CHARLES WUORINEN’S *FLUTE VARIATIONS II*:

AN ANALYSIS AND PERFORMANCE GUIDE

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Dissertation Prepared for the Degree of

DOCTOR OF MUSICAL ARTS

UNIVERSITY OF NORTH TEXAS

December 2014

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Charles Wuorinen’s contributions to contemporary music are significant. He has produced more than 260 compositions in a wide array of genres including pieces for orchestra, opera, ballet, chamber ensemble, and soloists.

This document serves as an analysis and performance guide for Charles Wuorinen’s work for solo flute, *Flute Variations II*. Issues of analysis include serial techniques, time-point nesting, and pitch centricity and provide insight into the compositional style of the composer. As this work exhibits techniques borrowed from traditional shakuhachi performance, this document provides a brief history of the shakuhachi and an overview of the shakuhachi techniques utilized in *Flute Variations II*. The performance guide provides a pedagogical narrative to aid in the synthesis of conceptual ideas with contemporary techniques.
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Kristan K. Dewhirst
I would like to thank my committee for their time and patience in the process of the writing and revising of this document. Special thanks is given to Terri Sundberg for her superb guidance and pedagogy over the past many years. Additional thanks is given to Dr. David Schwarz and Dr. Eric Nestler for their insights and attention to detail regarding this document. I extend my heartfelt gratitude to my mother, Kathy Evans, for her continuous and tireless support. A special thanks to my husband, Gregory Dewhirst, for his unwavering support, sacrifice, and patience throughout this entire process.
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CHAPTER 1

INTRODUCTION

Purpose

The purpose of this document is to provide an analysis and performance guide for Charles Wuorinen’s *Flute Variations II* for solo flute. The dual aspects of this document explore the relationship between Wuorinen’s compositional techniques and the flutist’s performance practice. *Flute Variations II* highlights the central aspects of Wuorinen’s compositional style. It not only uses serial elements and pitch centricity to define pitch content, but it also exemplifies Wuorinen’s technique of extending a serial row to duration and rhythm through the use of time-point nesting. This analysis explores the juxtaposition of atonal elements with tonal pitch centers as well as the connection between pitch order, content, and duration as it applies to form in *Flute Variations II*. Moreover, understanding the formal relationships highlighted in this analysis will help the performer make informed decisions regarding musical nuance and expression.

From a performance standpoint, *Flute Variations II* is a challenging work that utilizes contemporary flute techniques both to emulate the traditional Japanese shakuhachi and delineate formal sections. Due to the non-traditional notation and non-Western performance aspects of this composition, a detailed performance guide benefits musicians studying or preparing to perform this work. This guide also provides instructors with a resource for teaching this and similar works. Together, the analysis and performance guide make *Flute Variations II* more accessible to the performer while also creating greater recognition of Wuorinen’s works in the flute repertoire.
Significance

Charles Wuorinen’s contributions to the flute repertoire are substantial. His output includes a total of thirty-eight solo and chamber works for flute. Wuorinen’s works for solo flute have been performed and recorded by professional flutists including Harvey Sollberger and Robert Aitken. While many scholars have written about Wuorinen’s music and compositional style, no scholarly writing or in-depth research about his compositions for flute exists. As *Flute Variations II* synthesizes Wuorinen’s compositional style with Japanese shakuhachi and contemporary techniques, an analysis and performance guide of this nature not only helps flutists better perform this piece, but it also remedies the aforementioned absence of scholarship on Wuorinen’s flute works.

As Wuorinen composed *Flute Variations II*, he was heavily influenced by the Japanese shakuhachi player Watazumido-Shuso. This work presents elements of traditional shakuhachi playing through Western notation. As the notation of shakuhachi music is itself not standardized, it can be difficult for composers to translate shakuhachi gestures into Western notation and equally difficult for performers to recognize such gestures. Additionally, the physical execution of many shakuhachi techniques is dissimilar to standard flute techniques. This guide provides the performer with the knowledge necessary not only to recognize these techniques when they appear, but also to assist with their musical execution.

In addition to shakuhachi influences, *Flute Variations II* utilizes a number of contemporary performance techniques. These techniques include pitch bends, glissandi, varied vibrato speeds, singing while playing, microtonal trills, multiphonics, harmonics, key clicks, and

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flutter tonguing. Furthermore, though the flute’s traditional range is $C^4$ to $C^7$, this piece requires a four-octave range from $F^3$ to $F^7$. This virtuosic range requires extreme strength and precision of embouchure, a topic that this performance guide will thoroughly address. A physical mastery of this extended range, as well as the other contemporary techniques mentioned above, is necessary in order to convey the artistic intent of the composer and enhance rather than impede the musical line. Identifying how these contemporary techniques emulate shakuhachi gestures helps the performer create a musically unified performance.

Additionally, recognizing the compositional techniques used by a composer is a fundamental part of musical performance. This analysis demonstrates how Wuorinen uses a serial theme in *Flute Variations II* to organize form through the use of rotation, pitch centricity, and his own extension of the time-point system. Of particular significance to the performer are the location of time-points on both the large-scale formal level and the small-scale surface rhythm level. Knowledge of these time-point events combined with an understanding of the relationship between pitch centers and the prime row enhances phrasing on multiple levels. Awareness of the manner in which shakuhachi and contemporary techniques reinforce the formal events within this composition is vital to the musical whole. This document provides the performer with a comprehensive physical, musical, and theoretical guide to Wuorinen’s *Flute Variations II*.

**State of Research**

One can find the most complete biographical information pertaining to Charles Wuorinen in Richard Burbank’s bio-bibliography of the composer’s life and works.² Charles Wuorinen’s website also provides biographical information as well as a complete discography and catalog of

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compositions. Additional biographical information can be found in standard reference sources such as Grove Music Online.

Charles Wuorinen’s music and compositional style has been the subject of numerous articles that either discuss his music or review his album releases. Most significant to the topic of this document are those that discuss Wuorinen’s compositional style. William Hibbard’s article, “Charles Wuorinen: The Politics of Harmony,” discusses the manner in which Wuorinen uses twelve-tone sets and their transformations to articulate drama and non-Western elements in this masque. In Christian Carey’s article, “A row is a row is sometimes pitch-centric: Charles Wuorinen's contribution to post-tonal composition,” the importance of pitch centricity as a structural device is explored in Wuorinen’s Fourth Piano Conerto and the opera Haroun and the Sea of Stories. Perhaps most useful to an analysis of Flute Variations II is the article by Brendan McConville entitled "A 'Simple Composition' of Charles Wuorinen: Isomorphism, Self-Similarity, and Nesting in Cello Variations." This article illustrates Wuorinen’s time-point nesting method and the relationship between a serial row and its use to determine the background structure of the composition. In addition to these articles, there are a number of dissertation and theses that investigate the compositional techniques inherent in Wuorinen’s works: James Romig’s “Twelve-tone Rhythmic Structure and Its Application to Form: Time-Point Nesting and

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Rotation in Spin,“7 Igor Scedrov’s “A Study of the Reciprocal Relationship Between the Composer and the Performer in Selected Works for the Cello by Samuel Barber, Elliot Carter, and Charles Wuorinen,”8 Joseph Schiavo’s “The Piano Sonatas of Charles Wuorinen: An Evolution of Style,”9 and Heidi Upton’s “The Percussion Symphony by Charles Wuorinen and the Concerto for Prepared Piano and Chamber Orchestra by John Cage: An Analysis and Comparison – The Use of Piano as a Percussion Instrument.”10 Despite the number of dissertations and articles mentioned above that focus on Wuorinen’s compositions, there exists no scholarly research on his works for flute. The goal of this document is to remedy this dearth of scholarship.

Of great importance to an analysis of Flute Variations II is Charles Wuorinen’s Simple Composition, a book addressed to composition students that illustrates many of the compositional procedures Wuorinen uses in his works.11 Much of the book discusses the twelve-tone system and its extensions. However, Simple Composition also describes Wuorinen’s concepts of the time-point system and nesting methods. Though written in 1968, a decade before Wuorinen published Simple Composition in 1979, Flute Variations II provides an example of his synthesis of tonal pitch centers with serial operations and time-point nesting.

Very little information is available that specifically references Wuorinen’s *Flute Variations II*. A single commercial recording of this composition exists and is performed by Harvey Sollberger. The liner notes to this CD reveal Wuorinen’s fascination with shakuhachi techniques at the time of *Flute Variation II*’s composition.\(^\text{12}\) Nancy Toff’s *The Flute Book: A Complete Guide for Students and Performers*\(^\text{13}\) lists *Flute Variations II* in a catalog of flute literature. Yet, Toff only provides information regarding the instrumentation and publisher of this piece. James Pellerite’s *A Handbook of Literature for the Flute: A Compilation of Graded Method Materials, Solos, and Ensemble Music for Flutes* provides more information regarding this work. Pellerite places *Flute Variations II* in the most difficult category of solo flute music and provides a brief description of the contemporary techniques contained within *Flute Variations II*.\(^\text{14}\) Nonetheless, Pellerite’s description of these techniques is incomplete. None of the above mentioned references provide information regarding the theoretical or performance difficulties contained within this composition.

**Method**

In order to better understand *Flute Variations II*, this document provides an examination of both compositional and performance techniques. A theoretical analysis examines the structural form of *Flute Variations II* and identifies the serial and atonal elements that define such form. Identifying these compositional elements makes this piece more approachable to the performer. Such analysis also aids in understanding the relationship between formal elements and the deliberate placement of contemporary and shakuhachi techniques in order to reinforce the overall

\(^{12}\) Wuorinen, *Music for Two Decades*.

musical idea of the work. The analysis focuses on each section individually and then relates each section to the whole. For instance, the opening “theme” of Flute Variations II presents both a sustained pitch, A⁴, followed by a twelve-tone row beginning on the same pitch.[Example 1] These two elements provide the foundation for the pitch-centric, serial, and time-point devices used throughout the remainder of the work.

Example 1. Flute Variations II, mm 1-5. Pitch centric and twelve-tone opening of Flute Variations II.

This document examines both the non-traditional performance practices and non-traditional notation present in Flute Variations II in order to understand the technical and musical demands placed on the performer. Investigation of performance practices of non-traditional notation include singing and playing, multi-phonics, measured vibrato, glissandi, microtonal trills, and pitch bends. As these contemporary elements emulate shakuhachi techniques, this document’s overview of relevant shakuhachi flute techniques will help performers better understand the genre. Research for this performance guide utilized both written and recorded sources in order to complete an instructional narrative that encompasses aspects of composition, performance tips, and practice techniques.
Biography

Charles Wuorinen, born in 1938, is an American composer whose large body of works spans many genres. He began composing in his youth and at the age of sixteen won the New York Philharmonic’s Young Composers’ Award. Wuorinen received both a bachelor’s and master’s degree from Columbia University. His composition instructors included Otto Luening, Vladimir Ussachevsky, and Jack Beeson. Wuorinen began his teaching career at Columbia University in 1964. He later taught at Princeton University, Yale University, the University of Iowa, the University of California at San Diego, Manhattan School of Music, New England Conservatory, the State University of New York at Buffalo, and Rutgers University.15

As a champion of new music, Wuorinen co-founded the Group for Contemporary Music with fellow composer and flutist Harvey Sollberger in 1962. Dedicated to the performance of new chamber music, collaboration between this group and Stefan Wolpe helped bring international attention to Wolpe’s music with the writing and premier of Wolpe’s Trio for Flute, Cello and Piano and Piece for Two Instrumental Units. Wuorinen continued his promotion of new music when he organized and conducted the New and Unusual Music concert series from 1985 through 1989. This series highlighted performances of music by composers such as Elliott Carter, Lou Harrison, George Perle, Steve Reich, and Morton Feldman.16

Wuorinen won the Pulitzer Prize in 1970 for Time’s Encomium. This electronic work addresses “one of the fundamental dilemmas of electronic music – the fact that all renditions of a work will be identical – it takes the precision of the electronic medium as its theme, guiding the

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listener towards an awareness of the infinite variety of lengths and subtle variations in timbre of highly differentiated core units.” Wuorinen’s other honors include an American Academy of Arts and Letters Award in 1967, a two Guggenheim Fellowships in 1969 and 1972, a McArthur Fellowship in 1985, and his induction into the American Academy of Arts and Letters in 1985.

Wuorinen’s esteem as a composer grew in the 1970s, which led to commissions from several renowned musicians and orchestras. These include Michael Tilson Thomas and the Boston Symphony Orchestra’s commission of the Concerto for Amplified Violin and Orchestra (1972) and the Cleveland Orchestra’s commission of Tashi (1976). Wuorinen also composed several works for the New York City Ballet. These include Five: Concerto for Amplified Cello and Orchestra (1987), the ballet Delight of the Muses (1991), a transcription of the Schoenberg Op. 31 Variations (1996), and the Dante Trilogy (1993-95). Igor Stravinsky’s widow invited Wuorinen to compose a piece, Reliquary for Igor Stravinsky, based on Stravinsky’s final sketches. Wuorinen later served as composer-in-residence with the San Francisco Symphony Orchestra from 1983 to 1989. This affiliation resulted in the composition of Rhapsody for Violin and Orchestra (1983), The Golden Dance (1986), Machault mon chou (1988), and Genesis (1989). Wuorinen’s body of chamber works continued to grow with commissions from ensembles such as Speculum Musicae, Parnassus, the Da Capo Players, and the New York New Music Ensemble.

Wuorinen has composed for the flute throughout his career. Most notable in his flute output are the Duo Sonata for Flute and Piano (2004), Wind Quintet (1977), Speculum Speculi (1972), Flute Variations I (1963), Flute Variations II (1968), Chamber Concerto for Flute and

17 Ibid.
18 Ibid.
19 Ibid.
10 Players (1964), Sonata for Flute and Piano (1960), Trio for Flute, Cello, and Piano (1961), Second Trio for Flute, Cello, and Piano (aka Piece for Stefan Wolpe, 1962), Eight Variations for Flute and Harpsichord (1960), and Sonatine for Woodwind Quartet (1956). Flutists such as Harvey Sollberger and Robert Aitken have commissioned and recorded several of Wuorinen’s compositions. The remainder of this document focuses on Wuorinen’s 1968 Flute Variations II, written for and premiered by Harvey Sollberger.
CHAPTER 2
ANALYSIS

Introduction

Composed in 1968 for Harvey Sollberger, *Flute Variations II* is a virtuosic work that embodies many of the compositional techniques employed by Charles Wuorinen throughout his career such as serial techniques, pitch-centricity, and time-point nesting. Formally, this work consists of three large sections that reflect elements of symmetry. Of the thirty-two measures that make up *Flute Variations II*, ten measures form each of the two outer sections with twelve measures making up the inner core of the work. The outer sections are both fifty eighth notes in length. Further symmetry is defined by the three 2/2+3/8 measures contained in the inner section of the work. The first and last of these measures mark the beginning and end of the inner section. The third 2/2+3/8 measure divides the not only the inner section but the entire work into two groups of sixteen measures each. With regard to compositional techniques, the first and third sections use a twelve-tone series and its transformations to generate pitch content. The inner section uses time-point nesting to govern meter and events on multiple levels. All three sections contain elements of pitch-centricity.

Wuorinen and *Simple Composition*

Written during the compositional period in which he wrote *Flute Variations II*, Wuorinen’s *Simple Composition* is a composition textbook that describes his compositional and analytical techniques. This text falls into a post-Babbitt and pre-Straus framework. As such, Wuorinen describes several of the compositional and analytical techniques contained within *Simple Composition* in somewhat idiosyncratic terms. Though some of its constructs have been
refined by later theorists, the concepts Wuorinen describes and the manner in which he describes them in *Simple Composition* will be used as a guide in the analysis of *Flute Variations II*.

Wuorinen utilizes a version of the “moveable do” system throughout *Simple Composition* as he believes that it provides clearer relationships between different forms of a set. He notes that the pitch class assigned with the integer 0 is variable, though the first pitch class of a twelve-tone set will usually be labeled with 0. Wuorinen acknowledges that the “fixed do” system, in which pitch class C is always designated with the integer 0, has the advantage of standardization. However, he argues that, “when the first pitch class of a set is not C-natural, using fixed numbering obscures the relations among its different forms.”

Therefore, according to Wuorinen, “pitch class 0 is the note selected as the ‘origin’, pitch class 1 is one semitone above it, pitch class 2 is two semitones above it, and so forth.”

Wuorinen’s system of numerical notation includes six principles. The first states that the twelve pitch classes are designated with integers 0 through 11 and are numbered sequentially in ascending order. The second principle is that of the “moveable do” described above. His third and fifth principles clarify octave equivalence while the fourth principle affirms the use of semitones as the measurement between intervals. Wuorinen’s sixth principle maintains that intervallic direction has no meaning. He writes that, “this is a property of real notes and intervals, not of pitch classes or interval classes. For this reason, we neither speak of intervals as ‘ascending’ or ‘descending.’ Instead we observe the convention that all intervals are always measured *upwards* from 0.” Therefore, the first pitch class of a twelve-tone row is designated with the integer 0 and all subsequent pitches in the row are labeled with integers that reflect their distance in semitones from the first pitch.

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21 Ibid, 81.
The following analysis of *Flute Variations II* follows the principles Wuorinen outlined in *Simple Composition*. As such, the prime row of the work, <A, B♭, C, D, C♯, F♯, G, E♭, F, E, G♯>, is labeled as the pitch-class series <0, 1, 3, 2, 5, 4, 9, 10, 6, 8, 7, 11>. All transpositions and operations applied to the prime row use Wuorinen’s numbering system. [Table 1]

Table 1

**Matrix for prime row of Flute Variations II.**

<table>
<thead>
<tr>
<th></th>
<th>I₀</th>
<th>I₁</th>
<th>I₃</th>
<th>I₂</th>
<th>I₅</th>
<th>I₄</th>
<th>I₉</th>
<th>I₁₀</th>
<th>I₆</th>
<th>I₈</th>
<th>I₇</th>
<th>I₁₁</th>
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<td>6</td>
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<td>0</td>
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</tr>
<tr>
<td>P₅</td>
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<td>5</td>
<td>10</td>
<td>11</td>
<td>7</td>
<td>9</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>R½</td>
<td>R₀</td>
<td>R₁</td>
<td>R₃</td>
<td>R₂</td>
<td>R₅</td>
<td>R₄</td>
<td>R₉</td>
<td>R₁₀</td>
<td>R₆</td>
<td>R₇</td>
<td>R₈</td>
<td>R₁₁</td>
</tr>
</tbody>
</table>

Serial Operations in *Flute Variations II*

Wuorinen uses a twelve-tone row to govern form throughout *Flute Variations II*. Throughout the first and third sections of the work, Wuorinen applies serial operations such as transformation and rotation to the prime row. Though the inner section of the work is not serial, it is composed of time-points derived from the intervals of the prime row.

13
Flute Variations II begins with the sustained use of A⁴ followed by a statement of the prime row, \(<A, B^b, C, B, D, C^#, F^#, G, E^b, F, E, G^">. This row translates into the pitch-class series \(<0, 1, 3, 2, 5, 4, 9, 10, 6, 8, 7, 11>\). Wuorinen then builds the remaining measures of the first section by manipulating the prime row in a combination of what he calls the “fundamental operation” of transposition and the “further operation” of rotation.²²

After the initial statement of the row in the third and fourth measures, Wuorinen uses twelve ordered hexachords to generate the remaining pitch content of the first section. Six of these ordered hexachords originate from the prime row while the other six are derived from various transpositions or transformations of the row. Beginning in measure four, Wuorinen alternates the use of ordered hexachords from each of the two groups starting with the first six pitches from P⁰ followed by the last six pitches of RI¹. He then starts on the second pitch class of P⁰ to present another ordered hexachord that he pairs with a R⁵ hexachord. Wuorinen then uses the third, fourth, fifth, and sixth pitch classes of P⁰ to start subsequent pairings of ordered hexachords. As the alternation between P⁰ hexachords and “transformed hexachords” continues, it becomes apparent that the starting pitch classes of the six P⁰ hexachords – the A, B⁷, C, B, D, and C⁷ – are used in rotation to create a large scale projection of the first hexachord of the prime row. [Example 2] This nested sequence of intervals that governs the pitch order foreshadows the concept of nesting that becomes fundamental in the inner section of the work. Note that the first and last pairing of hexachords, those starting with the first and sixth pitch classes of P⁰, contain the full aggregate of pitches. These secondary sets create a clear beginning and end to the first section.

²² Ibid, 98.
Example 2. *Flute Variations II*, mm 1-10. Rotation of $P^0$ as a structural organizer.

Wuorinen organizes the third section, beginning in measure twenty-three, with serial pitch content as well. The ordering of events and materials used in this final section differs from those in the first serial section. The sustained and articulated $A^4$ that began the piece does return, though it does not begin the third section as it began the first. Wuorinen delays the return of this sustained pitch until the fourth measure of section three. Additionally, the first serial section contained two secondary sets. These rows acted as bookends at the beginning and end of the hexachord rotations. The third section also features two secondary sets. These two sets appear consecutively at the conclusion of the third section, measures thirty through thirty-two.

As in the first section, Wuorinen organizes the third section with the alternation of hexachords generated from transformation of the prime row with rotating hexachords taken from
the row RI⁰. In this instance though, Wuorinen reverses the order of events so that the rotating hexachords from RI⁰ appear after the transformed hexachords. Every pair of hexachords ends with a six-note excerpt from RI⁰. [Example 3] Wuorinen rotates the recurring row so that the second through seventh pitches of RI⁰ begin each RI hexachord. The last pairing of P¹⁰ and RI⁰ creates an aggregate that is followed by a full statement of the RI⁰ row.

Example 3. *Flute Variations II*, mm. 23-30. Rotation of hexachords derived from RI⁰.

Wuorinen’s use of RI⁰ to organize the pitch content of the third section is significant. It is the retrograde not only of I⁰ but also the retrograde of the row M¹¹. In *Simple Composition*, Wuorinen defines this multiplicative transformation for the row as an operation in which the pitch-class numbers of the prime row are multiplied by eleven, mod 12. When this operation is applied to the prime row of *Flute Variations II* to find M¹¹, it results in a row that is identical to
Using the retrograde of $M^{11}$, $Rm^0$, to conclude the work as a whole reinforces Wuorinen’s emphasis on the number eleven.

The value eleven is seen operating in all sections of *Flute Variations II*. For instance, the initial statement of the prime row in measure three shows the first eleven pitches stated in a single gesture and separated from the final note of the row by a rest. The time-point nesting elements found in the inner section of the work begin in measure eleven and uses eleven as a scaling unit in the first levels of nesting. It is fitting that the retrograde of $M^{11}$ concludes the work as a whole.

**Time-Point Operations in *Flute Variations II***

Since the late 1960’s, many of Wuorinen’s compositions make use of and extend the time-point system that was previously developed by Milton Babbitt. Babbitt’s system transfers the relationship between pitches into corresponding time intervals. It is a way of linking the intervals of a tone row to moments in musical time. In *Simple Composition*, Wuorinen describes Babbitt’s method as “a progress of mosaic-like accretion – small units of continuity pitch-class/time-point set-form complexes are conjoined to make a larger continuity. The large is built up out of, and gradually emerges from, the manipulation of small entities.”

In Wuorinen’s time-point nesting method, Babbitt’s time-point system that proceeds from small to large is reversed. Wuorinen’s time-points govern the largest scale of form and work inwards to smaller sub-sections. In this system, Wuorinen begins with large spans of music that he defines in a very general way, usually only with regard to length. He then links pitch interval size to form. Smaller intervals imply shorter musical sections and larger intervals imply longer

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23 Note that this holds true only when the first pitch class of the prime row, pitch class $A$, is labeled as zero as in Wuorinen’s method of composition. If pitch class $A$ is labeled with the integer 9 to begin the row, application of Wuorinen’s multiplicative transformation operation will result in a different ordered pitch-class series for $M^{11}$.

24 Ibid, 150.
time spans. This process repeats on multiple levels. In doing so, Wuorinen creates layers of self-similarity by carving out progressively smaller and more detailed layers of the work.25

Wuorinen’s large-to-small application of the principles of the time-point system to Flute Variations II follows the four levels of nesting he describes in Simple Composition. The first layer of division defines the overall duration of the time-point section that consists of measures eleven through twenty-two. Then, Wuorinen divides this total duration into time intervals proportional to and in the same order as those of the pitch-classes from the prime tone row. This retains the time-point system’s principle of correlating pitch intervals with time intervals. Wuorinen describes this second level of time-point division as “measures” with “meter signatures.”26 These “measures” are subject to further subdivision in order to create a third layer of time-point nesting. Each of the divisions within the second and third layers of time-point nesting mirror the durational intervals derived from the prime row and thus create an element of self-similarity between form, meter, and rhythm. Wuorinen uses a fourth level of nesting in Flute Variations II that extends the concept of self-similarity beyond duration to pitch content.

First Level of Time-Point Nesting

To analyze time-point nesting in Flute Variations II, one must first translate the prime row from pitch intervals into durational intervals. Shown below is the prime row of Flute Variations II, first as the ordered pitch class intervals of the prime row and then translated as durational intervals. [Example 4] In order to translate the pitch class intervals of the prime row into time intervals, one must consider that, because time is one-directional in that it only moves forward, any time-point must come after the one that came before. As Wuorinen states, “It is rather as if one had to express a succession of tones with intervals in one direction only – so that

25 Ibid, 150.
26 Ibid, 153.
the option of placing a tone (i.e., expressing an interval class) above or below its predecessor was not available, and one could only place it, say, above.” Therefore, one does not measure the shortest distance between the pitch-classes in the prime row, but rather the distance between them as they ascend. Note that in using Wuorinen’s system of numerical notation where pitch class A is labeled as 0, he is essentially using an ordered pitch class interval series to derive a second ordered pitch class interval series that he calls “durational intervals.”

Example 4. Flute Variations II, mm 3-4. The prime row translated into durational intervals.

Prime Row: \[0 1 3 2 5 4 9 10 6 8 7 11 0\]

Durational intervals: \[1 2 11 3 11 5 1 8 2 11 4 1\]

Sum of durational intervals =60

As noted earlier, the first layer of time-point division defines the overall duration of the time-point section. In Simple Composition, Wuorinen states, “the sizes of the durational intervals between the time points that correspond to the pitch classes of the set are scaled in accordance with a decision, made in advance, about how long the work is going to be.” To calculate the total duration of the time-point section, one multiplies the sum of the intervals of the row by a fixed scaling unit.

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25 Ibid, 134.
28 Ibid, 151.
The prime row of *Flute Variations II* spans sixty half steps from beginning to end, so the sum of the intervals between pitch-classes in the prime row in *Flute Variations II* is sixty. Translated to durational terms, it will span sixty time units. To determine the scaling unit decided upon in advance by Wuorinen, the total duration of the inner section, 660 eighth notes, is divided by the sixty time units derived from the row to determine that a one-unit interval is eleven eighth-notes in length. Therefore, the inner section of *Flute Variations II* contains 660 eighth notes that are divided into sixty parts that are each eleven eighth-notes in length.

*Second Level of Time-Point Nesting*

Wuorinen then divides the total duration of the section, the 660 beats or sixty parts of eleven eighth-note beats, into twelve large sub-sections. These sub-sections comprise the second layer of time-point division that Wuorinen describes as “measures” with “meter signatures.” Wuorinen carves out this second layer of nesting by translating the interval succession of the prime set into temporal terms in which eleven eighth-notes corresponds to one unit. In other words, each of the durational intervals of the prime row is multiplied by the scaling unit of eleven eighth notes to create a series of twelve subsections. [Table 2] The first sub-section, or measure, is eleven eighth notes beats (11x1), the second sub-section is twenty-two beats (11x2), the third sub-section is 121 beats (11x11), and so forth until Wuorinen attains the length of 660 beats. Wuorinen writes these twelve sections as twelve individual measures with meters that correspond to the determined number of eighth notes.

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29 Ibid, 153.
Table 2

*Second level time-point division “measures with meters”.*

<table>
<thead>
<tr>
<th>Measure:</th>
<th>11</th>
<th>12</th>
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<th>17</th>
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<th>19</th>
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<th>21</th>
<th>22</th>
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<tbody>
<tr>
<td>Duration in eighth notes</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 es</td>
<td>2x11=22</td>
<td>11x11=121</td>
<td>3x11=33</td>
<td>11x11=121</td>
<td>5x11=55</td>
<td>1x11=11</td>
<td>8x11=88</td>
<td>2x11=22</td>
<td>11x11=121</td>
<td>4x11=44</td>
<td>1x11=11</td>
<td></td>
</tr>
<tr>
<td>22 es</td>
<td>121 es</td>
<td>55 es</td>
<td>11 es</td>
<td>88 es</td>
<td>22 es</td>
<td>121 es</td>
<td>44 es</td>
<td>11 es</td>
<td></td>
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<tr>
<td>11 εs</td>
<td>11 εs</td>
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<table>
<thead>
<tr>
<th>Meter</th>
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<tr>
<td>2 + 3</td>
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<td>2 8</td>
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<tr>
<td>55</td>
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<td>11</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>2 + 3</td>
</tr>
</tbody>
</table>

At the second and third level of time-point division, it is important to understand Wuorinen’s understanding of the time-point itself. He clearly differentiates the properties of pitch intervals, time intervals, and time-points. Wuorinen states,

A pitch interval is the distance between two pitches (or more abstractly, the interval class separating two pitch classes). A time interval is the distance (or time length) between two time points. A time point is a location in the flow of time. In music, such an allocation is only recognizable if it is defined by an event….But by far the most common event that defines the location of a time point in music will be the first one just mentioned- the attack-point of a note.\(^{30}\)

Indeed, many of the time-points on the second-level of division, the “measures with meters,” begin and end with similar “events”. Each measure, with the exception of the first and last measures of the inner nesting section, begins with a four pitch gesture. [Example 5] These gestures often come in the form of grace notes or tremolos. Additionally, all measures within the second layer of nesting conclude with a five-pitched gesture, often a set of five grace notes. Note that when these events marking the beginning and end of measures are comprised of grace notes,

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\(^{30}\) Ibid, 131.
they have no durational value and do not contribute to the temporal length of the unit. Instead, they act solely as attack points.

Example 5. Flute Variations II, m. 12. Introductory four-pitch gesture and closing five-pitch gesture.

Third Level of Time-Point Nesting

The third level of time-point division occurs in seven of the twelve measures contained in the inner section. Wuorinen creates the third level of division in the seven larger measures in the same manner as the second level of division. The total duration of a measure is divided into twelve sections based on the durational intervals of the row, <1,2,11,3,11,5,1,8,2,11,4,1>. As the total duration of each measure differs, the scaling unit used varies between measures. To find the scaling unit for each measure, we divide the duration of the measure by the sum of the durational intervals of the prime row. For instance, in measure thirteen, we divide the total duration of the measure, 121 eighth notes, by sixty, the sum of the durational intervals in the prime row. In temporal terms, an interval of one unit in this section corresponds to $\frac{121}{60}$, or $2\frac{1}{60}$ eighth notes.

As Wuorinen states in Simple Composition, “the division process will become unduly complex arithmetically unless we begin to round off some of the previously figured subsection lengths to
integral number of beats, or simple fractions of them.”31 In measure thirteen, Wuorinen rounds
the length down so that an interval of one unit in this section corresponds to 120/60 or two
eighth-notes.

Once the interval size is determined, measure thirteen divides into twelve sections. This
is achieved by multiplying the unit of two eighth notes by the durational intervals of the prime
row. [Figure 1] The time-point divisions of measure thirteen are shown below. [Example 6] To
allow for the rounding off of the scaling unit, Wuorinen adds an extra eighth rest at the end of
this section in order to preserve its overall length of 121 eighth-notes as dictated by the second
level of time-point nesting.

Measures fifteen and twenty have the same meter as measure thirteen. Both follow the
same process of time-point division in which the scaling unit is rounded down to a length of two
eighth notes. Again, Wuorinen adds an eighth rest to the end of these measures to preserve the
proper length.

\begin{tabular}{c|c|c|c|c|c|c|c|c|c|c|c}
| Time-Interval Row: & 1 & 2 & 11 & 3 & 11 & 5 & 1 & 8 & 2 & 11 & 4 & 1 \\
| Eighth notes per time-point: & 2 & 4 & 22 & 6 & 22 & 10 & 2 & 16 & 4 & 22 & 8 & 2 |
\end{tabular}

\textit{Figure 1}. Multiplication of time-interval row to determine lengths of time-points in m. 13.

\footnote{31 Ibid, 152.}

Measure fourteen also follows the durational sequence of the prime row. In this instance, the unit size is approximately one sixteenth note in length. The total duration of thirty-three eighth notes in this measure is divided by sixty to equal 0.55 eighth notes and then rounded down to make one unit equal to one sixteenth note in length. Wuorinen adds an additional dotted quarter rest at the end of the section to maintain the appropriate length.

Wuorinen organizes the remaining three measures that contain third level time-points with a looser correlation to the durational intervals of the prime row. For instance, measure sixteen is fifty-five eighth-notes long. This results in a durational unit equal to .83 eighth notes. In this instance, Wuorinen rounds the time unit up to a whole eighth note. However, Wuorinen shortens the length between several time points in order to maintain the overall span of fifty-five eighth-notes. To do this, he shortens all original intervals larger than four by one eighth note. This results in the durational interval sequence \(<1,2,10,3,10,4,1,7,2,10,4,1>\) in contrast to the original sequence of \(<1,2,11,3,11,5,1,8,2,11,4,1>\).
Wuorinen uses a similar technique in measure eighteen where the interval size is 1.46 eighth notes. He rounds the time interval up to 1.5 eighth notes but then must alter two time intervals and add an additional eighth-note to the end of the section in order to preserve its length. The third and tenth time intervals would both be 16.5 eighth-notes in length according to the original row. However, Wuorinen shortens both intervals to fifteen eighth notes long so that the new sequence of durational intervals is \(<1,2,10,3,11,5,1,8,2,10,4,1>\). A similar alteration occurs in measure twenty-one where both the third and tenth time intervals are shortened from 8.25 eighth notes to 7.5 eighth notes. The new sequence of durational intervals is again \(<1,2,10,3,11,5,1,8,2,10,4,1>\).

Five of the “measures with meters” in *Flute Variations II* do not lend themselves to further time-point division due to their brief length. As Wuorinen found when experimenting with this system, the size of a unit limits the number of times it may be nested.\(^{32}\) Measures eleven, seventeen, and twenty-two are all eleven eighth notes in length. It is impractical to divide a measure that is only eleven eighth-notes long into sixty sections based on the interval durations of the prime row. The same is true of measures twelve and nineteen, which consist of only twenty-two eighth notes. Indeed, when describing a similarly brief measure in *Simple Composition*, Wuorinen states, “The 2/4 that follows is so small that we may be best off giving up and just filling it with twelve equal divisions.”\(^{33}\) While the brief measures are not subject to detailed slicing on the third level of time-point nesting, they do contain elements that reflect the intervals of the prime row as well as the overall scaling unit of eleven.

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\(^{33}\) Ibid, 152.
Though he does not create twelve equal divisions in measures eleven, seventeen, and twenty-two, Wuorinen does create twelve gestures within each of them. These measures are each eleven eighth-notes in duration with a meter of 2/2 + 3/8. To create twelve gestures within eleven eighth-notes, Wuorinen superimposes two 5:4 ratios on the rhythms of the 2/2 section. Thus, the eight eighth notes become ten units that are each 0.8 of an eighth note in length. These ten units each make up an event. The remaining two events are found in the 3/8 section. The first four sixteenth-notes comprise the eleventh event while the remaining eighth-note is the twelfth event. These twelve “events” imply the fourth level of time-point nesting detailed in the next section as their pitch content conforms to the space between intervals in the prime row. This can be seen clearly in measure eleven. [Example 7] Additionally, Wuorinen references the number eleven in each of these brief measures though not as a scaling unit. For instance, in measure eleven, he introduces two tone rows that consist of eleven pitches each.

Example 7. *Flute Variations II*, mm. 11-12. Third level of time-point nesting in brief measures.
Measures twelve and nineteen do not divide into twelve equal parts. Rather than dividing these measures into twelve equal parts or trying to divide the twenty-two eighth-notes into sixty equal parts, Wuorinen simply references the scaling unit of eleven. As the scaling unit is eleven eighth-notes and these measures are two units in duration according to the second level of time-point nesting, Wuorinen simply divides the measure into two equal parts consisting of eleven eighth-notes each. [Example 7] In measure twelve, a gesture of four grace notes introduces one unit of eleven eighth notes. This set of eleven eighth-notes is followed by another span of eleven eighth-notes, again beginning with the four pitch grace note gesture and ending with a gesture of five grace notes. Wuorinen uses a similar technique in measure nineteen.

Fourth Level of Time-Point Nesting

Wuorinen creates a fourth level of nesting in Flute Variations II. At this level, the number of pitch classes within each third level time point correlates with the durational units of the prime row. For instance, the sixth durational interval in the prime row is five units in length. Therefore, in all measures that utilize third-level time-point nesting, the sixth time-point has a duration of five units and contains five pitch classes. Third level time points that consist of a three unit intervals contain three pitch classes while those that contain a two unit intervals contain two pitch classes. Those third-level time-points consisting of four or eight units include four pitch classes. The one unit interval that begins the row results in the use of two pitch classes while the one unit interval that ends the row contains one pitch class. This also holds true for the 2/2+3/8 bars that are too small for third level time-point divisions. Durations of eleven units most often consist of a single pitch class, though several have two, three, or four pitch classes present. The exceptions to this correlation are measures twelve and nineteen. [Table 3]
Table 3

*Correlation between time-point interval length and number of pitch-classes per measure.*

<table>
<thead>
<tr>
<th>Initial Time-Point Intervals:</th>
<th>Measure</th>
<th>Number of Pitch-Classes Present Per Time-Point Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2 1 1 3 3 1 5 1 4 2 1 4 1</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>2 2 1 2 1 5 1 4 2 1 4 1</td>
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<tr>
<td></td>
<td>14</td>
<td>2 2 1 3 1 5 1 4 2 1 4 1</td>
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<td>15</td>
<td>2 2 2 3 2 5 1 4 2 1 4 1</td>
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<td>17</td>
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<td></td>
<td>18</td>
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</tr>
<tr>
<td></td>
<td>22</td>
<td>2 2 1 3 1 5 1 4 2 1 4 1</td>
</tr>
</tbody>
</table>

Pitch Centricity in *Flute Variations II*

One idea that has been central to Wuorinen’s compositions throughout his career is the concept of pitch centricity. Many of his works focus on specific pitch classes or pitch-class sets as a way to organize a piece in the absence of functional harmony. As Louis Karchin defines it, pitch centricity is the use of “one pitch to anchor those pitches surrounding it.”34 To achieve pitch centricity within a post-tonal framework, composers may use several means of pitch reinforcement such as frequent repetition, sustained length, extreme dynamics, extreme registers, and the use of rhythmic or metrical stress.35

Because many of Wuorinen’s works contain serial aspects, the issue of pitch centricity becomes quite interesting. In the early stages of Schoenberg’s twelve-tone compositions, his

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intention was to “postpone the repetition of every tone as long as possible.” The premature repetition of a tone would raise its status to that of a tonic. Regarding centricity, Joseph Strauss states, that “at one extreme, represented by much twelve-tone music, there is little or no sense of centricity. Even so, of course, the pitch classes are not treated identically, and it is important to be sensitive to any kind of special treatment accorded to pitch classes or pitch-class sets.”

Wuorinen has stated that the use of pitch centers within serial compositions has the effect of “bringing back an aspect of tonality which may have been abandoned unnecessarily.” Indeed, in his book, *Simple Composition*, Wuorinen writes that serial and tonal compositions are parts of a continuous whole. He states that, “If the highly chromatic music of late tonality can be regarded as proto-12-tone; if the last, 12-tone, works of Stravinsky can contain so many tonal-system puns – then surely our awareness of the two approaches to composition as parts of a single generous totality must become vivid indeed.” As Jeffrey Kresky states, Wuorinen’s music shows a reconciliation of twelve-tone music with tonality. Wuorinen merges these two elements through the tonicization of pitches within the set as well as the promotion of the first pitch of the set that he calls the “zero pitch.” Kresky notes that it is not uncommon in Wuorinen’s works for the emphasis on the first pitch of the set to return at the end of the work.

Wuorinen’s use of pitch centricity to unify *Flute Variations II* is immediately apparent with the opening gesture of the work. The opening pitch center of the piece is pitch class A. The work opens with a sustained A followed by rapid articulation of the same pitch before it

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36 Karchin, 59.
37 Strauss, 133.
38 Karchin, 60.
41 Ibid.
becomes the first pitch of the initial twelve-tone row. This “zero pitch,” as Kresky calls it, occurs as the first note of hexachord alternation and rotation in the following serial section, measures four through ten. Note that the last note of the prime row is a G#. This pitch creates a leading tone effect into the first two tone rows in measures three and four.

Wuorinen uses A⁴ at the end of measure ten to both conclude the first serial section and begin the following time-point section. The use of A⁴ in this manner acts as a sort of elided cadence between the opening serial section and following time-point nesting section. The notation in this instance is interesting as Wuorinen notates the A⁴ as a grace note with a clear, unbroken slur coming from the preceding pitch. However, a broken slur musically attaches this A⁴ grace note to the following measure, measure eleven, which begins the next formal section of the work. This A⁴ begins a restatement of P⁰ that continues for eleven pitches before another row, which also begins with A⁴, interrupts.

Throughout the inner time-point section, Wuorinen rarely uses pitch class A. The one exception is measure twenty-two, the last of the time-point measures, in which he uses A⁵ three times in a metrically strong manner. This foreshadows of the lengthy return of pitch class A in the final section of the work.

In the final serial section, Wuorinen again emphasizes pitch-class A. The return of a prolonged use of pitch class A does not introduce the return of serial techniques as it introduced the initial serial section. Rather, this sustained use of pitch class A is delayed by several measures. When A returns, it is no longer presented as a simple sustained pitch followed by repetition. In measure twenty-six, pitch-class A is presented in three different octaves and is embellished by microtonal slides, grace notes, and glissandi. [Example 8] Wuorinen follows this embellished presentation of pitch-class A with an articulated repetition of pitch class A similar to
that of measure two. However, he places this repetition an octave higher with the use of A⁵ and embellishes the last four notes with a flutter tongue.


After this sustained use of pitch-class A, Wuorinen avoids this pitch-class for several measures. The next appearance of A⁵ occurs after a brief fermata and is approached by a leading tone G#. This appearance of pitch class A marks the end of an aggregate set of pitches as well as the end of the rotating hexachords in this serial section. Pitch-class A returns one last time as the final note of the piece. Wuorinen again uses the original A⁴ and approaches it by a leading tone G#.

Other Aspects of Tonality

Although one may consider pitch class A the primary pitch center in this work, the tonic if you will, there are other aspects of tonality present in this piece. Wuorinen often uses intervallic relationships to create tonal pitch affiliations within both the serial and time-point sections of this work. He creates these associations either by quick succession of consecutive pitches or through long, sustained tones within a measure.
The first clear example of tonal relationships in *Flute Variations II* occurs in the first serial section of the piece. Here, Wuorinen highlights pitch class B through pitch repetition, sustained length, and intervallic relationships. He emphasizes $B^3$ throughout the opening serial section by giving it sustained length relative to other pitches and using the perfect fifth relationship with pitch class $F^\#$ solidify the importance of pitch class B. [Example 9] The first section ends with a final $B^4$.

Example 9. *Flute Variations II*, mm. 3-10. Emphasis on pitch class B.

Elements of tonality continue to center around pitch class B in the inner, time-point section. As measure eleven concludes with a strongly placed $B^3$, the following measure begins with a sustained $F^\#^4$. [Example 10] This creates a clearly audible perfect fifth relationship. The perfect fifth heard between the $B^3$ of measure eleven and $F^\#^4$ of measure twelve is further
enhanced by the following three sustained pitches: E₄, D⁴, and B³. The aural effect of these pitches sustained in succession suggests major and minor triadic outlines. The emphasis on these five pitch classes, B-D-Eᵇ-F-F♯, continues through measure thirteen. Wuorinen continues to tonicize pitch class B throughout the time-point nesting section.


In summary, throughout *Flute Variations II*, Wuorinen blends several varied compositional techniques. The use of pitch centers and aspects of tonality throughout sections governed by the highly structured compositional techniques of serialism and time-points creates an interesting dichotomy for the performer and listener alike.
CHAPTER 3
SHAKUHACHI INFLUENCES IN *FLUTE VARIATIONS II*

The music of renowned Japanese shakuhachi player Watazumido-Shuso influenced Wuorinen as he wrote *Flute Variations II*. Wuorinen infuses many elements unique to traditional shakuhachi performance, particularly those characteristic of Watazumido-Shuso’s style, throughout *Flute Variations II*. As such, it is important for the performer of this piece to understand the shakuhachi in terms of its history and performance practice.

**Brief History of the Japanese Shakuhachi**

The Japanese shakuhachi is an end-blown bamboo flute of Chinese origin. It was introduced to Japan in the eighth century as part of the court *gagaku* orchestra. Though several instrumental specimens remain, little is known of this early shakuhachi. It faded from the court orchestra by the tenth century, and there are no surviving manuscripts or notation for this early instrument. When the shakuhachi reemerged into Japan’s mainstream culture in the fifteenth century, it was in the *hitoyogiri-shakuhachi* form. This *hitoyogiri-shakuhachi*, like all subsequent shakuhachi, had four front finger holes rather than the five found on the ancient Japanese shakuhachi. The *hitoyogiri* had a smaller range than the modern shakuhachi and was less able to inflect pitch with the embouchure or by partially uncovering holes. This is due in part to the construction of the instrument, which was shorter and straighter than the modern shakuhachi. Despite its limitations, it remained in chamber music ensembles, called *sankyoku*, as an accompaniment to vocal music.

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44 Ibid.
45 Ibid.
As the shakuhachi continued to develop, use of the hitoyogiri began to decline. It was gradually replaced by the fuke-shakuhachi. With its wider range and greater flexibility, the fuke-shakuhachi rose to favor in the eighteenth century. This instrument of the Fuke sect of Zen Buddhism was the direct ancestor of the modern shakuhachi. During the evolution of the fuke-shakuhachi, a solo repertoire developed for use in meditation. In the eighteenth century, each of the almost forty komusō temples of the Fuke sect developed their own shakuhachi repertory. This repertory was “arranged” by shakuhachi master Kurosawa Kinko in the mid-eighteenth century. He collected and arranged over thirty pieces that form the basic pieces, or honkyoku, of the Kinko School of shakuhachi.46

In the nineteenth century, because of a ban on the Fuke sect from playing shakuhachi for religious purposes, shakuhachi masters focused on secularizing their art. The fuke-shakuhachi performers branched out from their solo repertory and became important members of sankyoku chamber ensembles. Nakao Tozan set about arranging both the sankyoku repertoire, known as gaikyoku or “outside pieces”, and the honkyoku repertoire of the fuke-shakuhachi. The Tozan repertoire of sankyoku and honkyoku are more rhythmical and use more precise scales than pieces from the earlier Kinko School. While making arrangements of both sankyoku and honkyoku pieces, Tozan developed a precise rhythmic notation for his shakuhachi music. He also encouraged the use of the shakuhachi in “new-style pieces” of Western influence known as sinkyoku.47

Today, both the Kinko and Tozan schools are the most prominent schools in shakuhachi performance and teaching.48 A few smaller schools, known collectively as the Meian schools,
exist as outgrowths of the Fuke temples that have kept their shakuhachi traditions. Outside of the Meian schools, the shakuhachi is no longer considered an instrument used for purely religious purposes, though many performers do believe in the notion of “Buddha-hood in a single note.”

The Modern Shakuhachi

Today’s typical shakuhachi is thicker than previous types and consists of a hollow bamboo tube with a flared lower end. It has four finger holes drilled in the front and one thumb hole in the back. With a range of about three octaves, instruments often appear in sets of various sizes. Most sets of instruments are constructed to play a semitone apart as this allows performers to accommodate tuning and range of others performing with it. It is used for solo and ensemble pieces of both folksong and modern works. The shakuhachi is based on anhemitonic pentatonic tuning though, due to Western influences, many shakuhachi instruments are tuned to A=440. The standard-size shakuhachi can span approximately three octaves, and its fundamental pitches are D⁴, F⁴, G⁴, A⁴, and C⁵. Performers use a combination of half-holing and embouchure adjustment to sound the pitches in between the fundamental pitches.

While considered a member of the flute family, there are several fundamental differences between the shakuhachi and Western flutes. For instance, the shakuhachi player uses a system of grace-note articulation rather than tongued articulation for reiterated pitches. Additionally, because there is no fixed key system, microtonal inflections are more easily produced on the shakuhachi as compared to the flute. Moreover, shakuhachi performers shake their head from side to side to create vibrato rather than through the diaphragmatic technique used by flutists.

49 Ibid.
50 Ibid.
51 Ibid.

52 Jeffrey Lependorf, "Contemporary Notation for the Shakuhachi: A Primer for Composers," Perspectives of New Music 27, no. 2 (June 1, 1989): 233.
While most traditional shakuhachi music is learned by rote, notation for the instrument’s music does exist. The notation of traditional shakuhachi music is unique to the instrument and uses a combination of tablature, verbal instructions, and precise graphic symbols. These graphic symbols vary from school to school.

Despite these differences, composers emulate numerous shakuhachi techniques in contemporary flute literature. When performing such techniques, it is important for the flutist to distinguish between standard flute writing, techniques that are common to both the flute and shakuhachi, and techniques that specifically emulate the shakuhachi. To do so, one must have a working knowledge of shakuhachi techniques, their usage, and their execution.

Watazumido-Shuso

Watazumido-Shuso (1910-1993) was one of the most influential modern shakuhachi performers and pedagogues. Born as Tanaka Mansaru, he is known by several other names including Watazumi Dosu Roshi, Tanaka Fumon, Iccho Fumon, Watazumi Fumon, and Watazumi Shuso. Watazumido-Shuso considered himself more than just a musician. He was a priest of the Fuke sect of Zen Buddhism and achieved the level of Roshi, or Master, and later became the unifying Head Abbot of the sect. Known for his strict physical discipline via the Jo stick, Watazumido-Shuso worked as a weapons drill instructor during World War II. He created his own philosophy, which he called “the way of Watazumi” or “Watazumi-do”, by combining his physical discipline with meditation practices.

Watazumido-Shusho based his unique style of music on a blend of Zen breath awareness and martial arts. He constructed his own version of the shakuhachi instrument that he called

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53 Lependorf, 232.
hocchiku or Do So. These hocchiku instruments are longer and wider than the standard shakuhachi and thus generate a lower range and darker timbre. Dan Mayers writes that, “Watazumido has a closet, covering an entire wall, filled with his beloved Do So. They are, essentially, raw bamboo hollowed out with a simple uta-gushi sliced in the upper end and holes bored at more or less appropriate points. The bore is entirely untreated and it seems more a matter of statistical luck rather than deliberate design that a particular Do So plays properly.”

With these hocchiku, Watazumido-Shuso developed his own playing style that was a type of honkyoku that he labeled as dokyoku or “music of the way.” Though he denied ever having a teacher, his dokyoku style showed influences from the musical styles of the Uramoto Setcho School. Watazumido-Shuso likely roamed Japan, as did the Komuso priests of the past, collecting and arranging honkyoku.

Watazumido-Shuso’s influence on Wuorinen when writing Flute Variations II is readily apparent. Though this work features an extended range, much of the writing is concentrated in the lower octave. By repeatedly sustaining pitches in the lower octave, Wuorinen emulates the lower range and darker quality of Watazumido-Shuso’s unique hocchiku. Additionally, the inner section of Flute Variations II features the sustained tones and freer rhythms of Watazumido-Shuso’s honkyoku style.

Shakuhachi Techniques in Flute Variations II

Wuorinen’s Flute Variations II is a great example of a composer’s transfer of techniques between the shakuhachi and the flute. This piece illustrates several techniques that are common

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to both shakuhachi and flute performance. Some of these include conventional trills and
tremolos, key slaps, and simultaneous singing and playing. There are many instances throughout
*Flute Variations II* in which Wuorinen uses the Western flute to imitate techniques that are
distinctive to traditional shakuhachi practice. These techniques fall into the categories of
articulation, vibrato, and pitch inflection.

*Articulation*

In general, shakuhachi players rarely use the tongue to articulate. Rather, they articulate
pitches through the use of sophisticated finger attacks. When shakuhachi players use the tongue
to articulate, they do so as a special effect.\(^58\) By contrast, those articulations that are common to
shakuhachi technique serve as special effects for compositions written for the Western flute.
Several of the common, shakuhachi specific articulations found in *Flute Variations II* include the
*mura-iki*, *komi-buki*, *kitte*, and *atari*.

The *mura-iki* articulation is an explosive attack that is typical of the performance style of
the Fuke sect though it is used in a more refined way within the Kinko School.\(^59\) This articulation
is a sudden, violent breath attack that sounds similar to a strongly accented *sforzando* and can be
used to articulate either the beginning or ending of a pitch. Wuorinen uses *Mura-iki* frequently
throughout *Flute Variations II*. A series of *mura-iki* can be found at the end of measure fourteen.
[Example 11] Here, the first pitch terminates in a *mura-iki*. The sustained B\(^3\) that follows begins
with a *mura-iki* attack, and the final tremolo gesture terminates with another *mura-iki*.
Additionally, according to Jeffrey Lependorf, the technique is particularly effective when the

\(^{58}\) Lependorf, 235.
mura-iki occurs on a lower pitch that precedes a high register pitch. Wuorinen uses a mura-iki that precedes an upper register pitch in line two of measure nineteen. [Example 12] In this instance, a key slap further emphasizes the mura-iki.

Example 11. Flute Variations II, mm 14, line two. A series of mura-iki.

Example 12. Flute Variations II, mm 19, line two. Mura-iki combined with a key slap.

Another articulation frequently used in shakuhachi performance is the komi-buki, or “staccato breath.” The opening figure in Flute Variations II makes use of the komi-buki. In measure two, the flutist plays a repeated series of staccato A4. [Example 13] This evokes the “staccato breath” of the komi-buki that is produced by “panting into the instrument on a single pitch” via quick bursts of air from the diaphragm. This technique appears again in the final section of the piece in measure twenty-seven where it accelerates into a flutter tongue.

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Lependorf, 236.
Lependorf, 236.
Another special shakuhachi articulation is the *kitte*. The *kitte*, which means “to cut”, is used to abruptly articulate the end of a sustained pitch. It is characterized by the sudden stoppage of air without the use of a taper. It can also appear as a grace note or sudden, downwards pitch-bend. Measure twenty of *Flute Variations II* illustrates instances in which a grace note provides a sudden ending to a sustained tone. [Example 14]

Perhaps most typical and recognizable in shakuhachi playing is the use of *atari* to articulate notes. *Atari* are sets of grace notes, executed rapidly, that articulate the initial note of a phrase or repetitions of notes. One should note that shakuhachi playing also utilizes traditional grace notes. These grace notes differ from *atari* in that the notated pitch uses a proper fingering and it clearly heard. *Atari* are more often perceived as brief interruptions and are not expected to be in tune. Rather, they create the perception of pitches that reside slightly above or slightly below the following pitch. In measure twenty, *atari* help articulate beginning and repeated pitches while *kitte* again end phrases. [Example 14] Measure twenty also shows the technique of doubling or tripling the *atari* to create a double or triple tonguing effect. 

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63 Ibid, 237.
64 Ibid.
65 Ibid.
Example 14. *Flute Variations II*, m. 20, line two. *Kitte* (*circle*) and *atari* (*arrow*) articulation.

Vibrato

Common to both Western and shakuhachi flute performance is the use of vibrato of varying speeds and depths. However, the methods used to produce such vibrato vary greatly. Unlike the Western flutist who uses diaphragmatic vibrato, the shakuhachi player uses a side-to-side motion of the head. This vibrato often produces deeper, slower waves than are produced by the diaphragmatic vibrato employed by flutists. The vibrato of the shakuhachi resembles string vibrato more so than that of the Western flutist.66 Another common characteristic in shakuhachi performance is the use of a strait tone without vibrato. This practice is frequent in more traditional styles, particularly in the lower register.

Wuorinen exploits the many variations of shakuhachi vibrato by calling for several specific vibrato speeds and depth, or “bandwidth” as he calls it, throughout *Flute Variation II*. For instance, measure twelve shows the use of several speeds and depths of vibrato on a single pitch as is typical in traditional shakuhachi performance. [Example 15] The performer must begin without vibrato as indicated by the marking “n.v.”. Then, they must move to a vibrato that is slow in speed but wide in bandwidth and progress to a fast vibrato, indicated by f.v., which is narrow in bandwidth.

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66 Ibid, 238.
As with articulation, there are special vibrato effects utilized by shakuhachi players. One such technique is a *sasa-buki*, translated as bamboo-leaf shape. The *sasa-buki* describes both the dynamic shape of the sustained pitch and how the width of the vibrato follows the shape of a crescendo and decrescendo. An example of this technique occurs in measure fourteen. [Example 16] Wuorinen instructs the performer to execute a crescendo and decrescendo in a bamboo-leaf shape. He enhances this shape as the vibrato moves from molto vibrato to slow vibrato throughout the crescendo and back to molto vibrato again as the note tapers in volume. This is also one of several instances in which Wuorinen specifies a vibrato usage that is typical for the shakuhachi player but may seem counter-intuitive for the modern flutists. Making the vibrato increase in bandwidth but slow in speed during a crescendo and increase in speed during a decrescendo is rather unusual.

Another type of vibrato characteristic of shakuhachi performance is the *yuri*. *Yuri* is a very wide vibrato, akin to a tremolo, created by shaking the head from side to side to create vibrato while also moving the head up and down to inflect pitch. These gestures generally begin
fast and then slow down to a more restrained vibrato or begin restrained and speed up into a yuri. Such an effect may be achieved during Flute Variations II in sections designated as “molto vibrato”. Measure fifteen shows an increase of vibrato speed and depth that develops into a yuri. The closing gesture of measure sixteen illustrates an instance in which Wuorinen combines a yuri vibrato with a series of fortepiano gestures. [Example 17] Wuorinen describes this “molto vibrato” as a fast vibrato with a wide bandwidth as opposed to “fast vibrato” which is described as a fast vibrato with normal bandwidth.


Pitch Inflection

Traditional shakuhachi performance makes extensive use of various types of pitch inflections. Performers inflect these pitches by either raising and lowering the head or by partially covering an open hole. These techniques transfer to some degree to the Western flute.

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67 Ibid, 239.
Flutist can use their embouchure to manipulate the air up or down as well as partially covering or opening open holed keys.

The use of glissandi is abundant throughout Flute Variations II. One particular type of glissandi, the nayashi, uses the angle of the air stream to attack a note by scooping into it from below.\textsuperscript{68} It is characterized as a short, semitone or larger glissando that leads up to a pitch. This can be seen in the opening of measure four. [Example 18] The suri, or suriage, is similar to the nayashi, though it is an ornamented glissando of sorts.\textsuperscript{69} The performer begins from the note below and slides their finger off of the appropriate tone hole and then quickly inserts the upper neighbor just before the main note is heard.

Example 18. Flute Variations II, mm. 3-5. Suri (boxed) and nayashi (circled) pitch inflection

One of the most frequent types of pitch inflection on the shakuhachi is the meri. This technique lowers the pitch through the partial covering of tone holes and dropping of the chin to change the air angle. Such a lowering can be as much or more than a whole-tone. Two such examples in Flute Variations II can be located in measures ten and eleven. [Example 19] In measure ten, the flutist must execute a glissando from an F\textsuperscript{4} to E\textsuperscript{4} and then continue to the glissando downwards to D\textsuperscript{4}. In the following measure, the flutist must again perform a large, descending glissando from G\textsuperscript{4} to and E\textsuperscript{b4}.

\textsuperscript{68} Signell, 178.
\textsuperscript{69} Ibid.
In addition to the use of glissandi, *Flute Variations II* demonstrates a type of pitch bend that occurs in traditional shakuhachi performance. This microtonal inflection is achieved by partially closing an open hole or by raising or lowering the head. Wuorinen uses this technique several times in *Flute Variations II* as what he terms a “microtonal slide.” In measure sixteen, Wuorinen instructs the flutist to execute a microtonal slide away from the written pitch and then back to the written pitch. [Example 17] He notates this with an arched line with an arrow pointing to the next note head.

Another type of shakuhachi pitch inflection that appears in *Flute Variations II* is the *kara-kara*. One performs a *kara* by beating the first hole of the shakuhachi. The *kara-kara* is a microtonal trill that occurs when one repeatedly strikes the first hole of the instrument.\(^{70}\) Such microtonal trills, notated with a double flat above the trill sign, occur throughout measures eighteen and nineteen of *Flute Variations II*. [Example 20]

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\(^{70}\) Ibid, 243.

Common Techniques

Several other techniques that are now common to modern flute performance are typical of traditional shakuhachi performance. Hole slaps are commonly performed in the lower register in shakuhachi performance. Wuorinen uses similar key slaps in Flute Variations II, often in conjunction with the mura-iki articulation. Additionally, shakuhachi performers are able to sing and play simultaneously while performing any of their lower octave pitches. Wuorinen uses this singing and playing technique to extend the flute’s range downward in gestures that emulate the low hocchiku of Watazumido-Shuso. Another transferable technique used frequently throughout

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71 Ibid, 246.
Flute Variations II is the use of flutter tonguing. Because of the cut of the shakuhachi, performers are generally unable to execute an effective flutter with the tip of the tongue. They are able to use a throat flutter, called a tamane, to achieve a similar effect.\textsuperscript{72}

Implications for the Performer

For the performer, knowledge of the aforementioned shakuhachi techniques can enhance the performance of Flute Variations II. The performer should become aurally familiar with the techniques mentioned above. This will support decisions made regarding how to best execute such techniques on the modern flute. Additionally, such understanding will aid in the performers conceptual perception of the work as a whole. The physical execution of the techniques above will be discussed in the following chapter.

\textsuperscript{72} Ibid, 247.
CHAPTER 4
PERFORMANCE GUIDE

From a performance standpoint, *Flute Variations II* contains two conceptual ideas that the flutist must blend together. On one hand, the performer must be aware of the strict underlying compositional processes of serialism and time-point nesting and how these techniques influence performance. Such techniques are highly structured and thoughtfully engineered. On the other hand, the performer should acknowledge the integration of shakuhachi elements within this work. As Karl Signell states in his writing about shakuhachi music, “The compositional structure is based on asymmetry and subtle motivic variation, not the symmetry and contrast of Western forms. Shakuhachi music should be listened to as the combination of single notes and phrases, and the organic nature of each tone should be appreciated in an existential way.”73

Understanding of these underlying concepts will aid the performer in synthesizing traditional shakuhachi techniques with Wuorinen’s compositional techniques in combination with the execution of challenging contemporary techniques. The performer’s ultimate challenge is to not only execute difficult passages but also to blend such flute techniques seamlessly in to the fabric of the work in a manner that highlights rather than detracts from Wuorinen’s conceptual ideas. The following performance guide will discuss the implications of compositional devices on performance, the performance of shakuhachi elements, and the performance of additional contemporary techniques.

73 Signell, 180.
Implications of Compositional Devices on Performance

As discussed in Chapter 2, Wuorinen used several compositional techniques when writing *Flute Variations II*. While one can perform this work without knowledge of these theoretical concepts, an understanding of the conceptual ideas upon which Wuorinen constructs this piece will aid in its performance. The serial and time-point techniques can aid the performer in making informed musical decisions throughout the piece, particularly in the realm of phrasing.

Performance of the serial sections of *Flute Variations II* requires knowledge of the serial process used in pitch production as well as smooth execution of contemporary techniques. The performer must decide how much influence the serial processes will have on phrasing. For instance, the initial tone row consists of eleven consecutive pitches separated from the twelfth by two short rests. [Example 21] This twelfth note slurs into the following tone row via a glissando. While the rests clearly separate the twelfth note of the row from its eleven predecessors, the flutist should understand that it relates to the gesture that came before. Additionally, the passage that this twelfth note leads into is also an aggregate of pitches and marks the first of the rotated P⁰ hexachords.

Example 21. *Flute Variations II*, mm. 3-4. Separation of twelfth note from prime row with use of rests.
Wuorinen begins alternating and rotating hexachords in measure three and continues to do so through measure ten. By pairing these hexachords together, the performer can create larger units with which to shape the musical line within a twelve-tone equality. [Example 22] The performer may also use these hexachord combinations to determine resting points within a continuous thread of twelve-tone pitches. For instance, the second rotation of the $P^0$ hexachord begins with the last two pitches in measure five. These two notes can act as a pickup into the strongly accented $B^3$ that initiates measure six. This combination of hexachords, $P^0$ and $R_1^5$, ends quite clearly at the end of measure six. The following two hexachords, the third rotation of $P^0$ combined with $I^{10}$, are clearly contained within the boundaries of measure seven. These provide the performer with logical resting places within a continuous line.

Example 22. *Flute Variations II*, mm. 3-10. Use of tone-rows (circles) and hexachord pairs (rectangles) to shape phrases.
In addition to utilizing the serial techniques of the outer sections to organize musical thoughts, the flutist can also use Wuorinen’s third and fourth level of time-point nesting. The performer should note that each time-point marks the beginning of an event. Measure sixteen illustrates the use of clear third-level time points and the individual events contained within each. [Example 23] Viewing these time-points as individual and separate events may help the performer reconcile the structure of the time-point technique with the shakuhachi’s conceptual ideal of the importance of the single note.

Example 23. *Flute Variations II*, m. 16. Third-level time points\textsuperscript{74}.

Musically, these time points can aid the performer in organizing elements within a musical gesture, such as grace notes and rests. As shown in chapter two, Wuorinen composes the third level of time-point divisions with a specific number of temporal units based on the intervals of the prime row. Because grace notes do not have a specific temporal value, they do not

\textsuperscript{74} Note that in measure 16 Wuorinen uses a looser correlation with the prime row’s durational interval sequence as explained in Chapter 2.
contribute to these third-level time point units as rhythmic values. Though not temporally significant, the pitch content of the grace notes Wuorinen uses is important. At the fourth level of time-point division there is a nested correlation between to the number of pitch classes used within a time-point and the time-points duration. For example, in Flute Variations II, time points that are four units in length contain four pitch classes. Using this knowledge, the flutist can make informed decisions regarding the placement and musical direction of grace note figures.

Measure sixteen shows both the use of rests and grace notes within the time-point system. [Example 23] As measure sixteen makes use of the first extended rests in this work, one should note that each extended rest occupies a single time point. Included in the time-point with the rests are sets of grace notes. This is due to the correspondence between the number of pitch-classes and the length of the time-points in the fourth level of time-point divisions. For example, the final half rest in measure sixteen, the four pitches in the following grace note gesture belong to the half rest’s time point. The grace notes clearly lead into the following eighth note and its time-point and act as a musical bridge between the two time-points.

Performance of Shakuhachi Elements

When writing Flute Variations II, Wuorinen borrowed heavily from traditional shakuhachi techniques and used them consistently throughout the entire piece. The elements of vibrato and pitch inflection are specifically defined in this work. Less clearly defined are the articulations that correlate with shakuhachi performance. As such, the performer should take particular care when executing the notated articulations.
Articulation

The use of the sforzando throughout Flute Variations II is a prime example of a shakuhachi articulation that should not go unnoticed by the performer. These strongly accented articulations imitate the mura-iki that is used to begin shakuhachi pitches. Therefore, the flutist should concentrate their efforts towards an explosive attack that features a highly percussive, explosive tongue noise on those specific pitches marked with a sforzando. For instance, the opening figure of measure fourteen requires an explosive, sforzando grace note followed by a full tone, accented C⁴. [Example 24] This idea repeats again with another explosive grace note followed by an accented B³. Wuorinen uses the sforzando to articulate the pitches that follow.


The opening gesture of Flute Variations II features both the mura-iki and komi-buki articulations. [Example 25] The flutists will strike the opening A⁴ with a forceful tongue and burst of air. This instantly evokes the image of Watazumido-Shuso playing his powerfully low hocchiku. As the A⁴ continues, Wuorinen instructs the flutist to add vibrato that leads into a rapid succession of pianissimo, staccato A⁴s. This creates the effect of a komi-buki. As such, the performer should play this as though they were panting rather than trying to produce a crisp staccato articulation. This can be done by using the diaphragm to “bounce” the air rather than relying on the tongue to interrupt the air stream.
Further shakuhachi influenced articulation may be seen in measure fifteen, which features instances of the shakuhachi’s \textit{atari} and \textit{kitte} techniques. In the first line of this measure, the flutist repeatedly rearticulates the low F$^4$ through use of G$^{b4}$ grace notes. [Example 26] Due to the nature of \textit{atari}, the flutist may chose to depress only the ring of the keys used for \textit{atari} grace notes to further the shakuhachi effect. Wuorinen interrupts the line with a brief harmonic E$^6$ before the \textit{atari} articulations begin again, this time with the F$^#4$ receiving the sustained time and E$^#3$ functioning as \textit{atari}.

\textbf{Example 26.} Flute Variations II, mm 15, lines one and two. \textit{Kitte (circle) and atari (arrow) articulation.}
Pitch Inflection

Wuorinen uses glissandi to emulate shakuhachi techniques throughout Flute Variations II. These figures emulate traditional techniques from shakuhachi performance, and they span anywhere from a half step to a minor third in both upwards and downwards directions. This is a rather straightforward feat for the shakuhachi player who has a large degree of flexibility regarding pitch bending via head motion. As the flute is much less flexible in the degree to which the angle of the air stream can bend a note, these glissandi become a complication for the flutist to perform fluidly.

Those glissandi that slip upwards require the flutist to smoothly slide the finger off the center hole of the appropriate keys. For example, in measure six, the flutist must execute a half-step glissando between E⁴ and F⁴. Because this is a small ascending interval, the flutist merely needs to slide the middle finger off the R2 hole in a gradual and smooth motion.⁷⁵ Once the hole is uncovered, the flutist can either slowly lift the uncovered key or angle the airstream upwards to bend the pitch as needed to reach the F⁴.

This technique becomes more complicated when Wuorinen writes glissandi that slide downward, particularly those glissandi that cover more than one semitone. Wuorinen writes this type of downwards glissando at the beginning of measure ten. [Example 27] The flutist must execute a glissando that descends by a half step, from F⁴ to E⁴, and then immediately descend another whole step with a glissando from E⁴ to D⁴. As this occurs in quick succession, one

⁷⁵All references to fingerings will be made using the figure below. The use of the right hand index finger will be referred to as RI, the right hand middle finger as L2, and so on.
should aim for a glissando from F⁴ to D⁴. To do this, one must do as Robert Dick suggests and
develop a new concept of “touch”. In other words, one must modify the finger movement so
that one gradually covers the holes and then carefully lowers the rings. In order to facilitate these
movements and develop the new concept of touch, Robert Dick suggests that the flutist flatten
the typical curve of the fingers. In this instance, to glissando from F⁴ to E⁴, one must gradually
depress the ring of R2 and then slide the finger over the hole. The same technique applies to R3
as the flutist slides from E⁴ to D⁴. The flutist performs both glissando with the right hand pinky
raised.

Example 27. Flute Variations II, mm. 10. Downwards glissando.

Of additional concern for the flutist are glissandi that change direction within a single
gesture. One such example occurs in measure three. [Example 28] At this point, Wuorinen is
emulating the shakuhachi’s furi. This gesture requires the flutist to glissando up a whole step and
then down a half step. A shakuhachi player would merely move their head up or down. The
flutist, however, must use a combination of finger slides and air direction to execute this gesture.
To slide from Eᵇ⁴ to F⁴, the flutist will gradually uncover the hole of R3 followed by the hole of
R2. As this is not quite enough to span the full whole-step to F⁴, the flutist will also need to
redirect the airstream upwards to raise the pitch. Upon reaching the F⁴, the flutist will slide

downwards to the E⁴ through the gradual covering of the R2 hole. Note that because the ring of R3 is depressed. The flutist will want to keep the airstream raised to preserve the pitch of E⁴.

Example 28. *Flute Variations II*, mm. 3. Multiple glissandi.

Wuorinen’s use of glissandi continues in the inner section of the work. The opening measure of this section, measure eleven, employs the use of a wide downwards glissando, this time spanning a major third. This glissando from G⁴ downwards to Eᵇ⁴ can be executed in two ways. The first is to finger the G⁴ followed by the slow depressing of the R3. Next, one slowly depresses R1 and then R2. The holes of R1 and R2 are slowly covered. By leaving the hole of R3 uncovered and with a slightly raised airstream, one will reach the Eᵇ⁴. This is difficult to do quickly with a smooth glissando. Closing R3 also closes the F key farther up the flute and can easily result in a bumpy glissando. An alternate method would be to start the initial G⁴ with the hole of L3 uncovered and with the rings of R1, R2, and R3 depressed. The timbre of the G⁴ is altered but by gradually sliding the fingers over the holes of L3, R1, and R2 in succession, the G⁴ to Eᵇ⁴ glissando is quite smooth.

Measures nineteen and twenty both include combinations of glissandi and tremolos. The tremolo glissando in measure nineteen is rather straightforward and one can simply bend the notes of the tremolo down one half-step to complete the gesture. The glissando and tremolo combination in measure twenty requires more study. In this instance, the flutist must not only
execute a combined glissando and tremolo, but also glissando in two different directions simultaneously. The initial tremolo consists of a G# to a D#. [Example 29] Wuorinen writes the glissando so that the G moves down to a G while the D moves upwards to an E. To execute this technique, the flutist will depress only the ring of the G key when playing the initial G. As the tremolo progresses, the flutist will increasingly cover this hole in order to create the downwards glissando effect. With regards to the D to E glissando, the flutist will gradually cover less and less of the R3 hole throughout the tremolo in order to achieve the upward glissando to the E.


Another type of shakuhachi inspired pitch inflection the flutist encounters in *Flute Variation II* is the microtonal slide. Found in measures sixteen and twenty-six, Wuorinen notates these gestures with curved arrows and writes that these are microtonal slides away from the written pitch and back. [Example 30] As Wuorinen does not clarify the direction of these slides, the performer may use the placement of the curved arrow as a clue. Those microtonal slides indicated by a curved arrow placed above the note should slide upwards and those slides indicated by a curved arrow placed below the note should slide downwards and back.\(^7\) Measure sixteen features two microtonal slides that bend upwards. To maximize the effect of these slides,

\(^7\) This holds true in Harvey Sollberger’s recording of *Flute Variations II*. 

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the flutist should both bend the pitch with the air stream and the partial uncovering and
recovering of the last covered hole used to sound the pitch.

Example 30. *Flute Variations II*, mm. 16 lines two and three. Microtonal slides indicated with
curved arrows.

The two final microtonal slides occur in measure twenty-six as pitch class A returns as
the pitch center of the work. [Example 31] The first microtonal slide occurs on A⁵ and bends
downwards according to the placement of the arrows. As this bend descends, the flutist will only
need to direct the airstream downwards and back up. The second slide in this measure requires a
different technique. Here, the slide occurs on an A³ that the flutist sings whilst playing the octave
A⁴ on the flute. The slide itself first ascends above and then descends below the written pitch.
The flutist executes this slide through inflection of the voice rather than the redirection of the
airstream.

Measures eighteen and nineteen require the execution of a several microtonal trills.

[Example 32] These types of trills imitate the shakuhachi’s *kara-kara* technique. Similar to the manner in which the shakuhachi player beats the first hole of the instrument to produce the microtonal inflection, the flutist will use fingerings to execute these gestures. [Figure 2]


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78 The fourth trill shown in Example 32 is not marked with the double flat Wuorinen uses to indicate microtonal trills and should be performed as a half step trill from D⁴ downwards to C⁴.
Figure 2. Suggested fingerings for microtonal trills. Keys marked with X should be trilled.

Vibrato

Throughout this entire work, the flutist should be very careful in their usage of vibrato. Wuorinen lists five different types of vibrato as seen in his notes section. [Figure 3] These different vibrato techniques all contribute to the shakuhachi feel of the piece. The flutist should take particular care to differentiate their “ordinary vibrato” from the fast or molto vibrato.

**NOTES**

n.v. = non vibrato
s.v. = slow vibrato = slow speed, variable (but usually wide) bandwidth
vibr. = ordinary vibrato
f.v. = fast vibrato = fast speed, narrow bandwidth
m.v. = molto vibrato = fast speed, wide bandwidth

Figure 3. Flute Variations II. Wuorinen’s notes on vibrato speed and bandwidth.
Measure twelve features Wuorinen’s varied use of vibrato. [Example 33] The sustained $B^4$ at the end of the measure progresses from no vibrato to slow and then fast vibrato. This use of vibrato imitates the *sasa-buki* vibrato of the shakuhachi. The flutist plays the concluding group of five notes without vibrato and decrescendos until the final *sf* on an $E^4$. This gesture is also indicative of the shakuhachi *mura-iki*. The use of varied vibrato continues in measure thirteen. Here the flutist again must change vibrato speed and depth frequently. This measure contains all five of Wuorinen’s indicated vibratos. Flutists should take special care when executing those gestures marked as *molto vibrato* as they imitate the shakuhachi’s *yuri* technique.

Example 33. *Flute Variations II*, m.12 line two, mm. 13. Varied vibrato speeds.
In this work, Wuorinen uses several vibrato gestures that are counterintuitive to common flute practice but typical within shakuhachi performance. One instance of this occurs in measure fourteen as the flutist performs a hairpin crescendo and decrescendo. [Example 34] The vibrato does not speed up through the crescendo and slow during the decrescendo as expected. Rather, one is instructed to begin at piano with a *molto vibrato* of fast speed and wide bandwidth and then gradually slow the vibrato as the peak of the crescendo is reached. The vibrato then speeds up and deepens as the dynamic level fades back to piano.


*Other Contemporary Techniques*

Wuorinen uses additional contemporary techniques that are not necessarily used to imitate the shakuhachi but which provide a considerable challenge to the performer. For instance, Wuorinen uses the technique of singing and playing several times throughout *Flute Variations II*. The first example occurs in measure thirteen. While not expressly notating this passage as “sung”, Wuorinen has written an F below middle C. [Example 34] As this pitch is out of the flute’s range, one must produce the pitch with their voice. In his recording, Harvey Sollberger sang the F below middle C while playing the F an octave above. Though it is not uncommon for flutists to sing an octave below what they play, Wuorinen has added extra challenges. The flutist must not only sing and play, but also begin without vibrato and add a
slow, deep vibrato as the sustained tone evolves. Perhaps, most challenging are the dynamic changes during these gestures. One needs significant vocal control to crescendo from a piano to mezzo forte and then decrescendo back to a pianissimo while sustaining the flute pitch. To execute this most effectively, one should first practice singing and playing without vibrato at a moderate dynamic level. Once one gains some stability in pitch and embouchure through practice, one may begin adding a slight crescendo in the middle of the note. The performer can then add a slow vibrato after gaining facility with the dynamic changes.

Another contemporary technique present in Flute Variations II is the use of an extended upper range. Measure twenty-one marks the climax of the inner section with its frenetic use of thirty-second notes and extended upper range into the fourth octave pitches. Technical facility up to D⁷ is standard in modern flute performance. Production of pitches beyond D⁷ becomes increasingly difficult with each half step. This passage extends three half steps beyond D⁷ to F⁷.

In order to produce these tones cleanly and consistently, the flutist must develop great strength of embouchure. The flutist must practice these pitches daily and for very short periods of time. Robert Dick recommends that flutist spend four to ten seconds in the first register for every one second spent in the fourth register.⁷⁹

Simply using faster air will not produce a tone in the fourth register. Rather it will result in the flute directing the air back towards the flutist. Robert Dick recommends that flutists build embouchure strength with harmonic exercises before attempting fourth octave pitches. When beginning practice of these pitches, the flutist should finger the note and then practice the pitch as a whistle tone. This will help determine the angle of the air without contributing to muscle fatigue. When ready to produce the tone, the flutist should extend their bottom lip forward so that

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⁷⁹ In *Tone Development Through Extended Techniques*, Robert Dick recommends 10 seconds in the first octave to every second in the fourth octave. In *The Other Flute*, he recommends a 4:1 ratio.
the airstream travels horizontally across the tone hole. Rolling the flute outwards to uncover most of the embouchure hole may will also be helpful for any of the fourth octave pitches.

When practicing these pitches for facility, Robert Dick recommends a practice pattern based on Taffanel and Gaubert’s exercise number twelve. He expands the seventh chord pattern to include fourth octave pitches. Flutists should practice these seventh chords with the extended range at the rate of one key per week until proficiency is established and then one key per day with extended range.

Example 35. Robert Dick’s suggested practice exercise for extended range.

Among the list of contemporary techniques used in Flute Variations II is the use of a single multiphonic. The multiphonic, located in measure 15, is a minor sixth between G⁶ and E⁶. This multiphonic may be produced reliably through use of a special fingering. The interval produced by this fingering is narrower than a pure minor sixth, and the flutist may need to experiment with pitch as they practice this technique.

With any multiphonic fingering, it is up to the performer to make changes in the embouchure and air speed and angle. The flutist’s aperture should vertically extend so that the airstream can reach the correct angle for both notes to speak. As Robert Dick advises, one should

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81 Ibid.
82 Ibid.
practice this technique by sounding both notes separately on the selected fingering in order to find the appropriate angle of air for tone production. Once both pitches are identified, the flutist can tune the throat to the weaker pitch. Dick states that in general, the lower lip defines the airstream for the lowest pitch while the upper lip is pursed forward enough to define the top of the airstream in order to reach the highest pitch.

Example 36. *Flute Variations II*, m. 15. Harmonic and suggested fingering\textsuperscript{83}.

\[\text{\includegraphics[width=0.5\textwidth]{example36.png}}\]

To summarize, Wuorinen’s *Flute Variations II* is characterized by the dual aspects of his compositional technique and the influences of traditional shakuhachi music. It requires understanding of the various formal elements and mastery of the performance techniques discussed above. Once this is achieved, the performer can create a conceptually cohesive performance.

\textsuperscript{83} Dick, *The Other Flute*, 18.
CHAPTER 5
CONCLUSION

Charles Wuorinen’s *Flute Variations II* synthesizes several compositional and conceptual ideas. This piece illustrates his use of serial techniques, time-point nesting, and pitch centers. As is characteristic of his style, Wuorinen masterfully combines these seemingly contradictory elements throughout this work.

Additionally, Wuorinen effectively incorporates traditional shakuhachi techniques into *Flute Variations II*. These shakuhachi elements enhance the highly structured compositional devices and modern flute techniques used. This document has illustrated how such elements work together to create a cohesive whole.

This document serves as a reference for musicians preparing this work for performance as well as a resource for instructors teaching *Flute Variations II* or similar works. Such scholarship regarding this work makes it more accessible to the performer. Wuorinen states, "I’ve always maintained that 90 percent of difficulty is psychological.....of course, with a new piece, there’s the unknown, the unfamiliarity, and when that’s coupled with something that’s maybe demanding, even a little bit, physically, the psychological environment is such as to make it seem much harder than it actually is." As Wuorinen has a rich catalog that utilizes the flute, more research is needed to create greater understanding and recognition of his works.

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