piccolos for “Birdsongs.” He gives options for instrumentation in
some sections, and in the performance notes, he encourages “varied and imaginative soundings of Inuksuit.”

Although no group plays exactly the same music as any other, there is enough overlap between the music of the three groups to make them coherent. The event map shows that all three groups play “Waves” exactly at the midpoint of the piece (though on different instruments). All three groups also play “Wind” at some point. Groups 2 and 3 have the same order of sections, except that Group 2 ends with “Wind” and Group 3 ends with “Birdsongs.” Additionally, in the first, third, and fifth sections of the piece, Adams calls for undulating or oscillating sounds (“Breathing,” “Waves,” and “Wind”) and in the second and fourth sections he calls for sounds with discrete attacks (“Calls,” “Clangs,” and “Inuksuit”). This alternation of discrete and wave-like attacks is reminiscent of the structure of “Deep and Distant Thunder,” the sixth movement of Earth and the Great Weather. The one exception to this large pattern is that Group 3 plays “Birdsongs” with discrete (if gentle) attacks in the fifth section.

Each of the parts of Inuksuit except “Birdsongs” is constructed from a series of phrases in which either the rhythmic proportion of notes or the number of repetitions of a figure steadily contracts or expands from one phrase to the next. I will discuss how this is done in each section, beginning with the “Inuksuit” figures.

Adams composed a total of sixty-six different “Inuksuit” parts of four different types—stacks, windows, double windows, and pyramids (Figures 5 through 9)—roughly equivalent to the different types of real inuksuit in the Arctic. These sixty-six parts are divided evenly between Groups 2 and 3. Since no two players may double an “Inuksuit” part, there are sufficient parts for up to thirty-three players per group or ninety-nine players in the ensemble. If there are fewer than ninety-nine players, some of the “Inuksuit” parts are not played.
Figure 7.5. Stack 1 (Group 2), “Inuksuit” sections of Inuksuit.

Figure 7.6. Window 1 (Group 2), “Inuksuit” sections of Inuksuit.
Figure 7.8. Pyramid 1 (Group 2), “Inuksuit” sections of *Inuksuit*.

Figure 7.9. Pyramid 4 (Group 3), “Inuksuit” sections of *Inuksuit*. 
In Figure 7.8 one can see that Adams has stacked eight staves for this pyramid part, each containing sixteen iterations of a single note value. The staves are all notated in 4/4 time, and the measures line up with each other vertically. One way to express the length of the notes in each staff is in terms of fractional measures per note (ms/note). On the bottom staff are whole notes, whose length could be expressed as one ms/note. For the sake of comparison, let us express it as the equivalent 2/2 ms/note. The next higher staff contains triplet whole notes, each note lasting 2/3 ms/note. Above that are duple half notes, which last 2/4 ms/note. The pattern continues to the top, where the nonuplet quarters each last 2/9 ms/note. Thus, as one moves up the staves, the notes progressively quicken. Though the meter and the speed of a simple quarter note is the same throughout the eight lines, the implied tempo of the top line is fastest. The relative tempi of the eight lines is related by whole number relationships, as in *In the White Silence*.

The players in Groups 2 and 3 are instructed to play the “Inuksuit” parts “ascending” in the second section and “descending” in the fourth section. In the second section the players therefore start by playing the bottom stave only, from left to right. When they have completed that, they play the bottom two staves together, again from left to right. The pattern continues until all nine staves are played simultaneously. Since each new staff gives the impression of a quicker tempo, playing multiple staves creates the impression of multiple tempi. When the players are instructed to play the figure descending, they reverse the process, starting with all the staves and ending with the bottom staff alone.

To see how Adams varies the different figures within a particular shape, one may compare Figure 7.8 with Figure 7.9, which contains Pyramid 4 from Group 3. Here the slowest rhythmic level is in the middle of the stack; each note in the fourth stave from the top lasts two measures, so its length could be expressed as 4/2 ms/note. The next higher staves contain notes
in the proportional length of 4/3, 4/4, and 4/5 ms/note. The pattern then cycles to the bottom of
the pyramid, where the staves begin as 4/7 and continue to 4/10 ms/note. Pyramid 4, like
Pyramid 1, is played reading the staves from left to right, either ascending or descending.
Comparing Pyramid 1 and 4, one sees that Adams generates variety from the same initial idea by
varying the position of the slowest staff. Additionally, assuming a relatively consistent beat
throughout the ensemble, each staff in the parts assigned to Group 2 (e.g., Pyramid 1) is twice as
fast as its corresponding staff in Group 3 (Pyramid 4).

Adams expands and contracts both rhythmic proportions and phrase lengths in the other
sections of the music, such that during the first half of the piece, successive phrases add notes,
and during the second half of the piece, they lose notes. As a result, *Inuksuit* has a dynamic
structure of one enormous, seventy-minute wave.

In the first section of music, the groups enter quietly in succession, one performer at a
time. In “Breathing,” (Group 1) and “Wind” (Groups 2 and 3), each motivic figure lasts for two
measures, but the figures accumulate in successively longer phrases. In “Breathing,” for instance,
the players start by taking two long breaths, each lasting two measures, and then rest (Figure
7.10). Next they take three breaths and rest. This process continues until they have taken ten
breaths, in a phrase lasting twenty measures.

In the second section, the music continues to thicken. In “Calls,” (Group 1) each phrase
lasts one measure, but Adams instructs the performers to sound increasing numbers of calls on
their conch shell trumpets in that time (Figure 7.11). The first phrase asks for two calls in the
rhythm of half notes. The next phrase asks for three calls in the rhythm of triplet half notes. The
pattern of quickening rhythm continues until the players sound ten calls in the rhythm of eighth
note quintuplets. After they reach the end of the pattern, they are free to repeat any of the
previous phrases for as long as Group 1 remains in “Calls.” Meanwhile, Groups 2 and 3 add sound by adding rhythmical layers in “Inuksuit (rising).”

Figure 7.10. “Breathing” (Group 1), *Inuksuit*. The “Wind” part played by Groups 2 and 3 after “Breathing” begins is similar.

At the center of the work for all three groups is “Waves,” in which numerous hairpins form a microcosm of the whole piece. Figure 7.12 shows a sample “Waves” part. Here the length of each phrase again remains constant (sixteen measures), while the time given to each figure within the phrase changes. For the players in Group 1, the waves expand; for the players in Groups 2 and 3, the waves contract. There is a definite similarity between this section and “solitary and time-breaking waves,” the second movement of *Strange and Sacred Noise*; both use tam-tams and instruments playing overlapping waves. In the earlier piece, however, there is one point at which the instruments converge; in *Inuksuit* the “Waves” section provides a long,
sustained, climax with no single point of greatest tension due to the independence of each musician and the non-identical parts. The incrementally changing length of each wave is also reminiscent of the string writing in “The Place Where You Go to Listen,” the first movement of *Earth and the Great Weather*. Adams draws upon techniques from his previous works throughout *Inuksuit*.

In the fourth section, the music starts to thin out. “Clangs” (Group 1) proceeds like “Calls” but with gradually slowing, rather than quickening, rhythms. Groups 2 and 3 shed one layer of sound after another in “Inuksuit (falling).”

![Figure 7.11. “Calls” (Group 1), *Inuksuit.*](image)

In the final section of *Inuksuit*, all drums are gone. The “Wind” parts for Groups 1 and 2, like the earlier “Wind” parts, consist of 2-bar *crescendi* and *diminuendi*. Now, however, the music is scored for triangle and sizzle cymbal, and the phrases begin with ten two-measure
figures and gradually whittle down to two two-measure figures. Finally, the piece dissolves back into the site through the sound of birdsongs played by Group 3 on orchestral bells (with optional piccolos).

Figure 7.12. “Waves” (Group 1), *Inuksuit*.

The “Birdsongs” are the only sounds not structured in the kind of rhythmic proportions described above (Figure 7.13). Additionally, this is the only section of the piece with a melodic pitch arrangement.\(^\text{12}\) Although the birdsongs are complex melodically, however, they are still not self-expressive for the performers or composer. They are intended to be merely transcriptions of natural birdsongs. The performance notes state that notations of birdsongs local to the performance site should be used. The performance folio of *Inuksuit* contains notations of

\(^{12}\) The conch shell trumpets and hand bells heard earlier are monotone, the whirled tubes are limited to a few harmonics, and the sirens are predictable along a pitch spectrum.
birdsongs heard in Alberta, Canada, which were used in the premiere at Banff. Subsequent performances have used those birdsongs when the same birds were native to the place of performance, as well as other native birdsongs that Adams has specially notated. Adams was actually revising *songbirdsongs* when he wrote *Inuksuit* in 2008-2009, and some of the birdsong notations in *Inuksuit* are taken right out of the score of the earlier piece. Unlike *songbirdsongs*, where Adams includes rules for the performance of each bird’s song that are derived from the bird’s singing habits, the birdsongs in *Inuksuit* are written with no particular instructions other than to leave space between each phrase. Performers take their cues from each other and, very often, from the sounds of the real birds singing at the performance site.

![Figure 7.13. Lapland longspur from “Birdsongs” (Group 3), Inuksuit.](image)

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13 Perhaps for this reason, in the performance notes Adams describes the birdsongs as “transcriptions” rather than “translations,” as he did in *songbirdsongs*. To be precise, the piccolo parts seem to be single-voice transcriptions. The orchestral bells parts contain a main line and a sort of shadow line (Figure 7.13) – perhaps a way to come closer to the sound of multiphonics of which birds are capable. The shadow line is similar to the celesta parts in “Wood Thrush” from *songbirdsongs*. 

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Analysis

As with other pieces that we have analyzed, Adams has left no doubt about his intentions: the performance notes clarify that he wants listeners and performers alike to engage their surroundings as a result of the work:

This work is intended to expand our awareness of the never-ending music of the world in which we live, transforming seemingly empty space into more fully experienced place... *Inuksuit* invites exploration and discovery of the relationship between music and the site, as well as the musicians’ interactions with both. The musicians are encouraged to consider carefully the selection of instruments, the distribution of performers, and the acoustical properties of the performance site.

As we look at *Inuksuit* in light if Adams’s stated aesthetic goals, it is worth observing that he has used many of the techniques for connecting to the natural world that were described in chapter 1:

**Direct imitation.** Group 3 and the piccolos imitate birdsongs.

**Approximate imitation.** All the groups imitate the sound of wind and waves.

** Representation.** Groups 2 and 3 play aural representations of stone *inuksuit*.

**Use of “Found” Natural Materials.** Some of the sounds are made by breathing through a megaphone of sorts; friction instruments such as rubbed stones, rattles and shakers; whirled tubes or other Aeolian instruments; and conch shell trumpets. All of these are very old means of making sound and can be produced with little modification of natural materials. They offer little variation in timbre. As a result, little in the way of personal emotional expression can be

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14 Granted, the plastic whirled tubes are modern and required some manufacturing, but the principle is quite simple. They produce a fundamental tone and harmonics by moving columns of air through a ridged tube. Shortly after hearing *Inuksuit*, I was on a farm, where I heard nearly the same alternating series of harmonics coming from a steel gate on a windy afternoon.
communicated with them, but little needs to be. These instruments are also, at least historically, meant to be played outdoors, as were piccolos and drums.

**Outdoor location.** Adams writes in the preface, “Inspired by the open landscapes of the high Arctic, *Inuksuit* may be performed in almost any outdoor setting, from mountains to plains, from forest to desert, from remote wilderness to city park. This piece is not intended for performance indoors.”

**Live animal-human hybrid music.** Group 3 and the piccolos play the songs of birds native to the performance site outdoors, which almost inevitably leads to a combined human-animal music.

Using these techniques Adams alters the conventional relationships of composer, performers, music, and listeners represented in Figure 7.14. First, he allows the performers to participate more in the creative generation of the music by leaving decisions about the exact instrumentation, size of the ensemble, choice of “Inuksuit” parts, distribution of the ensemble, and individual pacing up to them.

![Figure 7.14. Conventional conception of the flow of music from creation through reception.](image)

Second, as in *Earth and the Great Weather, In the White Silence, Strange and Sacred Noise*, and *The Place Where You Go to Listen*, Adams establishes algorithms that, once in place, create the music in a way that his hand is removed from moment-to-moment decisions. Moreover, performers do not need to put trademarks of individual expression into the music. The
sounds are simple, as should be their execution. Essentially the performers project their *aliveness*, a sort of inner kinetic energy, in certain rhythmic patterns and at certain locations.

Third, Adams focuses listeners and performers onto the place rather than his music at the beginning and end of *Inuksuit*; that is, he effectively makes the place the first and last performer of *Inuksuit*. Whereas indoor concerts generally begin with performers walking on stage, receiving applause, pausing for a brief moment, and then launching into the music, a performance of *Inuksuit* begins with a focused silence from the performers. As they listen to the surroundings and try to sense the right moment to begin, the audience responds to them attentively, and all notice the natural sounds of the performance site filling the air. Often this includes the sounds of birds singing and wind rustling through trees. The music of the place is thus included in *Inuksuit* from before the first written “note.”

When the performers sense that it is time to begin, the faint sound of a single performer breathing outdoors with minimal amplification blends so well with the sound of the place that the first “Breathing” figures may be unnoticed by an inattentive listener. The shift of listeners’ attention from the place to the music is very gradual and never complete. At the end of the piece, the performers gradually fade out, until only birdsongs are played. Again, the similarity of the music and the sounds of the place are so striking that listeners’ attention is divided between the two. By yielding some of the foreground to the place, the composer and performers draw our attention to the sounds of the outdoors, which listeners may notice and value.

Steven Schick described the listening experience this way. At Furman he noticed the way the sounds of triangle rolls (played by Group 1 near the end) and falling helicopter seeds mixed, the seeds sounding like “the wooden cousins of the triangles.” He continued, “What John does is to establish a listening acuity that is transposable to ambient sounds. We begin by listening to
music amongst the sounds of seed pods and wind and then end up listening to seed pods and wind as music.”

Figure 7.15. Flow of music in *Inuksuit*. An arrow can be understood as “affects,” with the means of affecting written next to it. Decisions about instrumentation and part selection are left to the performers. The place affects the music through its acoustic properties and by offering performers and listeners a choice of locations.

Fourth, Adams pushes listeners to take an active role in their experiences by situating the piece in a performance site that is often so large that all the sounds cannot be heard in any one location. Listeners must choose where they want to listen. In the process of experiencing the performance site and the interactions of place and music, they also contribute to the sounds of the piece.

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15 Steven Schick, conversation with the author, May 10, 2010.
The conventional relationship shown in Figure 7.14 thus becomes that which I show in Figure 7.15. Rather than initiating a uni-directional process, Adams unleashes a feedback loop in which performers, place, and listeners also act as critical musical determinants.

A second function of the many connections to the natural world in the sounds of *Inuksuit* is, I believe, to create a narrative that listeners perceive. Adams does not speak of this narrative in detail anywhere, but he alludes to it in the score when he writes that *Inuksuit* is “haunted by the vision of the melting of the polar ice, the rising of the seas, and what may remain of humanity’s presence after the waters recede.” The musical arc and performance choreography also give credence to a dramatic progression through the piece. In *Inuksuit* seems to be a musical history and premonition of life on Earth.

The piece begins in a state of palpable potential. The first sound is often wind, as in *Earth and the Great Weather*. As the sound of “Breathing” emerges from the wind, it seems to connect all members of the animate world to each other and to the surroundings. When the sounds of breathing, whirled tubes, and rubbed stones accumulate and swirl together, they seem like the first stirrings in the primordial soup four billion years ago. As the first section of the piece progresses, the sounds grow in volume, expand in timbre, and spread throughout the space of the performance site.

Then, suddenly, the first call of a conch shell trumpet pierces the air. It is the first sense of an individual standing out from a context within *Inuksuit*. It is a sound that only a human could make, and it commands our attention. Soon another conch trumpet is heard. Now there is

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16 In his unpublished autobiography, Adams writes of the strong effect that Peter Garland’s *Three Strange Angels* had on him as a student at CalArts. That piece uses the sound of whirled tubes *after* what sounds like a cataclysmic storm.
communication; multiple individuals each make their presence known and respond to one another.

The conch shell trumpets pile on to each other until the first strike of a bass drum commands my attention. *Wham!* It is the sound of another individual, announcing the beginning of “Inuksuit (rising).” The volume and suddenness of the sound introduces an element of power. The drum seems to signal the phase of history in which human command over the natural world produces fire, agriculture, and steel. As rhythmic layers are added within “Inuksuit (rising)” and the rhythm of the “Calls” becomes faster, the music becomes more complicated and tumultuous. The sounds are those of human instruments. They do not blend with the surroundings. They are assertive and clangorous. Just like real-life *inuksuit* are physical assertions of a human presence in a landscape, these “Inuksuit” seem to be an aural assertion of our power to transform a landscape.

Then the “Waves” begin. It is as if the entire place starts to heave. The sirens, played by Group 1, bring their connotations of urgency to the music. The tom-toms, bass drums, suspended cymbals, and tam-tams thunder like earthquakes. The waves are the rising seas that Adams alludes to in the preface. If the heterogeneity of the second section created a sense of unease, now the growing homogeneity – the shaking and quaking of all the groups – is terrifying. The music seems to evoke a time—possibly in the near future—of chaos.

After a brief period in which all three groups are swelling simultaneously, Group 1 starts the long descent with “Clangs.” Do these represent death knells tolling for the ultimate self-destruction of humankind? They start rapidly, piercing the air like the “Calls” earlier. As they begin to expand and slow, the “Inuksuit” figures return where they left off, eight rhythmic layers thick. As the players of Groups 2 and 3 shed one layer after another, the chaos slowly dissipates.
The discrete attacks—the stamps of individuality—slowly subside, like a giant beast that has been mortally wounded. The last section of music fades in. Groups 1 and 2, playing gentle swells on triangles and sizzle cymbals, return us to a quieter, swirling, undulating world. The changes in timbre and the gradual shortening of the “Wind” phrases create a long diminuendo.

Finally, Group 3 begins to play “Birdsongs,” while real birds sing and call throughout the performance site. Although an artist like David Rothenberg might be tempted to say that the performers make music with the birds, I suspect the birds do not perceive it this way. What is clear is that, as in *songbirdsong*, Adams cedes the musical language to the birds, here for the purpose of letting his music dissolve into the music of the place, also like *Earth and the Great Weather*. So long as there are birds, it works quite beautifully. *Inuksuit* fades into the world around it. Just as the performance site was the first performer in *Inuksuit*, it is also the last. Is this a view of “what may remain of humanity’s presence after the waters recede?” If so, is it a world of humans blending in with their surroundings, or are the humans gone? Is humanity itself like Shakespeare’s “poor player that struts and frets his hour upon the stage and then is heard no more?”

In the preface to the score of *Inuksuit*, Adams suggests that certain questions may arise through its performance:

What does it mean to act creatively with and within our environment? Can we listen and hear more deeply the field of sound all around us? How does where we are define what we do and, ultimately, who we are? And how do we understand the brevity of our human presence in the immensity of geologic time?

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17 Of course, an important difference between *Earth* and *Inuksuit* is that in the earlier piece the natural sounds at both the beginning and end were recorded.

Adams does not answer these questions himself. He leaves it to the piece to provide different answers for each listener. Above I have outlined a narrative deriving purely from the aural experience of *Inuksuit*, but there is also a strong spatial dimension to the experience.

As the first section of the piece proceeds, the performers move through the performance space, stopping at nine equidistant points on the way to their performance stations. In the act of gauging the distance between stops, the performers become aware of the physical space. As I walked to my performance site at one of the farthest edges of the lake at Furman University, I was aware of the sounds of frogs hopping into the lake next to me, the way the path that I followed curved downwards from the starting location, and the height and moisture of the grass where I stood. When the listeners begin to move throughout the performance space, they, too, become aware of it.

Since every performer is situated in a different location and the audience members are free to explore the performance site as they wish, each performance of *Inuksuit* is a very individual experience for players and audience members alike. Each individual notices different things about the sounds, biota, and topology of the place and how they interact. One of the most memorable elements of the Furman performance for me was the resonance of conch shell trumpets over the lake during “Calls.” I also enjoyed the look that a brood of seemingly perplexed ducks gave me as I played a siren in “Waves.” Clearly these experiences were prominent for me because I was stationed right at the lake. As I wandered through the woods at Round Top, the pleasure was very different; I had the feeling of walking through a magical forest, discovering hidden fairies playing percussion instruments. I noticed the stillness of the Texan creek juxtaposed with the hustle-bustle of the music. At Morningside Park in New York, I noticed one robin who, insistent like a true New Yorker, sang near the Central Field from before
the beginning of the piece until after it had ended. This was the only performance that also featured real sirens and a “Mr. Softee truck” in the background. The atmosphere was less magical and more festive than in Round Top, but it still transformed my experience of the park.

Because of this spatial dimension, I find Inuksuit to be a way to reconnect physically to our natural environments. In Western urbanized societies, our contemporary lives involve the constant movement from one “controlled environment” to another, each of which separates us from the real sources of life. We are inextricably tied to the natural world through our needs for food, water, and shelter, but few of us make our own food, collect our water, or build our homes from natural materials that we collect. Instead they appear to us in packages at the grocery store, through a faucet coming from a wall, or as large, prefabricated conglomerations of wood, steel, brick, plastic, and paint. Moreover, we travel in minutes what used to take weeks, and with television and the internet, we can be “virtually” anywhere at any time. Though one may be awed by how easily we control and adapt to our surroundings, our lack of groundedness takes its toll in what is increasingly termed “environmental depression.” Worse still, our attempts to reconnect to the natural world in specially designed places known as “natural parks” often do not succeed, since, as Byerly and Adorno have described, we bring to them a consumptive and alienated attitude.

Inuksuit, however, grounds us in a place. At Furman, as I dug my feet into the earth to strike a bowl in “Clangs” and then listened to it reverberate over the water, I felt my entire body connected to that place. Each experience of Inuksuit has been distinctly the experience of it in a given place. Adams’s prefatory comments clearly indicate that the point of Inuksuit is not primarily the communication of the piece’s narrative structure but rather the creation of an event in which music informs the experience of a place, and the place informs the music. Making
music in that place is active, persistent, and benign. Listening to the music uses all the listening types I have discussed, with Source Perception taking on a new importance. As a result, performers and listeners are neither alienated from, nor consumptive of, the surroundings but rather aware of and connected to them. Through Inuksuit the performance site becomes, in Ellen Dissanayake’s terminology, “special” to us.

Adams writes in the performance notes, “Each musician in Inuksuit should be a solitary figure, a singular marker in the larger landscape of the music and the place.” Before the dress rehearsal at Furman, Adams personally asked the performers to remain as focused through Inuksuit as they would be in a concert hall, even though it might seem to them that they were isolated and not heard. The responsibility of each individual performer, in spite of his seeming unimportance, parallels the place of each being in the Earth’s ecosystem. It might sometimes seem that our actions cannot impact the planet significantly, but, in fact, they have ramifications that we cannot see. Meanwhile, each listener’s responsibility to create his own experience of the piece and the place parallels the responsibility that all people have to create their own experience of life on this planet.

At the same time that Inuksuit encourages individuals to take responsibility for their own listening experiences, it also cultivates community. Whereas the normally quiet sobriety of a concert hall allows and encourages an introspective experience for each listener, Inuksuit invites human interaction in multiple ways. Some of them are common to many outdoor performances. Being outdoors (in good weather) probably boosts the morale of most people, facilitating more friendly interactions. Instead of facing in a single direction towards the musicians, listeners walk in all directions, encountering performers and other listeners and reacting to their expressions. The very intrusion of sounds and elements of the natural world onto the music breaks any sense
that listeners must repress their reactions and uphold a silence. Outdoor performances also lack a standard dress code, allowing listeners to encounter each other and the music with fewer pretensions. Moreover, *Inuksuit* offers an almost unparalleled opportunity for percussionists, which has led it to become something of a cult-piece among percussionists. Many players have traveled far and wide at their own expense to perform *Inuksuit* repeatedly.

Perhaps what seals the sense of community in a performance of *Inuksuit* is a common awareness of the narrative—a story of human emergence, domination, and ultimate dissipation. It is a story that involves all the listeners and performers and requires their communal dedication to rewrite. Interestingly, the metaphorical meaning of *Inuksuit* need not be explained as much as those of *Earth and the Great Weather*, *Strange and Sacred Noise*, or *The Place Where You Go to Listen*. It is self-evident through the sounds and spatial layout of the piece.

At the end of *Inuksuit*, players and listeners walk back to the starting location, giving up some of their individual experiences to share in a sense of common origin and destiny. When we leave the site, either as performers or listeners, our individual and communal relationships with the place have been transformed. We have listened to our surroundings and made music with them, but we have also become aware of how powerful we can be in collectively transforming a place.

It was John Cage’s intention with 4’33” to open our ears to hearing the whole world as music. *Inuksuit* treats the natural world as something to be not only noticed but engaged. Adams integrates the natural world itself into the piece, making it a full partner in the act of music-making. By shifting our attention away from ourselves in isolation to our place in a larger whole, *Inuksuit* becomes ecocentric music.
Ultimately *Inuksuit* asks us to reflect on transience and permanence. The stone *inuksuit* of the Arctic have lasted only a blink of the eye when compared to the age of the Earth itself, yet some of them appear “permanent” relative to a human lifespan. Perhaps they will remain even after the rising seas recede. Adams’s *Inuksuit*, however, is transient. After all its raucousness permeates a site, the music dies away, like all living things, and any trace of human presence on the site soon vanishes. What remains after *Inuksuit* is nothing more nor less than the experience of music and connection to a place that it provides. What listeners and performers do with that connection is left up to them.
Postscript: Inuksuit Indoors and on Recording

Indoors

Inuksuit was performed inside the Park Avenue Armory in New York City on February 20, 2011 as part of the Tune-In Music Festival. This was a surprise, since the score of Inuksuit explicitly states that Inuksuit “may be performed in almost any outdoor setting...[but] is not intended for performance indoors.” In addition, a performance of Inuksuit in a wood near Guilford, Vermont was recorded and released on Cantaloupe Music in 2013. A recording does not allow a listener to “participate actively in shaping his or her own experience, by finding their own individual listening point, or by changing locations throughout the performance” as Adams encourages in the score’s preface. An understanding of the weaknesses of these two performances clarifies some important facets of Inuksuit.

Adams has rejected possible indoor performances before and after the performance at the Armory, but the cavernous space of the Armory’s 55,000 square foot Drill Hall was too alluring to resist. In a pre-concert talk with the other organizers of the event, Adams said that he viewed the performance as a “glorious experiment,” in the same sense that bringing Strange and Sacred Noise, which was composed for the indoors, out into the desert and the tundra was also an experiment. In order to integrate the performance with the surroundings, a set of microphones was hung from the perimeter of the Armory, and automobile sounds of the streets were piped into the space.

As a purely musical experience, Inuksuit indoors was tremendous. The enclosed space reverberated the sounds of the seventy-eight players. The first breath, the first sand blocks, the first whirled tube, the first calls on the conch shells, the first strike on a bass drum—all these

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sounds pierced the performance space with a thrilling clarity. The crescendo leading into “Waves” was unmistakable, and the volume reached in “Waves” was at the limit of aural tolerance. Unlike the outdoor performance spaces, which seemed to blow some of the sounds into the ether, the Armory’s walls and floors preserved and amplified the sounds of Inuksuit for our hearing. The intensity of sound was probably one factor causing Alex Ross to write in The New Yorker that the performance was “one of the most rapturous experiences of his [Ross’s] listening life.”

Additionally, I did leave the performance with a distinct sense that I had heard Inuksuit in the Armory, just as previous performances had been integrally connected in my mind with Furman’s Swan Lake and Round Top’s woods. Several days later I heard Gustav Mahler’s Fifth Symphony performed at Carnegie Hall. Did Carnegie Hall affect how I heard that performance as much as the Armory affected how I heard Inuksuit? Unlikely. Would a performance of Mahler’s symphony at the Armory be just as distinctive? Also unlikely. The players of Inuksuit can disperse more than the players of Mahler without tearing the piece apart, because the players in Inuksuit are not meant to play exactly together. In fact, the way the players of each group speak to each other across distances of time and space is one of the piece’s most beautiful and powerful effects. The way the sounds moved across the Armory was a distinctive element of the performance.

The idea that the instrumental music of Inuksuit could be integrated with the surroundings, however, was mistaken. Aside from a passing car or two at the very beginning and end of the performance, the sounds of the outdoors were barely heard inside the Drill Hall. Perhaps the event’s organizers miscalculated the amount of amplification that would be

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necessary to allow the sound of a passing car to be heard over seventy-two wailing percussionists in a concentrated space. Moreover, while the cars were barely heard, the sounds of wind and birds were not heard at all. Therefore, when “Breathing” began, it did not emerge from the wind. When the piece ended with “Birdsongs,” it did not melt back into the sounds of the place. The lack of ambient sounds meant that the piece was set off from, rather than integrated with, its surroundings.

Even if there had been ambient sounds, the performance would still have conveyed mixed messages. Adams said before the concert that Inuksuit was intended “as a means of exploring where we are, of finding music within a space.” It was not clear, however, what was the space that this performance was meant to facilitate exploring – the Armory or New York City. If it was the Armory, then there was no need for the microphones placed on the perimeter of the building. If, on the other hand, the performance was aimed at “turning the Armory inside out, as Inuksuit becomes part of the never-ending music of this singular city” (as the program said), then the sounds of the performance should have been broadcast to the outdoors. Said otherwise, one of the many special characteristics of Inuksuit when it is performed outdoors is the blending of performance “space” and “place.” In this performance, the two were distinct.

Adams was right that Inuksuit can connect us to any place in which it is performed. It is constructed, however, to connect us to natural environments. The progression of sounds from wind to drums to bird calls is not accidental. The inspiration for Inuksuit was the melting of the polar ice and what may be the brevity of human existence on a planetary time scale. Only when it is heard outdoors does it have its full meaning.
On Recording

There are many rather unique qualities to the experience of listening to *Inuksuit* live. First, listeners are keenly aware that there are enormous listening possibilities among which they must choose. Even sitting in one place can be a choice. Second, the experience is multi-sensorial. Listening to *Inuksuit* live, one may also enjoy the scents of the place, touch its trees or grass, and enjoy the view of performers, place, and listeners. Third, when attending repeated outdoor performances of *Inuksuit*, one hears a very different combination of natural and performance sounds each time. All of these qualities contribute to listeners’ experience of the place in a performance of *Inuksuit*.

With the recording listeners experience none of these qualities. Listeners have no choice to move. As a result listening immediately becomes more passive. The experience of the CD is uni-sensorial. One does not enjoy the depth of experience one gets by combining the sound of the place with other sensory input. And each time one listens, one hears the same set of birds, the same timing of each section of the music. It happens to be a beautiful set of birds (with a prominent wood thrush) and a very well-performed, well-recorded performance. On repeated hearings the CD performance “works” musically, but the sense of personal discovery so present in a live performance of *Inuksuit* is broken. Listening becomes a vicarious and impoverished experience.

We are accustomed to vicarious experiences of the natural world and of music; we often see others experience the natural world on television or in magazines. But another vicarious experience does not contribute to a deepening of our relationship to the natural world. Perhaps a recording will be necessary for those who cannot get to a live performance. For those who can, however, it could encourage a misunderstanding of a truly iconic work.
CHAPTER 8. CONCLUSION

The nearer we get to the mere expression of emotion, as in the antics of boys who have been promised a holiday, the further we get away from art.

- Henry Sturt

Charles Ives wrote a series of essays intended to be published with his second piano sonata, *Concord, Mass., 1845*, in which he touched on the relationship of his music to the thinking of the transcendentalists, as well as the bigger questions of musical representation, programs, and expression. From these essays comes the epigraph above by Henry Sturt, as well as Ives’s ruminations on the “theory that music is the language of the emotions and only that.” Ives, for his part, felt that music could be influenced by feelings “of a spiritual nature, in the expression of which the intellect has some part.”

The dissertation began with several passages from John Luther Adams’s essay, “Beyond Expression.” In it, Adams, like Ives, does not so much challenge the validity of emotional expression in music as question whether self-expression is the only, or most relevant, aspiration for artists. He challenges artists in the twenty-first century:

1. To move beyond self-expression;
2. To move beyond anthropocentric views of history;

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3. To re-imagine and re-create our relationships with this planet and all those (human and other-than-human) with whom we share it;

4. To take us beyond ourselves, to remind us of the larger, deeper miracles of the world.³

In chapter 1 I outlined nine ways in which composers have connected music to the natural world, in order to give a context for understanding Adams’s music. I discussed various ways in which these techniques function, including providing humor, expressing emotion, describing scenes or narrating a story, imitating nature in her manner of operation, and recreating relationships with the natural world. I presented an analytical approach derived from the work of Jean-Jacques Nattiez for evaluating Adams’s music, and I outlined my own typology of listening. In each of the subsequent analyses of Adams’s works, I have presented some information about the genesis of the music, analyzed the score (when available) and sound of the music in detail, provided my own view of the listening experience each piece provides, and evaluated whether and how Adams achieves his aesthetic goals.

When I first read “Beyond Expression,” I imagined that Adams’s approach to his goals might be through a heavy-handed targeting of semantic-comparative listening. I thought he would try to convey a message by musically representing eco-political texts or images. I expected to find music that calculatedly shows the threats to the environment or that expresses the angst of environmentalists.⁴ In actuality, I have found that Adams generally does nothing of

⁴ Some examples of these types of musical-environmental statements include Steve Heitzeg’s O Colored Earth (1993) and Webassin (1993), both works with political texts; DJ Spooky’s Terra Nova: Sinfonia Antartica (2009) and Matthew Burtner’s Auksaluq (2012), two multimedia looks at climate change in the extreme North and South; Daniel Crawford’s aforementioned A Song of Our Warming Planet (2013) which sonifies climate data; and Karel Husa’s Apotheosis of this Earth (1971), an instrumental expression of outrage at human-caused environmental damage.
the sort. I have analyzed six of his compositions, dating from 1973-2009, both before and after the essay. Table 8-1 is a summary of the analyses, including: the evolution of Adams’s goals as composer; the variety of conceptual techniques, musical building blocks, and structural tools he has used for his composition; his frequent use of visual elements, percussion, and “noise”; his varied ways of creating a sense of place; the changing nature of “expression” in his music; and the trajectory in each piece.
<table>
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<th>Adams’s stated goal</th>
<th>Techniques for Connecting Music to the Natural World</th>
<th>Primary Functions of Connection to the Natural World</th>
<th>Building Blocks (Conceptual and Sonic Materials)</th>
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<tr>
<td><strong>Adams’s stated goal</strong></td>
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<td><strong>Description/Narration</strong></td>
<td><strong>Birdsongs</strong></td>
<td><strong>Piccolos</strong></td>
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<td>Re. birdsongs:  “To hear something of their essence,” “Spontaneous affirmations,” “Translation… evocation.”</td>
<td>Imitation</td>
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<td>Recordings of natural sounds</td>
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<td>To explore “the territory of ‘sonic geography.’” “To move beyond simple landscape painting in music, toward a music which…is landscape—a music which creates its own inherently sonic presence and sense of place.”</td>
<td>Imitation</td>
<td>Recreating relationships</td>
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<tr>
<td>“An attempt to evoke an enveloping musical presence equivalent to that of a vast tundra landscape.”</td>
<td>Representation</td>
<td>Expression (Description)</td>
<td>Spoken names of times, places, and natural objects</td>
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<td>“A convergence of sonic geography and sonic geometry.” “Each piece…is conceived as its own distinct and separate sound world, evoking the immediacy and presence of a place.”</td>
<td>Sounding natural relationships</td>
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<td>Gwich’in drumming patterns</td>
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<td>“A contemplative space for tuning our ears to the unheard resonances of the earth and sky.” “The essence of this work is the sounding of natural forces interacting with the consciousness of the listener.”</td>
<td>Sonification of real-time processes</td>
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<td>Quotation</td>
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5 John Luther Adams, *songbirdsongs*, prefacing to the score.
6 John Luther Adams, *Earth and the Great Weather*, prefacing to the score.
7 John Luther Adams, *In the White Silence*, prefacing to the score.
8 John Luther Adams, *Strange and Sacred Noise*, prefacing to the score.
10 Ibid, 4-19.
| Adams’s self-imposed limits on self-expression | Percussion quartet | String quartet | Band-pass filters | ensemble
| Speaker | Long-range rhythmic and intervallic processes | Long range rhythmic and intervallic processes | Real-time geophysical data | Piccolos
| Tape | Palindromic forms | Mosaic and axial form | Long-range rhythmic processes | (v. 1995)
| Chorus | | | Indeterminate form | Topography of the site

| Performers’ creative contribution\(^1\) | Percussion ensemble | Long-range rhythmic and intervallic processes | Real-time geophysical data | -
| Choice of phrases and timing | - | - | Choice of phrases and timing

| Elements giving a sense of a particular place | Percussion ensemble | Long-range rhythmic and intervallic processes | Real-time geophysical data | The performance site
| Title | Long-range rhythmic and intervallic processes | Long-range rhythmic and intervallic processes | Long-range rhythmic processes | Singular location in Fairbanks, Alaska
| Multiple birds of one locale in each piece | Palindromic forms | Mosaic and axial form | Indeterminate form | Topography of the site
| Names of places in ANWR and organic and inorganic objects found there | | | | The performance site
| Recordings of natural sounds | | | | Site
| Aeolian harps (v. 1989) | | | | Site
| Gwich’in drumming patterns | | | | Site
| Representations of animals and natural elements | | | | Site

| Elements of Noise | Percussion ensemble | Long-range rhythmic and intervallic processes | Real-time geophysical data | -
| Noisier bird calls | Long-range rhythmic and intervallic processes | Long-range rhythmic processes | Indeterminate form | -
| Recordings of wind and water | Palindromic forms | Indeterminate form | Topography of the site | -
| Unpitched percussion | Palindromic forms | Topography of the site | - | -
| Unpitched percussion | Palindromic forms | Topography of the site | - | -
| Pink noise generator | Palindromic forms | Topography of the site | - | -
| Unpitched percussion | Palindromic forms | Topography of the site | - | -

| Visual elements | Percussion ensemble | Long-range rhythmic and intervallic processes | Real-time geophysical data | -
| Placement of performers | Long-range rhythmic and intervallic processes | Long-range rhythmic processes | Indeterminate form | -
| Representation of physical height in “Pointed Mountains” | Palindromic forms | Indeterminate form | Topography of the site | Site
| Set, dancers, and film projections (v. 1995) | Palindromic forms | Indeterminate form | Topography of the site | Site
| White (sustained) notes and empty white space on the score | Palindromic forms | Indeterminate form | Topography of the site | Site
| Fractals and waves on page | Palindromic forms | Indeterminate form | Topography of the site | Site
| Glass panel display | Palindromic forms | Indeterminate form | Topography of the site | Site
| Inuksuit patterns in the score | Palindromic forms | Indeterminate form | Topography of the site | Site
| Performance site | Palindromic forms | Indeterminate form | Topography of the site | Site

| Larger Trajectory | Percussion ensemble | Long-range rhythmic and intervallic processes | Real-time geophysical data | -
| Birds of the East Coast and of the morning to birds of Alaska and the evening | Long-range rhythmic and intervallic processes | Long-range rhythmic processes | Indeterminate form | -
| Journey from the Arctic Coast, through ANWR, and back | Palindromic forms | Indeterminate form | Topography of the site | Site
| Cycle through all diatonic intervals | Palindromic forms | Indeterminate form | Topography of the site | Site
| Framed by movements sounding the Cantor set, which is itself symmetrical | Palindromic forms | Indeterminate form | Topography of the site | Site
| No beginning or end, but shaped by circadian, lunar, and annual cycles | Palindromic forms | Indeterminate form | Topography of the site | Site
| Movement of players and audience outwards and back together | Palindromic forms | Indeterminate form | Topography of the site | Site
| A history of life on Earth | Palindromic forms | Indeterminate form | Topography of the site | Site

Table 8-1. Summary of themes discussed in six pieces of John Luther Adams.

\(^1\) Beyond subtleties of phrasing, dynamics, timbre, and articulation.
One theme that has come up repeatedly in this dissertation is the myth of the woman at Naalagiagvik. I referred to it when discussing *Earth and the Great Weather*, which supposedly follows the woman taking a journey from Naalagiagvik through the Brooks Range and back to the Arctic Coast. Adams conflates this woman with Uvavnuk, the poet of the phrase “Earth and the Great Weather.” I also referred to the myth with regards to Adams’s installation *The Place Where You Go to Listen*, which, like the woman, “tunes in” to parts of the natural world most of us cannot hear.

The myth has clearly resonated strongly with Adams. The first piece in *Winter Music*, which is mostly a compilation of Adams’s essays and reflections, is a retelling of the Naalagiagvik myth, called (of course) “The Place Where You Go to Listen.” Adams describes the woman sitting at the edge of the water listening to the birds, caribou, plants, wind, snow, and ice. But at the end of his retelling, he throws in a twist: “Then, slowly, she draws a new breath. In a voice not her own, yet somehow strangely familiar, she begins to sing.”

From the beginning of his career, Adams, like the woman, has been trying to move from listening to the natural world to making music of his own that, perhaps, can bring his listeners closer to the natural world. In the preface to *songbirdsongs*, he writes, “What do we really create but answers to Creation?” The pieces he has created have been very different, but connecting many of them are four qualities that enable Adams to accomplish the goals that he espouses in “Beyond Expression.” What follows is a summary of these qualities.

1. Adams refocuses our listening to the sounds of the natural world.

Three of the pieces analyzed in this dissertation—*songbirdsongs, Earth and the Great Weather*, and *Inuksuit*—directly employ sounds of the natural world. Adams’s music facilitates a

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focused hearing of those sounds. Moreover, the context in which those sounds are heard in his
music helps listeners to focus on them as sounds rather than as tools for a composer’s expansion.

From the first sketches of *songbirdsongs* in 1973 to the revised version of 2009, Adams’s
building blocks for this piece were birdsongs that he notated by hand. Comparison of his pieces
with recordings of the real birds reveals that Adams imitates the birdsongs faithfully in melody,
rhythm, and timbre, from the noisy, piercing trill of the red-winged blackbird to the high,
melodious spiraling of the hermit and Swainson’s thrushes. There is nothing imagined or generic
about Adams’s versions of the birdsongs. Moreover, the rules with which the birds sing the
songs, as well as their contexts (the other birds that are heard singing with them in time and
place), are authentic. Listeners are able to focus attention on the birdsongs, since they share the
musical space with only a variety of ambient sounds on percussion, and since the location of the
performers surrounding the audience brings the songs into the listeners’ awareness more
completely than the remove of a stage allows. Of course, if one wants to hear birdsongs, there is
nothing to take the place of listening to birds. Nor does Adams intend his pieces to be primarily
instructional. Adams calls them “translations” or “evocations” out of respect for the limitations
of notation, temperament, and instruments and to communicate that he tries to capture the *gestalt*
of each bird’s song rather than particular iterations. But insofar as one hears Adams’s pieces as
representative of birdsongs, they are accurate. Insofar as one learns from them, one learns of the
actual birdsongs, not Adams’s compositional prowess.

In *Earth and the Great Weather*, Adams includes recordings (i.e., quotations) of wind,
birds, flowing water, candle and sizzle ice, waves, thunder, and calving glaciers. Many of these
sounds are first heard between movements, when there are no string, percussion, or vocal sounds
to interfere with hearing them. Moreover, although there is a partially hidden protagonist for this
piece (the woman from Naalagiagvik), her emotions about the natural world are not expressed musically in any way that might shape listeners’ reactions to the sounds. Listeners are free to hear them as they wish.

Of course, some people may be able to hear these sounds in their natural contexts. Certainly no one suggests that one must go to a concert hall to hear thunder. Some of the sounds, however, are Arctic-specific and not widely accessible. In addition, one may not truly listen to them when one experiences them in natural contexts replete with other sensory stimuli.

When hearing these sounds in *Earth and the Great Weather*, listeners may listen in multiple ways. They may listen semantically, since the sounds are informative about the journey of the woman from Naalagiagvik. Listeners may also use musical perception and emotional listening. The intensity, and possibly the type, of listening that listeners had for preceding movements may carry over into these sounds. When these quotations are followed by instrumental imitations (as in “One That Stays All Winter” or any of the drum quartets), the imitations encourage us to apply our musical listening backwards to the quotations. Finally, by using indigenous place names and drumming patterns to convey the human presence in ANWR, Adams encourages us to hear these as place-specific sound sources as well.

In *Inuksuit*, much of the music consists of inuksuit patterns played on percussion instruments. This music induces listening of any of the types I have described. Moreover, with this state of listening the audience hears the natural sounds occurring in the performance site: birds and other animals, winds, waters, and even the sounds of other people. With this state of listening, listeners may also notice the ways in which their own location within the topography of the site shapes the sound of the music. Towards the end of the piece, Adams includes native birdsong imitations, which are heard along with the birdsongs of the site. This juxtaposition
further focuses our listening onto a particular natural sound in the performance site, possibly inducing us to hear it in deeper and more varied ways than if we heard it alone.

2. **Adams integrates people into their real, natural environments.**

   Three of Adams’s pieces that I discussed integrate listeners into the natural environment that they inhabit when they experience the pieces. Most generally, *Strange and Sacred Noise* sounds natural phenomena that permeate the Earth yet are not necessarily sounded. Listeners experience fractals, which occur throughout the natural world in many different forms. The piece also provides a new experience of waves, which, according to quantum mechanics, are at the heart of all matter.

   *The Place Where You Go to Listen* enables listeners in Fairbanks, Alaska to become aware of the normally unheard, geophysical processes occurring around them. Some of those processes (e.g., geomagnetic fluctuations, seismic activity throughout Alaska) might not be perceptible without *The Place*; others (e.g., the cycling of the sun and moon in the sky, cloud cover) may be experienced in a new way because of the installation.

   *Inuksuit* integrates performers and listeners into a site by situating the performance outdoors. As the audience members move throughout the site, the music informs their experience of its topology, biota and sounds.

3. **Adams changes the roles of the composer, performers, listeners, and non-human natural world in the creative process.**

   As I described in chapter 1, many “nature”-inspired works stem from a hierarchical relationship in which the natural world provides aural resources for the composer to mold.
Performers may be given variable amounts of freedom, though as with all Western classical music, their freedoms were increasingly limited in the Romantic and Modern eras. To some composers, performers are simply means of getting their music heard. Listeners are assigned even smaller roles in the creative process, as they are asked to sit quietly and absorb the composer’s music in the confines of a concert hall seat. Each of Adams’s works that I have discussed takes an interesting turn in this dynamic.

For centuries “birdsong” pieces were written with only a loose connection to actual birdsongs. In the last century Amy Beach, Olivier Messiaen, and a few others began actually transcribing them before using them in compositions. As he created *songbirdsongs* Adams observed not only the actual birdsongs but also their ethological rules of performance. This allowed for the creation of a new musical system, consisting of the birds’ phrases in an indeterminate order along with broad instructions for putting them together according to the birds’ rules and patterns. The birds thus create the motives and their rules of development, Adams transcribes them, and the performers create within the set parameters. It is no longer clear who is on top of the hierarchy, or even if there is one. Because the music of the birds is left indeterminate, the structure of the piece upholds rather than circumscribes the birds’ almost limitless creativity. Indeterminacy is, of course, not new to Adams, but the way in which he uses it to reorganize the hierarchy of composer, performers, and natural world is.

In chapter 1 I mentioned arguments by Adorno and Schopenhauer suggesting that in writing music imitative of the natural world, Adams might fail both nature and music. In *songbirdsongs*, we can see how, rather than “relegate nature to raw material,”¹⁴ or merely imitate

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the external phenomena of birdsongs, Adams has created a new art form—a hybrid of songbird phrases and rules with human creative implementation. Instead of making music from nature, in which nature’s output is treated as a resource for human transformation, Adams facilitates a music that allows authentic birdsong and human artistry to coexist. Insofar as the pieces of songbirdsongs are expressive, they are expressive of whatever it is that birds speak of as much as what Adams and his performers want to say.

With regards to Earth and the Great Weather, one may speak of two kinds of relationship. First, through the spoken poetry and place names there is a described relationship between the Native Alaskans living in ANWR and the natural surroundings. A deep human awareness of, and integration with, the natural world is conveyed over the course of the piece. Second, there are the relationships within the musical parts of Earth and the Great Weather. In some ways this relationship is conventional. The use of “seagull” glissandi to imitate seabirds, for example, is quite accurate in pitch but generic in execution. The recorded sounds that are used are “frozen,” in the sense of being unable to change over time within the composition as they do in actuality. Imitations of winds, thunder, rivers, and glaciers are what Deryck Cooke calls “indirect” imitations; since the pitch of the source is indefinite, rendering by musical instruments results in some creative distortion of the sound source by the composer.

But there are also ways in which Adams reduces his moment-to-moment influence over the music. He allows his pitch gamut to be predetermined by the Aeolian harps that he recorded in ANWR. He leaves the timing of the place names in the hands of the performers. And most importantly, much of the music that he writes for the indirect imitations is algorithmic.

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15 Schopenhauer, Die Welt als Wille und Vorstellung, 169-170.
Nearly all of Adams’s music from *Earth and the Great Weather* on, in fact, becomes algorithmic, including *In the White Silence, Strange and Sacred Noise, The Place Where You Go to Listen,* and *Inuksuit.* Through these pieces Adams defines his role as the seeker of the algorithm that can imitate howling winds, express the sense of being in an Arctic landscape, or sound the Cantor set. In each piece, his ability to shape the algorithm becomes increasingly circumscribed. In *Earth and the Great Weather,* each Arctic Litany used a slightly different algorithm. In *In the White Silence,* Adams’s initial chord presages nearly all the horizontal and linear transformations to come. In *Strange and Sacred Noise,* Adams’s decision to sound fractals of precise form limits him further.

In *The Place Where You Go to Listen,* algorithms determine the entire piece. Adams cedes moment-to-moment control to the natural world rather than to performers, who have been completely eliminated. He creates an interdependent relationship between himself and the natural world: without the real-time agency of the natural world, the piece cannot exist, and without the piece, the real-time geophysical processes cannot be experienced (at least not sonically and not in one room).

In *Inuksuit,* all the boundaries that Adams had played with in previous pieces are further loosened. Adams continues to write algorithmic phrases for each of the three groups of players. Performers are given considerable freedom in their timing of phrases, however. Audience members shape their aural experience of the piece by traversing the performance site. And for the first time in Adams’s music, the natural world contributes sonically to the music in real time, especially at the beginning and end. *Inuksuit* does not rob “what appears in nature” of its

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16 With the exception of the experimental, outdoor performances of *Strange and Sacred Noise.*
“being-in-itself,” as Adorno cautioned.\textsuperscript{17} It actually facilitates an enriched experience of the place in which it is heard.

In \textit{Inuksuit} Adams unleashes a controlled chaos. Walking through \textit{Inuksuit} with the composer is like watching an enlightened monarch who has written the constitution for a democracy and now watches the newly empowered parties create their future.

4. Adams’s music facilitates a certain kind of listening that can aid in creating a deeper sense of awareness.

Program notes usually mention that \textit{Strange and Sacred Noise} is based on fractals, and visitors to \textit{The Place} probably learn from the museum or the antechamber that it is based on geophysical forces. Listening to the natural forms and processes in these pieces, we can derive meaning from a semantic-comparative process. The conceptual understanding and the real-time experience of the pieces are quite at odds, however. The concepts can be grasped in a moment, but the pieces, like the natural forms and processes that they sound or sonify, are lengthy (\textit{infinitely} lengthy in the case of \textit{The Place}). At any given moment in time, listeners may not be aware of where they are in the process. The same is obviously the case for listeners who do not have explicit knowledge that there are algorithms underpinning the music; Adams does not mention them in his writings about \textit{In the White Silence} or \textit{Earth and the Great Weather}.

Adams’s algorithms do not lend themselves to conventionally shaped melodies or harmonic changes. What is available to Adams’s listener at most moments is a sound mass undergoing a slow and steady transformation. Adams does what he can to make the sound attractively sensuous or powerful, but to fully experience the music listeners must surrender to it.

\footnote{Adorno, \textit{Aesthetic Theory}, 88.}
They must drop expectations of conventional musical rhetoric. At times they must even drop semantic-comparative listening—their awareness of the representation of “pointed mountains,” the sonification of the sun’s movements on the horizon, or the tale of the fate of humans on the planet, for example—and engage in sustained musical perception, following what is actually happening in the music at its pace and for its length. In essence, Adams creates music to be listened to as one would listen to the natural world.

Listening is a form of awareness, and Adam’s music thus demands a certain quality of attention from listeners. It is his hope that developing this kind of awareness without expectations will change listeners’ relationships to all that surrounds them.

What I hope to do is create a strange, beautiful, overwhelming, sometimes even frightening landscape and invite you to get lost in it, find your own way through it, have your own experience in that place... I believe that music has the power to serve as a sounding model for human consciousness and culture, for our relationship with the world in which we live. And it all begins with listening. Listening is a deep and powerful mode of awareness. And when we are listening closely, when we are listening carefully, whether it is to the noise of a city street or the silence of the Arctic, we come to hear that the whole world is music. So to me that is what it means to be an environmental composer.¹⁸

Humans allow ignorance and mindlessness to lead to the objectification and alienation of other beings. We observe this within human relationships, when one group of people blinds itself to any sign of another group’s humanity in order to justify torture or enslavement. We also see it in the human–“nature” relationship, in which largely urbanized humans treat the non-human natural world as a mere resource for human consumption. Adam’s approach to artistic creation and the natural world has been to rebuild our awareness of the world around us through the medium of music. To help us to listen, to know the place where we are, and to change the relationships that we perceive, he has written music that is beautiful yet self-effacing, ecocentric

yet rigorous. Adams has re-imagined and recreated relationships with the natural world in his music so that listeners may do so in their own lives.
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