

UNIVERSITY OF CALGARY

Smritiraag for String Sextet

by

Sonya Guha-Thakurta

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF MUSIC

DEPARTMENT OF MUSIC

CALGARY, ALBERTA

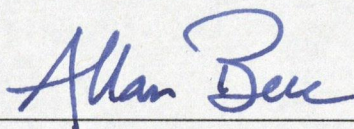
SEPTEMBER, 2005

© Sonya Guha-Thakurta 2005

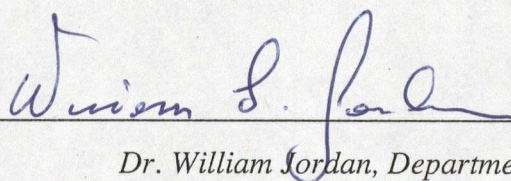
UNIVERSITY OF CALGARY

FACULTY OF GRADUATE STUDIES

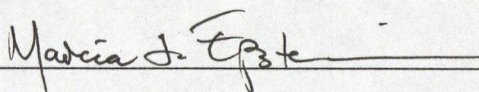
The undersigned certify that they have read, and recommended to the Faculty of Graduate Studies for acceptance, a thesis entitled “*Smritiraag* for String Sextet” submitted by Sonya Guha-Thakurta in partial fulfillment of the requirements for the degree of Master of Music in Composition.



Supervisor, Prof. Allan Bell, Department of Music



Dr. William Jordan, Department of Music



Dr. Marcia Epstein, Faculty of Communications & Culture

September 20, 2005

Date

ABSTRACT

Smritiraag is a string sextet of approximately fourteen minutes' duration written for two violins, two violas, and two cellos. The piece combines elements of North Indian classical music with elements of Western contemporary music. Modes, drone, ornaments, and rhythmic cycles from North Indian classical music are combined with Western melodic, harmonic, and rhythmic compositional techniques. The single-movement form makes reference to the form of a *raga* performance. The score is preceded by an essay that discusses the musical vocabulary contained in the work.

ACKNOWLEDGEMENTS

Heartfelt gratitude to
Professor Allan Bell
for his patient encouragement,
steady guidance,
and generosity of spirit.

Many thanks to
Dr. David Eagle
for his assistance.

A warm thank you to
Andrea Davison
for her editing
and suggestions.

DEDICATION

To Mor and Baba
who always encouraged me.

To José, whose
support and understanding
make everything possible.

TABLE OF CONTENTS

Approval page.....	ii
Abstract.....	iii
Acknowledgements.....	iv
Dedication.....	v
Table of Contents.....	vi
List of Examples.....	vii
List of Figures.....	viii
I. Introduction.	1
II. Research: North Indian classical music.	1
III. Musical language: Scales and modes	5
IV. Form	6
V. Rhythmic organization and <i>tala</i>	14
VI. Melody	22
VII. <i>Sruti</i> and ornamentation.	25
VIII. Drone.	27
IX. Harmony.	32
X. Timbre	35
XI. Development.....	36
XII. Conclusion.	44
Bibliography	46
Appendix A: Form diagram.....	49
Appendix B: Performance notes	50
Appendix C: <i>Smritiraag</i>	51

EXAMPLES

Example	Page
1. Stepwise melody, mm. 27-34	8
2. Quintal harmony, m. 48	9
3. Low tessitura melody, mm. 4-5	9
4. Melody line, mm. 22-24	10
5. “Cold” harmony, mm. 68-73.....	11
6. Symmetrical pairs of lines, mm. 2-3 and mm. 60-66	11
7. Blending “cold” and “warm,” mm. 165-169	13
8. Blending “warm” and “cold,” mm. 208-212	14
9. <i>Pancham Sawāri</i> and <i>Char tālá ki sawāri</i> , mm. 100-106	16
10. Rhythmic framework, mm. 183-188	17
11. Rhythmic accompaniment line, mm. 199-205	18
12. Rhythmic framework and melody, mm. 218-224	19
13. Two melodies, mm. 224-230	20
14. Rhythmic motif based on <i>Shashānk</i> , mm. 205-207	21
15. <i>Tihai</i> based on <i>Shashānk</i> , mm. 212-218	22
16. Melody based on D and A acoustic scales, mm. 35-40	23
17. Melody based on C-sharp <i>Todi</i> , mm. 177-180	23
18. Melody based on an octatonic mode, m. 48-50	24
19. Melodic motive, mm. 7-8	24
20. Upward-leaping octatonic motive, mm. 54-55	25
21. Exploration of microtones, mm. 1-3	26
22. “Thick” drone in cellos, mm. 9-14	28
23. “Thick” drone in violas, mm. 14-17 and violins, mm. 18-21...	29
24. Repeated-chord drone, m. 107	30
25. Harmonic drone in cello, mm. 20-24	31
26. Harmonic glissandi, mm. 66-72	32
27. “Warm” harmonic progression, mm. 46-48	33
28. Similar-motion cadence, mm. 164-165	35
29. Octatonic mode melody, mm. 90-94	37
30. Diminution of melody, mm. 242-243	38
31. Melodic motive in diminution, mm. 184-185 and 251.....	39
32. Melodic motive in augmentation, mm. 251-253	40
33. Melodic motive contracted, m. 98	40
34. Melodic motive harmonized with inversion, mm. 60-62	41
35. Composite melody, mm. 121-124	42
36. Time signatures, mm. 138-140	43
37. Time signatures, mm. 155-164	44

FIGURES

Figure	Page
1. <i>Raga Multani</i> ascent-descent pattern	2
2. <i>Tihai</i> against four beats	4
3. Octatonic tetrachords	6
4. Pentatonic groupings	6
5. Notes in common	6
6. <i>Talas</i>	15
7. Harmonic reduction of mm. 46-48	33
8. Harmonic reduction of mm. 69-73	34

I. Introduction

For the title of this composition, I invented the compound word *Smritiraag* in order to encapsulate some of the ideas that influenced the creation of this piece. The word can be translated as both “Colours of Memory” and “Music of Memory.” Therefore, it contains the essential ideas that provided an impetus to my creative process: the intangible qualities of memory and the way music can “colour” the mind of the listener. Because the composition is partly inspired by North Indian classical music as well as my memories of visiting India, it seemed appropriate to use my father’s language, Bengali. The word *smritiraag* is made up of the two Bengali words, *smriti* (pronounced with a silent “m”) and *raag*. *Smriti* means memory or memories. *Raag* or *raga* is commonly used to mean music or song. According to Vaidyanathan, “Raga is the most unique feature of Indian music, so that [*raga* and music] have become almost synonymous today.”¹ However, the word *raag*, like many Bengali words, has its origins in Sanskrit, and its “etymological meaning ... is colour.”²

I have listened to North Indian classical music all my life, and elements from this music have influenced my voice as a composer. In this piece, I made a more conscious investigation into North Indian classical music as a starting point for my creative research. I was struck by memories of visiting India during monsoon season and I was interested in creating two musical languages to reflect the extremes of climate in my experience of two landscapes: monsoon India juxtaposed with the Canadian Rocky Mountains in winter. During the composition process, the metaphor of “warm” and “cold” music provided a starting point, although the music developed beyond the clear delineation into two categories.

II. Research: North Indian classical music

The most important features of North Indian (or Hindustani) classical music are *raga* and *tala*. Simply stated, *raga* generates the pitch material of a piece and *tala* the rhythmic material. Discussion of *raga* must include discussion of: the drone, which

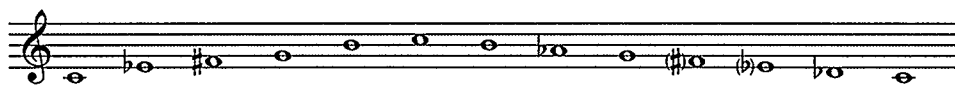
¹Anant Vaidyanathan, *The Language of Indian Art Music* (Toronto: Raag-Mala Music Society, 1991), 59.

² Ibid.

presents the essential notes of the mode; *sruti*, microtonal shading or inflection; and ornaments, which help define the characteristics of a *raga*. Another aspect of Hindustani music that influenced the composition of *Smritiraag* is the form of a *raga* in performance.

The word *raga* can be used generally to indicate the genre of an individual piece. When used specifically, *raga* describes the source for all melodic content of Indian classical music. The notes of a *raga* are “identified... as solfa syllables Sa Re Ga Ma Pa Dha Ni, corresponding to Doh Re Mi Fa So La Ti of the Western system.”³ Of these, Re, Ga, Dha and Ni may be lowered (Re) and Ma may be raised ($\overline{\text{Ma}}$). Normally, there are heptatonic and pentatonic *raga* scales; the hexatonic scales are “invariably derived from heptatonic scales.”⁴ Each *raga* is a pre-composed melodic framework for improvisation, including certain guidelines and restrictions that help define its distinct character. A *raga*, then, is “not a melody, but a melodic matrix”⁵ that provides not only a collection of pitches like a scale or mode, but also patterns of movement between these pitches. For example, a *raga* may omit certain notes when ascending (*Arohi*) and include them when descending (*Avarohi*). The Hindustani *Raga Multani*, based on the scale *Todi* (Fig. 4), has an ascent-descent pattern that omits Re and Dha in the ascent (Fig. 1).⁶ In practice, this means Re (or Dha) must always be followed by a lower note: Ga-Re-Sa and Sa-Re-Sa are both correct.

Figure 1: *Raga Multani* ascent-descent pattern



The elements of drone, *sruti*, and ornaments are essential to the character of each particular *raga*. The drone is traditionally performed by tanpura (also called tambura), a plucked stringed instrument with four very resonant strings. As Vaidyanathan notes, “At the extreme, the strumming action becomes inaudible for all practical purposes and only the combined vibrations of the four strings can be heard clearly.”⁷ Vocalists or instrumental soloists choose the tonic that best suits their tessitura, and the tanpura will be tuned to that

³ Ibid., 15.

⁴ Wim Van Der Meer, *Hindustani Music in the 20th Century* (The Hague: Martinus Nijhoff Publishers, 1980), 11.

⁵ Vaidyanathan, 60.

⁶ Ibid., 23. The approximate transcription to Western notation in all examples is my own.

⁷ Ibid., 79.

“key.” The first string is most commonly tuned to the fifth note of the *raga* scale (Pa) with the two middle strings tuned to the upper tonic (Sa') and the fourth string tuned to the lower tonic.⁸ This drone begins before the melodic soloist and continues throughout the *raga*.

Microtonal adjustments, or *srutis*, add to the identity and expressive power of each *raga*. Indian music uses just tuning. This necessitates different tunings for the same note depending on its context. Meer presents a detailed example:

The *ni* of Miyan ki Malhara ... is known to be very low³⁹ but its meaning should be understood in the totality of the phrase *p n d n — s'*. This movement is an entity, and even writing it in notation distracts from the issue, as the notes are shown separately. The *ni* never appears independently, certainly not as a fixed pitch ratio. The student does not try to grasp the pitch of this note but tries to understand how the whole passage should sound. The minute difference in intonation is known as *sruti*.

³⁹Vide note 55.

⁵⁵B.C. Deva, [Psychoacoustics of Music and Speech], p.53. Many musicians however deny the harmonic seventh in a *tanpura* and most likely it plays no role in their intonation, at least not consciously. When Miyan ki Malhara was taught to me I felt the lowest point of *ni* is equal to the harmonic seventh.⁹

The purely-tuned octave and perfect fifth above the tonic are absolute intervals in North Indian music. Intervals of thirds, however, must be context dependent: *Ga* is not an absolute interval above Sa; rather, the tuning depends on the *raga* and on the melodic approach. Students learn which tuning of a note is most desirable in a given context by listening to and repeating after a master performer or teacher.

Ornaments of many descriptions play an important role in defining the identity of each *raga*. However, the three most important ornaments are *kana*, *minda*, and *andolita*.¹⁰ *Kana* is a very brief note, like a grace note, either preceding another note or connecting two notes; *minda* is a gradual transition from one note to another, like a glissando.¹¹ *Andolita* or *andolan* literally means “swaying,” and it occurs on a long note. “The note sways either downward or upward, touching the adjacent note.”¹² In the same way that a *raga* may

⁸ For discussion of other notes used in the drone, consult Meer, 18 and 34.

⁹ Meer, 10 and 19.

¹⁰ Meer, 21.

¹¹ Ibid.

¹² Vaidyanathan, 25.

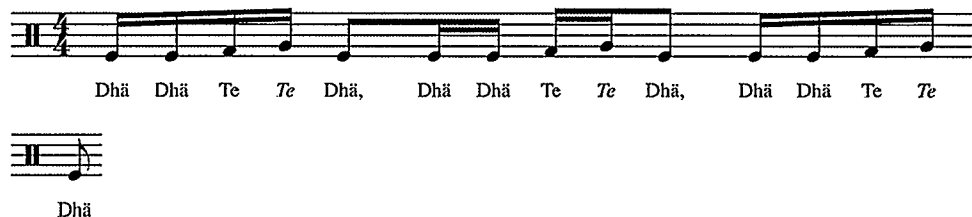
have a particular ascent-descent pattern that omits notes in one direction, a *raga* may also have a pattern requiring particular ornaments in certain contexts of note movement or duration.

Tala is a rhythmic cycle, a pattern of beats that continuously repeats. The beats of a *tala* are learned orally and memorized as recited syllables. Beyond the beats, rhythms or pulses of a *tala*, each syllable, or *bol*, has an expressive tonal quality, corresponding to the different pitches a tabla can produce. As the *raga* is a framework for melodic improvisation, so the *tala* is a framework for rhythmic improvisation. Normally each *raga* performance will use one *tala* from its entrance to the end of the piece.¹³ The first beat of the *tala* is called *sam* and any important structural downbeat will fall on it. Even in elaborate improvisations, the performer must keep count in order to mark *sam* at its return. The realization of a *tala* can involve isorhythms and complex syncopations that ultimately lead back to *sam*. This return to the beginning of the cycle is a recognizable feature of the *tala* system and is often emphasized by the use of a *tihai*, a short rhythmic pattern – usually syncopating the main *tala* beats – that repeats three times. On the final repetition, the last beat of the *tihai* falls on *sam*, the first beat of the next repetition of the *tala*, making a decisive rhythmic cadence (Fig. 2).

Figure 2: *Tihai* against four beats¹⁴

Beats	1	2	3	4
Bols	Dhā Dhā Te Te	Dhā, —	Dhā Dhā Te Te	Dhā, —
	+ Dhā			

Note: + is *sam*; — equals one *bol*, or one quarter of a beat



¹³ Aloke Dutta, *Tabla - lessons and practice*, 2nd ed. (Austin, Texas: by the author, 1995), 8.

¹⁴ Dutta, 32. See Dutta, 13-18, for pronunciation and performance directions for the *bols*. The transcription to Western notation is my own.

The realization of a raga in performance is traditionally in three sections. *Alap*, the beginning section, involves melody and drone only. It is an introduction to and slow unfolding of the notes and basic melodic patterns of a raga. Generally, the *alap* has an improvisatory character and an unmetred rhythmic profile. The second section, made up of *jod* and the faster *jhala*, introduces a pulse in the melodic instrument.¹⁵ This pulse is reinforced as the tabla enters, introducing the *tala*. There can be animated interplay between the melodic soloist and the tabla player, featuring extended isorhythms and syncopation in both parts – though usually not at the same time. This imitative dialogue builds in intensity, leading to the final section, *gat*. According to Vaidyanathan, “improvisation on the Gat is largely rhythmic improvisation, allowing for a wide variety of complex rhythmic motifs, especially Tihai-s.”¹⁶ The soloist and the tabla player often compete to outdo one another with the speed, dexterity and complexity of each successive phrase, imitating and elaborating on each other’s material until a breathless climax is reached that signals the end of the *raga*.

III. Musical language: Scales and modes

The pitch material for the harmonic and melodic language of *Smritiraag* is taken from a group of scales and their transpositions: the acoustic scale, the octatonic mode, and *Todi*, a raga-scale (Figs. 3-5). These scales have properties in common that facilitate moving smoothly from one to another or combining melodic material from one scale with harmonic material from another.

The common link between the octatonic mode and acoustic scale is the octatonic tetrachord that appears repeatedly in the octatonic mode and once in the acoustic scale beginning on its fourth note (Fig. 3). There are also several notes in common between *Todi* and the acoustic scale that begins a semitone lower; these common notes form a pentatonic scale (Fig. 4). Exploiting this pentatonic group provides a means to move smoothly from *Todi* material to acoustic material. There are also five notes in common between the octatonic mode and *Todi* scale starting on the same note (Fig. 5).

¹⁵ Vaidyanathan, 46, 54.

¹⁶ Ibid., 54.

Figure 3: Octatonic tetrachords in the acoustic and octatonic scales

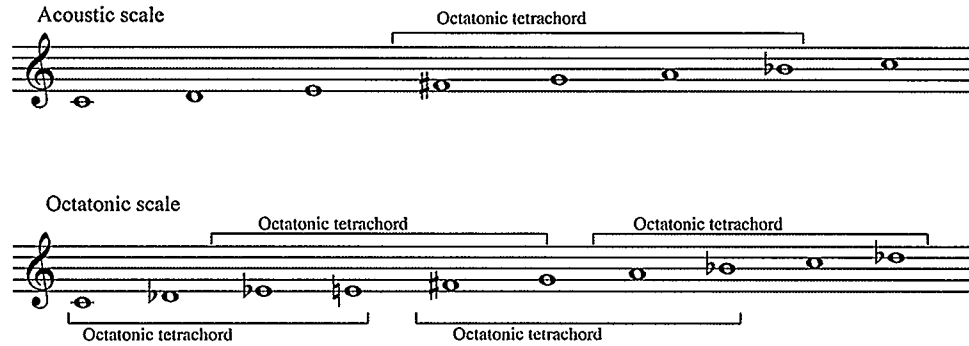
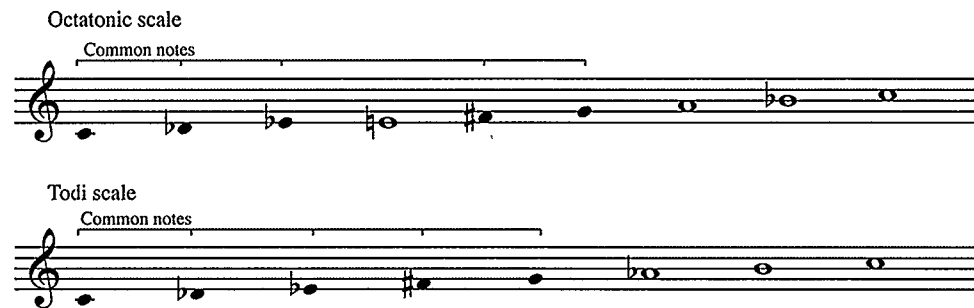


Figure 4: Pentatonic grouping in the *Todi* and acoustic scales



Figure 5: Notes in common from octatonic and *Todi* scales



IV. Form

While composing *Smritiraag*, in order to draw upon two musical traditions, I used the metaphor of “warm” and “cold” music to help organize the two different sets of characteristics that arose in the music. Vivid memories of India in monsoon season and the Canadian Rocky Mountains in winter were the initial inspiration for creating contrasting

musical languages. Although this metaphor suggests two completely separate worlds, the music does not hold to absolute boundaries. One organizing concept in *Smritiraag* comes from the juxtaposing and blending of these two musical languages. The other main element that organizes the sections of the piece is the general outline of a *raga*, following the broad tempos and rhythmic shape only. Combining these two concepts generates an episodic form based on the two musical languages interrupting each other and interacting, with underlying references to the sections of a *raga* performance (Appendix A).

My associations with the “warm” and “cold” climates and landscapes influenced the musical choices I made during the composition of *Smritiraag*. I use resonant timbre and harmony to allude to humidity, blurring in the melody through glissandi and overlapping melody notes to allude to hazy landscapes, and slow melody without a strong sense of pulse to allude to slow physical movement because of heat. To capture my impressions of the “cold,” I use *sul pont*, harmonics, and pizzicato timbres to allude to icy, dry conditions; small symmetrical gestures to allude to the symmetry of snowflakes; tremolo textures to allude to shivering; and angular melodies to allude to icicles and jagged peaks of the Rockies.

The “warm” music uses a melodic and harmonic language based mainly on the acoustic scale and *Todi*, with an emphasis on the pentatonic scale it contains. “Warm” melodies are largely stepwise, using major seconds prominently (Ex. 1). Harmony in this music favours tertial, secondal and quintal chords, which often occur at important structural points (Ex. 2). Other features that characterize this “warm” music include the use of glissandi, grace notes decorating long sustained notes, and a languid exploration of low and medium tessituras on each instrument (Ex. 3). The timbres focus on ordinary string colour (without *sul pont*, for example) and *arco* playing. The result is a full and resonant sound.

Example 1: Stepwise melody, mm. 27-34

Example 1: Stepwise melody, mm. 27-34. The score is for a string quartet (Violins 1 & 2, Violas 1 & 2, and Cellos 1 & 2) and includes performance instructions such as "Espressivo con rubato", "poco rit.", "a tempo", "poco accel.", and "poco rit.".

Measure 27: Vn. 1 (5) *Espressivo con rubato* $\text{♩} = 100$. Vn. 2, Vla. 1, Vla. 2, Vc. 1, Vc. 2 are silent.

Measure 28: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, Vc. 2 are silent.

Measure 29: Vn. 1 (ord.) *mf*. Vn. 2, Vla. 1, Vla. 2, Vc. 1, Vc. 2 are silent.

Measure 30: Vn. 1 (ord.) *mf*. Vn. 2, Vla. 1, Vla. 2, Vc. 1, Vc. 2 are silent.

Measure 31: Vn. 1 (*p*). Vn. 2, Vla. 1, Vla. 2, Vc. 1, Vc. 2 are silent.

Measure 32: Vn. 1 (*p*). Vn. 2, Vla. 1, Vla. 2, Vc. 1, Vc. 2 are silent.

Measure 33: Vn. 1 (*p*). Vn. 2 (ord.) *mf*. Vla. 1 (*p*). Vla. 2 (*p*). Vc. 1, Vc. 2 are silent.

Measure 34: Vn. 1 (*p*). Vn. 2 (ord.) *mf*. Vla. 1 (*p*). Vla. 2 (*p*). Vc. 1, Vc. 2 are silent.

Example 2: Quintal harmony, m. 48

Example 3: Low tessitura melody with glissandi and grace notes, mm. 4-5

The “cold” music uses mainly the octatonic mode and *Todi*, emphasizing intervals of minor seconds and thirds in the principal lines (Ex. 4). Where I use the acoustic scale in “cold” sections, I focus on the octatonic tetrachord contained within it. Harmonies

are more tense than in the “warm” music, using minor seconds or major sevenths and fourths, often in closely voiced chords (Ex. 5). The music is less overtly melodic and the lines are more angular. Symmetry in small gestures is also a recurring feature (Ex. 6). The instrumental colours of *sul ponticello* and muted playing are paired with tremolo textures. Use of pizzicato, harmonics and high-register playing also help to define this “icy” character (Exs. 4 to 6).

Example 4: Melody line emphasizing minor seconds and thirds; high register, *sul ponticello*, tremolo and harmonics, mm. 22-24

The musical score for Example 4 consists of two systems of staves for a string ensemble. The first system covers measures 22 and 23, and the second system covers measure 24.

System 1 (Measures 22-23):

- Vn. 1:** Treble clef. Measure 22: *sul pont*, *pp*, tremolo eighth notes. Measure 23: *mp*, tremolo eighth notes.
- Vn. 2:** Treble clef. Measure 22: *sul pont*, *pp*, tremolo eighth notes. Measure 23: *mp*, tremolo eighth notes.
- Vla. 1:** Alto clef. Measure 22: *pp*, tremolo eighth notes. Measure 23: *mp*, tremolo eighth notes.
- Vla. 2:** Alto clef. Measure 22: *pp*, tremolo eighth notes. Measure 23: *mp*, tremolo eighth notes.
- Vc. 1:** Bass clef. Measure 22: *pp*, sustained harmonic. Measure 23: *mp*, sustained harmonic.
- Vc. 2:** Bass clef. Measure 22: *pp*, sustained harmonic. Measure 23: *mp*, sustained harmonic.

System 2 (Measure 24):

- Vn. 1:** Treble clef. Measure 24: *f*, melodic line with accents.
- Vn. 2:** Treble clef. Measure 24: *f*, melodic line with accents.
- Vla. 1:** Alto clef. Measure 24: *f*, melodic line with accents.
- Vla. 2:** Alto clef. Measure 24: *f*, melodic line with accents.
- Vc. 1:** Bass clef. Measure 24: *f*, sustained harmonic.
- Vc. 2:** Bass clef. Measure 24: *f*, sustained harmonic.

Example 5: “Cold” harmony, closely voiced; muted tremolo and harmonics
mm. 68-73

68 11 ♩ = 100

Vn. 1

Vn. 2 *arco con sord*
p (unmeasured)

Vla. 1 *change bow ad lib.*
arco
pp sul C

Vla. 2 *arco con sord*
p (unmeasured)

Vc. 1

Vc. 2 *con sord*
p (unmeasured)

mf

mp

p

mf

mf

p

Example 6: Symmetrical pairs of lines; pizzicato and high-register *sul ponticello* tremolo, mm. 2-3 and mm. 60-66

2 *c. 3''*
pizz
f

Vn. 1

Vn. 2 *c. 3''*
pizz
f

Vla. 1

Vla. 2

Vc. 1 *c. 5''*
sul C
p

Vc. 2 *ord.*
wide/slow v.
s.v.
sul G
p

mp

mf

p

mp

mf

p

change bow ad lib.

10

60 *arco sul pont* *mf* *symmetrical lines*

Vn. 1

Vn. 2

Vla. 1 *mf* *symmetrical lines* *mp* *symmetrical lines*

Vla. 2 *mf* *mp*

Vc. 1 *mp* *mf* *3*

Vc. 2 *mf* *mp*

63 *symmetrical lines* *pp* *symmetrical lines* *pizz* *mp* *symmetrical lines* *mp* *mp* *mf* *mp* *3* *change bow ad lib* *pp* *sul D*

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

Smritiraag has two main sections (Appendix A). In the first section, the “warm” and “cold” musics are mainly juxtaposed or alternated. Although heard simultaneously, the “warm” cello lines in mm. 2 to 3 do not blend homogeneously with the jagged pizzicato violin parts. A similar juxtaposition of contrasting musical layers occurs in mm. 60 to 66, with cellos continuing a slow descent to complete their “warm” phrase while violins and

violas present unrelated “cold” music above (Ex. 6). In other parts of the first section, “cold” and “warm” music interrupt each other and alternate. An example is the “cold” music from rehearsal (R) 4 to R 5 followed by the “warm” music from R 5 to R 8 (Appendix C).

In the second large section of *Smritiraag*, the two musical languages become increasingly blended. From R 24 to the end, elements of each contribute to the whole. For example, while the extreme high register at R 24 would normally be associated with the “cold” music, this section also includes glissandi, solo lines using notes from the acoustic scale and pentatonic harmony, all elements normally associated with the “warm” music (Ex. 7).

Example 7: Blending “cold” and “warm”: high register with glissandi and acoustic-scale melody, mm. 165-169

The musical score for Example 7, measures 165-169, is presented for a string ensemble. The score includes staves for Violin 1 (Vn. 1), Violin 2 (Vn. 2), Viola 1 (Vla. 1), Viola 2 (Vla. 2), Violoncello 1 (Vc. 1), and Violoncello 2 (Vc. 2). The key signature has one sharp (F#) and the time signature is 4/4. The tempo is marked 'Meno mosso' with a metronome marking of 66. The score is divided into measures 165, 166, 167, 168, and 169. Annotations include 'Pentatonic with added F#', 'Pentatonic', and 'Pentatonic Pentatonic'. Dynamics range from 'ff' to 'p'. A specific section in the second cello (Vc. 2) is labeled 'E acoustic scale'.

Another instance of music that blends elements from both musical languages occurs in mm. 208 to 212. The melody in the second cello has the contour and ornaments of a “warm” melody, yet the pitch material, drawn from the octatonic tetrachord, is characteristic of the “cold” music. In the background the first violin, viola and cello provide pizzicato

accompaniment using notes from the *Todi* scale. Because the emphasis is on pentatonic melodic movement this suggests “warm” music, however the pizzicato timbre is strongly identified with “cold” music in the first section of the piece. Therefore, the two different musical landscapes can no longer be separately identified, and a new, blended musical language is evident (Ex. 8).

Example 8: Blending “warm” and “cold”: slow melody with glissandi and ornaments, using notes from the octatonic tetrachord; pizzicato accompaniment using pentatonic and *Todi* scales, mm. 208-212

V. Rhythmic organization and *tala*

Smritiraag uses rhythmic cycles or *talas* in a non-traditional manner. Instead of choosing one *tala* to organize the rhythmic portion of an entire piece, as in the North Indian tradition, I used several *talas* as raw rhythmic material: *Pancham Sawäri*, *Char tälá ki sawäri* and *Shashäñk* (Fig. 6). The accentuation in the last bar of both *Pancham Sawäri* and *Char tälá ki sawäri* creates a syncopation of the main pulse. Therefore, in my usage, these bars appear either as simple time triple-metre measures or as compound time duple-metre measures. The *talas* are used in three main ways: as a framework of time signatures and structural arrival points; as rhythmic accompaniment lines; and as rhythmic cells. These cells appear in different melodic lines, and are subject to developmental processes.

Figure 6: *Talas Pancham Sawäri, Char tälá ki sawäri and Shashänk*¹⁷

Pancham Sawäri

Char tälá ki sawäri

Shashänk - written twice

¹⁷ Dutta, 23-31. The transcription to Western notation is mine, and only approximately indicates pitch variations for the syllables of each *tala*.

An example of a *tala*-derived framework of time signatures is found in the section from R 15 to R 24 (Appendix C). The rhythmic outline of this section is mainly organized by alternating occurrences of *Pancham Sawäri* and *Char tälá ki sawäri*; the time signatures follow the sequence 4 - 4 - 4 - 3, 4 - 4 - 3 (Ex. 9). Although the underlying rhythmic framework is based on the *talas*, only the main divisions of each *tala* are present. The full rhythmic character of the *talas*, which would need to include accents and pitch variations, is hidden beneath the texture of constant tremolo sixteenth-notes.

Example 9: *Pancham Sawäri* and *Char tälá ki sawäri* organize the time signatures, mm. 100 to 106

The musical score for Example 9 consists of three systems of staves. The first system (measures 100-101) features two violas (Vc. 1 and Vc. 2) in 4/4 time. Vc. 1 has a melodic line with dynamics *p*, *mp*, and *p cresc.*, while Vc. 2 provides a constant tremolo accompaniment at *p*. The second system (measures 102-103) continues with Vc. 1 and Vc. 2, with Vc. 1 changing to 3/4 time and dynamics *mp*, *p*, and *p*, and Vc. 2 changing to 3/4 time with dynamics *mf* and *p*. The third system (measures 104-105) introduces a second viola (Vla. 2) in 3/4 time, which has a melodic line with dynamics *cresc.*, *mf*, and *p*, while Vc. 1 and Vc. 2 continue their tremolo patterns with dynamics *cresc.*, *mf*, and *p*.

From R 26 to R 31, the rhythmic accompaniment line is based on *Pancham Sawäri*. In the beginning of this section, from m. 183 to m. 186, the *tala* provides a framework of time signatures in the order 4 - 4 - 4 - 3, and the second cello outlines only the downbeats (Ex. 10). This sparse outline develops throughout the section, always presented pizzicato, until at R 29 the rhythmic accompaniment line is fully presented in the second viola and

second cello (Ex. 11). Although the material uses a pattern of time signatures based on the *tala*, the rhythmic phrase that develops has its own character, differing from *Pancham Sawäri* as it would be used in North Indian classical music.

Example 10: Rhythmic framework based on *Pancham Sawäri*, mm. 183-188

26 Più mosso ♩ = 92

Pancham Sawäri

183 con sord

Vn. 1 *p* *mp* *mf*

Vn. 2 *p*

Vla. 1 *p* *mp* *mf* *p*

Vla. 2 *p*

Vc. 1 *mp*

Vc. 2 *pizz* *mp*

187 27

Vn. 1 *mp*

Vn. 2 *pp*

Vla. 1 *senza sord* *p*

Vla. 2 *senza sord* *pizz* *mp*

Vc. 1 *mf* *mp*

Vc. 2 *mf* *mp*

Example 11: Rhythmic accompaniment line fully presented, mm. 199-205

The musical score for Example 11, measures 199-205, is presented in two systems. The first system (measures 199-202) is marked with a box containing the number 29. The second system (measures 203-205) continues the piece. The score is for a string ensemble (Violins 1 & 2, Violas 1 & 2, Cellos 1 & 2) in 4/4 time. The first system (measures 199-202) features a complex rhythmic accompaniment in the lower strings and a melodic line in the first viola. The second system (measures 203-205) continues the accompaniment and introduces a new melodic line in the first violin.

In the section from R 31 to R 37 the rhythmic framework and two main melodic lines are based on the *tala Char tālā ki sawāri* (Ex. 12). In this case, the pizzicato accompaniment helps to emphasize the main beats, but the full rhythmic phrase is presented over two repetitions of the rhythmic cycle in the first viola melody. Another melody based

on *Char tälá ki sawäri* is heard in the second violin at R 32 against the first melody from R 31, now presented in the second cello (Ex. 13).

Example 12: Rhythmic framework and melody based on *Char tälá ki sawäri*, mm. 218-224

The musical score for Example 12, mm. 218-224, is presented in two systems. The first system (mm. 218-221) and the second system (mm. 222-224) are both in 4/4 time. The instruments are Violin 1, Violin 2, Viola 1, Viola 2, Violoncello 1, and Violoncello 2. The score includes various dynamics such as *ff*, *mf*, *mp*, *f*, and *p*. The word *arco* is written above the staves for Violin 1, Violin 2, Viola 1, and Viola 2. The score shows a complex rhythmic and melodic interplay between the instruments.

Example 13: Two melodies based on *Char tälá ki sawäri*, mm. 224-230

The musical score for Example 13, measures 224-230, is presented in two systems. The first system covers measures 224 to 230, and the second system covers measures 227 to 233. The instrumentation includes Violin 1 (Vn. 1), Violin 2 (Vn. 2), Viola 1 (Vla. 1), Viola 2 (Vla. 2), Cello 1 (Vc. 1), and Cello 2 (Vc. 2). The key signature is one sharp (F#), and the time signature is 4/4. The score includes various dynamic markings such as *p*, *mp*, *mf*, *pp*, *f*, *cresc.*, *arco*, *pizz*, *submp*, and *pp*. The notation includes slurs, ties, and articulation marks.

There is an important rhythmic cell based on the *tala Shashänk*. This is presented by the first cello in mm. 185 to 188 (Ex. 10). The next presentation of this cell occurs leading into R 30 as a kind of rhythmic cadence that emphasizes the arrival downbeat (Ex. 14). Each time this rhythm is heard, the instrumentation intensifies the feeling of arrival:

first it is played by one instrument, then by two. The pattern continues leading into R 31. The cell is repeated three times to create a *tihai* played by three, then four instruments (Ex. 15). The same cell is used in the cello lines, repeated three times to create another *tihai*, leading to the final measure of the piece.

Example 14: Rhythmic motif based on *Shashānk*, mm. 205-207

The musical score for Example 14 spans measures 205 to 207. It features six staves: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature is one flat (B-flat major/D minor). The time signature is 4/4. Measure 205 is marked with a rehearsal mark '205'. Measure 206 is marked with a rehearsal mark '30'. Measure 207 is marked with a rehearsal mark '30'. The score includes dynamic markings (*f*, *mf*) and articulation (*pizz*). The Vn. 1 staff has a *pizz* marking in measure 207. The Vla. 1 staff has a *pizz* marking in measure 207. The Vc. 1 staff has a *pizz* marking in measure 207. The Vc. 2 staff has a *mf* marking in measure 205.

Example 15: *Tihai* based on *Shashānk*, mm. 212-218

The musical score is divided into two systems. The first system covers measures 212 to 218, and the second system covers measures 215 to 31. The instrumentation includes Violin 1 (Vn. 1), Violin 2 (Vn. 2), Viola 1 (Vla. 1), Viola 2 (Vla. 2), Cello 1 (Vc. 1), and Cello 2 (Vc. 2). The score features various musical notations such as notes, rests, and dynamic markings (*mf*, *f*, *ff*, *pizz*, *arco*). The time signature changes from 3/4 to 2/4 and back to 3/4. The key signature is B-flat major. The score is a *Tihai* based on the *Shashānk* raga.

VI. Melody

In North Indian classical music, the continuous melody is the essential focus of a *raga* performance. Because this musical tradition is partly the inspiration for *Smritiraag*, melody plays a central role in my composition. There are melodies in each of the main

modes, and the contrasting characteristics of the modes help to colour the mood of each section. Common tones are used to move between different modes and between transpositions of the same mode. In some sections, short melodic fragments take on thematic importance. These appear within longer melodies and as accompaniment.

The melody from R 5 to R 6 uses the acoustic scale beginning on C (Ex. 1). At R 6 the mode shifts to D acoustic, with another shift just before R 7 to A acoustic (Ex. 16). These shifts are accomplished through the use of common tones in the melody. These melodies are mostly stepwise, with a focus on the interval of a major second. This characteristic combined with the normal bowed string colour in low to mid-range tessituras defines this section as an example of “warm” music. An example of a melody in *Todi* occurs in the first violin at R 25 (Ex. 17). At R 8, the melody in the first violin is octatonic (Ex. 18).

Example 16: Melody based on D and A acoustic scales, mm. 35-40

Example 16 is a musical score for six parts: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The score is divided into two main sections: D acoustic (mm. 35-40) and A acoustic (mm. 41-42). The tempo changes from *a tempo* to *poco rit.* and then back to *a tempo*, with an *allarg.* section. Dynamics include *mp*, *mf*, *p*, and *f*. The score includes various musical notations such as slurs, ties, and crescendo/decrescendo markings.

Example 17: Melody based on C-sharp *Todi*, mm. 177-180

Example 17 is a musical score for Vn. 1. The score is divided into two main sections: C-sharp *Todi* (mm. 177-180). The tempo is *a tempo*. Dynamics include *mf* and *p*. The score includes various musical notations such as slurs, ties, and triplet markings.

Example 18: Melody based on an octatonic mode, mm. 48-50

Most of the important melodic motives use notes from the octatonic tetrachord. The main motives include: a stepwise octatonic motive that first appears in descending form (Ex. 19); a stepwise repeated-note motive first heard in m. 27 (Ex. 1); and an upward-leaping motive always heard in a triplet rhythm (Ex. 20). These motives are frequently part of melodic and accompaniment textures and the first two are heard in inversion as often as in their initial form.

Example 19: Melodic motive based on stepwise octatonic tetrachord, mm. 7-8

Example 20: Upward-leaping octatonic motive, mm. 54-55

VII. *Sruti* and Ornamentation

Microtonal shading and ornamentation are two distinctive features of North Indian classical music that lend a specific character to a melody or *raga*. In *Smritiraag*, the exploration of microtones begins in the first measure with the use of wide vibrato. Juxtaposing two Gs in the cellos, with one player on the open string (where vibrato is not possible) and the other on the stopped C string moving from no vibrato to normal vibrato to wide vibrato, allows the microtones around the G to become the focus of the opening gesture (Ex. 21). This exploration of microtones in the wide vibrato expands into the glissandi of m. 3, when more microtones can be heard in the slow move to F# and back.

Example 21: Exploration of microtones around G, mm. 1-3

Senza misura

Violoncello 1: *c. 2"* *one long slow bow* *s.v. → ord. → wide/slow v. → s.v.* *c. 1"* *c. 2"* *change bow ad lib.* *sul C* *n* *mp* *n* *sul G* *n* *p*

Violoncello 2: *c. 2"* *change bow ad lib.* *sul G* *n* *pp* *c. 1"* *one bow* *s.v. → wide/fast v.* *n* *sul C* *n* *mp* *sf*

Vn. 1: *c. 3"* *2* *pizz* *f* *p* *c. 2"* *p*

Vn. 2: *c. 3"* *pizz* *f* *p* *c. 2"* *p*

Vc. 1: *c. 5"* *sul C* *p* *n* *pp* *c. 5"* *mp* *mp* *mf* *p* *c. 5"*

Vc. 2: *ord. → wide/slow v. → s.v.* *sul G* *change bow ad lib.* *p* *mp* *n* *n* *pp*

This first use of a glissando establishes it as an important ornament throughout the piece, parallel to the Indian ornaments *meend* (descending glissando) and *soot* (ascending glissando).¹⁸ The glissandi connect adjacent notes in intervals ranging from the minor second to the minor sixth. There is a progression from single-direction glissandi to those

¹⁸ Vaidyanathan, 25.

with a change of direction after briefly touching upon a turning-point note (Ex. 21, m.3).

The grace note is the other important ornament in this piece. It is used like a *kana*, leading to a main note, and also like an *andolan*, “swaying” back and forth from a main sustained note to an adjacent grace note (Ex. 21, m.3). This use of the grace note is foreign to the Western tradition and therefore clearly refers to the North Indian classical tradition.

VIII. Drone

In a *raga* performance, the drone is a constant repetition of the first and fifth notes of the *raga* mode, Sa and Pa, providing the only harmonic element. In *Smritiraag*, the drone appears in many different guises. The opening gesture explores a drone on G in the two cellos, transforming it from a static constant to a dynamic and almost melodic gesture (Ex. 21). This opening gesture is both a reference to a North Indian classical *raga* beginning with the drone and an exploration and development of the drone as a thematic element.

Other instances of a drone appear throughout *Smritiraag*: a simple sustained pitch, a “thickened” drone of two or more pitches, a rhythmically animated drone, and an expanded drone using the notes of a harmonic series. The simple drone, consisting of a single pitch sustained in one part at a time, is the starting point, heard as the sustained G in either cello part from mm. 1 through 9. This expands to a two-note “thick” drone in the two cello parts, a minor third settling to a major second, which supports the “warm” harmonic zone based on the pentatonic elements of *Todi* and the acoustic scale (Ex. 22). This “warm,” thick drone is later played by the violas, then the violins (Ex. 23).

Example 22: “Thick” drone in cellos, mm. 9-14

9

2

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

p

n

p

mp

mf

pp

change bow ad lib.

pp

13

3

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

arco

mp

mf

arco

mp

change bow ad lib.

p

change bow ad lib.

pp

Example 23: “Thick” drone in violas, mm. 14-17 and violins, mm. 18-21

The musical score for Example 23 is divided into two systems. The first system (mm. 14-17) features violins (Vn. 1, Vn. 2) playing a melodic line with dynamics *mp*, *mf*, and *mp*, and violas (Vla. 1, Vla. 2) playing a sustained drone with a "change bow ad lib." instruction. The second system (mm. 18-21) features violins (Vn. 1, Vn. 2) playing a melodic line with dynamics *mp* and *pp*, and violas (Vla. 1, Vla. 2) playing a sustained drone with dynamics *mf* and *mp*. The violas also play a rhythmic element in the second system. The score includes a tempo marking of 72 bpm and a rehearsal mark 4.

Another exploration of the drone contains a rhythmic element. Using a repeated note instead of a sustained note animates the drone and transforms it from fulfilling only a harmonic role to fulfilling both harmonic and rhythmic roles in the music. The second cello plays an animated drone on the repeated E beginning at R 15 (Ex. 9). This line briefly

participates in the melodic counterpoint in m. 103 before returning to the drone E. This pattern continues to develop throughout the section, with repeated-note drones becoming moving melody lines and then receding into the background again as repeated notes. As the music progresses, the single repeated-note drone expands to become a repeated-chord drone (Ex. 24), and eventually the notes are shifting so often that the drone disappears.

Example 24: Repeated-chord drone, m. 107, beats one and two

The musical score for Example 24 shows measures 107 and 108. The top staff is for Viola 2 (Vla. 2), the middle for Violoncello 1 (Vc. 1), and the bottom for Violoncello 2 (Vc. 2). The time signature is 4/4. The key signature has one flat (B-flat). The music consists of repeated eighth notes in a descending pattern. The Viola 2 part is marked 'arco sul pont' and 'p'. The Violoncello 1 and Violoncello 2 parts are both marked 'p'. A box with the number '16' is above the first measure.

A simple drone in the first cello at R 4 adds the element of timbre (Ex. 25). It is the only instrument playing a harmonic in this section, a distinctive string colour that stands out clearly from the rest of the texture. The “timbre-drone,” with the added element of rhythmic animation, recurs more clearly at R 11 through the use of harmonic glissandi in the first cello and viola parts (Ex. 26). Later in this section the first violin also joins in playing a harmonic glissando. This drone is farther removed from the simple drone as these glissandi are made up of several notes from each string’s overtone series. The element that unifies all the notes and creates the sense of a constant drone is the timbre of the harmonics. The texture created by three sets of rapidly shifting harmonics is what appears to the ear as a drone.

Example 25: Harmonic drone in cello, mm. 20-24

20

4 *icy* ♩ = 72

sul pont
pp

sul pont
pp

arco sul pont
pp

arco sul pont
pp

pp

pp

23

mp

f

mp

f

mp

f

mp

f

pp

pp

Example 26: Harmonic glissandi, mm. 66-72

66

11 Cold, distant ♩ = 100

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

arco con sord

p (unmeasured)

mp

p

change bow ad lib

arco

pp sul C

arco con sord

p (unmeasured)

mp

p

change bow ad lib

pp sul D

pp

con sord

p (unmeasured)

mp

p

The overtone drone in this section, from R 11, creates a pedal harmony made up of the notes of the D and C overtone series. Because the two overtone series are only a major second apart, the effect of the major-second clashes is of a blanket of sound rather than a clear recognizable harmony. The harmonic progression in muted tremolo that is superimposed upon this backdrop creates sharper dissonance, especially when D-sharp, A-sharp, C-sharp and G-sharp are present (Ex. 26). The dissonance and sense of detachment from the pedal harmony both contribute to the “cold” sensibility of the section.

IX. Harmony

Harmony in *Smritiraag* is drawn primarily from the acoustic, octatonic and *Todi* scales. Harmony is used both to colour the mood of a “warm” or “cold” section and to mark arrival points, usually with a progression from a tense to a relaxed harmony. In the “warm” sections, prominent chords usually originate from the notes of the acoustic scale for tense chords, or the notes of the pentatonic scale (quintal chords) for relaxed harmony (Ex. 27, Fig. 7). In the “cold” sections, the most prominent harmony is derived from the notes of the octatonic mode, often from the octatonic tetrachord, which also generates significant melodic material in *Smritiraag* (Ex. 5, Fig. 8). The tense chords in “cold”

sections include minor seconds, tritones, and major sevenths, while the relaxed chords use fewer of these intervals, more major seconds and wider spacing.

Example 27: “Warm” harmonic progression, acoustic-scale chords to quintal chord mm. 46-48

acoustic-scale chord (passing) acoustic-scale chord quintal chord

Figure 7: Harmonic reduction of mm. 46-48: chords derived from acoustic scales and pentatonic scale

F acoustic (C-flat = B) A acoustic (with enharmonic spellings) [A-B(Cb)-C#(Db)-D#(Eb)-E-F#-G] quintal chord (rearranged)

Figure 8: Harmonic reduction of mm. 69-73: “cold” harmonic progression emphasizing octatonic-mode chords

OT = chord from octatonic tetrachord
OCT = chord from octatonic mode

OCT OCT (pentatonic) OT OCT (pentatonic) OCT (minor triad) OCT (minor triad) OT OT OT

Voice leading in harmonic progressions is mainly smooth and stepwise, often including at least one note in common between successive chords. Bass movement is most frequently by step or small-interval leaps (Ex. 27). In cases where the bass line moves in wider leaps or more angular lines, it is usually providing the main melody, as in the section between R 24 and R 25 (Appendix C).

Cadences at phrase endings and formal arrival points in “warm” sections are usually produced with contrary motion between the outer voices (Ex. 27). One or both of the outer parts is generally stepwise. In “cold” sections more of the cadences use oblique movement of the outer voices (Ex. 5). Although contrary-motion cadences can create a stable and strong arrival, a few important structural cadences use similar motion at points of high tension (Ex. 28).

Example 28: Similar-motion cadence, mm. 164-165

24 Meno mosso $\text{♩} = 66$

Vn. 1 *f* *ffpp*

Vn. 2 *f* *ffpp*

Vla. 1 *f* *ffpp* *p*

Vla. 2 *f* *ff*

Vc. 1 *f* *ffpp*

Vc. 2 *f* *ff*

X. Timbre

Timbre plays an important structural role in *Smritiraag*. Colouristic effects help to define the “warm” and “cold” musics and these sections delineate the form. Exploring many different timbres creates a metaphorical link to the intangible and elusive qualities of memory. Often only a scent can create a very strong association with a particular memory, even if the details remain obscured. In the same way, compositionally, hearing a *sul pont* timbre instantly refers back in the piece to any other *sul pont* passage, whether it is concretely remembered or not. The timbres of *sul ponticello* tremolo, pizzicato, and harmonics are so distinctive that they create links between different sections. It is possible to hear these sections as continuously developing even when they are separated in time by other music.

The two main groupings of timbre fall under the overriding metaphor of the musics representing “warm” and “cold” climates in musical terms. The “warm” music uses normal bowed string timbre and tends to linger in low and mid-range registers. Tertial and closely spaced major-second secondal harmony creates the resonance associated with this

colour (Exs. 1 and 16). The “cold” music uses special string timbres, including *sul ponticello*, pizzicato, muted, harmonics and tremolo (Exs. 24 and 25).

The first instance of *sul ponticello* tremolo occurs in mm. 21 through 26 (Ex. 25). This brief section interrupts the flow of music with a contrasting tempo, harmonic profile and timbre. It leaves questions in the mind of the listener as to where it comes from and what its purpose is. The next *sul ponticello* tremolo section, from mm. 60 through 63, leads into a longer section characterized by muted unmeasured tremolo in half of the ensemble (Exs. 6 and 26). Although the *sul ponticello* timbre is missing, the tremolo ties this section, from mm. 68 to 83, to the previous measured-tremolo music. Each time tremolo music is heard, it is in a longer section. With the return of *sul ponticello* measured tremolo in m. 99, a fully-developed section based on the earlier music answers the questions that were raised by its previous entrance (Appendix C, R 15 to 24). This section brings the music to its climax at m.165, completing the development of the *sul ponticello* tremolo timbre.

A similar pattern of development follows the use of pizzicato in *Smritiraag*. The first taste of pizzicato in mm. 2 through 9 is in the form of brief, enigmatic gestures unrelated to the slow unfolding cello lines below. Similar small outbursts of pizzicato appear in mm. 17 to 20. Slightly longer pizzicato gestures develop in mm. 59 through 65, and this time they relate to the surrounding music much more closely (Ex. 6). A repeated pizzicato note in mm. 146 to 149 raises the question of context one last time before the pizzicato returns as an accompaniment texture from m. 183 to 218, finally settled into its main role in the music.

The timbre of harmonics is also first introduced sparsely only to play a more important role in the music later on. The harmonic drone at R 4 develops into both a composite melody and a background texture of harmonic glissandi in the section from R 11 to R 13 (Appendix C).

XI. Development

Melodic development occurs at both the phrase and the sub-phrase level. Melodic phrases are developed through modal change, diminution, and imitation. A melody that returns in a different mode occurs from mm. 27 to 31 (Ex. 1). Originally presented by the

first viola and first violin in the acoustic mode, when it returns in mm. 90 to 94 in the first violin it is presented in octatonic mode (Ex. 29). This modal change also reflects a shift from a “warm” melody in an acoustic-mode harmonic context to a “cold” melody in octatonic mode. Whereas the first is harmonized with sustained lines blossoming from and overlapping with the single melody line, the second is a solo line with sparse accompaniment *sul pont* and pizzicato, timbric characteristics that support the “warm” and “cold” sensibilities.

Example 29: Octatonic mode melody, mm. 90-94

The first viola melody from mm. 218 to 222 is an example of a phrase that undergoes diminution (Ex. 12). It returns in m. 242 in the second violin expressed in shorter note values (Ex. 30). This same melody is presented in imitation with itself at R 31, but the imitation is not exact. The second line, in the first violin, is shifted up to begin on the sixth note of the D *Todi* mode, instead of the original fourth note (Ex. 12). Therefore, the melodic contour and rhythm are the same but the intervals are different.

Example 30: Diminution of melody, second violin, mm. 242-243

The musical score for Example 30 spans measures 242 and 243. The staves are labeled Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. Vn. 1 and Vc. 1 have whole rests in both measures. Vn. 2 plays a melodic line starting in measure 242 with a *mp* dynamic, marked *arco*, and ending in measure 243 with a *mf* dynamic. Vla. 1 has a whole rest in measure 242 and a half note in measure 243. Vla. 2 plays a melodic line starting in measure 242 with a *mp* dynamic, marked *arco*, and ending in measure 243. Vc. 2 has whole rests in both measures.

Short melodic motives within phrases undergo various developmental changes including diminution, augmentation, inversion, and expansion or contraction of intervals. The motive that is heard in the first viola in m. 27 becomes the basis for much of the motivic development throughout the piece (Ex. 1). It appears later in the piece in diminution (Ex. 31) and augmentation (Ex. 32). Frequently appearing in related versions contracted to the interval of a minor second (Ex. 33) or expanded to the interval of a minor third (Ex. 2) instead of its original major second, this motive also appears in inverted form (Exs. 33 and 34). Sometimes this melodic motive is harmonized symmetrically with its inversion, in any of the interval forms in which it appears (Ex. 34).

Example 31: Melodic motive in diminution, mm. 184-185 and 251, vn. 2

Example 31 shows a musical score for measures 184-185 and 251, focusing on the melodic motive in diminution for Vn. 2. The score is written for six staves: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature is one sharp (F#) and the time signature is 4/4. The score is divided into two systems. The first system covers measures 184-185, and the second system covers measure 251. The melodic motive in diminution is primarily carried by Vn. 1 and Vn. 2. Vn. 1 plays a melodic line starting in measure 184, marked *mp*, and continues into measure 185, marked *mf*. Vn. 2 plays a melodic line starting in measure 184, marked *mp*, and continues into measure 185, marked *mp*. Vla. 1 and Vla. 2 play a melodic line starting in measure 184, marked *mp*, and continues into measure 185, marked *mp*. Vc. 1 and Vc. 2 play a melodic line starting in measure 184, marked *mp*, and continues into measure 185, marked *mp*. The second system covers measure 251, where the melodic motive in diminution is primarily carried by Vn. 1 and Vn. 2. Vn. 1 plays a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vn. 2 plays a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vla. 1 and Vla. 2 play a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vc. 1 and Vc. 2 play a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*.

Example 31 shows a musical score for measures 251-252, focusing on the melodic motive in diminution for Vn. 2. The score is written for six staves: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature is one sharp (F#) and the time signature is 4/4. The score is divided into two systems. The first system covers measures 251-252, and the second system covers measures 251-252. The melodic motive in diminution is primarily carried by Vn. 1 and Vn. 2. Vn. 1 plays a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vn. 2 plays a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vla. 1 and Vla. 2 play a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vc. 1 and Vc. 2 play a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. The second system covers measures 251-252, where the melodic motive in diminution is primarily carried by Vn. 1 and Vn. 2. Vn. 1 plays a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vn. 2 plays a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vla. 1 and Vla. 2 play a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*. Vc. 1 and Vc. 2 play a melodic line starting in measure 251, marked *mp*, and continues into measure 252, marked *mp*.

Example 32: Melodic motive in augmentation, mm. 251-253, vn. 1

36

251

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

p

p

p

p

p

cresc.

cresc.

cresc.

Example 33: Melodic motive contracted, m. 98

98

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

p

p

p

sul pont

mf

mp

arco sul pont

mf

mp

mf

mp

The octatonic-mode pizzicato fragment performed by first violin in m. 2 (Ex. 21) undergoes development by augmentation and a change of timbre. When this motive returns in mm. 121 to 124, it is played arco by the violins and second cello as a composite melody and in longer rhythmic values (Ex. 35).

Example 35: Composite melody, octatonic mode, mm. 121-124

The musical score for Example 35 consists of two systems of staves, measures 121-124. The first system (measures 121-122) shows a composite melody in an octatonic mode. The instruments are Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The time signature is 4/4. The key signature has one flat (B-flat). The dynamics are marked as *mp* (mezzo-piano). The second system (measures 123-124) continues the melody. The dynamics include *cresc.* (crescendo) and *n* (piano) with a wedge. The key signature changes to two flats (B-flat and E-flat) in measure 123. The time signature changes to 3/4 in measure 123 and back to 4/4 in measure 124. The score includes various musical notations such as notes, rests, and slurs.

Some elements of rhythmic development have already been discussed. The rhythmic phrasing of a melody is developed by diminution, augmentation and layering of different rhythms. The *talas* that organize a framework of time signatures can similarly be developed by diminution. An example is the *tihai*, or rhythmic cadence, that leads to R 24. This *tihai* is based on the repetition of a pattern of time signatures instead of being based on

a particular rhythmic phrase. The pattern of time signatures used for this *tihai* is derived from the *tala Char tälá ki sawäri* (Fig. 6), which is seen at R 21 (Ex. 36). When the pattern of time signatures returns at m. 155, it is in diminution (Ex. 37). To create a *tihai*, the traditional method is to repeat a rhythmic pattern three times. In this case, however, the second repetition undergoes a permutation by cutting the compound duple-metre measure in half and rearranging the order (Ex. 37).

**Example 36: Time signatures arranged according to *Char tälá ki sawäri*,
mm. 138-140**

The musical score for Example 36, measures 138-140, is presented for six staves: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature has one sharp (F#). The time signatures change across the measures: 4/4, 6/8, and 4/4. Dynamics include *p* (piano), *mp* (mezzo-piano), and accents (>). A box labeled '21' is above measure 138.

Example 37: Time signatures arranged according to *Char tálá ki sawäri* in diminution; *tihai*, mm. 155-164

The musical score is divided into two systems, each containing six staves for Violins (Vn. 1, Vn. 2), Violas (Vla. 1, Vla. 2), and Cellos (Vc. 1, Vc. 2). The first system (mm. 155-164) is titled "Char tálá ki sawäri" and "Char tálá ki sawäri (permuted)". The second system (mm. 160-164) is also titled "Char tálá ki sawäri". The score includes various musical notations such as notes, rests, and dynamic markings like *mp*, *p*, *mf*, *f*, and *cresc.*

XII. Conclusion

The research I did into North Indian classical music provided many ideas that stimulated my composing. I have only begun to explore a fraction of the possibilities

suggested by combining concepts from North Indian music with those from the Western musical tradition. Learning about the *raga* and *tala* systems of Hindustani music has enriched my creative process and I am interested in pursuing this further. Before this project, I composed music that was primarily organized by the use of small intervallic cells and tended toward dissonant harmony focusing on intervals of sevenths, fourths, and tritones. I feel that incorporating modal elements and rhythmic cycles into my music has broadened my expressive palette. In the composition of *Smritiraag*, I worked with modal melodies that move from one scale or transposition to another through the use of common tones, and I explored varying levels of tension in tertial and non-tertial harmonies. Incorporating scales and modes into my musical language has opened up a wider range of expressive possibilities from simple stepwise melodic movement and consonant harmony to angular lines and dissonant harmony. The rhythmic cycles in *Smritiraag* provided a framework for the formal organization of the music, a technique I will explore in future compositions.

Writing for string sextet challenged me to stretch my boundaries and learn about string writing in greater depth. The addition of a viola and cello to the traditional string quartet provides greater opportunity for dialogue between instruments in the lower registers. The richness and variety within the sextet ensemble impelled me to discover many timbres and colour combinations that I can take to future projects.

I will continue to pursue research into music from other cultural traditions in greater depth as a means to further expand my technique and versatility as a composer.

BIBLIOGRAPHY

MONOGRAPHS

Ayyangar, R. Rangaramanuja. *'Sangeeta Ratnakaram' of 'Nissanka' Sarngadeva*.
Bombay: Wilco Publishing House, 1978.

Danielou, Alain. *The Raga-s of Northern Indian Music*. London: Barrie and Rockliff, 1968.

Deva, B. Chaintanya. *Indian Music*. New Delhi: Indian Council for Cultural Relations,
1974.

Dutta, Alope. *Tabla - lessons and practice*, 2nd ed. Austin, Texas: by the author, 1995.

Joshi, Baburao. *Understanding Indian Music*. Westport, Connecticut: Greenwood Press,
1963, 1974 (reprint).

Meer, Wim Van Der. *Hindustani Music in the 20th Century*. The Hague: Martinus Nijhoff
Publishers, 1980.

Shankar, Ravi. *My music, my life*. New York: Simon and Schuster, 1968.

Srivastava, Indurama. *Dhrupada*. Delhi: Motilal Banarsidass, 1980.

Vaidyanathan, Anant. *The Language of Indian Art Music*. Toronto: Raag-Mala Music
Society, 1991.

RECORDINGS

Borodin Quartet; Yuri Yurov, viola; Mikhail Milman, violoncello. *String quartets nos. 1-3; Souvenir de Florence/ Peter Ilich Tchaikovsky*. Teldec 4509-90422-2, 1993.

Chang, Sarah and others. *Dvorak String Sextet/ Tchaikovsky Souvenir de Florence*. EMI
CDC 5 57243 2, 2002

Chaurasia, Hariprasad. *Flute Fantasia*. Super Cassettes Industries Ltd. SICCD 037, 1992.

Chaurasia, Hariprasad. *Ragas Durgawati and Mishra Shivananjani*. Navras NRCD 0090,
1997.

Chaurasia, Hariprasad. *Rag Lalit*. Nimbus Records NI 5152, 1989.

Duke String Quartet; Helen Kamminga, viola; Sophie Harris, cello. *Lyric Suite/ Alban Berg, Verklärte Nacht / Arnold Schoenberg*. Collins Classics 15062, 1997.

Khan, Ali Akbar. *Signature Series Volume 3*. Alam Madina Music Productions AMMP CD9404, 1994.

Raphael Ensemble. *String sextet in B flat major, op.18; String sextet in G major, op. 36, Johannes Brahms*. Hyperion CDA66276, 1988.

Schönberg-Ensemble. *Verklärte Nacht; Streichtrio op.45; Phantasy für Violine und Klavier op. 47*. Philips, 1986.

Shankar, Ravi. *In Celebration*. Angel CD7243 5 55577 2 8, 1995

Vaidyanathan, Girija and others. *The Language of Indian Art Music*, demonstration cassettes 1 and 2. Toronto: Raag-Mala Music Society, 1991.

SCORES

Brahms, Johannes. Sextet Nr. 1 für 2 Violinen, 2 Bratschen, und 2 Violoncelle, Op. 18.
New York: Kalmus.

Brahms, Johannes. Sextet Nr. 2 für 2 Violinen, 2 Bratschen, und 2 Violoncelle,
Op. 36. New York: Kalmus.

Dvorak, Antonin. Sextet in A major for 2 Violins, 2 Violas and 2 Violoncellos, Op. 48.
London: Edition Eulenburg.

Schoenberg, Arnold. *Verklaerte Nacht*, Op. 4. Berlin-Lichterfelde: Verlag Dreililien.

Tchaikovsky, Piotr Ilyich. *Souvenir de Florence*, Op. 70. New York: International Music Company, 1980.

APPENDIX A: *Smritiraag* form diagram

C = cold

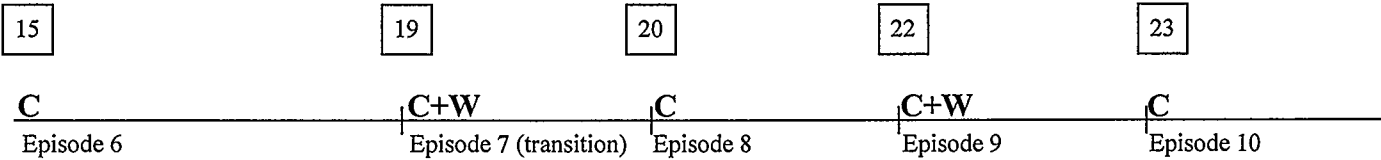
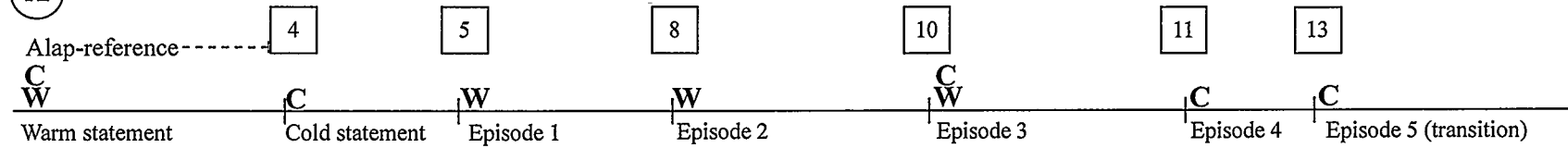
W = warm

$\overset{C}{W}$ = cold juxtaposed with warm

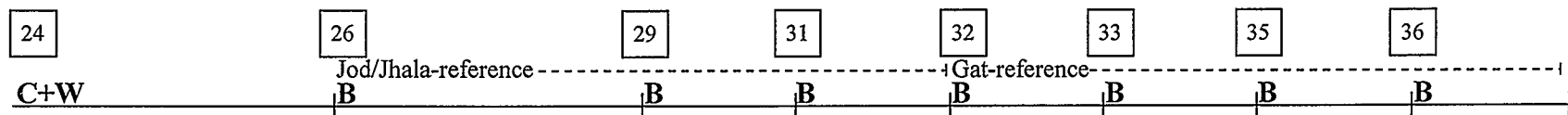
C+W = cold and warm beginning to blend

B = a blended mix of cold and warm

A



B



APPENDIX B: Performance notes

Glissandi are to be played starting at the beginning of a note and lasting for its full duration, where possible. This often results in very slow glissandi.

Example: measure 5, Vc 1: The *gliss* begins on beat two and lasts until arriving at the G on beat three.

Grace notes written within a sustained note are to be very lightly touched upon before returning to the sustained note, which is indicated with a small note head. The grace notes are proportionally notated and should be played in an improvisatory, rhythmically fluid manner.

Example: measure 4, Vc 1: The first two grace notes are proportionally notated within the B-flat they return to. The third grace note, however, is played just before beat four because it is notated in connection to a regular note (not a small note head).

Harmonic *glissandi* move up and down an open string, touching on harmonic nodes and so briefly sounding the natural harmonics. They are notated to indicate the upper and lower harmonics at either extreme of the *gliss*. The speed of these glissandi should be fairly quick and steady in tempo. Bowing is *ad lib* and should not synchronize between parts when two or more are playing harmonic glissandi.

Example: measure 66 to 72, Vc 1: Begin the *gliss* on the first notated harmonic halfway through beat two and turn around at the second notated harmonic; continue up and down in this manner until beat two of measure 72, stopping on whichever harmonic occurs on beat two.

APPENDIX C Smritiraag

51

Sonya Guha-Thakurta

Senza misura

Violin 1

Violin 2

Viola 1

Viola 2

Violoncello 1

Violoncello 2

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

c. 2" *one long slow bow*
s.v. → ord. → wide/slow v. → s.v. *c. 1"* *c. 2"* *change bow ad lib.*

c. 2" *change bow ad lib.* *c. 1"* *one bow*
s.v. → wide/fast v.

c. 3" *pizz* *f* *p* *c. 2"* *p*

c. 3" *pizz* *f* *p* *c. 2"* *p*

c. 5" *sul C* *p* *n* *pp* *mp* *c. 5"* *mp* *mp* *mf* *p* *c. 5"*

ord. *wide/slow v.* *s.v.* *sul G* *change bow ad lib.*

p *mp* *n* *n* *pp*

Alla misura ♩ = 54
cantabile

1

Vn. 1 *mp* 3

Vn. 2 *mp*

Vla. 1

Vla. 2

Vc. 1 *mf* 3 *mp* *change bow ad lib.* *pp*

Vc. 2 *p* *pp* *n* *mp* 3

2

Vn. 1 (pizz) *p*

Vn. 2 (pizz) *p*

Vla. 1 *n* *p* *mp*

Vla. 2 *n* *p* *mp*

Vc. 1 *pp*

Vc. 2 *mf* 3 *change bow ad lib.* *p*

12

3

arco

mp *mf*

arco *mp*

change bow ad lib.

change bow ad lib.

mf *p*

mf *pp*

pp

pp

15

mp *mf*

mf *mp*

mf

mf

mf

mf

Violins (Vn. 1, Vn. 2), Violas (Vla. 1, Vla. 2), and Cellos/Double Basses (Vc. 1, Vc. 2) score, measures 17-20. The score is in 4/4 time and features a key signature of one flat (B-flat major or D minor). The music is divided into two systems by a double bar line. In measure 17, the Violins play a melodic line with a trill on the second beat, while the Violas and Cellos/Double Basses provide harmonic support with eighth-note patterns. Dynamic markings include *mp* (mezzo-piano) and *pp* (pianissimo). The second system (measures 18-20) continues the melodic development in the Violins and the harmonic patterns in the lower strings, with a crescendo leading to a *mf* (mezzo-forte) dynamic in measure 20.

19

4 Icy ♩ = 72

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mp

pp

p

pp

arco sul pont

arco sul pont

22 *sul pont*

Vn. 1 *pp* *mp*

Vn. 2 *pp* *mp*

Vla. 1 *mp*

Vla. 2 *mp*

Vc. 1

Vc. 2

24 *f* *mp*

Vn. 1 *f* *mp*

Vn. 2 *f* *mp*

Vla. 1 *f* *mp*

Vla. 2 *f* *mp*

Vc. 1

Vc. 2 *sul pont* *mp*

26 *gradually move to unmeasured trem.*

5 *Espressivo con rubato* ♩ = 100

Vn. 1 *dim. molto* *pp*

Vn. 2

Vla. 1 *ord.* *n* *mp* *cresc.*

Vla. 2 *dim. molto* *pp*

Vc. 1

Vc. 2 *gradually move to unmeasured trem.* *dim. molto* *pp*

29 *poco rit.* *a tempo*

Vn. 1 *ord.* *mf* *p* *p*

Vn. 2

Vla. 1 *mf* *p*

Vla. 2 *ord.* *p* *mf* *p* *p*

Vc. 1

Vc. 2

33 *poco accel.* *poco rit.* **6** *a tempo* *poco rit.* *a tempo*

Vn. 1 *mp* *< mf >* *p mp*

Vn. 2 *ord.* *mp* *< p*

Vla. 1 *p* *mf* *p mp*

Vla. 2 *p* *p* *mf* *p mp*

Vc. 1 *p* *mf* *p mp*

Vc. 2 *ord.* *mp*

38 *allarg.* **7** *a tempo*

Vn. 1 *cresc.* *f* *mf*

Vn. 2 *f* *mf*

Vla. 1 *cresc.* *f*

Vla. 2 *cresc.* *f* *mf* *mp*

Vc. 1 *cresc.* *f* *mf*

Vc. 2 *cresc.* *f* *mf*

43 *allarg.*

Vn. 1 *mf* *f*

Vn. 2 *mf* *f*

Vla. 1 *mf* *f*

Vla. 2 *f*

Vc. 1 *mp* *mf* *f*

Vc. 2 *mf* *f*

8 *Meno mosso cantabile* ♩ = 72

48

Vn. 1 *mp* *mf* *p* *mf*

Vn. 2 *p* *mp* *p* *mf*

Vla. 1 *p* *mp* *p* *mf*

Vla. 2 *p* *mp* *f*

Vc. 1 *p* *mp* *f*

Vc. 2 *p* *mp* *p*

[illegible]

The first system of the musical score for 'The Swan' from 'The Nutcracker' features six staves: Violin 1 (Vn. 1), Violin 2 (Vn. 2), Viola 1 (Vla. 1), Viola 2 (Vla. 2), Violoncello 1 (Vc. 1), and Violoncello 2 (Vc. 2). The key signature is one flat (B-flat major or D minor), and the time signature is 4/4. The score begins at measure 55. A tempo marking of quarter note = 66 is indicated. A rehearsal mark '9' is placed above the first measure of the second staff. The dynamics range from *mf* (mezzo-forte) to *pp* (pianissimo). The music includes triplets and various articulations such as accents and slurs.

10

58

Vn. 1 *f* pizz *arco sul pont* *mf*

Vn. 2 *f* pizz *arco sul pont* *mf*

Vla. 1 *f* pizz

Vla. 2 *f* pizz

Vc. 1 *f* *mp*

Vc. 2 *mf* *f* *mp* *mf*

61

Vn. 1 *mf* *pp*

Vn. 2 *mf* *pp*

Vla. 1 *mf* *mp*

Vla. 2 *mf* *mp*

Vc. 1 *mf* *mp*

Vc. 2 *mp* *mf* *mp*

64

Vn. 1 *pizz* *mp*

Vn. 2 *pizz* *mp*

Vla. 1 *mf* *mp*

Vla. 2 *mf* *mp*

Vc. 1 *mf* *mp* *pp* *change bow ad lib.* *sul D*

Vc. 2 *mf* *mp* *pp*

68 11 Cold, distant ♩ = 100

Vn. 1 *mf*

Vn. 2 *arco con sord* *p* (unmeasured) *mp* *p*

Vla. 1 *arco* *pp* *sul C* *change bow ad lib.*

Vla. 2 *arco con sord* *p* (unmeasured) *mp* *p*

Vc. 1

Vc. 2 *con sord* *p* (unmeasured) *mp* *p*

73 12 change bow ad lib.

Vn. 1 *pp* [sul G]

Vn. 2 *mp*

Vla. 1 *mf* [sul D] change bow ad lib.

Vla. 2 *mp*

Vc. 1 *mf* [sul A] change bow ad lib.

Vc. 2 *mp*

78

Vn. 1

Vn. 2 *mf* *mp* *cresc.* *mf*

Vla. 1

Vla. 2 *mf* *mp* *cresc.* *mf*

Vc. 1 *f*

Vc. 2 *mf* *mp* *cresc.* *mf*

84 13 *sul G*

Vn. 1 *f*

Vn. 2 *p* *senza sord sul pont* *pp*

Vla. 1 *f* *mp* *f*

Vla. 2 *p* *senza sord sul pont* *pp*

Vc. 1 *pizz* *mf*

Vc. 2 *p*

90 14 *poco riten.* *allarg. 3* *Meno mosso* ♩ = 72

Vn. 1 *mf* *mp* *f* *p*

Vn. 2 *mf* *mp* *f* *p* *(sul pont)*

Vla. 1 *mp*

Vla. 2 *mp* *(sul pont)* *p* *ord.* *pp*

Vc. 1 *mf* *(pizz)* *mp*

Vc. 2 *mf*

95

Vn. 1 *pp*

Vn. 2 *ord.* *pp*

Vla. 1 *pp*

Vla. 2 *mf* *mp* *sul pont*

Vc. 1 *(pizz)* *mf* *mp* *arco sul pont*

Vc. 2 *mf* *mp* *sul pont*

99

15

Vn. 1 *pp*

Vn. 2 *pp*

Vla. 1 *pp*

Vla. 2 *pizz* *mf*

Vc. 1 *p* *mp* *p cresc.*

Vc. 2 *p* *mp* *p*

102

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mp

p

mf

p

105

16

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

cresc.

mf

p

arco sul pont

p

cresc.

mf

p

108

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mp

mp

mp

111

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

cresc.

cresc.

cresc.

mf

mf

mf

114 17

Vn. 1

Vn. 2

Vla. 1 *sul pont*
p *mp* *p* *cresc.*

Vla. 2
p *mp* *p* *cresc.*

Vc. 1
p *mp* *p* *cresc.*

Vc. 2
p *mp* *p* *cresc.*

117

Vn. 1

Vn. 2

Vla. 1 *mf* *mp* *cresc.*

Vla. 2
mf *mp* *cresc.*

Vc. 1
mf *mp* *cresc.*

Vc. 2
mf *mp* *cresc.*

120 18

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mf

mp

mp

mf

mp

mf

mp

ord.

n

mp

123

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

cresc.

cresc.

cresc.

125 19

Score for measures 125-126. The score is for six staves: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature has one flat (B-flat) and the time signature is 4/4. Measure 125: Vn. 1 has a whole rest. Vn. 2 plays a sixteenth-note figure starting on G4, marked *f*, with a *sul pont* instruction above the staff. Vla. 1 has a whole rest, marked *mf*. Vla. 2 plays a sixteenth-note figure starting on G3, marked *mf*. Vc. 1 plays a sixteenth-note figure starting on G2, marked *mf*. Vc. 2 has a whole rest. Measure 126: Vn. 1 has a whole rest. Vn. 2 continues the sixteenth-note figure, marked *p*. Vla. 1 has a whole rest, marked *ord.*. Vla. 2 continues the sixteenth-note figure, marked *p*. Vc. 1 continues the sixteenth-note figure, marked *p*. Vc. 2 has a whole rest.

127

Score for measures 127-129. The score is for six staves: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature has one flat (B-flat) and the time signature is 4/4. Measure 127: Vn. 1 has a whole rest. Vn. 2 plays a sixteenth-note figure starting on G4, marked *sub mp*. Vla. 1 has a whole rest. Vla. 2 plays a sixteenth-note figure starting on G3, marked *sub mp*. Vc. 1 plays a sixteenth-note figure starting on G2, marked *sub mp*. Vc. 2 has a whole rest. Measure 128: Vn. 1 has a whole rest. Vn. 2 continues the sixteenth-note figure, marked *p*. Vla. 1 has a whole rest. Vla. 2 continues the sixteenth-note figure, marked *sub mp*. Vc. 1 continues the sixteenth-note figure, marked *sub mp*. Vc. 2 has a whole rest. Measure 129: Vn. 1 has a whole rest. Vn. 2 continues the sixteenth-note figure, marked *mp*. Vla. 1 has a whole rest. Vla. 2 continues the sixteenth-note figure, marked *mp*. Vc. 1 continues the sixteenth-note figure, marked *mp*. Vc. 2 has a whole rest.

[illegible]

20

133

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

ff

ff

mf

fp

ff

pp

mf

ff

pp

ffpp

mf

ff

pp

136

Vn. 1 *mf* *f* *subp* *fp*

Vn. 2 *mp* *f* *mp* *mf* *p*

Vla. 1 *mp* *f* *subp* *f* *mf* *p* *mp* *p*

Vla. 2 *mp* *f* *subp*

Vc. 1 *mp* *f* *subp* *fp* *mf* *p* *mp*

Vc. 2 *mp*

138 21

Vn. 1 *mp*

Vn. 2 *mp*

Vla. 1 *p* *mp*

Vla. 2 *p* *mp*

Vc. 1 *p* *mp*

Vc. 2 *p* *mp*

141

Vn. 1 *mf*
mf

Vn. 2 *mf*

Vla. 1 *mf p*

Vla. 2 *mf*

Vc. 1 *mp*

Vc. 2 *mf*

143

Vn. 1 *mp*
f
mp
subp
mp

Vn. 2 *mp*
mf
f

Vla. 1 *mp*
mf
f
p < mp

Vla. 2 *mp*
mf
f
mp

Vc. 1 *mp*
mf
f
mp

Vc. 2 *mp*
mf
f
mp

22

146

Vn. 1 *mf* *p*

Vn. 2 *pizz* *p*

Vla. 1 *pizz* *p*

Vla. 2 *pizz* *p*

Vc. 1 *p* *pizz* *p*

Vc. 2 *sul A* *change bow ad lib.* *pp*

23

149

Vn. 1 *f* *subp* *f*

Vn. 2 *f* *arco* *mp* *f*

Vla. 1 *arco* *mp* *f*

Vla. 2 *arco* *p* *f* *mp*

Vc. 1 *arco* *f* *subp* *f*

Vc. 2 *f* *subp* *f* *mp*

153

Score for measures 153-156. The score is for six instruments: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The time signature changes from 6/8 to 3/4 at measure 154. The key signature has one flat. Dynamics include *p*, *mp*, and *p*. The measures are marked with 6/16 and 3/4.

157

Score for measures 157-160. The score is for six instruments: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The time signature changes from 3/4 to 6/8 at measure 158. The key signature has one flat. Dynamics include *mf*, *p*, *f*, and *mf*. The measures are marked with 6/16, 3/4, and 6/8.

161

Vn. 1 *f* *mp* *cresc.* *f*

Vn. 2 *f* *mp* *cresc.* *f*

Vla. 1 *mp* *cresc.* *f*

Vla. 2 *mp* *cresc.* *f*

Vc. 1 *mp* *cresc.* *f*

Vc. 2 *sf* *mp* *cresc.* *f*

24 **Meno mosso** ♩ = 66

165

Vn. 1 *ffpp* *p*

Vn. 2 *ffpp* *p*

Vla. 1 *ffpp* *p*

Vla. 2 *ff*

Vc. 1 *ffpp* *p*

Vc. 2 *ff* *mp* *mf*

169

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mp *mf* *mp* *mf*

172

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mp *p*

176

25

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mf

p

Measure 176: Vn. 1 starts with a half note G4, followed by a quarter rest. Vn. 2 starts with a half note G4, followed by a quarter rest. Vla. 1 has a half note G3, followed by a half note A3. Vla. 2 has a half note G3, followed by a half note A3. Vc. 1 has a half note G2, followed by a half note A2. Vc. 2 has a half note G2, followed by a half note A2. Measure 177: Vn. 1 has a melodic line with triplets of eighth notes. Vn. 2 has a similar melodic line. Vla. 1 and Vla. 2 have sustained notes. Vc. 1 and Vc. 2 have sustained notes. Measure 178: Vn. 1 has a melodic line with triplets of eighth notes. Vn. 2 has a similar melodic line. Vla. 1 and Vla. 2 have sustained notes. Vc. 1 and Vc. 2 have sustained notes.

179

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

p

pp

Measure 179: Vn. 1 starts with a half note G4, followed by a quarter rest. Vn. 2 starts with a half note G4, followed by a quarter rest. Vla. 1 has a half note G3, followed by a half note A3. Vla. 2 has a half note G3, followed by a half note A3. Vc. 1 has a half note G2, followed by a half note A2. Vc. 2 has a half note G2, followed by a half note A2. Measure 180: Vn. 1 has a melodic line with a box containing '179'. Vn. 2 has a similar melodic line. Vla. 1 and Vla. 2 have sustained notes. Vc. 1 and Vc. 2 have sustained notes. Measure 181: Vn. 1 has a melodic line with a box containing '179'. Vn. 2 has a similar melodic line. Vla. 1 and Vla. 2 have sustained notes. Vc. 1 and Vc. 2 have sustained notes. Measure 182: Vn. 1 has a melodic line with a box containing '179'. Vn. 2 has a similar melodic line. Vla. 1 and Vla. 2 have sustained notes. Vc. 1 and Vc. 2 have sustained notes.

26 Più mosso ♩ = 92

183 *con sord*

Vn. 1 *p* *mp* *mf*

Vn. 2 *con sord* *p*

Vla. 1 *con sord* *p* *mp* *mf* *p*

Vla. 2 *con sord* *p*

Vc. 1 *mp*

Vc. 2 *pizz* *mp*

27

187

Vn. 1 *pp*

Vn. 2 *pp*

Vla. 1 *senza sord* *p* *mp* *mf* *mp cresc.*

Vla. 2 *senza sord pizz* *mp*

Vc. 1 *mf* *mp*

Vc. 2 *mf* *mp*

191

senza sord

p *cresc.* *mf*

Vn. 1

senza sord pizz

mf

Vn. 2

f *pp*

Vla. 1

mf

Vla. 2

Vc. 1

mf

Vc. 2

28

195

pp

Vn. 1

Vn. 2

Vla. 1

Vla. 2

sul C

mp *cresc.* *mf* *pp*

Vc. 1

f

Vc. 2

29

199

Vn. 1 *pp*

Vn. 2 *f*

Vla. 1 *pp*

Vla. 2 *f*

Vc. 1

Vc. 2 *f*

203

Vn. 1

Vn. 2 *f*

Vla. 1

Vla. 2 *ff* *f*

Vc. 1

Vc. 2 *ff* *mf*

30

207

Vn. 1 *pizz* *mf* *mp* *mf*

Vn. 2

Vla. 1 *pizz* *mf* *mp*

Vla. 2

Vc. 1 *pizz* *mf* *mp* *mf*

Vc. 2 *arco* *mp* *mf* *dim.*

211

Vn. 1 *cresc.* *f*

Vn. 2 *mf*

Vla. 1 *mf* *cresc.* *f*

Vla. 2 *mf*

Vc. 1 *f*

Vc. 2 *p* *pizz* *mf*

215 31

Vn. 1 *f* *ff*

Vn. 2 *f* *ff*

Vla. 1 *arco* *mf*

Vla. 2 *f* *ff*

Vc. 1 *ff* *mf*

Vc. 2 *f* *ff*

219 *arco*

Vn. 1 *mf* *f*

Vn. 2 *arco* *pp*

Vla. 1 *f* *mf*

Vla. 2 *arco* *pp*

Vc. 1

Vc. 2 *mf*

223 32

Score for measures 223-225. The score is for six instruments: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature has one sharp (F#) and the time signature is 4/4. Measure 223 starts with a treble clef and a 6/8 time signature. Measure 224 changes to a 4/4 time signature. Measure 225 changes to a 6/8 time signature. Dynamics include *mf*, *p*, *pp*, *mp*, *pizz*, *cresc.*, and *arco*.

Vn. 1 *mf* *p* *pp*

Vn. 2 *mp*

Vla. 1 *p* *pp*

Vla. 2 *pizz* *mp*

Vc. 1 *mp* *cresc.*

Vc. 2 *arco* *mp*

226

Score for measures 226-228. The score is for six instruments: Vn. 1, Vn. 2, Vla. 1, Vla. 2, Vc. 1, and Vc. 2. The key signature has one sharp (F#) and the time signature is 4/4. Measure 226 starts with a treble clef and a 6/8 time signature. Measure 227 changes to a 4/4 time signature. Measure 228 changes to a 6/8 time signature. Dynamics include *mf*, *pp*, *sub mp*, *f*, *mp*, *arco*, and *pp*.

Vn. 1

Vn. 2 *mf* *sub mp* *f*

Vla. 1 *pp*

Vla. 2 *mf* *sub mp* *f* *mp*

Vc. 1 *mf* *arco* *pp*

Vc. 2 *mf* *mp*

229 33

Vn. 1 *p* *p*

Vn. 2 *mp* *pp*

Vla. 1 *mf*

Vla. 2 *arco* *mp*

Vc. 1 *mf* *mp* *p*

Vc. 2 *p* *mp* *p*

232

Vn. 1 *p*

Vn. 2 *p* *mp* *mf*

Vla. 1 *p* *mf*

Vla. 2 *p* *mf*

Vc. 1 *p*

Vc. 2 *p* *p* *mp*

235

Vn. 1 *mp* *mf*

Vn. 2 *sub p* *mp* *mf*

Vla. 1 *p* *mp*

Vla. 2 *p* *mf*

Vc. 1 *mf* *p*

Vc. 2 *p* *mf* *mp*

238

34

Vn. 1 *f* *pp*

Vn. 2 *pp* *pizz* *p*

Vla. 1 *pizz* *p*

Vla. 2 *pizz* *p*

Vc. 1 *p*

Vc. 2 *mf* *pp*

241 *pizz* *arco*

Vn. 1 *mp* *p*

Vn. 2 *arco* *mp* *mf*

Vla. 1

Vla. 2 *arco* *mp*

Vc. 1 *mf* *p*

Vc. 2 *pizz*

244

Vn. 1 *p*

Vn. 2 *mp* *p* *pp* *pp*

Vla. 1 *p*

Vla. 2 *p* *pp*

Vc. 1 *p*

Vc. 2 *p*

246 35

Vn. 1 *cresc.* *mf* *p*

Vn. 2 *p* *pp* *p* *cresc.*

Vla. 1 *cresc.* *mf* *p* *cresc.*

Vla. 2 *pp* *pp* *p* *cresc.*

Vc. 1 *p* *cresc.*

Vc. 2 *p* *mp* *p* *cresc.*

249 36

Vn. 1 *mp*

Vn. 2 *mf* *p*

Vla. 1 *mf* *p*

Vla. 2 *mf* *p*

Vc. 1 *mf* *p*

Vc. 2 *mf* *p*

252

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

p

cresc.

mf

mp

p

cresc.

mp

p

cresc.

mp

[illegible]

258 37

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

submp

subp

submp

subp

subp

subp

261

Vn. 1

Vn. 2

Vla. 1

Vla. 2

Vc. 1

Vc. 2

mf *f* *subp*

mf *f* *subp*

mf *f* *subp*

mf *f* *subp*

mf *f* *subp*

mf *f* *subp*

264 38

Vn. 1 *f mp cresc.*

Vn. 2 *f mp cresc.*

Vla. 1 *f mp cresc.*

Vla. 2 *f mp cresc.*

Vc. 1 *f*

Vc. 2 *f*

268

Vn. 1 *f*

Vn. 2 *f*

Vla. 1 *f*

Vla. 2 *f*

Vc. 1 *f*

Vc. 2 *f*