

ABSTRACT

Title of Dissertation: RAGAS FOR THE WESTERN FLUTE: A
DISCUSSION OF COMPOSITIONS AND
PERFORMANCE PRACTICE OF
REPERTOIRE INSPIRED BY INDIAN
CLASSICAL MUSIC

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2017

Dissertation directed by: Dr. John Lawrence Witzleben, Musicology and
Ethnomusicology

‘Western music is music without microtones, as Indian music is music without
harmony.’ –H.A. Popley, *The Music of India*, 134.

The goal of this dissertation is to demonstrate how the Western flute can faithfully
represent Indian classical music through performance of various works by important
composers of the 20th and 21st centuries.

One of aspects of the performance of this genre of music is its use of microtones.
While the Western flute was not originally designed for the execution of microtones
they can nevertheless be achieved in performance of Indian-Western fusion works for
flute. What happens when we combine a Western instrument with the use of
microtones, and perform music without harmony? Can we faithfully represent the
Indian Classical tradition in performances of Indian-Western music for flute?

This dissertation will focus on works that are written for flute and reference elements of Indian Classical music. Since 1958, with the premiere of John Mayer's Dance Suite for sitar, flute, tabla, tanpura, and symphony orchestra, several composers of Indian descent have created works referencing *raga* forms in many ways. Several techniques unique to both Hindustani music (the classical music of North India) and Carnatic music (the classical music of South India) do not translate easily to the Western flute. In fact, with the modern addition of keys, the use of microtones and slides in these *ragas* (melodic forms that are expanded upon throughout a work) becomes awkward. Furthermore, limited performance directions in several of these works put the actual execution of these techniques into question. In an effort to make these works more accessible to flutists interested in performing them, this dissertation will suggest an explanation of the requisite extended techniques for flute.

The recital associated with this dissertation was performed in the Gildenhorn Recital Hall. A recording of this recital can be accessed at the University of Maryland Hornbake Library.

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AND PERFORMANCE PRACTICE OF REPERTOIRE INSPIRED BY INDIAN
CLASSICAL MUSIC

by

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Musical Arts in
Flute Performance
2017

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Acknowledgements

I would like to recognize many people who have helped me in ways great and small with this project. I would like to express my gratitude to Deepak Ram and Debu Nayak, whose advice and guidance has aided my interpretation of Indian music. I am grateful to Johnathan Mayer for taking multiple trips to the British National Library in order to make his father's flute concerto, *Mandala ki Raga Sangeet*, accessible. I am very grateful to Asha Srinivasan for providing scores, musical examples, and insight to her compositions, and Shirish Korde for taking the time to explain aspects of his compositions on the phone. I would like to thank Henri Tournier and Jeann-Miramón Bonhoure for their time and insight on performance practice and Indian music. I am indebted to my friend Kate Farrar and my parents for their unflagging support of my scholastic endeavors. My cat, Mjólnir, deserves special acknowledgement for his support through dedicated lap-sitting for the duration of this project.

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Chapter 1 DISCUSSION OF SOURCES AND LITERATURE REVIEW

Section 1: Historical Context

The preparation for this dissertation has involved consulting and cross-checking multiple sources of ethnomusicology texts, musical scores, manuals on extended techniques, and manuals on instrumental study of Hindustani classical music. The advice given from this variety of sources has influenced my perspective and interpretation of Indian-Western fusion works for flute.

A shifting backdrop of political and social ties has shaped the long development of Indian-western fusion music. First starting with experiments comparing a harpsichord and *bin* (a type of zither), and evolving through British colonialism and Indian independence, the long and complicated relationship between India and the West is very much the catalyst for the pieces discussed in this dissertation.

Cross-exposure happened gradually and at various levels in Indian society. During the 17th and 18th centuries, the British, French, Danish and Dutch occupied the ports of India, and most of their activities in India centered around trade and control of ports.¹ The first records of any European scholarship on Indian music was in 1786, in which Francis Fowke and Jiwan Shah tested the pitches of a *bin* against those of a harpsichord (Fowke later acknowledged having tuned the bin to the harpsichord).² While there may have been European interest in Indian music, the intellectual

¹ Gerry Farrell, *Indian Music and the West* (New York: Oxford University Press, 1997), 18.

² *Ibid.*, 18.

framework for studying non-Western music did not exist at that time. Farrell credits this moment that “the Moghuls were in terminal decline and the British economic and political momentum was unstoppable” as a turning point in Western scholarship on Indian music and culture.³

In a similar fashion to studying ancient Greek texts to ‘rediscover’ the roots of Western music, much of the British scholarship on Indian music overlooked current practices in favor of Sanskrit manuscripts, in an attempt to find an ancient Hindu music without the Muslim influences. In the nineteenth century, a number of officers and British civil servants showed particular interest in Indian music. Among their number are Ernest Clements, Alexander Ellis, Charles Russel Day, and Augustus Willard. Ernest Clements was an English civil servant who founded the Philharmonic Society of Western India, and sought to find a system of notation based on ancient texts.⁴ Alexander Ellis, a mathematician, sometimes referred to as the founding father of comparative musicology, published “On the Musical Scales of Various Nations” in 1885, which compared intervals and scales of various instruments.⁵ Although Alexander Ellis did not travel to India himself, his research influenced others who did. Charles Russell Day, a member of the Oxfordshire Light Infantry, published *The Music and Musical Instruments of Southern India and the Deccan*.⁶ Augustus N. Willard published *A Treatise on the Music of Hindustan* in 1834, a book that due to its

³ Ibid, 18.

⁴ Ibid, 48.

⁵ Ibid, 75.

⁶ Ibid, 71.

emphasis on gathering information from performing musicians, was a forerunner in ethnomusicology.⁷

During this time of the British occupation of India, many of the elites of Indian society perceived Western music to be fashionable. In the 19th century, many influential figures of the time experimented with Western music to various ends. Maharajas such as Nalvadi Krishnaraja Wodeyar, the maharaja of Mysore, maintained a Western wind band, string orchestra, and full orchestra under the direction of a European bandmaster, and even sent some of the musicians to Trinity College in London.⁸ The musicologist Sourindro Mahon Tagore set out to establish Indian music as being on par with Western music, and advocated for a Bengali notation system as a better way of connecting loyal Indians to the British crown.⁹ In 1875, S.M. Tagore arranged a version of “God Save the Queen” in *Vittoria-Gitika (Sanskrit Verses Celebrating the Deeds and Virtues of Her Gracious Majesty the Queen Victoria)* as a demonstration of the cross-compatibility of this system.¹⁰ Rabindranath Tagore, one of the leading literary figures of the time, came from one of the wealthiest families in Calcutta. His training in both Western and Indian music gave him an eclectic musical knowledge and clear views on the relative merits of the two systems.¹¹ Tagore’s understanding of the two systems heavily influenced his compositions. He created an entire genre of Indian music known as *Rabindra Sangeet*, which combines elements of North and South Indian classical music, Bengal folk and religious music, and

⁷ Ibid, 48.

⁸ Ibid, 47.

⁹ Pamela Moro, “Constructions of State and Classicisation of Music: Comparative Perspectives from Southeast and South Asia,” *Journal of Southeast Asian Studies* 35, no. 2 (June 2004): 191-192.

¹⁰ Gerry Farrell, *Indian Music and the West*, 76.

¹¹ Ibid, 156.

Western music.¹² Many of his songs were later translated into English by the Scottish musician Arthur Geddes.

Many of the attempted efforts toward finding a system of notation for Indian music were ultimately doomed for failure. Some of them sought to notate Indian music in a system similar to the Western model. This was found to be troublesome, however, because Indian music did not conform to the ‘rationality’ of time signatures, staff notation, and tempered tuning.¹³ A system for music notation had already existed for Carnatic music since the 17th century: a Carnatic scholar named Venkatamakhi devised a system of seventy-two parent scales, known as *melas*, which could classify all combinations of notes. This was adopted by several North Indian musicians in explaining *ragas*, but this South Indian notation was not an adequate system for the notation of North Indian music.¹⁴ V.N. Bhatkhande, an Indian musicologist, offered an alternative solution to trying to fit Indian theory into the Western staff. Having traveled through different regions of the Indian subcontinent, he codified the multitude of *ragas* into a system of *thaats*, or scale forms. This system was widely accepted, and is used today as shorthand for teaching and learning various aspects of *ragas*. *Thaats* and Bhatkhande’s system will be discussed further in the next chapter.

There was an effort by both British civil servants and Indian musicologists and performers, each seeking to catalogue, itemize, and define Indian music. Both civil servants and Indian musicians were particularly interested in defining Indian music—with a variety of motivations for doing so. For some the motivation may have

¹² Gerry Farrell, *Indian Music and the West*, 155.

¹³ *Ibid.*, 219.

¹⁴ Peter Lavezzoli, *Bhairavi: The Dawn of Indian Music and the West* (New York: Continuum Publishing Group, 2006), 21.

been a notion that this art form was in need of preservation. For others, this ‘classicization’ had a more nationalist bent.¹⁵ Notable among these efforts was the effort to document the exact location of *srutis* (microtones) down to fractions of a cent so that they might be standardized. This effort was confounded by the fact that definite placement of *srutis* within the gamut of an octave varied not just between *gharanas*, or schools, or simply between individuals, but could even change depending on which *raga* each individual was performing.¹⁶ Bhatkhande, in his newly delineated notation system, avoided precisely defining the positions of *srutis*. This is, however, considerable scholarship on how *srutis* are derived—through the same mathematical formulae from which the Greek scales were derived, except the portions were made even smaller.¹⁷ In actual practice, for example, it may be difficult to define precisely how wide the *Pramana sruti* is (Lentz defines it as 22 cents), but most Western performers practice this as the intonation difference between a major and minor tone.¹⁸

Several inventions brought over by the British had far-reaching impacts on Indian music. The introduction of the harmonium (a portable keyboard) was anathema to many Indian musicians, as it was both constructed in 12 tone equal temperament, a pitch system ill-suited to match with just intonation, and unable to modulate pitch and therefore play microtonal *srutis*.¹⁹ Multiple sources ascribe the

¹⁵ Moro, *Constructions of State*, 192.

¹⁶ Nadir Jairazbhoy, *The Rāgs of North Indian Music* (Middletown, CT: Wesleyan University Press, 1971), 35-36.

¹⁷ Donald Lentz, *Tones and Intervals in Hindu Classical Music*, (Lincoln, NE: University of Nebraska Press, 1961), 8.

¹⁸ *Ibid.*, 5.

¹⁹ P. Sambamoorthy, *South Indian Music, Book IV* (Madras, India, The Indian Music Publishing House, 1963), 130. Third Edition.

rising popularity of the harmonium to the ‘deterioration’ of Indian music.²⁰ Another highly influential invention was the advent of recording technology in the form of the phonograph. For the first time, Indian musicians were able to listen back to recordings. Initially (and even sometimes today), the length of playing time for a standard disc was not enough to accommodate a typical *alap* performance segment, let alone the realization of an entire performance of a *raga*. An *alap* is an abstract, meterless introduction to a *raga*, for which a performance may last up to half an hour. Many *raga* performances were truncated in order to fit the limited recording time.²¹

During the 20th century, the most famous example of cross-collaboration between Indian and Western musicians was that of Ravi Shankar. Shyam Shankar, Ravi Shankar’s father, had close ties to England as a barrister-at-law at the Middle Temple in London, and would later go on to teach Indian philosophy in New York. Uday Shankar, Ravi Shankar’s brother, followed Shyam Shankar to London in 1920 to study art. After dancing in a performance organized by Shyam Shankar in 1924, Uday began to collaborate with the dancer Anna Pavlova, most famously in their *Radha Krishna Duet*. Uday Shankar returned to India to form an Indian dance troupe in 1929, and when they moved to Paris in 1930, the younger Ravi Shankar went with them.²² This period was a formative experience for the young Ravi Shankar, in which he grew up dancing and playing musical instruments on cultural tours for audiences all around Europe. It was during this period with this ensemble that he met Allaudin

²⁰ Peggy Holroyde, *Music of India* (New York: Praeger Publishers, 1972), 127.

²¹ Gerry Ferrell, *Indian Music and the West*, 136.

²² Gerry Ferrell, *Indian Music and the West*, 163-164.

Khan, who would later become his guru. Ravi Shankar rose to international fame when he became the sitar teacher of George Harrison of the Beatles.

John Mayer, perhaps an equally talented musician but coming from lesser means, grew up in an impoverished neighborhood of Chandni Chawk section of Calcutta. His mother was a Tamil and Telugu-speaking South Indian woman from Madras, and his father was an Anglo-Indian dock worker whose ancestors emigrated from Germany in the middle of the eighteenth century.²³ Mayer began his early musical training with Philip Sandre at the Calcutta School of Music.²⁴ He would eventually get a scholarship to study at the Royal Academy of Music in London.²⁵ While playing violin in the London Philharmonic Orchestra, John Mayer started his career as a composer. During this time, he made his break into the jazz scene, and some of his first compositions were recorded. This group became known as Indo-Jazz Fusions. Co-led with Joe Harriott, the group consisted of a double quintet: one of Indian musicians and instruments and one of Western musicians and instruments. This combination of elements of Indian music and Western jazz, debuted in 1965, was the first of its kind.²⁶ In this collaboration, though the art forms are far from incompatible, the jazz musicians involved found themselves having to move distinctly eastward to find common ground.²⁷

The results of Indian artists' collaborations with Western musicians and composers has resulted in a multitude of influences across many genres. Several jazz

²³ Kesner, Lori Ann "Krishna Meets Pan: Indian-Western Fusion in Two Works for Flute and Harp." (DMA diss., University of Cincinnati, 2006), 11.

²⁴ Kesner, "Krishna Meets Pan", 13.

²⁵ Kesner, "Krishna Meets Pan", 15.

²⁶ Peter Lavezzoli, *Bhairavi: The Dawn of Indian Music and the West*, 307.

²⁷ Gerry Ferrel, *Indian Music and the West*, 192.

musicians incorporated Indian instruments, *ragas*, scale forms, and even *talas* (rhythmic cycles) into their performances; these included John McLaughlin, John Coltrane, and of course Indo-Jazz Fusions with John Mayer and Joe Harriot. Popular influences in rock include George Harrison of the Beatles and members of Pink Floyd, Quintessence (a 1970s progressive rock band), and The Who, while folk influences include Davey Graham and The Incredible String Band with Mike Heron and Robin Williamson. Western classical musicians' involvement ranges from direct collaboration with Indian musicians to using material and musical ideas from Indian classical music to influence compositional choices. Zubin Mehta and Yehudi Menuhin worked directly with Ravi Shankar to premiere new Indian-Western fusion works.²⁸ Olivier Messaien, Benjamin Britten, Pierre Boulez, and Philip Glass drew on elements of Indian classical music in their compositions.²⁹

Section 2: Discussion of Sources

There exists currently a huge literature on Indian classical music, both concerning Hindustani music (the music of north India) and Carnatic music (the music of south India). For general information on Indian classical music, I consulted a number of sources. George Ruckert's *Music in North India* and T. Viswanathan and Matthew Harp Allen's *Music in South India* provided background on both culture and beginner's exercises for *raga* and *tala*. Martin Clayton's *Time in Indian Music: Rhythm, Metre, and Form in North Indian Rag Performance* explains the *tala* cycles. Nazir Jairazbhoy's treatise *The Rāgs of North Indian Music* provided helpful insight

²⁸ Vamanrao H. Deshpande, *Indian Musical Traditions*, (Bombay: Popular Prakashan Private Limited, 1987), 158-159

²⁹ Holroyde, *Music of India*, 27.

on theoretical and current intonation practices, in particular his continuation of the Helmholtz study with additional drones. Additional observations on intonation in Indian music were found in Donald A. Lentz's *Tones and Intervals of Hindu Classical Music*, Ludwig Pesch's *The Illustrated Guide to South Indian Music* and P. Sambamoorthy's *South Indian Music Book IV*.

Additionally as this project is a cross-cultural study of applied performance practice, sources regarding the background of the interaction between Indian and Western music cultures were consulted. Gerry Farrell's book *Indian Music and the West* discusses the introduction of Western instruments and their adaptation, the cross-cultural interactions of British and Indian figures from colonial times to the present, and select figures in the Indian nationalist movement that were influential in defining Indian music on Indian terms, (as opposed to external, colonial interpretations). Peter Lavezzoli's *Bhairavi: The Dawn of Indian Music in the West* is a collection of vignettes about important musicians in Indian Classical music during the latter half of the 20th century.

Section 3: General Information on Indian Classical Music

While a brief discussion of the salient features of Indian classical music can be found in Chapter 2, the topics discussed are only intended to provide a backdrop for the long, rich tradition to which the music belongs. I have found the following sources helpful in preparation of this project: Martin Clayton's book *Time in Indian Music: Rhythm, Metre, and Form in North Indian Rag Performance* for its overview of the *tala* system, and explanation of musical time in the Indian cultural perspective,

and how these function in performance³⁰; Ravi Shankar's *Learning Indian Music: A Systematic Approach* for its hands-on approach to learning *swaras*, *ragas*, *rasas*, *thaats*, and *talas*³¹; Lyon Leifer's *How To Play the Bansuri* for its practical advice³², which helped me translate many of these techniques to the flute; Peggy Holroyde's *Music of India* for its chapters on ornamentation³³; Gopal Sharman's *Filigree in Sound: Form and Content in Indian Music* attempts to place Indian music in the perspective of Indian life and thought³⁴; and Geetha Ravikumar's *The Concept and Evolution of Raga in Hindustani and Karnatic Music*, for its display of similarities between the two musical systems³⁵.

Among various titles in flute literature, a common theme is Krishna: after all, this dusky blue skinned deity of the Hindu pantheon played flute. Many composers of these exotic-sounding pieces are Western, including Robert Baksa (Soliloquy: Krishna's Song), Marilyn Bliss (*Murali, the Flute of Krishna*), James D'Angelo (*Three Portraits of Krishna*), Rolande Falcinelli (*Krishna Gopala*), Louis Moyse (*Hommage a' Krishna*), and Albert Roussel (*Joueurs de Flûte*, mvt. 3: Krishna). Most of these pieces use altered tonalities to imbue a sense of exoticism, rather than attempt to authentically represent Indian music in the Western musical context. Appropriations of the name Krishna are not necessarily an indication of their Indian-ness. Similar attempts have been made to represent our own Western flute-playing

³⁰ Clayton, Martin. *Time in Indian Music: Rhythm, Metre, and Form in North Indian Rag Performance*. (New York: Oxford University Press, 2000.)

³¹ Shankar, *Learning Indian Music: A Systematic Approach* (Ft. Lauderdale, FL: Onomatopoeia, INC, 1979).

³² Leifer, *How to Play the Bansuri*. (Glenview, IL: Rasa Music Co., 1997).

³³ Holroyde, *Music of India*. (New York: Praeger Publishers, 1972).

³⁴ Sharman, *Filigree in Sound: Form and Content in Indian Music*. (London: Trinity Press, 1970)

³⁵ Ravikumar, *The concept and evolution of raga in Hindustani and Karnatic music* (Mumbai, India: Paras Prints, 2002).

deity of the Greek pantheon, Pan. Similarly, these are more to represent the *idea* of Pan and his exploits than to provide an accurate representation of Pan *à la greque*. This dissertation focuses on covering music for the Western flute by composers of Indian descent, who intentionally seek to draw on multiple elements of Indian music in their compositions.

Section 4: Methodology:

The performance practice philosophy of this dissertation has resulted from a combination of studying extended techniques for the flute and individual study of Indian classical music. In addition to listening to recordings of prominent artists in the field of Hindustani classical music for an aural guide to relevant techniques, I have taken private lessons on the *bansuri* from Deepak Ram and consulted multiple guides on *bansuri* playing. While most of these guides serve as a primer on Indian classical music with some general advice on playing the *bansuri*, Lyon Leifer's approach is that of a beginner's manual with recorded exercises, aiming at instructing new *bansuri* students until they find their first teacher. Lessons as guided through this manual and my lessons with Deepak Ram have aided me in developing a kinesthetic understanding of the capabilities of the *bansuri*. In conjunction with these lessons, I have revised my approach to the pieces discussed in my dissertation, whilst consulting numerous extended technique manuals.

Robert Dick's pioneering manual on extended techniques for the flute has aided in the research on performance practice of Indian classical music, in particular through its discussion of glissandi and the microtone scale. In addition, the following sources were consulted: FluteXpansions website, which is edited by Matthias Ziegler

and Shanna Gutierrez, for the demonstrations of extended techniques; Pierre-Yves Artaud's manual, *Present-day Flutes* and Carin Levine's and Christina Mitropoulos-Bott's manual, *The Techniques of Flute Playing* are two modern handbooks on extended techniques. These were consulted for confirmation of fingerings such as those for bisbigliandi, percussive effects, and microtone scales, and additional information on spatial notation.

Throughout this dissertation, I often refer to a number of Indian instruments, including the *bansuri*, *murali*, *sitar*, *tabla*, and *tanpura*. These are discussed in further detail in Chapter 2. Additionally, this dissertation will reference both Hindustani music, the music of North India, and Carnatic music, the music of South India. Both Hindustani and Carnatic music have both classicized and folk traditions. While each of these musical traditions is unique, they have a common ancestor in their development, and both recognize *tala* and *ragas*, although they differ greatly in both instrumentation and uses of melody and rhythm. The works by Asha Srinivasan are directly related to her experience learning Carnatic music. There are also other extant crossovers of Carnatic music into Western performance tradition: one example is Ravi Shankar's use of the scale form *Nata Bhairavi* in his composition *Morning Love*.³⁶ These references diverge in how these melodies are used.

Section 5: Composers and compositions discussed in this dissertation

The composers whose works will be discussed in the dissertation are Shirish Korde, John Mayer, Ravi Shankar, Deepak Ram, and Asha Srinivasan. Aside from the

³⁶ Bethany Padgett, "Transcription and Analysis of Ravi Shankar's Morning Love for Western Flute, Sitar, Tabla and Tanpura" DMA diss., Louisiana State University, 2013, 38.

common aspect that all of these pieces attempt to blend elements of Western and Indian classical music, they all have an additional commonality: they were composed outside of India. These works range in composition date from 1976 to 2014, beginning with Ravi Shankar's *L'Aube Enchantée* for flute and harp and ending with Asha Srinivasan's *Utthista* for flute and piano.

Ravi Shankar

Ravi Shankar (1920-2012), who had such an extensive career performing and advocating Hindustani Classical Music, composed several Indian-Western fusion works, including his two concerti for sitar and orchestra. He collaborated with the flutist Jean-Pierre Rampal, which resulted in two pieces for flute: *L'Aube Enchantée* (Enchanted Dawn) for flute and harp, and *Morning Love* for flute, sitar, and tabla.

A formal analysis and discussion of *L'Aube Enchantée* can be found by Lori Ann Kesner in her dissertation, "Krishna Meets Pan: Indian-Western Fusion in Two Works for Flute and Harp." In this dissertation, Kesner juxtaposes the biographies of Ravi Shankar and John Mayer with differences in their compositional choices. The formal analysis of Ravi Shankar's *L'Aube Enchantée* includes many elements that Ravi Shankar borrowed from his experience as an Indian classical musician. Kesner contrasts Ravi Shankar's background with that of John Mayer, claiming that while Ravi Shankar's formal training and background led him to compose Western music in

a way that followed the traditional rules and structure of a *raga*, John Mayer may have not felt as indebted to this art form³⁷.

John Mayer

In 1977, the year following Ravi Shankar's *L'Aube Enchantée*, John Mayer was commissioned by James Galway along with the Feeney Trust to compose two pieces for flute, which resulted in the concerto *Mandala ki Raga Sangeet* (A Circle of Raga Music) for flute and orchestra, and *Sri Krishna* for flute, keyboard and *tanpura* (a stringed instrument used to produce a drone). John Mayer composed works for flute over a period of 26 years—from 1977 until 2003. In her dissertation, Kesner discusses how John Mayer's personal history influenced his compositional style. Growing up in a lower-caste family in India, Mayer may have not felt as strong a connection to Indian classical music as Ravi Shankar did.³⁸ In his compositions, Mayer freely mixes Western formal structure and elements of jazz with Indian *thaats* and *raga* forms.

The title of the concerto *Mandala ki raga sangeet* translates as “A Circle of Raga Music.” This concerto is a five-movement work that explores different aspects of Indian classical music. In describing his composition, John Mayer states that the foundations for this concerto are in the *ragas* and *talas* of India and the orchestration techniques of the gamelan and the Far East.³⁹ Mayer describes a *raga* as the rules for ascent and descent of a melodic mode, (the *arohana* and *avorohana*), individual rules

³⁷ John O. Robison “The Music of John Mayer: An Intercultural Composer from India.” *Intercultural Music* 5 (2003): 148.

³⁸ *Ibid.*, 148.

³⁹ From the liner notes of John Mayer recording “Galway Plays Mayer”, 1982

of how certain notes are approached, and the way the *tanpura* acts as a ground bass. He describes *ragas* as being closely connected to certain moods or *rasas*, such as tranquility, loneliness, heroism, eroticism, and so forth, and having particular connection to the day or night, time of year, or different ceremonial occasions.⁴⁰

John Mayer uses a *tanpura* as a ground bass in the first, second, and final movements of this concerto—always playing the root and the fifth. Mayer also calls for the *tanpura* in many of his other works, including *Sri Krishna* for flute, piano, harpsichord, and *tanpura*. The structure of *Sri Krishna* is a set of seven motifs that depict various stories from the life of Krishna, similar to *ragamala* paintings, which Mayer defines as “miniature paintings by Rajput artists [that] portray the gods and mortals, affected by the *rasa* (mood) of the particular raga.”⁴¹ Many of the movements are marked to indicate their style to be similar to a folk song.

Shirish Korde

Shirish Korde is a composer of Indian descent who spent his early years in East Africa. Since 1965, he has lived in the United States. Shirish Korde studied jazz at the Berklee College of Music, composition and analysis at the New England Conservatory, and ethnomusicology at Brown University. His output ranges from solo and ensemble works to operas and musical theater. Many of his compositions have drawn from his background in Indian music, including *Anusvara* (a series of compositions for various instruments, including the original version for flute in 2007), *Lalit*—arranged for various ensembles, including flute and *tabla* (2009), cello

⁴⁰ From the liner notes of the John Mayer Recording “Galway Plays Mayer”, 1982.

⁴¹ From the liner notes of the John Mayer Recording “Galway Plays Mayer”, 1982.

and *tabla* (2012), and for *bansuri*, harp, and vibraphone (2007)—*Dream Sutra* for violin and string quartet, *Kabir Songs* for soprano, chamber ensemble, and tape (1992), and *Svara-Yantra*, a concerto for violin and orchestra (2006).

The composition *Lalit* was based on the original performances and improvisations of *bansuri* master Hariprasad Chaurasia. Select parts of Chaurasia's recordings of *Lalit* were transcribed by myself, using the model example provided by Richard Widdess in his *alap* transcription.⁴² In the score, Korde gives a certain amount of flexibility to the performer, including sections that may be removed for an abbreviated performance. The instrumentalist may remove as many of these sections as they deem necessary, as long as their performance continues to match with the *tala* cycle. Several elements of Korde's *Anusvara* (2007) for solo alto flute reference North Indian classical music, especially in the combination of tempo suggestions in the first movement, in particular the musical marking "Like a North Indian Alap."

Deepak Ram

Deepak Ram studied composition at the University of Rhodes, South Africa. His thesis, "A Portfolio of Original Compositions Exploring Syncretism Between Indian and Western Music," establishes a framework through which Indian-Western fusion compositions can be analyzed.⁴³ This thesis is geared to aid the interpretation of similar Indian-Western fusion works. In addition to his accomplishments as a

⁴² Richard Widdess, "Dynamics of Melodic Discourse in Indian Music: Budhaditya Mukherjee's Alap in Rag Puriya-Kalyan," in *Analytical and Cross-Cultural Studies in World Music*, ed. Michael Tenzer (New York: Oxford University Press, 2011), 187-224.

⁴³ Deepak Ram, "A Portfolio of Original Compositions Exploring Syncretism Between Indian and Western Music" (M. Mus thesis, University of Rhodes, 1995), 2.

composer, Ram is an active performer and a senior disciple of Pandit Hariprasad Chaurasia.

Surya, published in 2002, was originally written for guitar and improvised *bansuri*. In the program notes, Deepak Ram writes that he based the work on the south Indian *raga Kirwani*. He explains that there are seven short movements, which emulate elements of Indian music, such as *alap*, *jor*, *jhala*, *gat*, and *taan*. This piece is largely through-composed, with a great amount of flexibility on the part of the flutist. Ram advises that most of the flute part is open for improvisation, and only the main melody—also called the *pakad* in Indian classical music—should remain intact. Additionally, he advises that portamenti or glissandi should only incorporate the notes of E Harmonic minor.

Asha Srinivasan

Asha Srinivasan is an Indian-American composer. Growing up in a musical family in Bombay, India, she began taking vocal lessons in Carnatic music at the age of 6. After moving to the US, she was introduced to Western classical music through the public school system, and continued her studies of composition through to completion with a Doctor of Musical Arts degree from the University of Maryland, College Park.

Srinivasan draws from both her Western musical training and her Indian musical heritage to create her compositional language. She identifies her personal experience growing up in India as her source of inspiration for writing *Dviraag*. For Srinivasan, her experience with Indian classical music is a point of departure, upon

which she draws inspiration for her compositional material, rather than feeling compelled to adhere strictly to musical forms. Similarly, *Utthista*, premiered in 2014 at the National Flute Association convention in Washington, D.C., was based on the Sanskrit poem *Suprabhatam*. The pitch and rhythmic patterns that form the main melodic material are derived from the Sanskrit language in the poem.⁴⁴

To this date, there are two other dissertations that discuss Indian-Western fusion works for flute. Both of these dissertations have been influential in analyzing Indian-Western fusion works. The first of these, by Lori Ann Kesner, is discussed above.⁴⁵ There is one element in Bethany Padgett's dissertation that is especially valuable: her transcription and analysis of *Morning Love* for flute, *sitar*, and *tabla* based on a recording by Ravi Shankar and Jean-Pierre Rampal. Additionally, she provides biographical data about Ravi Shankar's collaborations with Western musicians that led to his work with the flutist Jean-Pierre Rampal.⁴⁶ The transcription is the first written version of *Morning Love*, as the original performance was a result of Ravi Shankar teaching the *raga* to Jean-Pierre Rampal. In my own transcription of Hariprasad Chaurasia's recording of *Lalit*, the transcription of *Morning Love* in Bethany Padgett's dissertation has provided helpful insight, as have the transcription examples in Richard Widdess's article, "Dynamics of Melodic Discourse in Indian Music: Budhaditya Mukherjee's Alap in Rag Puriya-Kalyan."⁴⁷

⁴⁴ Srinivasan, Asha. *Utthista for Expanded Flute and Piano*, program notes.

⁴⁵ Kesner, Lori, "Krishna Meets Pan," 7-8.

⁴⁶ Padgett, "Transcription and Analysis of Ravi Shankar's Morning Love," 9-10.

⁴⁷ Richard Widdess, "Dynamics of Melodic Discourse", 187-224.

Section 6: Possible Contribution to the Field

As previously mentioned, Lori Ann Kesner (2006) and Bethany Padgett (2013) have already written dissertations on this subject. One important element is missing from these dissertations and most notes from composers (the exception here being Asha Srinivasan's detailed performance notes for her pieces): the large number of extended techniques that seem to be required are not explained for many of the pieces. Using Robert Dick's contemporary manual for extended techniques, *The Other Flute*, Bruno Bartolozzi's *New Sounds for Woodwind*, and other modern extended technique manuals, this dissertation aims to offer more specific solutions for these techniques, combining them with examples of how they are achieved with the original instrumentation.

This dissertation will contribute to the scholarly discussion of works in this genre. In addition to the aforementioned works discussed in Bethany Padgett's and Lori Ann Kesner's dissertations, this dissertation will include works not discussed in either, as well as works by additional composers—Shirish Korde, Asha Srinivasan, and Deepak Ram. These will include Shirish Korde's *Anusvara* (2007) and *Lalit* (2009); Asha Srinivasan's *Dviraag* (2009) for flute and cello, and *Utthista* (2014) for flute and piano; and many works by John Mayer, including the concerto *Mandala ki Raga Sangeet* (1976). Within this group of works are examples of music closely adhering to the compositional style of a *raga*, as is the case with Shirish Korde's *Lalit*, and examples of departure from conventions traditional to Hindustani or Carnatic music, as is the case with Asha Srinivasan's *Utthista* and *Dviraag*, and John

Mayer's *Mandala ki Raga Sangeet*. All of these pieces are composed with extended techniques.

Chapter 2: OVERVIEW OF INDIAN CLASSICAL MUSIC

Section 1: Origins

Indian music as it is practiced today in India has its roots between the 5th and 7th centuries, A.D. The first written record of the term *raga*, or the melodic formats of classical music in India, is dated between the 11th and 14th centuries. This record is in the *Sangit Makaranda* of Narada, in which the term *raga* is referred to in conjunction with different classifications known today, including *sampurna*, *shadav* and *audav* along with the ideas of *ragas* and *raginis*, or masculine and feminine ragas. Out of the 58 *ragas* mentioned in this work, 15 bear the names of present-day *ragas*. This dates the origins of Hindustani music as it is practiced today to the medieval period.⁴⁸

Both Hindustani and Carnatic music have roots in the medieval period. Hindustani music as practiced today was greatly influenced during the Muslim rule of the Pathans and the Moghuls. Sunil Bose suggests the prime musical activity during the Moghul rule was during the reign of Akbar the Great, in 15th century. During this time period, music existed under a system of patronage at the Moghul court. Emperors amply rewarded great composers, such as Mian Tansen, for their songs, and there existed an oral tradition similar to the *gharana* system of today. Carnatic music holds much more in common with the practice of the medieval period. Donald Lentz maintains that the differences between the the two traditions are slight:

In the study of the Hindu Classical music system the confusion due to apparent discrepancies of explanations among Western writers on the Hindu system was at first doubly augmented by the differences in terminology between the many regions in India; in general, between the North (Hindustani) and South (Karnatic). The confusion resulting from the varying terminology and modes of explanation was brought into focus when the language problem between localities was clarified. The differences in explanation by top Hindu authorities ultimately proved only to be of degree and not of kind; and when the terminology was

⁴⁸ Sandeep Bagchee, *Nad: Understanding Raga Music* (Mumbai, India: Eeshwar Publishers, 1998), 77

categorized, the over-all greatness and basic uniformity of the physical aspect of the musical system was apparent and understandable. The basic elements as described by ancient Sanskrit writers prevail, but the names and treatment in different regions vary.⁴⁹

A number of *ragas* are used by both traditions, but may vary in how they are realized and what instruments may play them. Several instruments may be similar: for example, the transverse bamboo flute is played both in Hindustani and Carnatic music, but each practice has a definite preference. Carnatic music favors the sweet, bright melodies of the smaller *venu*, while Hindustani music has a marked preference for the larger, lower pitched *bansuri*.

In the Hindustani tradition, the musician is at once a performer, composer, and interpreter.⁵⁰ Since so much of the realization of the *raga* depends on the artist's improvisation, no two performances of a *raga* will be the same. The Carnatic system, however, concentrates on forms based on songs. The melodic form in this tradition is much more fixed. The basic melody, upon which the performance is based, adheres strictly to the original composition. New ornamental pitches can be introduced during performances, but the basic *raga* remains unchanged throughout a traditional piece.⁵¹ Carnatic music gives more attention to the text and adherence to the original melody. Here, the identity of the composer of a *raga* is paramount.⁵² The most famous composers, such as Tyagaraja, are considered saints.⁵³

In contemporary practice, the boundaries between Hindustani and Carnatic practices are becoming less fixed. This applies particularly in the use of particular *ragas*. Artists in the Hindustani tradition may choose to perform a Carnatic *raga*, and

⁴⁹ Lentz, Donald, *Tones and Intervals of Hindu Classical Music*, 2.

⁵⁰ *Ibid.*, 3.

⁵¹ Malm, William, "Central and Southern Asia", in *Music Cultures of the Pacific, Near East, and Asia*, ed. Wiley H. Hitchcock (Upper Saddle River, NJ: Prentice Hall, 1996), 124.

⁵² Lavezzoli, Peter, *Bhairavi: The Dawn of Indian Music in the West*, 21.

⁵³ Malm, William, *Central and Southern Asia*, *Music Cultures of the Pacific, Near East, and Asia*, 127

vice versa. Expanding from the normal *ragas* available to him, Ravi Shankar incorporated *ragas* of South Indian music into his traditional Hindustani performances. Ravi Shankar's second collaboration with the flutist Jean-Pierre Rampal, *Morning Love*, was based on the south Indian *raga Nata Bhairavi*.⁵⁴ Additionally, Ravi Shankar collaborated with South Indian musicians, creating a truly national music.⁵⁵ Later artists continued to follow his influence by drawing from both Hindustani and Carnatic *ragas*. Deepak Ram based his composition for flute and guitar, *Surya*, on the south Indian *raga Kirwani*. Ram maintains that the main melody is open for improvisation, which is the quintessence of North Indian classical music.⁵⁶

Similar to our Western scales, there are there are seven main notes or *svaras* in use today, by the name of *sa, re, ga, ma, pa, dha, and ni*. The *sargam* system, analogous to our own Solfège, is named based on the first four note names *sa, re, ga, and ma*. *Sa* and *Pa* are fixed, and may not be raised or lowered. *Ri, Ga, Dha, and Ni* may be flattened (*komal*) and *Ma* may be raised (*tivra*). These *svaras* are combined in order to form scales known as *thaats*. The seven main *svaras* and the five *vikrit swaras* combine to 12 tones, similar to our own 12 semitone system.

These *svaras* combine to form *thaats*, or scales, of which there are up to 72 different kinds. Each *thaat* has a unique set of raised or lowered pitches. V.N. Bhatkhande, the eminent Indian musicologist, was the first to organize *ragas* into

⁵⁴ Ravi Shankar, *Raga Mala* (New York, NY: Welcome Rain Publishers, 1999), 184-185.

⁵⁵ S. Slawek, "Ravi Shankar as a Mediator between Traditional Music and Modernity," in *Ethnomusicology and Modern Music History*, ed. S. Blum; P. V. Bohlman; D. Neuman, (Urbana, IL: University of Illinois Press, 1993), 176.

⁵⁶ Deepak Ram, *Surya*, (Walnut Creek, CA: Seher Music, 2002), 1.

thaats based on related scale material. From these, only 10 form the basis for *ragas* used today.⁵⁷ These *thaats* are found below (Example 2-1).

The ten primary *thaats* of the Hindustani system and their ten corresponding *ragas*.

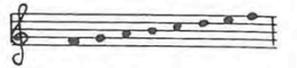
BILAVAL THAT	RAGA BILAVAL
KALYAN THAT	RAGA KALYAN
KHAMAJ THAT	RAGA KHAMAJ
KAFI THAT	RAGA KAFI
ASAWARI THAT	RAGA ASAWARI
BHAIRAVI THAT	RAGA BHAIRAVI
BHAIRAV THAT	RAGA BHAIRAV
PURVI THAT	RAGA PURVI
MARWA THAT	RAGA MARWA
TODI THAT	RAGA TODI

2-1. Ten primary *thaats* as derived by V.N. Bhattachande⁵⁸

⁵⁷ Lavezzoli, *Bhairavi*, 21

⁵⁸ Ravi Shankar, *My Music, My Life* (New York: Simon and Schuster, 1968), 98.

These *thaats* are essentially modes—the *Asavari thaat* is akin to our Aeolian mode, and *Khamaj* akin to our Mixolydian. Below is a chart comparing these two modal systems (Example 2-2).

Medieval Church modes	<i>Thāts</i> (Parent scales) in north Indian music transposed to C
1. IONIAN	BĪLĀWAL
	
2. DORIAN	KĀFĪ
	
3. PHRYGIAN	BAIRAVĪ
	
4. LYDIAN	KALYĀN
	

Example 2-2 Chart comparing Western church modes with Indian *thaats*.⁵⁹

Ragas are melody forms with strict rules regarding their performance. Every *raga* is based on these *thaats* or ‘parent scales.’ They can be pentatonic, hexatonic, or

⁵⁹ Deepak Ram, “A Portfolio of Original Compositions Exploring Syncretism between Indian and Western Music” (M.Mus Thesis, University of Rhodes, 1995), 11.

septatonic, and can have up to three deviations from the next parent scale.⁶⁰ Additionally, *ragas* have specific regulations for ascent and descent, as well as for which notes receive particular emphasis. The number of possible *ragas* is nearly infinite. Scholars have figured that given the seventy-two parent scales of Indian music, with all their permutations, each scale could give rise to hundreds of different patterns or combinations.⁶¹ If the rules are not followed, one *raga* could be mistaken for another. Adherence to these rules of ascent and descent is precisely how one performance of a *raga*, a prescriptive improvisational art form, can be recognized despite its inevitable variability. Some *ragas* may be nearly identical, having the same ascending and descending form and belonging to the same *thaat*, and differ from each other only in their treatment of *sruti*, or microtones.

The term *raga* relates to the Sanskrit word *ranga* which means “to color.” Lavezzoli quotes a Sanskrit phrase, “That which tinges the mind with color is raga.”⁶² Each *raga* has a prescribed mood, which determines the style with which the *raga* is performed. Additionally, each *raga* has an appropriate time of day or night when it should be performed. Bandopadhyaya divides these into three groups: *Sandhi Prakash Ragas*, which are played when the sun is rising and setting (i.e. From 5 am to 7 am and from 5 pm to 7 pm); *Purva* or *Purvanga Vadi Ragas*, which are played between 7am to mid-day and 7 pm to midnight; and *Utter* or *Uttaranga Vadi Ragas*, which are performed after the *Purva Ragas* and before the *Sandhi Prakash ragas*.⁶³ As indicated by Bandopadhyaya in *The Origin of Raga: a Concise History of the*

⁶⁰ Mukerji, D.P., *Indian Music: An Introduction* (Bombay: P.R. Bhide, 1945), 28.

⁶¹ Shankar, *My Music*, 15.

⁶² Lavezzoli, *Bhairavi*, 19.

⁶³ Bagchee, *Naad*, 334.

Evolution, Growth and Treatment of Raga from the Age of Bharatamuni to

Bhatkhande, the *thaats* from which the *ragas* originate may have an effect on their time appropriateness:

Students are advised to note that the prominence of “Tivra Madhyama” F sharp in any group denotes night time or evening twilight and “Suddha Madhyama” Flat “F” denotes morning time or morning twilight. For example the *Ragas*, namely *Basant*, *Paraj*, *Lalit*, *Sohini*, *Kalingda*, *Bhairava* and *Ramkali* are sung between 3 a.m. to 9 a.m. whereas the *Ragas* *Shree*, *Puravi*, *Puriya-Dhanashree*, and *Marava*, are sung in the 4th quarter of the day.⁶⁴

Likewise, some *ragas* have associations with specific times of the year. *Megh ragas* were associated with monsoons, autumn with *Bhairav*, winter with *Malkauns*, and spring with *Hindol*. These associations may have arisen from cultural conditioning rituals, or folk origins. These associations only exist in Hindustani classical music, whereas in Carnatic music there exists no link between *ragas* and particular seasons or times of day.

Section 2: *Srutis*, or *Microtones*

Srutis, or the microtonal division of the octave, are a common element in Indian classical music. These are calculated mathematically in the same way that the 12 *swaras* were derived. A division of 22 *srutis* to the octave is generally recognized, although some treatises recognize as many as 66 microtonal divisions of the octave.⁶⁵ Twelve of these 22 *srutis* are the main *swaras* which correspond to our Western twelve-note chromatic scale. The remaining ten *srutis* are used in ornamentation.

⁶⁴ Bandopadhyaya, S. *The Origin of Raga: a Concise History of the Evolution, Growth and Treatment of Raga from the Age of Bharatamuni to Bhatkhande* (New Delhi: Munshiram Manoharlal, 1977), 64-65.

⁶⁵ Nadir Jairazbhoy, *The Rāgs of North Indian Music: Their Structure and Evolution*, 34.

These *srutis* that do not fall into the main *swaras* are never used as a main note, but instead create an effect of melodic continuity and consistency.⁶⁶

There is not a clear consensus in the number or the exact location of these *srutis* within the 12 octave scale. Since there are 22, not 24, these additional *sruti* are not evenly spaced within the octave either. Jairazbhoy notes that Bhatkhande avoided defining precisely where these *srutis* are within the octave, and that in actual *raga* performance, each artist will prefer different locations for these *sruti* than another.

Sruti are used in improvisation, and the expression and ornamentation of a *raga*. An artist distinguishes themselves in *raga* performance through their innovations in an *alap*, and their ability to improvise melodic fragments or *taans* over a rhythmic framework known as *tala*. When used for the purposes of ornamentation, *sruti* fall into two categories—*gamakas* and *meends*. *Gamaks* are microtonal oscillations from one scale degree to another. *Meends* are smooth-moving glissandi that can span several *sruti*. The use of *srutis* in ornamentation will be discussed further in the performance practice chapter.

Section 3: Tala

In the context of both Carnatic and Hindustani classical performance of *raga*, *tala* cycles dictate the performance of rhythm in the metered sections of a *raga* performance. The rhythmic hierarchy in Indian classical music is cyclical. *Tala* cycles are marked by percussion instruments, are recurrent, and have specific beat patterns that mark the parts of the cycle. An accomplished *tabla* player would play this cycle while filling in extra rhythms to complement the soloist's performance, and improvise

⁶⁶ Sharman, Gopal, *Filigree in Sound: Form and Content in Indian Music* (London: Trinity Press, 1970), 52.

at specific moments during a performance. The cycle starts and ends on *sam*, the first beat, and all improvisations happen within the constructed rhythmic pattern. Common *tala* cycles have as few as five beats and as many as twenty. Variations within these patterns are allowed, so long as the principle beat structure continues to be audible. One of the most popular *tala* cycles in the present day is *teen-tal*, which is a sixteen-beat cycle (Example 2-3). This particular *tala* cycle is featured in Shirish Korde’s *Lalit*, although there are no explicit rhythmic patterns in the *tabla* part that would help the flutist to keep track. Instead, an alternate method is to learn *teen-tal*. The *taal* signs in the first row represent the rhythmic groupings of this sixteen beat cycle. The second row shows the *matras*, or basic counts, and the third row displays the *bols*. The *bols* are mnemonic representations of the various rhythmic strokes featured in *teen-tal*.

Taal signs	X				2				0				3			
Matra	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Bols	dha	dhin	dhin	dha	dha	dhin	dhin	dha	dha	tin	tin	ta	ta	dhin	dhin	Dha

2-3 *Teen-tal* cycle.

Teen-tal has 16 beats that have 4 equal subdivisions. The first beat is called *sam*, and the 9th beat is *khali*, or empty. The bol syllable *dha* indicates that both hands strike at the same time. This occurs on the first and second larger beats—*sam* and beats and 4.

The musician communicates with the *tabla* player throughout the performance. One of the principal ways they demonstrate their knowledge of *tala* is through their treatment of the *pakad*. A *pakad*, also known as *mukhra*, is a catch-phrase that shows

the basic blueprint of the *raga*.⁶⁷ Musicians play the *pakad*, which varies in lengths depending on the *raga*, in time to play the last note on *sam*, or beat 1 of the new cycle. There are various devices for truncating the *pakad* to add an element of surprise. A musician must not play the *pakad* leading into every *sam*, but every time it is played it must line up with the *tabla*. A common practice is for the musician to intentionally avoid *sam*, improvising on the *pakad*, and almost seemingly by accident lining up again with the *tabla*. This improvisational scheme requires mastery of the *tala* cycle on the part of the musician.

Section 4: Raga Structure

Ragas begin with an unmeasured section known as an *alap*. The *alap* is open ended; some realizations of the *alap* last for only a couple of minutes, while others take a more meditative quality and take up to half an hour to reach fruition.⁶⁸ This is the beginning of a *raga* performance, in which the important characteristics of the *raga* are presented in an unhurried manner. For the duration of the *alap*, a drone is present, typically played by the *tanpura* or a *sruti* box (a type of harmonium). The drone consists of two notes, the root and the sonant note (usually the fourth or fifth above the root). The artist highlights important notes and phrases one at a time, gradually expanding the range and developing a sense of pulse. The second part of the *alap*, the *jor*, has rhythmic elements, but still lacks a steady, definite pulse. Throughout the *jor* the rhythmic excitement rises, and leads into the *jhala*, or the climax. In this section there is a definite sense of pulse but not yet a fixed meter. At the conclusion of the *alap*, the *gat* is introduced with a set *tala* cycle.

⁶⁷ Lavezzoli, *Bhairavi*, 24

⁶⁸ Lavezzoli, Peter, *Bhairavi: The Dawn of Indian Music in the West*, 24.

There are three tempo settings in the *gat*—slow, medium, and fast—referred to as *vilambit*, *madhya*, and *drut*, respectively. Each tempo setting is called a *lay*. The *tabla* player and soloist usually engage in a call-response dialogue with each other known as the *sawab-jawal*.⁶⁹ The style of *raga* performance that was popularized in the West by Ravi Shankar, Ali Akbar Khan, and Vilayat Khan is known as the *alap-jor-jhala-gat* style. The *gat* is the final fixed instrumental composition after the *alap*, comprising several different but interrelated sections that are given thematic treatment. Various melodic phrases are repeated rapidly with different beat patterns and different ratios of notes (for example 6 notes followed by 4, 7 notes followed by 4, etc) juxtaposed with the ongoing *tala*. Sections are delineated by *tihai*, which are short repetitive phrases played over 3 times and culminating on *sam*.⁷⁰

Section 5: Instruments

The practices of playing the following instruments have had a direct influence on some or all of the pieces mentioned in this dissertation. Prior to Shirish Korde's composition of *Lalit* for flute, alto flute and *tabla*, a prior version of the same work was published for *bansuri*, harp, and vibraphone. The *sitar* is perhaps one of the most popular solo instruments in Hindustani classical music aside from the voice. In his second collaboration with Jean-Pierre Rampal, Ravi Shankar composed *Morning Love* for flute, *sitar*, *tabla*, and *tanpura*. The *tabla* also makes an appearance in Shirish Korde's *Lalit*, with specific directions for the *tabla* player. The *tanpura* is present in John Mayer's *Mandala Ki Raga Sangeet* and *Sri Krishna* and Shirish

⁶⁹ Ibid., 21.

⁷⁰ Holroyde, *Music of India*, 175-176.

Korde's *Anusvara* and *Lalit*, and is directly referenced in Ravi Shankar's *L'Aube Enchantée*, Asha Srinivasan's *Dviraag*, and Deepak Ram's *Surya*.

Bansuri

The *bansuri* is one of the oldest instruments, with references to its performance dating back to the *Vedas*, that is still played in India today (Example 2.4). A *bansuri* is a transverse bamboo flute made from a single unbroken node of bamboo, with six or seven finger holes and an embouchure hole. This instrument has mythic associations in Indian music: Krishna, one of the most widely worshiped deities in the Hindu religion, is often depicted with a bamboo flute. For many centuries this instrument was often associated with shepherds and cow-herds. As recently as the 1940s, the *bansuri* became accepted as a classical instrument largely due to the efforts of Pandit Pannalal Ghosh.⁷¹ Notable artists of the North Indian tradition are Pannalal Ghosh, Hariprasad Chaurasia, and Devendra Murdeshwar. Pannalal Ghosh, having studied with Ustad Allauddin Khan (the same master with whom Pandit Ravi Shankar studied), adapted his playing style after vocal *khyal* performances. *Khyal* is a genre of *raga* performance with roots in the eighteenth century. Multiple sources credit Pannalal Ghosh for his efforts to have the *bansuri* accepted as a concert instrument in its own right.

⁷¹ Bagchee, *Naad*, 273.



2.4 A full set of bansuri

Technical capabilities of the *bansuri*

The *bansuri* has a range of two octaves, with an additional half an octave depending on the performer's skill. A *bansuri* player typically has a set of *bansuri* in various keys, although many artists prefer to play on the E-bass bansuri. In the North Indian musical tradition, the lower pitched *bansuri* are preferred, and in Carnatic music, the higher pitched *bansuri* are favored. Given the open holes, the *bansuri* is capable of glissandi and microtonal embellishments. The maximum range of a glissando on this instrument is a major seventh, and involves playing from a completely closed finger position to a completely open finger position. Microtonal embellishments are performed by delicately moving the fingers around the tone holes (similar to the technique of *flattement* on *traverso*) and further manipulating the air stream with the embouchure.

Sitar

The *sitar* is a long-necked lute of North India, brought to international prominence through the playing of Ravi Shankar, Vilayat Khan, and Nikhil Banerjee.⁷² While the *sitar* in its modern form dates back to the 18th century, it likely developed from the Persian three-stringed lute known as the *setar*. The *sitar* has six strings on which the instrumentalist plays, and thirteen resonating sympathetic strings, which are tuned to the scale of the *raga* before the performance begins. When a note is played on one of the six main strings, the corresponding sympathetic strings vibrate and produce an echo with a lush harmonic.⁷³



2.5 *Sitar*.

⁷² Ruckert, *The Music of North India*, 94.

⁷³ Lavezzoli, *Bhairavi*, 31.

Tabla

The pair of hand drums, *baya* and *tabla*, which have become the most popular drums of the classical tradition, are known together as *tabla*. The *baya* drum is the large broad-mouthed drum played with the left hand, and the *tabla* drum is the narrower drum, played with the right hand. *Tabla* are commonly used in the context of an Indian classical performance as accompanying instruments. The role performed by *tabla* players is to maintain the rhythmic cycle, which the artist has selected for his or her composition. Following the conclusion of an *alap*, the soloist will select their time measure, and the *tabla* player will strictly adhere to it, providing a mathematically correct tempo. Besides controlling the time, the *tabla* player will additionally enrich the quality of the performance by mirroring the soloist and displaying their skill and dexterity on the instrument.⁷⁴



Example 2-6 *Tabla* set. *Bayan* drum is on the left, *tabla* drum on the right.

⁷⁴ Joshi, *Understanding Indian Classical Music*, 33.

Tanpura

The *tanpura* is a long-necked lute with four or five strings and no frets. The *tanpura* provides a fixed, unchanging drone which can be heard continuously in the background of a classical performance. This instrument's four or five strings are conventionally tuned to the tonic, octave above, and the sonant tone, which can either be a fourth or a fifth above the tonic.⁷⁵ In the context of modern performance, the *tanpura* is occasionally replaced by the hand-pumped harmonium or a *sruti* box (Examples 2-7 and 2-8).



2-7 Acoustic *tanpura*



2-8 Electronic *tanpura* (*sruti* box)

⁷⁵ Jairazbhoy, *The Rāgs of North Indian Music*, 27.

Chapter 3: COMMONALITIES BETWEEN INDIAN CLASSICAL MUSIC AND WESTERN MUSIC

Since the purpose of this dissertation is to function as a performance guide for flutists interpreting Indian-Western fusion works, this overview cannot be complete without a discussion of the common elements that enable successful performances of these works. The common fundamental elements of our musical languages are what make such fusion works reasonable to attempt. Both musical systems have tonal center and a scalar, mathematically derived hierarchy, though ideas surrounding intonation diverged on aesthetic means. Indian music, which developed around the performance of a melody against a drone, uses just intonation. Western music began to favor equal temperament in the 18th century. By fixing semitones equidistant from one another in a chromatic line, Western music sacrificed perfectly tuned intervals in order to gain the ability to deftly move from one key to another.

Most Western instruments, with the exception of fixed-intonation instruments such as the piano, are capable of playing tuned to just intonation. This is common practice in the context of a performance without a keyboard instrument. In chamber music and orchestra performances, just intonation is favored because of the purity of intervals. In this way, practitioners of Western music are already accustomed to making a certain amount of adjustment to fit into an ensemble sound—but not necessarily as a method for producing microtones.

While both Western and Indian intonation systems observe just intonation, they differ in the functional of intonation. Western music, twentieth century experimental music notwithstanding, divides the octave into twelve half steps. More flexibility is

reserved for the ability to modulate key areas. Indian music, which focuses on pure intervals based on the root and the fifth, accepts more flexibility within the scope of an octave. As part of this dissertation focuses on the syncretism of several Indian-Western works for flute, this problematizes the relationship between the two systems. However, since this discrepancy concerns not so much in the existence of particular tones of a scale as in the *functional use* of intonation within a scale, the two systems are compatible: The only requirement is for the Western performer to adapt their use of scale and harmony to that of Indian classical music. In Western music, the performer's observance of intonation focuses on staying within harmonic chord structure. A performer in Indian classical music practice deftly moves in and around the perfectly tuned intervals as a form of ornamentation—though it is equally important to have the pure intervals (e.g., the root and the fifth) exactly matching.

Western perceptions of microtones have changed since initial colonial involvement in India, as documented by Gerry Farrell in *Indian Music and the West*.⁷⁶ In this volume, he explains that during the seventeenth and eighteenth centuries most Europeans were primarily concerned with economic, political, and territorial gains. When attempts at mutual understanding were made, they were not always assuming equal importance. Farrell gives us an account of Western interaction with Indian music dating back to 1786, where in Benares, Jivan Shah and Francis Fowke tested the pitches of the *bin*, a stick zither of the Indian subcontinent, against those of the harpsichord. (Fowke acknowledged having tuned the *bin* to the harpsichord for this exercise—thus defeating the idea of accurate comparison!). In the nineteenth century, several scholars of both British and Indian origin, namely Ernest Clements, V. N.

⁷⁶ Farrell, *Indian Music and the West*, 24.

Bhatkhande, and Sourindro Mohun Tagore, wrote treatises with the aim of preserving Indian music.⁷⁷ Ernest Clements was an English civil servant and the founder of the Philharmonic Society of Western India. In a preservationist attitude, he attempted to reduce to notation and preserve the ‘best musical compositions at present sung by celebrated musicians.’ Clements warned against the use of equal temperament (i.e., through the use of the harmonium), which he considered destructive to the spirit of Indian classical music. In response to British pressure to come up with a system of notation for Indian music, V. N. Bhatkhande proposed a uniform system of notation for the whole country. Bhatkhande, an Indian musicologist, codified a multitude of *ragas* into a comprehensible system of *thaats*, or scale types, showing that Indian music was a developing and changing art form capable of renewing itself from within.⁷⁸ Bhatkhande’s system is widely accepted and used today.

Among many of the works written about Indian classical music, a number of them mention that Indian classical music has a common theoretical ancestor with our own Western music: Greek music. In *The Ragas of North Indian Music*, Alain Danielou mentions the accounts of Megasthenes, the Greek traveler in 150 BC as an attempt to link Western music with Indian musical practice.⁷⁹ While theoretically this claim is very difficult to prove, some commonalities remain between Western and Indian classical musical practice.

Similar to Western musical practice, Indian music also uses 12 semitones to the octave and a scale based on 7 *svaras* (1 or 2 of which may be omitted, resulting in scales with five to seven notes). The individual scale degrees or *svaras* were

⁷⁷ Ibid., 51-55.

⁷⁸ Farrell, *Indian Music and the West*, 76.

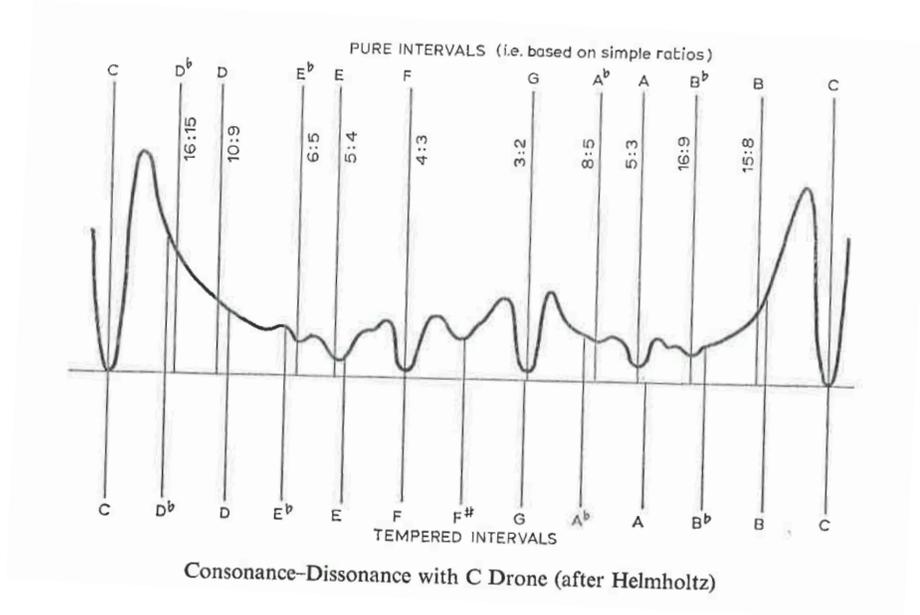
⁷⁹ Alain Daniélou, *The Rāga-s of Northern Indian Music*, 2.

determined theoretically in a similar division—first at the fifth, then at the fourth. The two systems here diverge in common practice. Indian classical music *always* observes just intonation, whereas Western music *sometimes*—in the case of performances with the piano—observes equal temperament. Most historical treatises on Indian Classical system further divide the octave into *sruti* or microtones. While the use and observance of microtones is indisputably common practice in India, most historical texts have inconsistencies with regard to how many *sruti* there are to an octave, and their exact location with relation to the *sargam* scale. Some authors even claim to have forty-nine or even sixty-six different intervals to the octave.⁸⁰

Certain tones are emphasized, while others are de-emphasized. In Western musical practice, dating back to the Middle Ages, the root, fifth, and fourth scale degrees are considered to be consonant intervals. The third and sixth scale degrees were later included as consonants as well. In Indian music, the ‘pillar tones’ are most commonly the root and the fifth, and can be heard constantly throughout a performance in the drone of the *tanpura*. Less frequently, the fourth scale degree is substituted for the fifth in certain *ragas*. Jairazbhoy demonstrates this in *The Rāgs of North Indian Music: Their Structure and Evolution* through his observation of a study of the effect of drones by Hermann Helmholtz. As observed on a graph of one violin playing individual pitches against another violin’s drone, certain intervals create an audible consonance, primarily at the fourth or fifth, with lesser consonances at the third or the sixth (Example 3-1).⁸¹

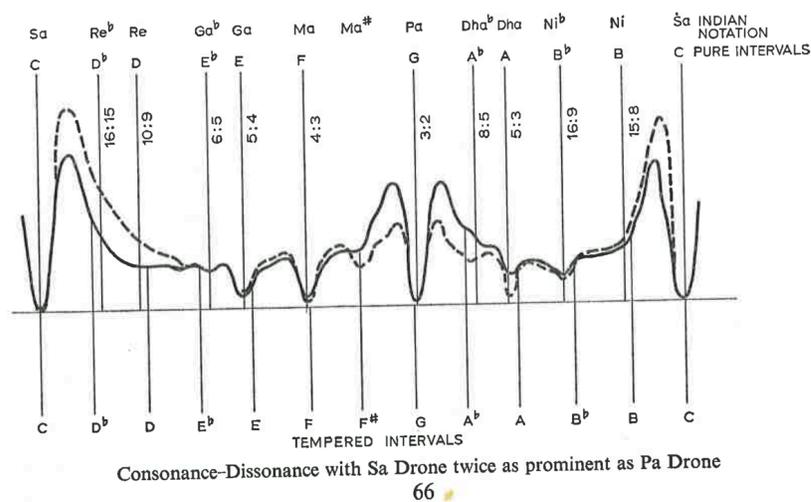
⁸⁰ Jairazbhoy, *The Rāgs of Northern Indian Music*, 34.

⁸¹ *Ibid.*, 66.



3-1 Chart from Helmholtz study using one drone⁸²

The horizontal axis represents a continual increase in pitch, and the vertical axis represents the relative dissonance against the drone (in the study, the pitch C was used.) Areas of particular dissonance occur around the second and the seventh scale degrees. Jairazbhoy takes this study further, and demonstrates the consonances and dissonances that occur when a second drone is added (Example 3-2).



3-2 Chart from Helmholtz study using two drones⁸³

⁸² Jairazbhoy, *The Rāgs of Northern Indian Music: Their Structure and Evolution*, 66.

⁸³ *Ibid*, 66.

When a second drone is present, the semi-consonances of the third and the sixth are more consonant, and there are also increased consonances on the part of the second and the seventh scale degrees. The augmented fourth, or the tritone, remains relatively dissonant. A study of this relationship with a *tanpura* playing the drone was not included, but the relationship of the individual voice to the overtones would be slightly different.⁸⁴ Thus the addition of a second drone destabilizes commonly accepted Western ideas of consonances and dissonances. When Western instruments play against a *tanpura* drone, they are subjected to the same perceived intonation tendencies from the *tanpura* as Indian instruments.

In his book, *The Rāgs of North Indian Music: Their Structure and Evolution*, Nadir Jairazbhoy demonstrated how the twenty-two *sruti* system is technically at odds with the twelve-semitone system:

In his later writings, Bhatkhande contradicts this earlier opinion when he says, “To distinguish between two *rags* on the basis of the difference of only one *sruti* would not be acceptable to any present-day vocalist or instrumentalist.” If this statement is applied to the above scheme representing the semitones in terms of *srutis* it would mean that musicians could not distinguish between *rags* having a minor third (Gab) and a major third (Ga natural) or a minor seventh (Nib) and a major seventh (Ni natural), for the difference between these is only one *sruti*. Obviously this is not so. Bhatkhande goes on to say that there is no absolute measure of *sruti* available to him and that he recognises that the position (intonation) of a note in any one *rag* fluctuates with the changing context in which it occurs.⁸⁵

The harmonium, introduced by the British to much dismay among practicing musicians of the time period for its equal division of the octave, may have had an

⁸⁴ Ibid, 67.

⁸⁵ Ibid, 34.

effect on the practice of the time, and led ultimately to the use of the 12-semitone system in common practice today.⁸⁶

Donald Lentz in his book *Tones and Intervals of Hindu Classical Music*, demonstrates how the Hindustani scale is derived based on just intonation—in the same way our Western scale is observed in practice for orchestras and chamber music. Because of the nature of Indian music in its relation to the ground pitches *sa* and *pa* that are heard constantly in the drone, modulations are not possible. When staying in one tonic area, as is common practice in Indian classical music, Western instruments can represent the practice relatively well, as they are *also* designed to adjust to just intonation:

A comparison of the ratios with Western just intonation ratios can be made by referring to column III. In the comparison the Southern names of column XII are being used. Basically the Hindu intervals are derived from just ratios. Corresponding ratios between the Hindu system (column II) and the Western just intonation (column III) are apparent when they both use the same starting pitch.⁸⁷

Note how in the following chart, tone number 3 (or D flat in the Western system) has the same ratio from the Indian scale to just intonation, but differs from the Western scale by 12 cents.

⁸⁶ Holroyde, *Music in India*, 126

⁸⁷ Lentz, *Tones and Intervals of Hindu Classical Music*, 12.

3 / Comparative Chart of Tones within the Octave in Hindu and Western Music Systems

I Tone num- ber above funda- mental (1)	II Ratio of Indian interval	III Note and ratio of corres- ponding interval in just intona- tion	IV Number of cents above funda- mental (Indian)	V Interval size and number of cents in just in- tonation	VI Note and number of cents in tempered intona- tion	VII Type of sruti interval from preceding tone	VIII Appear- ance from funda- mental in cycle of fifths	IX Appear- ance from funda- mental in cycle of fourths	X Comple- mentary pairs.	XI West- ern name	XII Some Southern names	XIII Some Northern names	XIV Abbre- via- tions
1	1/1	C 1/1			C		1	1		C	Shadaja	Shadaja	
2	256/243		90	Chromatic semitone		Purana		6	22 cents		Gauli Rishabha or Ekasruti Rishabha	Komal Rishabha	
3	16/15	D ^b 16/15	112	Diatonic semitone 112	D ^b 100	Pramana	8			D ^b	Suddha Rishabha or Dvisruti Rishabha	Madhya Rishabha	
4	10/9		182	Minor 2nd		Nyuna		11	<70)		Trisruti Rishabha	Suddha Rishabha	
5	9/8	D 9/8	204	Major 2nd 204	D 200	Pramana	3		22 cents	D	Chatussruti Rishabha	Tivra Rishabha	
6	32/27		294	Pythagorean 3rd		Purana		4	<70)		Suddha Gandhara or Bhairavi Gandhara	Ati-komal Gandhara	
7	6/5	E ^b 6/5	316	Minor 3rd 316	E ^b 300	Pramana	10		22 cents	E ^b	Shatsruti Rishabha or Sadharana Gandhara	Komal Gandhara	
8	5/4	E 5/4	386	Major 3rd 386	E 400	Nyuna		9	<70)	E	Antara Gandhara	Suddha Gandhara	
9	81/64		408	Ditone		Pramana	5				Chyuta Madhyam Ga or Tivra Antara Ga	Tivra Gandhara	
10	4/3	F 4/3	498	Fourth 498	F 500	Purana		2	<90)	F	Suddha Madhyama	Suddha Madhyama	
11	27/20		520	Sharp 4th		Pramana	12				Begada Madhyama or Tivra Suddha Ma	Ekasruti Madhyama	
12	45/32	F [#] 11/8*	590	Aug. 4th 590+	F [#] 600	Nyuna		7	22 cents	F [#]	Prati Madhyama	Tivra Madhyama	
13	64/45		612	Dim. 5th 610		Pramana	7				Chyuta Fanchama	Tivratara Madhyama	
14	3/2	G 3/2	702	5th 702	G 700	Purana	2		680 } 22 cents 702 } <90)	G	Panchama	Panchama	
15	128/81		792	Aug. 5th		Purana		5	22 cents		Ekasruti Dhaivata	Ati-komal Dhaivata	
16	8/5	A ^b 8/5	814	Minor 6th 814	A ^b 800	Pramana	9		<70)	A ^b	Suddha Dhaivata or Dvisruti Dhaivata	Komal Dhaivata	
17	5/3	A 5/3	884	Major 6th 884	A 900	Nyuna		10	22 cents	A	Trisruti Dhaivata	Suddha Dhaivata	
18	27/16		906	Sharp 6th 906		Pramana	4				Chatussruti Dhaivata	Tivra Dhaivata	
19	16/9		996			Purana		3	<90)		Suddha Nishada or Komal Kaisiki Ni	Ati-komal Nishad	
20	9/5	B ^b 9/5	1018	Minor 7th 1018	B ^b 1000	Pramana	11		22 cents	B ^b	Shatsruti Dhaivata or Kaisiki Nishada	Komal Nishad	
21	15/8	B 15/8	1088	Major 7th 1088	B 1100	Nyuna		8	<70)	B	Kakali Nishada	Suddha Nishad	
22	243/128		1110	Dim. 8ve 1130		Pramana	6		22 cents		Chyuta Shadia Nishada	Tivra Nishad	

3.3. Comparative Chart from Donald Lentz's *Tones and Intervals of Hindu Classical Music*.⁸⁸

⁸⁸ Ibid., 12.

Chapter 4: CAPABILITIES OF THE MODERN FLUTE

Section 1: History of Extended Techniques

Most of the examples of extended techniques required of the modern flutist can be found in compositions written after 1930. It is not surprising that a musician through the process of learning to play a particular instrument might occasionally discover various curiosities that would fall within the scope of extended techniques, but it is surprising that such a long history of discovery existed with no practical application existing in Western music.

Johann Joachim Quantz, a still-referenced flutist and instructor for Frederick the Great of Prussia, jokingly gave the fingerings of seven very high notes, which even for the modern flute are considered to be extreme in range.⁸⁹ In 1636, probably in an attempt to create the Greek tetrachord, a scholar named Mersenne suggested boring three rows of differently spaced holes in the body of the flute, and using a system of slides to select one of the three toneholes. Over a century later, Charles Delusse suggested the use of a quarter-tone system.⁹⁰ Charles Nicholson, a famous flutist during the nineteenth century, was known for using harmonics and glides in his performances.⁹¹ Attempts to produce double notes on the flute, or play polyphonically on the flute, also have a long history. Georg Bayr, a pedagogue during the late eighteenth/ early nineteenth century, identified the fingerings for these double notes in his 1818 book, *Méthode pur la Flûte*. While extended techniques were occasionally

⁸⁹ Raymond Meylan, *The Flute*, trans. Alfred Clayton (London: B.T. Batsford, 1988), 127.

⁹⁰ *Ibid*, 128.

⁹¹ Nancy Toff, *The Development of the Modern Flute* (New York: Taplinger Publishing Company, 1979), 139.

being explored throughout the eighteenth and nineteenth centuries, still other professionals during this time period denied the existence of multiphonic fingerings on the flute. In Berbeguier's 1818 *Nouvelle Méthode pur la Flûte*, he states "It is physically impossible to produce TWO NOTES at once on a wind instrument."⁹²

Although the existence of extended techniques such as multiphonics, the use of quarter tones and upper register scales had been acknowledged since the mid-eighteenth century, their lack of popularity can be attributed to a lack of functional use within the scope of Western music. For that reason, the possibility of producing these effects remained in essence a mere curiosity.⁹³ Nancy Toff, in her book *The Development of the Modern Flute*, states that "Even multiphonics were reported well before the age of the avant-garde, albeit as a physical feat rather than a musical technique."⁹⁴ These 'oddities' of the flute were not fully explored until the flute itself had undergone a considerable transformation. J. J. Quantz documented these extended fingerings in a time period during which the flute had one key. By the time that Bayr published his book in 1818, the construction for the flute had progressed to incorporate a mechanism of thirteen keys. However, further exploration of the technical possibilities of the flute through musical composition would not be fully realized until the twentieth century.

In the early twentieth century, a group of American composers, following the example provided by Charles Ives, began to experiment with stylistic and aesthetic ideas gleaned from their exposure to musics from China, Japan, Persia, and

⁹² Meylan, *The Flute*, 129.

⁹³ Ibid, 130.

⁹⁴ Toff, *The Development of the Modern Flute*, 140.

Indonesia.⁹⁵ Largely due to the influence of these composers and their European contemporaries, the full extent of the sonorities possible on the Western flute began to be experimented with. Edgard Varèse's *Density 21.5* and Luciano Berio's *3 Sequenza* for solo flute are two of the seminal works of this time period, which definitively disbanded the idea of the Western flute as an instrument only intended for delicate, birdlike sounds and allusions to the *Pan* myth.⁹⁶

Two manuals on contemporary techniques have been a vital contribution to composers and performers alike in the twentieth century. The first is Bruno Bartolozzi's *New Sounds for Woodwind*, a manual aimed at discovering the true limitations of wind instruments. Though Bartolozzi himself only played the bassoon, he confirmed the cross-applicability to other woodwind instruments through collaborations with woodwind players in the Maggio Musicale Orchestra of Florence. In the introduction to his work, Bartolozzi says that

Many players (consciously or unconsciously) have been aware that changes in timbre are necessary in order to achieve more evident changes in volume. For instance, the bassoon has a remarkably limited range of volume, but a greater *apparent* range can be achieved by modifications in tone quality. Nevertheless such modifications in timbre have never been regarded as desirable objectives in themselves and, in general, makers and performers have always aimed at as great a degree of timbric unity as is possible throughout the compass of instruments.⁹⁷

This 1967 remark on the performance practice typical to Western music is a strong indication of the sentiment of the time that the old avenues of traditional composition had not been fully explored. This work was later continued in *The Other Flute*, a

⁹⁵ John Corbett, "Experimental Oriental: New Music and Other Others," in *Western Music and its Others: Difference, Representation and Appropriation in Music*. Georgina Born and David Hesmondhalgh, ed. (Berkeley, University of California Press, 2000)

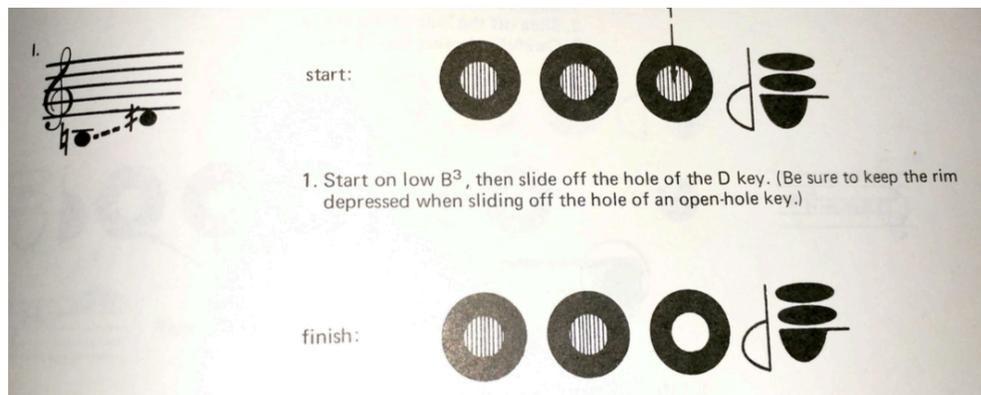
⁹⁶ Pierre-Yves Artaud and Catherine Dale, "Aspects of the Flute in the Twentieth Century," *Contemporary Music Review* 8 no. 2, 1994: 149.

⁹⁷ Bruno Bartolozzi *New Sounds for Woodwind*, trans. Reginald Smith Brindle (London: Oxford University Press, 2013), 3-4

manual written specifically for flute by Robert Dick. This manual expands on specific extended techniques for the modern flute, some of which include multiple sonorities based on natural harmonics, those based on fingerings of pitches in the chromatic scale, and those based on microtonal segments, singing and playing simultaneously, and circular breathing.

Section 2: Glissandi

Pitch bends on the flute can be performed in several different ways. Simply by changing the orientation of the lips to the embouchure hole, the flutist can modify the pitch up to a minor second. This is accomplished by lipping the note up or down, changing the angle of the head up or down, or rolling the flute in or out. Pitch bends greater than a semitone involve manipulating the keys through slides or careful, coordinated movements between two or more keys (Example 4-1).



4-1 Keyed Glissando⁹⁸

Full explanations of performing glissandi throughout the range of the flute are found in Robert Dick's *The Other Flute*, Carin Levine's *The Techniques of Flute Playing*, and Pierre-Yves Artaud's *Present-Day Flutes*. Likewise, microtones are

⁹⁸ Dick, Robert, *The Other Flute*, 73.

possible on the Western flute through embouchure manipulation and alternate fingerings.

Section 3: Technical Developments in the Twentieth Century

Subsection 1: The Quarter-Tone Flute

Eva Kingma, a Dutch flutemaker specializing in low flutes, first developed the quarter-tone flute in 1987. The first quarter-tone system flutes were actually bass flutes, followed by alto flutes. In order to achieve a quarter-tone scale on the alto and bass flutes, Kingma added holes to the keys. Before the Kingma C-flute was made with quarter-tones, Michael Allen and Alexander Murray each made a quarter-tone flute.⁹⁹ In constructing the quarter-tone C flute, Kingma encountered problems that she did not have in constructing quarter-tone alto and bass flutes: the keys were so close together that it was difficult to find room for more keys. To solve this mechanical problem, Eva Kingma consulted with the flutemaker Bickford Brannen to create a key-on-key system (see Example 4-2). This system nests the quarter-tone notes in the pre-existing tone-holes on the modern flute.

⁹⁹ Deborah Fether, "A Discussion of Contemporary Flute Design and the Issues Surrounding these Developments" (DMA diss., City University of London, 2005), 26.



4.2 The Kingma System C Flute

The addition of keys on this model of flute does not sacrifice flexibility for a new technique: the key-on-key system maintains the open tone holes already in existence on the C flute, and employs a system of added levers to control the new pitches. Thus, all the glides and microtones possible on the standard C-flute are still possible on the Kingma-system flute.

Subsection 2: The Glissando Headjoint

Robert Dick has been an ongoing advocate of contemporary music. As an active composer and flutist, he has published several of his compositions, and in 2004, helped create the *glissando* headjoint. This headjoint was created as a joint effort between Eva Kingma, Kaspar Baechi, and Bickford Brannen.¹⁰⁰ The *glissando* headjoint is a telescoping headjoint that enables the flutist to execute completely smooth glissandi (see Example 4-3). The headjoint's starting position is the same as

¹⁰⁰ "The Glissando Headjoint," Robert Dick. Accessed 16 January 2017, <http://robertdick.net/the-glissando-headjoint/>

the normal flute position, with the capability of extending downwards up to a minor third below the starting pitch.



4-3 Glissando headjoint. The standard headjoint fits into a carrier tube, which enables the flutist to perform glissandi. Two 'wings' ensure secure positioning when using this headjoint.

The exact range of the glissando, from starting position to fully extended, is dependent on the fingering of the starting note.¹⁰¹ When beginning on a low B³, the flute can glissando down to an A³, or an interval of a minor second below the normal range of the flute. When the starting fingering is more open, however, the range enabled by the glissando headjoint expands to a major third; for example, C⁵ to A^{b 4}. Because of the increased length of the tubing, the space between each normally fingered interval is slightly larger. A scale played with the glissando headjoint at its full extension is wider than an octave. This range could be augmented by the use of fingered glissandi as well as lip glissandi.

Section 4: How Well can the modern flute play Indian music?

Both Indian classical music and Western classical music have a transverse flute that plays two octaves with the second octave an overtone of the first, and with at least a half an octave above playable with modified fingerings. Traditionally, the

¹⁰¹ Melissa Keeling, "Glissando Headjoint - Lesson (& Van Halen!)," last modified 2 March 2015, accessed 26 March 2017, <https://www.youtube.com/watch?v=Ed6oakJ2kok>

home note, *sa*, is situated in the middle of the flute with all the finger holes in the left hand depressed. From this position, three more keys may be depressed to reach the fifth of the scale, *pa*. The Western flute is in the key of C with intricate keywork to enable the flexibility of playing through all the keys. However, some keys may be better suited to playing *ragas* than others. Ideally, the musician would prefer to have the ability to maintain pitch flexibility above and below the tonic note. This means that the lower pitches, B through D, would not be ideal because they do not have much flexibility in performing pitch bends. Below D, all the keys are manipulated by the right-hand pinky. Thus the musician is forced to attempt these through a careful, simultaneous manipulation of the embouchure and the finger lifting or lowering the key. An example of this difficulty comes in *Mandala ki raga Sangeet*, which is pitched with the tonic note in C.

In Indian music, a *bansuri* player would have many *bansuri* of various lengths in order to cover a wider range. Throughout the course of a *raga*, they might choose to change instruments in order to change their range. The progression of this is generally from a lower-pitched instrument to a higher-pitched instrument. Shirish Korde makes use of this practice in *Lalit*, which begins on the alto flute but changes to the C flute in the middle of the first *gat*. The flutes exchanged are not separated by an octave, but by a perfect fourth. *Lalit* is set with a tonic at E, which nods to the popular E-bass *bansuri* typically played in Indian classical music—indeed the very same key area which Hariprasad Chaurasia plays on his recording of *Lalit*. On the alto flute, which is a fourth lower, E is a fingered A in the left hand. When the finger gamut shifts in the middle of the first *gat*, the tonic shifts to E. This becomes particularly problematic

shortly thereafter, in a passage that includes quickly shifting from a C3 to a D#3 several times rapidly in succession (Example 4-4).



4-4 *Lalit*, 248-251

In my performance of *Lalit*, I re-wrote this section so that the shift from alto flute to C flute occurred later in the *gat*. Following is the aforementioned section of *Lalit*, transposed to shift the transition from alto flute to C flute later in the first *gat* (Example 4.4).



4.5 *Lalit* mm. 248-251, transposed for alto flute.

In one of his books on South Indian music, P. Sambamoorthy notes that the clarinet had become a popular instrument used in dance concerts instead of the Indian flute. He suggests that its rise to popularity was largely because it has a wider range than the Indian flute. Sambamoorthy is careful to also note that “although the clarinet is graduated to the European tempered scale, yet when an Indian musician plays it, he intuitively produces the notes of just intonation by adjustments in blowing.”¹⁰² Similarly, the Western flute offers a wider range than the Indian flute, and is equally equipped to play in just intonation as the clarinet.

¹⁰² P. Sambamoorthy, *South Indian Music, Book IV*, 273-274.

In further investigation of the capabilities of the modern flute in terms of playing Indian classical music, I have posed questions to two individuals who are particularly involved in the performance of Indian classical music, both on *bansuri* and on the modern flute. These two individuals are Jeanne-Miramon Bonhoure and Henri Tournier. Jeanne-Miramon Bonhoure is a French flutist who can be heard playing in recordings on YouTube along with Rishab Prasanna. Rishab Prasanna is performing on the *bansuri*, and Jeanne performs alongside him on the Western flute. Henri Tournier is a French flutist who studied with Hariprasad Chaurasia, and has written many articles on Indian classical music performance, including *Hariprasad and the Art of Improvisation*.¹⁰³ I have asked both of them several questions regarding their experiences playing *ragas* on the Western flute, and their responses were communicated via email.

Jeanne Miramon-Bonhoure's experience playing Indian music on the Western flute changed as she adapted her playing style. At first, she only played Indian music on the *bansuri*. In a second phase, she tried to render Indian ornaments on the Western flute to sound like a *bansuri* by developing extended techniques. In her third phase, which she is in now, she approaches Indian music on the Western flute assuming the limits of having keys, and sees the Western flute as having huge potential to make Indian music sound different. One of the reasons why Jeanne eventually moved away from more extended techniques used to imitate Western music on the flute is that she felt that in the process of trying to imitate the timbres, the fluidity was lost.

¹⁰³ Henri Tournier, "Biography," accessed 26. March 2017, <http://www.henritournier.fr/biographie.html>

In general I really think it's better not try to "sound like" but to explore and use the full potential of our instrument to play a raga; it might sound different from what an indian ear would expect from a raga presentation, but if the rule of the raga development and the pitch of the notes are respected it works; furthermore the limit of bansuri in terms of octave range, equality of register are balanced on silver flute and indian flute players really enjoy that; in lighter music genres, i also use chromatisme (with my silver flute) and they love it (so difficult to do on bansuri!). The tong [tongue] technique, various phrasing and notes combination we learn in conservatoire are also useful to bring something a bit different in indian music.¹⁰⁴

While Jeanne felt that the Western flute had no such limits in terms of phrasing, sound, and pitch, she felt that the microtonal oscillations or *gamaks* were much easier on the *bansuri*. Specific to *L'Aube Enchantée*, she felt that the pitch bends added by the Valade and Aussel duo are frequently incorrectly played or over-exaggerated by performers that do not know *raga Todi*. Unless they could be correctly affected, Miramon-Bonhoure suggested that these *meends* be left out.

Henri Tournier is another initially Western-trained flutist who later began learning *bansuri*. Tournier has a background in jazz, and was drawn to the complexity of improvisations and incredible devotion exhibited by Indian classical musicians. Following his interests, he studied with Hariprasad Chaurasia.

Regarding the *bansuri*, Tournier commented that the *bansuri* itself is only 20-30 years into practice in Hindustani Classical music; the analogous instrument played in the Carnatic tradition, the *murali*, has a more continuous tradition. Tournier prefers to play Indian music on the *bansuri*. He explained that the nuances of playing *taans*, *gamaks*, and in general affecting *srutis* to differentiate *ragas* are simply much easier on the *bansuri* because of the lack of keys. If both instruments are at a performer's disposal, the natural choice is the one that can most easily produce the desired aesthetic. When we spoke on the phone, Tournier commented that he will soon be

¹⁰⁴ Jeanne Miramon-Bonhoure, Email conversation, 3/19/2017

playing with other Indian classical musicians who specifically asked for him to play on a C flute; this instrument is exotic to them, and can do so many things that the *bansuri* cannot. Tournier additionally commented that there have been other instruments brought into the Indian classical tradition, (e.g., the Iranian *santoor*, a struck zither) that are incapable of playing pitch bends. Tournier explained that the artists performing on these instruments got around these difficulties by playing with subtleties, e.g. Chromatic lines and careful attention to phrasing.

When asked whether the Western flute would be able to satisfactorily play ragas at all, Tournier explained that he felt that while the *bansuri* would be the optimal choice to perform Indian classical music, for anyone well versed in playing both *bansuri* and C flute, the C flute would be reasonably suited for playing certain ragas. Specifically, some ragas require more pitch bends and microtonal subtleties than others, and would be especially difficult to manage on the C flute.

Section 5: Modifying Timbre on the Flute

The timbral differences between the shakuhachi (a Japanese end-blown bamboo flute) and the Western flute were researched in a study conducted by Michèle Castellengo and Benoît Fabre.¹⁰⁵ First, they did a sonographic study of both the flute and the *shakuhachi* (a Japanese end-blown bamboo flute), recording each instrument during a performance of traditional music. For the Western flute, Haydn's "London Trio" and J.S. Bach's "Bourrée Anglaise" from the Suite in B minor were performed.

¹⁰⁵ Castellengo, Michèle and Benoît Fabre, *The Contemporary Transverse flute and the Shakuhachi: Convergences. An Acoustic Analysis of Performance Techniques*. Contemporary Music Review 8:2, 217-237.

In this example, the purity of the tone characteristic of the Western flute is evident (Example 4-6).

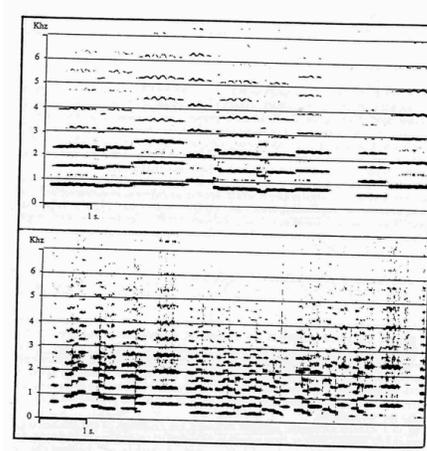


Figure 1 Transverse flute. Sonograph analysis of two extracts of classical music. Above: J. Haydn, 106
London Trio. Below: J. S. Bach, Bourrée from Suite in B minor.

Example 4-6

The strata displayed on the sonograph analysis are mostly harmonics, and the homogeneity of the tone of the flute from one note to the next is evident in the evenness of the graph. For the *shakuhachi*, a sonograph was taken of two extracts of traditional music (See Example 4.6).

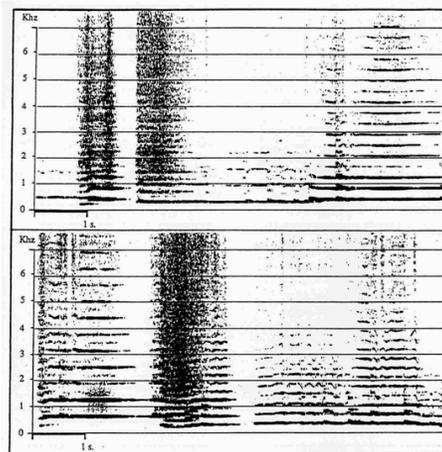


Figure 2 Shakuhachi. Sonograph analysis of two extracts of traditional music performed by 107
Iwamoto.

¹⁰⁶ Ibid., 218.

¹⁰⁷ Ibid., 219.

Example 4-7

The wide diversity of sound spectra is apparent in this graph, as some sections are thick with multiphonics and unpitched air, and others more closely resemble the spectrum of the Western flute. When these two sonograph excerpts are compared, the sonorities appear to be quite different. What must be taken into consideration, however, is the desired aesthetic typical of each instrument. Western music favors pure tones rich that are rich in harmonics, whereas the *shakuhachi*'s sound is characterized by a wide diversity of sound spectra and extraneous noise. As described by Castellengo and Benoît in their article, "In both cases the question is clearly one of flute technique. For the reader may conclude rather too hastily that the differences observed in Figure 1 (Ex. 1) and Figure 2 (Ex. 2) are due essentially to the differences in construction between a transverse flute and a *shakuhachi*."¹⁰⁸ A second sonograph was taken of the same Western flute performing modern compositions. "Unity Capsule" by Brian Ferneyhough and "Froissements d'ailes" by M. Lévinas were performed (Example 4-8).

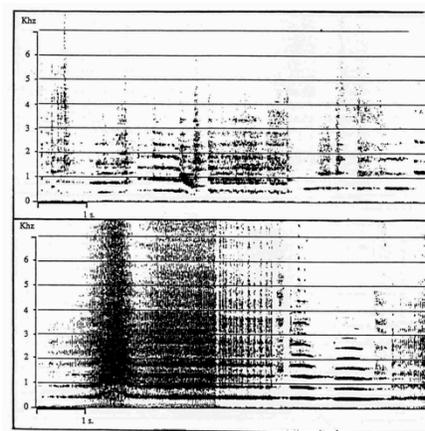


Figure 3 Transverse flute. Sonograph analysis of two extracts of contemporary music performed by Pierre-Yves Artaud. Above: B. Ferneyhough, *Unity Capsule*. Below: M. Lévinas, *Froissements d'ailes*. 109

Example 4-8

¹⁰⁸ Castellengo and Benoît, "The Contemporary Transverse Flute and the Shakuhachi, 219

¹⁰⁹ *Ibid*, 220.

In this second study, the sonograph taken of the Western flute closely resembled that of the *shakuhachi*. The reason given by Castellengo and Benoît for this change was not simply that the music had changed, but more importantly, that the way in which the flute had been played changed dramatically. The link that this study uncovered between the Western flute and the *shakuhachi* is in the method of tone production, which is achieved by aiming a jet of air across the tone hole. This method of tone production is the same for several types of flutes throughout the world, including the Middle Eastern *ney* and the *bansuri*.¹¹⁰ While the standard performance technique of the *bansuri* does not call for the explosive articulations often found in traditional *shakuhachi* playing, harsher articulations are particularly common, especially when establishing rhythmic vitality in the *jor* section of the *alap*.¹¹¹ This series of studies shows that on any flute for which the tone hole is blown directly across, the timbre is largely dependent on the method of sound production. In other words, the sound produced was not so dependent on the type of flute being played (i.e., bamboo, wood, or metal) as on *how* it is played.

¹¹⁰ Ibid, 221.

¹¹¹ Bagchee, *Nad: Understanding Raga Music*, 273.

Chapter 5: ELEMENTS OF INDIAN CLASSICAL MUSIC IN THESE COMPOSITIONS

Included in this chapter are salient features of Indian classical music which are present in many of the pieces mentioned on this dissertation]. The use of the *tanpura* is required in many of John Mayer's works, including *Sri Krishna*, *Mandala ki raga Sangeet*, and *Trimurti*; Shirish Korde's *Lalit* and *Anusvara*, and implied through the accompanimental writing in Ravi Shankar's *L'Aube Enchantée* and Asha Srinivasan's *Dviraag*. Several of these pieces, including *Lalit*, *L'Aube Enchantée*, and Deepak Ram's *Surya*, feature a *pakad* or a catch phrase. As discussed in this chapter, a rhetorical device known as a *tihai* is present also in *L'Aube Enchantée*, *Lalit*, and *Surya*. All of these pieces call for non-Western scale forms, which can be difficult to master initially. To this end, this chapter is designed towards closing these particular knowledge gaps, and leading toward a more authentic playing experience of these Indian-Western fusion works for flute.

Section 1: The tanpura, thaats, and raga-space

In addition to lessons with Deepak Ram, I collaborated with the *tabla* player Debu Nayak on Shirish Korde's *Lalit*. In my lessons with Deepak Ram and in my sessions with Debu Nayak, we had a *tanpura* drone going using a phone app for the entirety of the practice. The *tanpura* is generally used for the entirety of a practice session: not just during a practice of an individual *raga* but during the technical exercises as well.

This helps train the ear to play inside the *raga* and match the intonation tendencies of the *tanpura*. Lyon Leifer refers to this practice as an exploration of ‘raga space.’¹¹²

John Mayer uses the *tanpura* in his compositions specifically in improvisatory sections. In *Mandala ki raga Sangeet*, the *tanpura* is the second instrument to enter, following flute’s glissando into C.

The *thaat* featured in *Mandala ki raga Sangeet* mvts. 1 and 5 is highly symmetrical. There are two chromatic clusters in the scale form: B-C-D \flat and F \sharp -G-A \flat . This configuration also creates two minor-third intervals within the octave. While this scale does not fall easily under the fingers, as with most scales it does come with practice. This scale form is also frequently set in cadenza segments along with the *tanpura*. In my preparation for the dissertation recital I practiced this *thaat* with the following exercise (Example 5-1):

with tanpura set on C and G, Sa/Pa

5-1 Scale form of *Mandala Ki Raga Sangeet*, played in the form of Taffanel & Gaubert exercise number 3.

I adapted the same exercise for *Dviraag*, *Lalit*, and *L’Aube Enchantée*. The experience of playing this *thaat* with a *tanpura* drone in the background is inherently different than playing it alone or even with a single drone note. As observed in

¹¹² Leifer, *How to Play the bansuri*, 30.

Chapter 3 with Jairazbhoy's expansion of the Helmholtz drone study, the intonation tendencies are slightly different for a melody instrument playing against two drones than they are against one. Playing scalar exercises over the *tanpura* helps the flutist adapt to the 'raga space.' Likewise, as most works that draw upon *ragas* as an influence will use a scale form with intervallic relationships that may feel foreign to the musician, each *thaat* and tonal center be identified and learned anew.

As Jairazbhoy observed in the Helmholtz study, the presence of the an additional drone exerts a somewhat destabilizing influence over the first. The minor second, tritone, minor sixth, and major seventh become much less dissonant. This effectively broadens the acceptable placement of these pitches. As also observed by Jairazbhoy, many Indian classical musicians may choose to place a note differently from one performance to another, but the importance then lies in the consistency within the scope of one *raga*.

John Mayer, as previously discussed, did not necessarily feel obligated to adhere to all the common practices of Indian classical music. One way in particular that he chose to deviate from common practice was through his *occasional* use of the *tanpura*. That is, the *tanpura* player would start and stop multiple times during a performance to dramatic effect, rather than follow the standard convention of an ever-sounding drone in the background.

Section 2: References to the *tanpura* in other works

In the slow section of *Dviraag*, Asha Srinivasan uses the cello to substitute for the root and fifth of the *tanpura*. In this section the flute elaborates with an unhurried melody that carefully avoids references to larger beat patterns (Example 5.2).



5.2 *Dviraag*, mm. 63-65

Ravi Shankar also employs other instruments to emulate the *tanpura* sound in *L'Aube Enchantée*. Kesner notes how Shankar imitates a typical drone pattern of *Pa-Sa-Sa-Sa*. In *L'Aube Enchantée*, this appears as *Dha-Sa-Sa-Sa* (B \flat -D-D-D) and also as *Sa-Ga-Ga-Ga* (D-F-F-F).¹¹³ While *Dha*, the minor sixth, is an uncommon sonant note for the *tanpura*, the repetitive rhythmic pattern emphasizes the reference to the *tanpura*.



5.3 *L'Aube Enchantée*, harp part. m. 8

Both of these motives feature skip of a minor third, two repeated pitches on the upper octave, and a leap down the octave. In the latter example, Shankar utilizes Western instruments' ease of transposition while still emulating patterns of Indian classical music.

Section 3: Drawing on Actual Raga Performances

While most of these pieces showcase elements of Indian classical music, none but Shirish Korde's *Lalit* go so far as to enable a flutist to experience the performance of a *raga*. *Lalit* was commissioned by new music virtuoso Patricia Spencer and *tabla*

¹¹³ Kesner, *Krishna Meets Pan*, 47-48.

maestro Samir Chatterjee, and was premiered at the National Flute Convention in New York in August 2009. This piece is based on the *raga Lalit*. The key signature that Shirish Korde has chosen for this piece seems unusual (at least in Western context) in that it calls for sharps and flats simultaneously (Example 5-4).



5-4 Tonal Center and Key Signature of Shirish Korde's *Lalit*

With concert E as a tonal center, the key signature calls for a B flat, G sharp and D sharp. *Lalit* is a *raga* that should be played at sunrise, in the first hour of dawn. In *Filigree in Sound: Form and Content in Indian Music*, Gopal Sharman writes that

In Indian music certain notes are linked with the time of day and any *raga* scales containing re and dha, for instance, are called *sandhiprakash ragas* (*sandhi*, merger; *prakash*, light), meaning *ragas* played or sung just before sunrise and at twilight.¹¹⁴

Shirish Korde follows suit in his composition of *Lalit*. Scale degree two and six are flat, and the flattened fifth scale degree avoids a perfect fifth. The flattened second scale degree is an indication that this is a *sandhiprakash raga*, and the presence of *komal dha*, the flat sixth, is an indicator that this is a pre-sunrise *raga*.¹¹⁵ The *raga Lalit* is characterized by the lack of a perfect fifth. E, the primary note, is instead paired with A as a main note, as heard continuously in the *tanpura* drone. In keeping with Hindustani classical music, all three sections of this piece are played without pause between movements. This *raga* opens with an *alap* played on the alto flute. In the next section, the first *gat*, the *tabla* enters playing *teen-tal*, and the flute leisurely begins the first 'improvisatory' section. This section is characterized by a recurring theme in the flute known as the *pakad*. The *pakad* is a 'catch phrase' of a

¹¹⁴ Sharman, *Filigree in Sound*, 56-57.

¹¹⁵ Bandopadhyaya, *The Origin of Raga*, 61.

composition, which always leads to *sam* (beat 1 of the 16-beat cycle). The *pakad* need not happen every 16 beats, but it must always end on *sam*. As this movement progresses, the expository sections become farther apart. The third section, the second *gat* (or *jhala*) features a truncated *pakad*, and frenzied increases in tempo right until the climax.

This composition is based on the traditional structures of *raga Lalit*, including the patterns of its *aroha* and *avaroha* (ascent and descent), sharp and flat notes, and the tuning of the *tanpura*, and also references *taans* or improvisations by Pandit Hariprasad Chaurasia. Chaurasia recorded *raga Lalit* many times, each time varying the *tala* cycle and the improvisations along with them. Though Shirish Korde's composition *Lalit* may also closely resemble the *taans* of other performances by Chaurasia, the one that I have transcribed sections of for this project is of his 1988 performance in collaboration with the *tabla* player Anindo Chatterjee. Many Indian classical musicians may use various improvisations multiple times throughout performances, but do not feel beholden to a specific formula or order.

My notational choices for my transcription were largely influenced by Widdess' article on an *alap* transcription¹¹⁶ and Bethany Padgett's transcription of Jean-Pierre Rampal and Ravi Shankar's performance of *Morning Love* by Ravi Shankar. The selections I transcribed were from the *jor*, in which there are definitive rhythmic relationships, but not yet imposed over a *tala* cycle. For that reason, there were discernible divisions, but they periodically broke down rhythmically. When the beat patterns lost definition, I eliminated the stems to avoid imposing a Western supposition of a beat hierarchy. Furthermore I eliminated suggestions of measures and

¹¹⁶ Widdess, "Dynamics of Melodic Discourse", 187-224.

time signatures entirely from the score. Instead, the general passage of time is marked with a time marking, indicating the section of the recording that I transcribed.

Comparing Hariprasad Chaurasia's *Lalit* realization with Shirish Korde's version of *Lalit* provides us a good example of the infinite variations possible within one *raga* performance. Both of these versions of *Lalit* have the same basic scale structure, tonic note, and sonant note (Example 5-5).



5-5 Hariprasad Chaurasia: *Lalit*, ~27:12 to 27:16¹¹⁷

While the above transcription was taken from the *chor*, these patterns were used in the second *gat* in Shirish Korde's rendition of *Lalit* (Example 5-6).



5.6 Shirish Korde, *Lalit*, mm. 393-395

While Shirish Korde favors *teen-tal* for the first and second *gat*, Chaurasia plays the first *gat* in *rupak-tal*, a seven-beat cycle, and moves to *teen-tal* for the second *gat*.

While many of the *taans* or improvisations hold much similarity to one another, they do not always terminate in exactly the same way. Similarly, despite the almost infinite variations in rhythm, melody, and form, a *raga* is distinguishable from hundreds of others not only because of its scale and pitch content, but because of the way the particular melodic content is emphasized.

¹¹⁷ Hariprasad Chaurasia and Anindo Chatterjee, *Lalit*, Nimbus Records 1988.

Section 4: Working Around the Fixed-Music Divide: Flexibility in Performance

Shirish Korde's *Lalit* in full performance is 25 minutes in length. Shirish Korde additionally marks specific sections in the 1st and 2nd *gat* as 'optional,' and these are printed in red in the original score. This innovation allows performers to customize and truncate their version of *Lalit*, and is simultaneously true to the improvisational, open-ended spirit of *raga* performance. When omitting sections, the performer must be careful to calculate the *tala* cycles accordingly, and to eliminate sections in groups of 4 measures at once. Adhering to this strategy of eliminating a full 16-beat cycle of *teen-tal* in cuts ensures that the *pakad* will continue to line up with the *sam* throughout the performance. In his composition of *Surya*, Deepak Ram allows for flexibility in performance by stating that the flutist is welcome to improvise on the already established melody, so long as the *thaat* or scale remains intact.

Section 5: Articulations

While the *bansuri* is normally played in smooth, connected lines, occasionally artists borrow from the techniques used by other instruments to create more variety and rhythmic drive in their playing:

Besides this, different blowing techniques are used to obtain a wider musical range on the flute. In these techniques, it is the use of the tongue against the back of the teeth, normally referred to as tonguing, which is of importance. In this sense, this is similar to the fingering techniques on string instruments, used to produce a variety of notes, including the manner of 'attack' on a note as well as the 'cutting' of the note to produce staccato sounds. This use of the tongue to cut the note and play staccato is referred to as *taktari* by the flautists, in Hindustani music.¹¹⁸

In order to emphasize the rhythmic pulse of the *jor* and the *jhala*, a *sitar* performer will strum repetitively on the high pitched drone strings called *chikari*

¹¹⁸ Bagchee, *Nad: Understanding Raga Music*, 274.

strings. Lacking the capability of articulating in such a manner on the *bansuri*, Hariprasad Chaurasia instead uses a combination of tonguing and blowing techniques to produce ‘Sa’ in a staccato manner while continuing to play the melodic line.¹¹⁹

Similarly, in Hariprasad Chaurasia’s recording of *Lalit*, the *jod* and *jhala* can be recognized by the use of this technique. Excerpts shown below depict the rhythmic patterns found in the *jor* and *jhala* (Example 5-7).

5.7 Transcribed from Hariprasad Chaurasia’s recording, 30:38, from the *jor* section of the *raga Lalit*

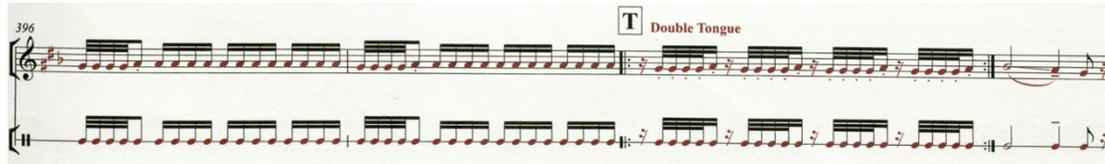
This first excerpt features a rhythmic drive, but it does hold onto an established tempo. Several minutes later, Chaurasia arrives at the *jhala* (Example 5-8).

5-8 Transcribed from Hariprasad Chaurasia’s recording, 35:20-35:37

Note especially the instances of the repetitive tonguing occurring at 35:20 and 35:30. This is the final flourish before the end of the *alap*, following which the *tabla* enters and the second *gat* begins.

¹¹⁹ Ibid, 275.

In Shirish Korde's *Lalit*, this repetitive tonguing is also present, although it takes place in the second *gat*, not the *zor* or *jhala*. In this instance, rhythmic activity has long been present since the entrance of the *tabla* in the first *gat* (Example 5-9).



5-9 repetitive tonguing in *Lalit*, mm. 396-398

Section 6: Use of Rhythm

John Mayer avoids using common *tala* cycles in his compositions, but rather references *tala* structure through cyclical treatment of accompaniment parts. Several cycles called for in the concerto *Mandala ki Raga Sangeet* have a cyclically recurring line. The following is an example of a 10-beat cycle that does not follow the beat pattern of the popular *jhaptal*. *Jhaptal* has a recurring beat pattern of 2+3+2+3. Mayer uses both of the variations in the final section of the first movement interchangeably. This section is marked in 10/16, and has divisional markings separating the final two beats from the rest of the measure. Mayer's use of highly complex rhythmic structures seems to have more in common with twentieth-century compositional techniques than Indian *tala* cycles.¹²⁰ Mayer may be using *tala* cycles in specific places throughout his music, but he does not necessarily delineate *tala* in the traditional method (Example 5-10).¹²¹

¹²⁰ Kesner, *Krishna Meets Pan*, FIND PAGE NUMBER

¹²¹ Robison, *The Music of John Mayer*, 176.



5-10 *Mandala ki Raga Sangeet mvt. 1*

Deepak Ram wrote the main *gat* in his flute and guitar duo, *Surya*, in *rupak-tal*, which is a seven-beat cycle. The beats throughout this cycle occur in three groups: a group of three followed by two groups of two. As noted in the example below, however, the first to groups of two are emphasized, followed by a group of three (Example 5-11).



5-11 *Surya*, mm. 126-129

This grouping is emphasized for several bars, but later on, the grouping emphasis is challenged by the melody in the flute, which seems to be grouped in groups of 3+2+2. Throughout the rest of the piece, the flute alternates between emphasizing *rupak-tal* as is traditionally played with mirroring the guitar part (Example 5-12).



5-12 *Surya*, mm. 205-207

Section 7: Sawab-Jawal

One feature of the second *gat* in *Lalit* is its use of a *sawab-jawal*. Popularized by Pandit Ravi Shankar in his performances, this gave new dimension to performances

in coordination with a *tabla* player. Throughout this section, the flute and *tabla* chase each other, each instrumentalist almost competitively attempting to disarm the other with increasingly difficult rhythmic combinations (Example 5-13).



5-13 *Sawab-Jawal* in Shirish Korde's *Lalit*, mm. 495-497.

At the conclusion of this section, the rhythms become truncated, and this chasing sequence begins to push the tempo (Example 5-14).



5-14 Truncation of *Sawab-Jawal* in *Lalit*, mm. 541-548

This is the final opportunity for the flutist to push the tempo into the climax of the piece. In each of the sixteenth-note sections above, the flutist may increase the tempo by playing at the tail end of the *tabla* player's sixteenth notes, almost cutting them off (Example 5-15).



5-15 End of *Sawab-Jawal* in *Lalit*, mm. 549-551

Though depicted at first with a gap between the first and third beats of the bar (mm. 541-548), and in measures 549-551 with even sixteenths between the flute and *tabla* part, in practice the perceptible divisions (especially between the 3/8 measure of 548

and 4/4 measure of 549) are not so exact. This end to the *sawab-jawal* more closely resembles a chase. Towards the end of 551, there has been a marked increase in tempo from where the *sawab-jawal* began, and the flute and *tabla* player fit closely together in interlocked, hocketing sixteenths.

Section 8: References to Rhythm Exercises

Asha Srinivasan included the following program notes along with her composition of *Dviraag*:

Dviraag is a fabricated word taken from the Sanskrit prefix “dvi” meaning “two” and the word “raag” loosely meaning “melodic mode.” The pitch material for this piece is entirely based on a combination of two complementary pentatonic modes. The primary rhythmic material, introduced towards the beginning by the cello, was derived from a Carnatic vocal exercise I fondly remember learning as a child, in India. Of all the beginner’s exercises I learned, this one always stood out as being surprisingly challenging and unusual in its subdivisions. This exercise has become the basis for an exploration of intricate rhythmic subdivisions grouped into salient short phrases that recur throughout the piece in various contexts.

Asha Srinivasan later provided more information regarding this challenging rhythmic exercise.

One of the first things you learn in Carnatic music is the *sarali varisai* and then the *janta varisai*. The exercise I’m referring to was something my teacher in India taught me as part of the *janta varisai* series. Later, I tried to find this exercise online but I cannot find it anywhere. So possibly this is something special that her teacher taught, etc. I always loved this exercise even as a kid. It was the last in the series, before we embarked on the next level which was learning actual songs. As such, it was the most challenging exercise in terms of the swarams and the rhythm, but I found that exhilarating and it’s been in my memory since. I actually found my old music books from when I studied with my teacher (ages 6-9) and she wrote it out in tamil for us. So I was able to relearn it and reacquaint myself with it for this composition.¹²²

The *sarali varisai* and *janta varisai* series are melodic-rhythmic exercises given to every beginning vocal student of Carnatak music. This series was developed by the composer Purandara Dasa in the sixteenth century, and trains the student to be able to

¹²² Email conversation with Asha Srinivasan, 3/20

sing sequences of *swaras* in tune and in time.¹²³ Each exercise is eight beats long, and continues up the *swaras* of a given *raga* in a sequence (Example 5-16).

Raga: Mayamalavagowlai (CDBEFGAbBC)
Tala: Adi



1. sa sa ri sa_ ri sa ri ga ri_ ga ri ga ga ma sa sa ri ri ga sa ri sa ga sa ri ga sa ri ga ma

2. ri ri ga ri_ ga ri ga ma ga_ ma ga ma ma pa | ri ri ga ga ma ri ga ri ma ri ga ma ri ga ma pa ||
3. ga ga ma ga_ ma ga ma pa ma_ pa ma pa pa da | ga ga ma ma pa ga ma ga pa ga ma pa ga ma pa da ||
etc...(4. ma ma pa..., 5. pa pa da...)

Then down the scale starting with:

1. sa sa ni sa_ ni sa ni da ni_ da ni da da pa | sa sa ni ni da sa ni sa da sa ni da sa ni da pa ||
etc...(2. ni ni da..., 3. da da pa..., 4. pa pa ma..., 5. ma ma ga...)

5-16 *Janta Varisai* exercise on *raga Mayamalavagowlai*, primary motivic material for *Dviraag*.

This exercise is evident in the rhythmic motive of *Dviraag*, but instead of *raga Mayamalavagowlai* is transposed into the two scale forms of *Dviraag* (Ex 5-17).

5-17 Excerpt of *Dviraag*, mm. 6-9.

Exactly as practiced in the *janta varisai* exercise in Example 5.15, after eight beats, the cello repeats the motive on the second scale degree. The flute's first display of this rhythmic motive in measure 18 features the second, complementary pentatonic mode.

Section 9: Use of "pakad" in These Compositions

A *pakad* is a catch-phrase in Indian classical music. In addition to the scale form, the *pakad* is how one *raga* is distinguished from another. There are several phrases

¹²³ Viswanathan and Allen, *Music in South India*, 51-52.

associated with any particular *raga*, and these are present in any realization of a *raga* from the very beginning of the performance—that is, the very beginning of the *alap*.¹²⁴ V. N. Bhatkhande catalogued the *pakads* to various *ragas* in his six-volume work, the *Kramik Pustak Malika*.¹²⁵ Some of these *pakads* contain valuable melodic information—be it the avoidance of *Pa*, the fifth, or a particular way of approaching *Sa*, the root, that distinguish them from other *ragas*.

In Ravi Shankar’s *L’Aube Enchantée*, the *pakad* appears at regular intervals until the second *gat* begins, at which point the stressed intervals change. Below is the example of how the *pakad* appears in the first *gat*, or the medium-tempo section (Example 5-18):



5-18 M. 56, *L’Aube Enchantée*.

In each instance of the *pakad*, the harp and the flute play the above melody, which highlights *Re*, the minor second, *Sa*, the tonic, and *Ni*, the seventh.

Shirish Korde’s *Lalit* provides an example of how the *pakad* can be played against the *tala* cycle. Beginning with the first *gat*, the *pakad* begins with several repetitions (Example 5-19):

¹²⁴ Lavezzoli, *Bhairavi*, 24.

¹²⁵ M. Gautam, “*The Raga: Evolution and some Related Concepts*” in *The Musical Heritage of India*. (New Delhi: Munshiram Manoharlal, 2001), 81.

12
A. Flute
Tabla
Theka

5-19 mm. 12-14, *Lalit*

The above example shows the first entrance of the *tabla* in measure 13. When the flute melody lands on the D in measure 14, the *tabla* begins playing general patterns to mark the beat. Following are two more repetitions of the *pakad*, which is played for the full length of a 16-beat cycle of *teental* (Example 5-20).

F
Theka
with flute

5-20 mm. 14-18, *Lalit*.

The *pakad* repeats once more before the *tabla* begins playing in *teental*. After this 16-beat cycle is established, the flute begins to play more extensive improvisation-like sections in between repetitions of the *pakad*. While the *pakad* is frequently played in an identical manner each time, occasionally there are elaborations:

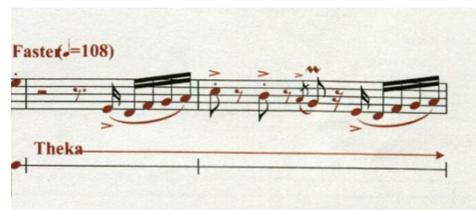
Tune with elaboration

5.20 *Lalit*, mm. 45-48

With each iteration of the *pakad*, the prior lead-in in the flute part varies. The *taans* that lead into the *pakad* vary each time, and highlight a humorous device that the flute and *tabla* embody at this point: they give the impression that the soloist ‘forgot’ where they were in the 16-beat cycle and must hurry up and play a lead-in to arrive

on *sam* along with the *tabla* player. In some instances, the improvisatory sections are quite extensive, and last for multiple cycles of *teen-tal*.

The second *gat* of *Lalit*, similar to Shankar's *L'Aube Enchantée*, features a different *pakad* than the first *gat*. This melody is also descending, but given the faster pace of the *gat*, is more concise in nature. Similarly, the *tabla* plays a double *teen-tal* in this movement. Following the introduction of the *pakad* for this *gat*, the reoccurrences of the *pakad* frequently initiates an increase in tempo (Examples 5-22 and 5-23):



5.22 *Lalit*, 410-411.



5.23 *Lalit*, 485-487.

Section 10: Use of “tihai” in These Compositions

Tihai is a common element of Indian classical music used both as a rhetorical device and to neatly divide sections. In the following selections from Shirish Korde's *Lalit*, the *tihai* is played three times in rapid succession. In the first instance of a *tihai*, this neatly divides the first *gat* section that is performed on alto flute from the rest of the piece, which is performed on C flute. This technique gives the flutist a final flourish before there is a 16-beat break in the music, accommodating the instrument changes.



5.23 *Lalit*, mm. 139-143

In Hariprasad Chaurasia's 1988 recording of *Lalit*, he finished the *jhala* section of the *alap* with a three-part *tihai*, which consists of three threefold-repeated patterns, all following each other in a neat succession. The first *tihai*, occurring at 35:30, consists of a descending line of rapidly articulated notes; the second, occurring at 35:37, consists of a series of rapidly articulated scalar runs, and the third, beginning on the D-sharp, and ending at 35:55. The third part of the *tihai* serves an additional purpose: to rein in the tempo and bring the *jhala* to a close (Example 5-25).



5-25 final *tihai* at the close of the *alap* in Hariprasad Chaurasia's realization of *Lalit*

Following this final flourish, the *alap* concludes, and the recording continues with the *tabla* player's entrance for the first *gat*.

The second instance of a *tihai* in Shirish Korde's *Lalit* comes at the very end of the second *gat*, marking the end of the piece. Both instances of the *tihai* in *Lalit* have the *tabla* player mirroring the rhythmic patterns found in the flute (Example 5.26).

5-26 Final *tihai* of Shirish Korde's *Lalit*. This excerpt repeats three times.

Similarly, Ravi Shankar's *L'Aube Enchantée* features a *tihai* once in a solo flute passage midway through the piece, and in a very elaborate final flourish at the conclusion of the piece (Example 5-27).

5-27 Ravi Shankar, *L'Aube Enchantée* mm. 314-332

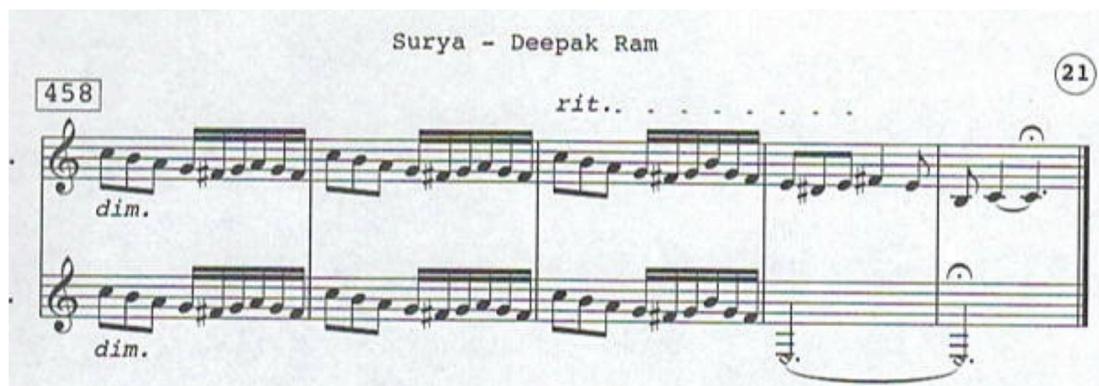
These are all examples of how the *tihai* is employed to create sections.

The *tihai* can also be used as a rhetorical method in Indian classical music performance. In Deepak Ram's composition, *Surya*, the *tihai* is derived from the main melodic material, or *pakad*. (Example 5-28):



5-28 *Surya*, mm. 329-330.

Using the *pakad* as a *tihai* is a simple way for the performer to subvert the audience's expectations. Throughout the final section of *Surya*, or the *gat*, the theme comes back at somewhat regular intervals. After several repetitions at the beginning of the *gat*, the structure opens up to include increasingly long areas of improvisation between repetitions of the *pakad*. In many instances, the *pakad* is repeated, but never thrice. The tripartite repetition of the *pakad* is played only at the very conclusion of *Surya*. With the understanding that the *tihai*, or the thrice-repeated *pakad* is only played at the end, an effective performance technique would be to play through the twice-repeated *pakad* sections as if one were going to play it a third time (Example 5.25).



5.28 Deepak Ram, *Surya*, 458-462

Chapter 6: EXTENDED TECHNIQUES AND PERFORMANCE PRACTICE OF INDIAN-WESTERN FUSION WORKS

Section 1: Articulations

In the concerto *Mandala Ki Raga Sangeet*, John Mayer explores different timbral possibilities of the flute through flutter tonguing and rapid articulated notes, especially in the faster sections. The flutter tonguing passages only occur when preceding a *meend* to the main note or to the sonant note (usually C or G). There is no analogous technique found in Indian classical music. In Vrindavan, the second movement of *Sri Krishna*, fluttersong and repeated emphasis on one note is prevalent, but seems to be an effect rather than an attempt to match any previous tradition. Lori Kesner, in her dissertation, suggests that Mayer did not necessarily feel motivated to emulate Indian classical tradition in his compositions.¹²⁶

Peggy Holroyde mentions in *Music of India* that the South Indian flute is typically played with more syncopation, and that the sound has a different ‘feel’ from the pathos of the North Indian *bansuri*. In Asha Srinivasan’s *Dviraag*, the timbre of the flute is explored fully. Whereas the Western flute, which is designed for an even, pure tone, has a headjoint with smoothed-out edges, the *bansuri* is made out of bamboo, a porous material, and has a different timbre. Asha Srinivasan achieves variation in timbre in *Dviraag* with a combination of key clicks, syllables said into the instrument, and explosive attacks (labeled “cha”).

¹²⁶ Kesner “Krishna Meets Pan”, 14.

As exemplified in *Dviraag* (Example 6-1):

Strict ♩=ca. 98-104
mechanically, like a clock

Fl. *p* *t* *p*

Vc. *f* *f* *f*

6
Fl. *pizz.* Cha *Ka*

Vc. *vigorously, raucously* *ff*

6-1 *Dviraag*, mm. 2-9

The repeated tonguing sections in *L'Aube Enchantée* are found in a very specific section—a section of increased rhythmic activity. The rhythmic pulse first divides the quarter into six, then eight. When the flutist can seemingly tongue no faster, the *gat* begins (Examples 6-2 and 6-3).

6-2 *L'Aube Enchantée*, m. 91, Divisions into sixtuplets

6-3 *L'Aube Enchantée*, mm. 101-102, Divisions into octuplets

Section 2: Taans

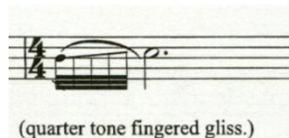
A *taan* is an embellishment in which notes are woven together in larger patterns.

Throughout the development of an *alap*, an artist will present various combinations of notes within the allowable context according to the rules of a *raga*. In the context of a

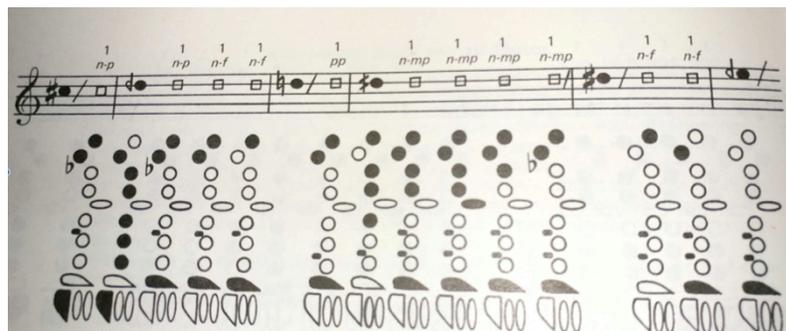
vocal performance, these are introduced in the second movement, or the *bandish*, woven in short patterns. The third movement, *sanchari*, introduces more types of *taans*, such as *gamak*, *meend*, and *ghasit*. In the fourth movement, known as *abhogi*, the *taans* grow faster and longer in range.¹²⁷

In the context of an instrumental performance, *taans* are generally considered to be the rapid executions of varying combinations of patterns within the context of a *raga* form. These combinations grow in length (from three to six or seven notes) and have varying patterns. These are often rapidly executed in the faster, more technical passages of a performance.

The *taans* featured in *Lalit* by Shirish Korde consist of quarter-tone glissandi. The first, given the key signature of B \flat , C \sharp and G \sharp , covers the range of a minor third. This microtonal segment can be played using the suggested fingerings in Robert Dick's *The Other Flute* Chapter 2-B, Microtones (Examples 6-4 and 6-5).

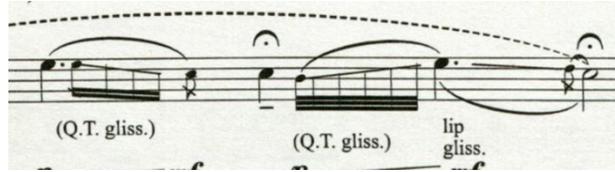


(quarter tone fingered gliss.)
6-4 Scan of *Lalit*, m. 6

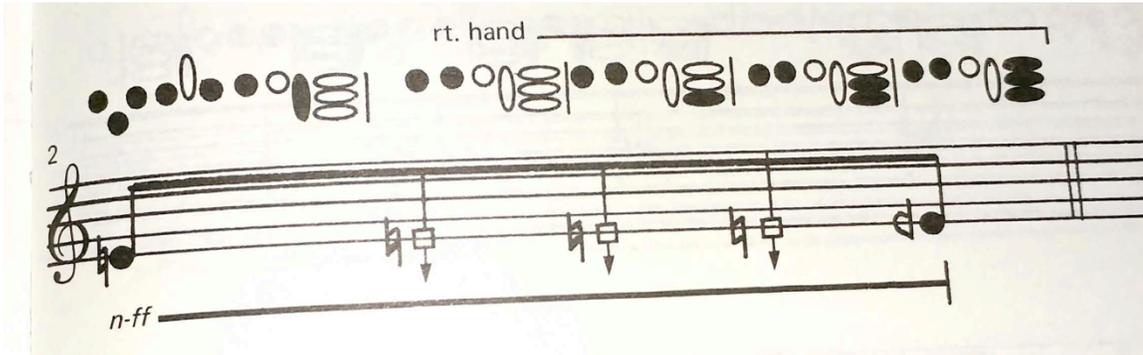


6-5 Scan of Robert Dick Keyed Glissando for closed hole flutes

¹²⁷ G. Joshi, *Understanding Indian Classical Music* (Bombay: D.B. Taraporevala Sons. & Co, 1977), 24.



6-6 *Lalit*, m. 10



6-7 Scan of Robert Dick Microtone Segment no. 2

For this range of quarter-tone glissandi, the performer must use the Microtonal Segment no. 2 as prescribed by Robert Dick , and then switch to the Microtone Scale for Closed-Hole Flutes. Both of the above examples could also be played using the Kingma system alto flute, whose key-on-key system enables the flutist to play a quarter-tone chromatic scale.



6-8 *Anusvara*, m. 71

The above *taan* (Example 6-8) can be performed using the same suggestions for the quarter-tone glissando found in *Lalit*.

Section 3: *Srutis*, or Microtones

Srutis, or the microtonal division of the octave, are a common element in Indian Classical music. A division of 22 *srutis* to the octave is generally recognized,

although some treatises recognize as many as 66.¹²⁸ The present-day system relies on a twelve-tone scale similar to the Western one, but requires more flexibility in pitch, thus resulting in 22 *srutis*.¹²⁹ Twelve of these 22 *srutis* are the main *swaras* which correspond to our Western twelve-note chromatic scale. The remaining ten *srutis* are used in ornamentation. These *srutis* that do not fall into the main *swaras* are never used as a main note, but instead create an effect of melodic continuity and consistency.¹³⁰

When used for the purposes of ornamentation, *sruti* fall into two categories—*gamakas* and *meends*.

Subsection 1: *Gamakas*

Gamaks are a form of musical expression in Indian classical music, and are produced by the shake or quiver of notes.¹³¹ *Gamaks* can be used to express the character of a *raga*. This type of expression might be used in one *raga* more often than another. The performance of these is an oscillation between scale degrees and/or *srutis*.¹³² This is considered for singers to be an intense vibrato, in which they take one note and quickly waver it up and down.¹³³ Gopal Sharman codifies these fast oscillations between *srutis* into 19 types of *gamaks*.¹³⁴ Mahajan Anupam identifies *gamaka* as coming from Parsadeva, DQ: “defined as the oscillation of a *swara*

¹²⁸ Jairazbhoy, *The Rāgs of North Indian Music*, 34.

¹²⁹ Sharman, *Filigree in Sound*, 46.

¹³⁰ *Ibid.*, 52.

¹³¹ Mahajan Anupam, *Ragas in Hindustani Music: Conceptual Aspects* (New Delhi: Gyan Publishing House, 2001), 53.

¹³² Leifer, *How to Play the Bansuri*, 68.

¹³³ Lavezzoli, *The Dawn of Indian Music in the West*, 28.

¹³⁴ Sharman, *Filigree in Sound*, 52.

beginning with its prescribed *sruti*, which moves to secure the support of another *sruti* of a neighboring note in such a way that it passes like a shadow over it.”¹³⁵

Shirish Korde’s *Lalit* has several instances of *gamaks*, beginning with the flute’s opening line in the first *gat*:



6-9 *Lalit*, mvt. 2 m. 5 (on alto flute)

These oscillations in a descending line give a lighthearted character to this opening section, which in a way reflects the thematic associations of the *raga Lalit*: An early morning raga, that has several appearances throughout Indian literature. In one reading, *Lalit* has been described as “A Vina and a book in her hands, Lalita appears, the Goddess of music. Charmingly playful she talks lightly, her eyes like red lotuses.”¹³⁶ Another scene featuring *Lalit* has been told in the following manner: “The young and fair Lord of Lalita wears a garland of the sweet-scented seven-fold flowers. His lovely laughing eyes are long like the petal of the white lotus. It is dawn. Overwhelmed by fate, Lalita sighs dressed for a lover’s meeting.”¹³⁷ Such scenes are also depicted in *ragamala* paintings of Lalit (6-10).



6-10 *Lalit*, mvt. 2 mm. 349-350 (on C flute)

¹³⁵ Mahajan, *Ragas in Hindustani Music*, 53.

¹³⁶ Daniélou, *The Raga-s of Northern Indian Music*, 101.

¹³⁷ Mahajan. *Ragas in Hindustani Music*, 28.

In all of the suggested themes of *Lalit*, the character implied is lighthearted.

Given the pervasivity of all of these sections, one interpretation of *Lalit* may be to play these with a lighthearted character in mind (Example 6-11).



6-11 *Lalit*, mvt. 3 mm. 416-419

Shirish Korde also employs the microtonal capabilities of the flute in *Anusvara* for alto flute. The *gamaks* in this piece are achieved through both lip glissandi and timbral trills (Example 6-12).



6-12 Lip glissandi, *Anusvara*, m. 24

The lip glissandi in *Anusvara* requires the flutist to push the pitch of the note sharp at increasingly frequent intervals. As implied by the directions, this technique involves changing the position of the lips until the desired pitch is reached—in this case by diverting the air stream higher. A similar effect could also be reached by pushing the note higher with the breath, much in the same way that vibrato is produced.

The timbral trills in *Anusvara* are written with the main pitch alternating with a harmonic fingering (Example 6-13):



6-13 Timbral trill in *Anusvara*, m. 10

Timbral trills, sometimes also referred to as *bisbigliandi*, are the smallest forms of trills. They employ a multitude of additional fingerings that enable subtle microtonal variations. These variations alternate between the initial pitch and one of a nearby, related fingering. This technique results in a shimmering sound and wavering quality. Fingering guides to playing timbral trills and bisbigliando are found in Pierre-Yves Artaud’s *Present-Day Flutes* and Carin Levine’s *The Techniques of Flute Playing*.

Bisbigliandi

In *Utthista* for solo flute, Asha Srinivasan calls for a timbral trill in the form of a *bisbigliando*. This terminology is more commonly found in harp parts, but nevertheless means “a tremolo between different fingerings of the same pitch, often referred to as a timbral (color) trill. The result is a fast, shimmery change of tone color.”¹³⁸ When referred to in flute repertoire, a *bisbigliando* generally refers to a timbral trill in the upper registers of the flute. The execution of a *bisbigliando* involves playing a note in its harmonic, and trilling to another fingering that includes the original note in its harmonic series. This effect is only possible in the upper extremities of the flute. In *Utthista*, the *bisbigliando* is called for twice—first in the second register of the flute (Example 6.14), and second in the third octave (Example 6-15):



6-14 *Bisbigliando* on A³.

¹³⁸ “Bisbigliando,” FluteXpansions, accessed 17 April 2017, <https://www.flutexpansions.com/bisbigliando>.



6-15 *Bisbigliando* on $A \flat^4$.

Both of these bisbigliandi can be performed using the harmonic series of the flute. In the first given example, the middle octave A is sustained while the shaded notes are trilled.¹³⁹ The trilled notes are to the fingering of D^2 , which is the lowest fundamental in the harmonic series on the flute into which A^3 fits. In the case of the $A \flat^4$, the third harmonic in the series is sustained while the right hand trills the grey shaded notes. In the case of the $A \flat^4$, the $A \flat^4$ is both a third-partial harmonic of the $A \flat^2$ and a fifth-partial harmonic of $D \flat^2$.

Shirish Korde's *Anusvara* for alto flute solo calls for both timbral trills and bisbigliandi. Bisbigliando fingerings are occasionally different than they would be for the open holed flute. In this case, the second partial of the A^1 harmonic is sustained while the right hand fingerings alternate with the lower harmonic:



6-16 *Bisbigliando* on E^4 .

¹³⁹ The register indications here are relative to their location on the flute: B1, C2-B2, etc to C5; alto flute C1-C4. Locations relative to the piano in terms of range are as follows: flute B3-C7, alto flute G3-G6.

In *Anusvara*, Shirish Korde calls for timbral trills in the lower register. This is indicated as alternating actual fingering of the note with another fingering with a slightly different timbre. In the low register of the flute, this is chiefly accomplished by tapping the keys on the foot joint.



6-17 timbral trill in *Anusvara*, m. 8



6-18 timbral trill in *Anusvara*, m. 10

When both *bisbigliandi* and *timbral trills* are performed, the pitch is slightly lowered and the quality is altered. This timbral alteration results in a fast-occurring mixture of microtones, or *srutis*, which as previously discussed, is one method of ornamentation in Indian classical music.

Section 4 Meends

Lyon Leifer notes in his manual *How to Play the Bansuri* that in the *alap* section of a *raga* performance, nearly all the intervals are taken with a certain amount of *meend*. On the *bansuri*, intervals involving a *meend* are performed using the fleshy part of the finger, anywhere from the first joint to the second joint. Slowly closing and opening the finger holes while moving from note to note, and putting the finger slowly but directly into the center of the tone hole produces a smooth *meend* from one

note to another. This effect gradually lengthens or shortens the air column, and can be heard as a continuous glissando.¹⁴⁰

Hazrat Inayat Khan wrote that vocal music is considered to be the highest musical form, because the voice “comes direct from the soul as breath, and has been brought to the surface through the medium of the mind and the vocal organs of the body.”¹⁴¹

To this degree he describes instruments as being poor imitators of the voice. With regard to flutists, he writes that flutes especially “express the heart quality, for they are played with the breath which is the very life.”¹⁴²

To some extent, it is possible to adapt the *mukhra* of the *khayal bandish* for the flute. This is because the instrument is, to some degree, capable of producing lingering sounds and can, therefore, approximate the human voice and also can be played legato.¹⁴³

Ideally, the *meend* and *gamak* are played in a smooth, continuous manner, highlighting the *srutis* between the notes. Various *ragas* highlight some *sruti* over others, so the exact placement of the pitch bend will differ in every performance. On Indian string instruments, such as the *sitar*, the *meend* is produced by bending the strings across the fret. This technique is used to give the *sitar* a vocal quality.¹⁴⁴ Vocal performance continues to be the standard to which all Indian classical instrumental soloists aspire.

It is this standard that is sought after in the performance of these Indian-Western fusion works. On the *bansuri*, fingering constraints limit execution of a continuous

¹⁴⁰ Leifer, *How to Play the Bansuri*, 69.

¹⁴¹ Lavezzoli, *The Dawn of Indian Music in the West*, 30.

¹⁴² *Ibid.*, 30.

¹⁴³ Bagchee, *Naad*, 275.

¹⁴⁴ Lavezzoli, *The Dawn of Indian Music in the West*, 31.

glissando to a 6th or 7th, although these are rarely larger than a 4th or 5th. The purpose of playing *meends* is to highlight *srutis* and showcase a musician's inventiveness.

Musicianship in the *alap* section of an Indian classical performance is judged by the performer's ability to effectively connect notes to one another. The *meend* or *glissando* is used for almost every note.

The *meend* and the *gamak* are the most important distinguishing elements in Indian music in which the staccato employment of notes is not the rule and fine musicianship depends on the extent to which a performer uses all the *srutis* to create the effect of melodic continuity and consistency: so that although the music is put together from separate notes, the overall effect is one of an unbroken totality of the most delicate filigree which may be dismembered only at peril of murdering the music.¹⁴⁵

Section 5 Execution of Pitch Bends

Pitch bends in Western repertoire are commonly referred to as *glissandi*. A glissando can be executed on the flute in one of two ways: through manipulation of the fingers and through manipulation of the lips. A lip glissando can lower the pitch of the flute up to a minor third and raise a note up to a minor second, depending on the original pitch of the flute and the octave. Open notes such as C# are the easiest to manipulate, and the flexibility of a lip glissando decreases with the additional keys that are depressed.



6-19 from John Mayer's *Mandala Ki Raga Sangeet*, mvt. 2

In John Mayer's concerto for flute and orchestra, *Mandala Ki Raga Sangeet*, a repeated oscillated figure is called for consistently throughout the performance. In the second movement specifically, the *meend* performed is between C#³ and C³, then

¹⁴⁵ Sharman, *Filigree in Sound*, 52.

between D³ and C#³ (As shown in Example 6.19) These two intervals are most easily performed with a lip glissando.

The second standard method of glissandi production are keyed glissandi, and are performed using two methods—either by sliding the fingers off the open holes of the flute, or by carefully lifting the rim of the keys. This technique, most effective when performed on an open-hole flute, achieves a more-or-less continuous glissando from low B³ to high A#⁶.¹⁴⁶ Robert Dick's groundbreaking treatise gives instructions on playing this multi-octave glissando, with specific instructions at transition points.

Most of the material written from 1976-1978 by Ravi Shankar and John Mayer calls for more constrained glissandi, used sparingly and no more than a major third in width. The original score and performance of *L'Aube Enchantée* were entirely without glissandi. This technique was added in later by Roberto Aussel and Pierre-André Valade, in which an arrangement for flute and guitar. The exact places in the score where the glissandi were added are as follows (Examples 6-20 and 6-21):



6-20 From B \flat ² to D³ in the *pakad*, m. 56



6-21 *meend* from D⁴ to E \flat ⁴, m. 91s

In both of these cases, the glissando was added in a subsequent performance by the Valade and Aussel duo. In the case of the first glissando, given the context and tempo

¹⁴⁶ Dick, *The Other Flute*, 72.

of the *gat*, the fingering suggestion given in Robert Dick’s book is not feasible. Instead, the flutist is better served by fingering a thumb-B \flat and carefully lifting through the decrescendo. Arriving on the D as gently as possible will avoid drawing attention to the slightly broken glissando, and allow the performer to adhere to the suggested phrase marking. The second glissando is very simple to achieve on the open-holed flute: the fourth finger simply slides off and on the tone hole while keeping the key depressed, which creates a smooth glissando from D \flat 4 to E \flat 4 .

The *glissandi* are present in John Mayer’s *Mandala ki Raga Sangeet*, and indicated to represent a *meend*, which Mayer defines in the score as a “smooth-moving glissando.”¹⁴⁷ In this concerto, this *meend* is an ongoing motive used in the slow, unmetered ‘*alap*’ sections, and emphasizes the note above and below the root and the fifth (Example 6-22).



6-22 Examples of *meend* in John Mayer’s *Mandala Ki Raga Sangeet*.

In Utthista (Asha Srinivasan)

Utthista, which was commissioned by and written for Lisa Bost-Sandberg, calls for an ‘expanded flute.’ This consists of the fully chromatic quarter-tone flute and the glissando headjoint. The quarter-tone scale flute has a key-on-key design that allows half-holed notes even on keys that are not normally controlled by the fingers, thus enabling the flutist to play a full quarter-tone chromatic scale. Regarding the

¹⁴⁷ John Mayer, *Mandala Ki Raga Sangeet*, 1 (from flute part)

performance of this piece, Asha Srinivasan writes that “the piece could easily be adapted to standard flute and not lose the impact of the music. All microtones and glissandi are optional and I think the piece could work without it.”¹⁴⁸ With this comment in mind, however, Asha Srinivasan’s work is the only one mentioned in this dissertation that specifically calls for a quarter-tone flute and glissando headjoint (Example 6-23).

g.hj (like a wide vib.)

mm. 36-37

mm. 229-230

mm. 232-233

6-23 *Utthista*, examples using *glissando* headjoint

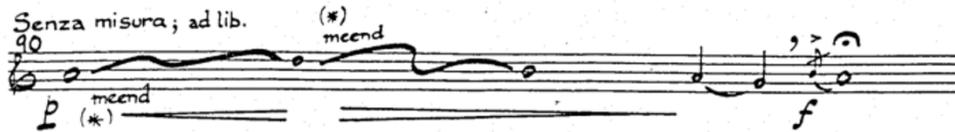
Srinivasan states that the *ragas* and rhythms used in *Utthista* clearly articulate the *raga*, even without the use of the glissando headjoint. The use of them does, however, add a slightly more authentic feel to the *raga*.¹⁴⁹ These glissandi enhance the piece through the timbral changes in the flute.

In Sri Krishna

Sri Krishna, written by John Mayer for James Galway and initially recorded by him and Philipp Moll in 1981, has an extensive *meend* in the first movement (6-24):

¹⁴⁸ Asha Srinivasan, email from composer, 6/29/16.

¹⁴⁹ Asha Srinivasan, email from composer, 3/21/2017



6-24 *Meend* from *Sri Krishna*, mvt. 1. “Govinda-Krishna, Krishna the Cowherd”, m. 90

Sri Krishna was written for the flute three years after the first publication of Robert Dick’s extended-technique manual, *The Other Flute*, and well before the invention of the *glissando* headjoint. Without the *glissando* headjoint, the following combination of fingerings must be used:

1. Start fingering A; slowly slide off the tone hole, and gently lift the rim to B.
2. Switch to the B⁴ harmonic
3. Slide off the tone hole of the D key, until the pitch D is reached
4. Noting how the graphic for the *meend* wanders above the pitch D, the performer might consider going further to F#. In this case, the performer can slide fingers off of the toneholes for E and F.
5. Return to B by reversing this process
6. Switch from B⁴ harmonic fingering to the regular B fingering

However, given the desired aesthetic of a *meend*—to have a smooth-moving glissando from one note to the next, and to highlight the *sruti* in between the different notes—the use of the *glissando* headjoint would be considered appropriate. Similarly, there are some sections of *glissandi* in Shirish Korde’s *Lalit* and *Anusvara* that are not specifically written for the *glissando* headjoint, but could benefit from its use. The three following excerpts are from *Lalit* (Example 6-26).



6-25 *Lalit*, m. 184

The above excerpt spans the range of a major second, and can easily be executed starting from the home position on the *glissando* headjoint. The second excerpt can make use of the same technique—while spanning a minor third for the first half of the excerpt (Example 6-26):



6-26 *Lalit*, mm. 331-337

When the glissando spans a distance greater than what is playable on the *glissando* headjoint (as in the F^3 to A^3 interval in m. 336, and $B \flat^4$ to $G\sharp^4$ in measure 337), the flutist must then employ conventional key slides to extend the range. In the case of the interval F^4 to A^4 , the glissando from F^4 to $G\sharp^4$ can be extended by sliding the fourth finger off the tone hole of the G key.

The following excerpt exceeds the full range of the *glissando* headjoint, and has no current solution (Example 6-27):



6-27 *Lalit*, mm. 557-559.

Similarly, Shirish Korde's *Anusvara* calls for several glissandi even wider than the aforementioned set. *Anusvara* is written for the alto flute. While a standard alto flute would not be suitable for a smooth glissando as indicated, this effect would be possible using the Kingma system alto flute. A *glissando* headjoint for the alto flute does not currently exist.



6-28 *Anusvara*, m. 87-88

These glissandi have a wider range than the glissando headjoint, and must be played using the chromatic scale (Example 6-28). Shirish Korde indicates in the performance indications *re/re#* that the flutist should trill the D# key while playing through these glissandi in order to get the effect of a timbral oscillation (Example 6-29).



6-29 *Anusvara*, m. 85

Chapter 7: CONCLUSION

The primary motivating factors in this project have been twofold: First, to promote flute repertoire drawing on Indian classical music through providing flutists with information on performance techniques; Second, to seek an answer to the following question: *Can the Western flute effectively emulate elements of Indian classical music?*

As discussed in Chapter Three, the perceived notion that Western music and Indian music have differing intonation systems is largely due to the difference in functional use of intonation, rather than fundamental differences in the placement of notes within a scale.

As discussed in Chapter Four, a combination of changes in design of the Western flute as well as innovations in performance technique have increased its adaptability in imitating music of other cultures.

These innovations in construction and performance techniques can be observed in an increased vocabulary among composers seeking to incorporate elements of Indian classical music into the Western perspective.

As is common in historical performance practice of Western music, knowledge of the targeted musical area is key to understanding how an authentic performing experience can be achieved. This idea is hinted at through Sambamoorthy's observation of Indian musicians playing Western instruments, and reinforced by Henri Tournier's and Jeanne-Miramon Bonhoure's perspectives of coming to Indian music as Western-trained classical musicians.

Jeanne-Miramon Bonhoure and Henri Tournier, both fluent in performing both on

the Western flute and Indian *bansuri*, both reflected that they would rather play Indian music on the *bansuri*, and hinted that some *ragas* may not be appropriate for Western flute. One of the most cited examples is that *gamaks*, or microtonal oscillations, are simply easier to perform on the *bansuri*. Though they cite a strong preference for performing Indian music on the *bansuri*, both of these flutists noticed a marked appreciation among Indian musicians for the capabilities of the Western flute.

Whether these innovations in flute construction (the glissando headjoint and the quarter-tone flute) will be considered gimmicks remains to be seen. At this particular point in time, it is unclear whether these inventions will lead to greater acceptance of the Western flute's capability in emulating Indian classical music. While the innovations in construction and performance technique have increased the fluidity with which the Western flute may play Indian classical music, some *ragas*, particularly those requiring extensive use of microtones, may be best attempted on the *bansuri* and not the Western flute.

While the innovations in flute construction and performance technique may help approximate the atmosphere of Indian music, the performer is advised to also complement their preparation for performances with study of Indian music. The performance practice of Indian music holds much similarity to the advice of musicians studying historical performance of Western music: The best way to learn the techniques and nuances of a particular music culture is to learn kinesthetically from the experience of playing that music, if possible, on the original instrument.

Appendix

1. Transcription of Hariprasad Chaurasia, 1988 recording of *raga Lalit*

Lalit

Hariprasad Chaurasia transcribed by Caroline Rohm

27:00-27:16

30:38

34:02 34:04 34:05 34:09

35:20

35:30 x3

35:37

35:55

36:00

36:08

Glossary

alap: First movement of a *rag* performance, characterized by a slow abstract beginning which gathers momentum (*jor*) through use of an accelerating tempo.

Arohana/ aroha: The ascending series of notes particular to a given *raga*.

audav: neuter, referring to the gender of a *raga*.

Avarohana/ avaroha: The descending series of notes particular to a given *raga*.

bansuri: The keyless, transverse bamboo flute of North India. The *bansuri* is constructed with six or seven finger holes and an embouchure hole.

bhairavi: a *thaat* in Hindustani classical music and also a *raga* of using that scale form. *Bhairavi thaat* is characterized by its lowered second, third, sixth, and seventh scale degrees.

bin: In classical literature, any stringed instrument; in more modern times a long-necked lute which is the ancestor of the *sitar*. also *venu*.

chikari: the high drone strings on an instrument, used for rhythmic articulation.

drut: one of the three degrees of speed in Indian classical music. *Drut* is fast.

gamak: a type of ornamentation that resembles a mordent with quarter tones.

gat: A fixed composition for instruments, drumming, or dance, in which contrasting rhythmic parts play a structural function. The term is more generally used to describe the entire part of an instrumental performance that is accompanied by *tabla*.

gharana: A musical style that is handed down through the teaching of a specific lineage of *gurus*. In former times it carried implications of the blood lineage and intermarriage of a musical family.

Hindustani: The general name for the classical tradition of North India.

janta varisai: a beginning vocal exercise in Carnatic classical music that simultaneously practices elements of rhythm and melody. The *janta varisai* series follows the *sarali varisai* series.

jhala: the rapid section, which concludes an instrumental performance that uses the repeated striking of drone strings.

zor: the second part of an *alap* in which a rhythmic pulse is introduced, but which has no fixed meter.

Karnatic/ Carnatic: The general name for the classical tradition of South India.

kirwani: a south Indian *raga* which has a scale comparable to the harmonic minor scale.

khali: (empty) the section of a rhythmic cycle (*tala*) which is signified by the wave of the hands

khamaj: the name of a *thaat* similar to the Western major scale; also the name of a *raga* in the same *thaat*.

khyal: a vocal style of many varieties that arose in the eighteenth century and has become a prevalent way of rendering classical music.

komal: A flattened pitch. In the *sargam* system, *Re*, *Ga*, *Ni*, and *Dha* may be lowered.

lay: (speed) tempo in its sense of slow-medium-fast, or relative speed wherein one describes the division of the beat or the ratio between a composition and the *tala* in which it is set.

madhya: one of the three degrees of speed in Indian classical music. *Madhya* is moderate.

matra: a single count or beat. A *matra* is the basic time measurement unit in Hindustani classical music.

Megh: referring to a *raga* associated with monsoons.

melas: the parent scales from which Carnatic *ragas* are derived, of which there are 72.

Mughal: A dynasty of rulers beginning with Babar in 1526 and extending through 1859, including Akbar the Great, Jehangir, and Shah Jahan.

Mukhra: a phrase of a composition in *khyal* style that is used as a refrain or point of return in fixed composition.

murali: The bamboo flute used in Carnatic music performance; usually higher in pitch than the *bansuri*.

ney: an end-blown flute made of a reed, played in many musical traditions throughout the Middle East.

pakad: a distinctive melodic phrase which characterizes a *raga*.

pandit: In the Hindu tradition, a term of respect for a person of learning or artistic accomplishment, or a teacher.

pramana sruti: a microtonal interval of approximately 22 cents.

purva: the lower tetrachord of a *raga*, including *Sa*, *Re*, *Ga*, and *Ma*.

purvanga vadi: a *raga* in which the sonant note is in the lower tetrachord.

raga: *ragas* are the melodic formats of classical music in India. Ranging from simple scales to actual compositions, most *ragas* lie in between these poles. Most suggest melodic ideas loosely interwoven with upward and downward scale motions.

ragamala: In performance, a garland, or medley, of *ragas*. Historically, *ragamalas* were a series of miniature paintings romantically depicting the flavor and poetic implications of *ragas*

ragini: A female *raga* from the older classification methods that a certain number of parent *ragas* would have a given number of wives (*raginis*), and from them came offspring (*putras*), which aligned the *raga* literature into families.

rasa: Used in music to describe basic moods. They were classified into nine basic types (*navarasa*) in the ancient literature on the dramatic and musical arts.

sam: The first beat of a *tala* cycle.

sampurna: masculine, referring to the gender of a *raga*.

sandhi prakash ragas: *ragas* associated with the changes in light, primarily sunrise and sunset.

Sanskrit: A language with origins in Vedic times, which later developed into a vast classical language of ancient India

sarali varisai: a beginning vocal exercise in Carnatic classical music that simultaneously practices elements of rhythm and melody.

sargam: The names of the pitches, or a composition or section in which the names of the notes are used. Comparable to solfeggio in the west.

sawal-jawab: (note-spelled *sawab-jawal* in Shirish Korde's *Lalit*) "question-answer" dialogue in which the melodic soloists lay a rhythm and the *tabla* player answers with an imitation, or variation based on the same idea.

shadav: feminine, referring to the gender of a *raga*.

shakuhachi: and end-blown bamboo flute native to Japan.

sitar: The long-necked lute of North India brought to international prominence through the playing of Ravi Shankar, Vilayat Khan, and Nikhil Banerjee.

sruti: the name for microtonal intervals in Indian classical music.

sruti box: an instrument that works on a system of bellows, designed to produce a drone in Indian classical music.

swara/svara: Note or pitch.

taan: A melodic pattern used to expand the *raga* in performance after the fixed composition; often used in the sense of a fast melodic run.

tabla: The pair of hand drums, *maya* and *tabla*, which have become the most popular drums of the classical tradition.

tala: The system of rhythm in Indian classical music, specifically the rhythmic cycle.

tamil: a dravidian language spoken primarily in the Tamil Nadu province of India and Sri Lanka.

tanpura: The stringed drone, the long-necked lute heard in the background of a classical performance; also spelled *tamboura*.

telugu: a dravidian language spoken in India, native to the Andhra Pradesh, Telangana, and Yanam provinces of India.

thaat: a basic scale from which *ragas* are derived, according to V.N. Bhatkhande's system.

tihai: A rhythmic or melodic pattern repeated three times, often returning to the downbeat of the rhythmic cycle.

tivra: A raised pitch. In the *sargam* system, only *Ma* (the fourth scale degree) may be raised.

ustad: In the Islamic tradition, a title for a respected or learned person or teacher.

uttar/ uttaranga vadi: a *raga* in which the sonant note is in the upper tetrachord.

vadi: the sonant note of a *raga*. Within a *raga* performance, the sonant note receives special treatment.

Vedas: holy scriptures passed down in an oral tradition that arrived in India around 1500 B.C. There are four volumes, and the third, the *Samaveda*, expands the recitations from three notes to seven, or a full scale.

vikrit: out of twelve *svaras* of the Indian classical system, seven are standard *shuddha* *svaras* analogous to our major scale, and the remaining five are *vikrit*, or modified tones. When a *vikrit* tone is used in a scale form, it replaces one of the *shuddha* *svaras*.

vilambit: one of the three degrees of speed in Indian classical music. *Vilambit* is slow.

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