Authority, Critique, and Revision in the Sanskrit Music-Theoretic Tradition: Rereading the Svara-mela-kalānidhi

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Abstract: The influential sixteenth-century Sanskrit treatise Svara-mela-kalānidhi describes a novel system of naming tones, of organizing rāga-s by pitch content, and of reckoning svara-s on 12 fret positions rather than 22 śruti-s. Contrary to its common construal as a sudden rupture in tradition, we highlight the rhetorical means by which the treatise systematically grounds its authority (and that of its ambitious patron, Rāmarāya) in the canon of saṅgīta-śāstra. We also offer a new translation and a new (non-Pythagorean) interpretation of its svayambhu-based tuning system.

Indian music has a vast textual tradition. Music historians are faced with a corpus of hundreds of treatises, in Sanskrit, Persian, Tamil, and various vernaculars, spanning two thousand years. It is unclear how best to approach this variegated literature, much of which comes down to us without clear authorship, oral tradition, or historical context. Over the last century or so, two contrasting stances have emerged. One familiar stance regards music-theoretic texts—particularly those in the Sanskrit tradition—with great reverence, reading them as scriptures composed by sages, offering timeless musical truth (e.g., Tagore 1896, 50–51; Prajnananda 1973, 18–22; Veer 1986, 138–40; Daniélou [1943] 1995, 84–87). Another familiar stance regards such texts with skepticism, reading them as scholarly documents produced by fallible humans: full of contradictions to be resolved, pitches to be calculated, and claims to be tested against empirical observation (e.g., Bhatkhande [ca. 1912] 2012, passim; Forster 2010, 570–74; Ramanathan 1992, 80–83; Thatte 2010, 44–49). The latter stance tends to regard stylized rhetoric, claims to authority, and arcane myth as mere noise: distractions from the task of the critical musicologist. Consider V. N. Bhatkhande’s dismissal of mythic claims about music’s origin:

How could a curious student like you be satisfied with a definition of classical music as “that which was sung for Śiva by Bharata?” You will surely ask: “Who was this Brahmadev? And who was his disciple Bharata? When did they live? How will I be able to answer these questions?” . . . The authors of [these treatises] sometimes write so cryptically that it is impossible to make sense of it. We should
not think that they themselves have unraveled these matters. (Bhatkhande [ca. 1912] 2012, 59)

The stakes of taking one stance or the other would seem to be quite high. Amartya Sen has argued that Indologists who emphasize the “nonmaterial and arcane” over the “rationalistic and analytical” end up “undermining an adequately pluralist understanding of Indian intellectual traditions,” encouraging a “separatist” politics of identity founded on a vision of a religiously defined, timeless, univocal Indian culture (2005, 159–60). Others have argued that a critical, analytic attitude toward Indian music theory represents a significant rupture from the past, a novel attempt to “cast a disciplinary net around the ragas” (Bakhle 2005, 240), a project alien to music’s hereditary practitioners, toxic to orthodox structures of authority, and indelibly marked by a colonial encounter with European scholarly models (Neuman 2004, 86; Qureshi 1991, 159; Weidman 2006, 237–40). In this light, one’s approach to music treatises would seem to bear not just on structures of melody but also on structures of knowledge and power: To what extent did Indian music-theoretic traditions allow critique? When Indian music theorists question their authoritative treatises, are they merely reproducing Western intellectual habits? Or are they carrying on an Indian tradition of argumentation, performing a distinctively Indian secular modernity stripped of mythological ornament, with its own traditions of empiricism, rationalism, and critique?

The treatise we discuss here is widely construed to be the origin of just such a critical, rational, and yet decidedly precolonial way of knowing music: the Svara-mela-kalānidhi, (Compendium of svara-s and mela-s, hereafter SMK). The SMK was written in 1550 by one Rāmāmātya, a prominent court scholar at Vijayanagara, located on the Deccan plateau in Southern India. It describes a new system of naming tones, a novel method of setting frets on a vīnā, and a system of organizing rāga-s by pitch content, or mela. It establishes a tonal schema that seems to be oriented to a fixed system tonic, and a way of reckoning tones that obviates the ancient system of 22 śruti-s, presenting instead a system of measuring 12 tone-values on frets without explicitly measuring the intervals between them. This last point is particularly important in light of politically contentious debates over Indian intonation in the past century, often presented as a stark conflict between an indigenous system of 22 śruti-s and a Western system of 12 semitones, and thus between Indian tradition and colonial modernity (cf. Van der Meer 2005; Jairazbhoy 2008; Rahaim 2011). Coincidentally, the SMK was completed just a few decades before Chinese theorist Zhu Zaiyu calculated 12-tone equal temperament. Though the resultant tuning systems were quite different, their presentation was quite similar: Zhu Zaiyu and Rāmāmātya framed their revisions as conservative extensions
of canonical sources. Yet each has been interpreted by twentieth-century scholars as an exceptional appearance of a modern sensibility in an otherwise rigidly orthodox music-theoretic tradition (see Kuttner 1975).

In fact, the SMK’s reputation as an abrupt rupture in musical tradition reaches far beyond the technical details of its tonal system. M. S. Ramaswami Aiyar’s highly influential 1932 English translation and commentary presents the SMK as a sort of sixteenth-century music reform project, replacing an “antiquated,” “puerile,” “fanciful” approach with a “new classifying method” (1932, lx). Amanda Weidman demonstrates that Ramaswami Aiyar, a passionate music modernizer, had rather different motives than Rāmāmāṭya evidently did, selectively trumpeting the SMK’s rational, “scientific” contributions and dismissing its rhetorical, mythic, and poetic form (2006, 236–39). Yet his specific construal of the SMK as an abrupt rupture in tradition has been quite influential. Subsequent writers have presented the SMK as a “landmark” (te Nijenhuis 1977, 20) that “revolutionized the theory and practice of music” (Forster 2010, 566). Such claims usually center around its supposed rationality: that it is “remarkably lucid and rational” in contrast to its precedents (Roy 1937, 31), “rationalizes intervals and scales” (Sathyanarayana 2001, 24), “rationalize[s] aspects of current practice” (Powers and Katz 2001, 159), introduces “rationally defined notes” (Grieg 1987, 354), or even that it introduces rational “Pythagorean” intervals to Indian music (te Nijenhuis 1977, 21). John Allen Grieg goes so far as to say that the SMK inaugurated an unprecedented “empirical” approach to music that worked to “force the questioning of orthodoxy and all accepted wisdom in favor of perceptual evidence” (1987, 346).³

Starting from a careful rereading of the Sanskrit original, placed in the context of its production at the Vijayanagara court, we attempt to give a fuller, richer picture of the SMK. While we fully agree that the SMK had a powerful influence on subsequent music theory, our reading calls into question its common construal as a revolutionary document of rationalism, empiricism, modernity, or Pythagoreanism. Instead, we aim to highlight the interplay of logic, authority, and the subtle processes by which the reader is led into a new tonal schema even while maintaining continuity with an older canonical tradition. In response to the regnant tendency (see Qureshi 1991, 152) to counterpose the already-given “musical authority” of stable Sanskrit texts against the shifting complexities of “mere oral tradition,” we examine the rhetorical processes by which the SMK conjures its authority in the first place. This, we hope, will not only clear up some common misconceptions about the tonal system of the SMK in particular but also nuance the current understanding of canon formation and critique that have become so central to the intellectual history of music reform in India. More broadly, writing
as we are in an age of widespread anxiety about the “clash of civilizations” (Huntington 1993), we hope that our approach to this text may provide a way of thinking beyond a rigid dichotomy between secular, modern reason and religio-mythic, traditional authority.

The Svara-mela-kalānidhi as Text

The SMK is lean and tightly focused; it contains no discussion of metrical structure, dance, or even specific songs. It has only five short chapters: (1) an introduction, (2) a description of a tonal system, (3) a description of vīnā-s and their tuning, (4) a description of mela-s (pitch-sets), and (5) a description of rāga-s. The last two chapters consist largely of lists and have, we feel, been adequately translated and summarized by other authors (Ramaswami Aiyar 1932; Bhatta 1963; Forster 2010). We focus instead on the first three chapters: the heretofore neglected introductory section (chapter I) and the widely misconstrued chapters on tones (chapter II) and the setting of frets on a vīnā (chapter III). Our citations of the SMK will be in the format (chapter.verse)—for example, (III.4) refers to chapter III, fourth verse.

The SMK was finished, according to Ramaswami Aiyar’s precise but anachronistic reckoning, on a Thursday: August 21, 1550 (1932, xv). It seems to have been commissioned by Rāmarāya, the de facto ruler of the Vijayanagara Empire, soon after he officially presented himself as the sole sovereign. The author is called Rāmāmātya: “Rāma the minister” or, more likely, “the minister of Rāma.” He presents himself as a well-regarded administrator and music composer (SMK, I.15–22). As a reward for writing the SMK, he was presented the command of Kōṇḍavīṭa fort on the eastern sea (the Bay of Bengal) and the township of Jeluri-Simhāsana on the western sea (the Arabian Sea), thereby making him a powerful lord as well (I.31, 33).

The SMK seems to have been both the most original and the most widely read of the Vijayanagara treatises on music. Not only was it cited and critiqued in subsequent works such as the Caturdaṇḍiprakāśikā but it was copied by hand and housed in several royal libraries soon after its publication. The Vijayanagara court was hastily moved south after the 1565 sack of the main city, and it thus seems likely that copies were disseminated in the 15 years following its composition. Manuscripts that have survived the centuries have been cataloged in Thanjavur, Chennai, Mysore, Varodara, and Bikaner (Ramaswami Aiyar 1932, v; Bhatkhande [ca. 1912] 2012). The first critical Sanskrit edition was printed in 1906 at Kumbakonam by S. Narayanasvami Aiyar. In 1910, V. N. Bhatkhande pseudonymously reprinted this edition with commentary in Marathi—now very rare, but available in Hindi translation (Bhatta 1963). In 1932, M. S. Ramaswami Aiyar printed a widely read crit-
ical edition with a lengthy introduction and translation in English that, as noted earlier, is strongly biased toward his own practical concerns as a music reformer.

We therefore have produced our own original English translation of the first three chapters (largely the work of Srinivas Reddy), using Ramaswami Aiyar’s Sanskrit critical edition as the source text.  

Śāstra

The SMK is written in the tradition of musical śāstra. The term śāstra resists a handy English gloss, as it refers both to general bodies of knowledge (rather like the suffix “-ology”) and to specific synoptic works that systematize this knowledge. The śāstric tradition consists of authoritative texts and commentaries on a vast range of scholastic disciplines, from phonetics to medicine to architecture, including prescriptive rules alongside descriptions of standard practices. The common twentieth-century term śa striya saṅgīt refers to music that (in principle, at least) is ratified by śāstra. Authors of śāstric literature, like modern academics, frequently refer to earlier, authoritative śāstra-s—but often without explicit citation and with a heightened respect for the authority of the canon they invoke.

A tradition so steeped in the legitimizing force of ancient masters, which “preserv[es] material from earlier sources long after it had ceased to relate directly to current performance practice” (Widdess 1995, 118), may well “strike an unsympathetic Western critic as self-fulfilling,” as “an outright rejection of the principles of objective observation and scientific method” (Rowell 1992, 119), or as a “regressive re-appropriation of the past” (Pollock 1985, 499), but the SMK provides a fascinating example of how the citation of past texts can be a key strategy that accommodates the present. The scrupulous citation of canonical verses enables critical intertextuality: commentary, allusion, explanation, reconstrual, and questioning. As a śāstric scholar, Rāmāmātya was adept at borrowing foundational terms and metaphors from these past sources even while adapting these terms to changing practices.

Since roughly the beginning of the Common Era, the production of Sanskrit śāstra-s was intertwined with the promotion of political, religious, and cultural power in South Asia, and Vijayanagara in particular was a major crucible of music-theoretic scholarship. In addition to a large body of works of philosophy and poetry, at least seven other major Sanskrit śāstra-s on music were produced there in the two hundred years preceding the SMK (see Sathyanarayana 2001). But the SMK mentions none of these local writings. In fact, only one śāstra is explicitly referenced in the SMK: the encyclopedic, synoptic, widely revered Saṅgīta-ratnākara (hereafter SR), written three
centuries earlier by a polymath named Śārngadeva at the Yādava court at Devagiri, hundreds of miles north, in what is now known as Maharashtra. Like most medieval music theorists (writing in Persian as well as Sanskrit), Rāmāmātya quotes the SR frequently and even reproduces extended sections of the SR verbatim and without citation.

However, the SMK was neither a dutiful reproduction of orthodoxy nor a sweeping modernist rebuke of received tradition. Rāmāmātya explicates his novel analytic approach within the discursive world of the SR. His own stance on the music-theoretic tradition he inherits is neither entirely skeptical nor entirely credulous. As we will demonstrate, the SMK is a document of both tradition and modernity, of both rationalism and empiricism, of scholarly revision, political duty, and pious devotion.

Chapter I: Invoking Divine, Scriptural, and Political Authority

A modern-day reader, having heard of Rāmāmātya’s legendary rationality, might expect to open the SMK and find a table of tunings, a list of scale types, or a summary of theoretical statements. But the SMK, like all śāstric texts, begins by framing itself, suggesting how it should be read, and staking a claim to its own particular kind of authority. Rāmāmātya begins by invoking Śrīraṅga, the tutelary deity of the last legitimate Vijayanagara dynasty.Śrīraṅga’s form is both majestic and elegant, his love for Śrī his sole treasure. Endowed with devoted skill in matters of svara [melody], śruti [intonation] and grāma [scale] and eternally delighting in the creation of playful rhythms, his ornamented body is the universe of sound. May Lord Nārāyaṇa protect us. In the very beginning, venerable Brahma arose from the lotus that sprang from Viśnu’s navel, just as the essence of music came from the Śāma Veda, and the knowledge of truth from the scriptures of Vedānta. (I.1–2)

This dazzling opening, in which music is presented as a natural outpouring of Śrīraṅga’s celestial form, is well in line with the prevailing tendency, in Persian and Sanskrit music theory, to intertwine scholarly and divine authority. Rāmāmātya then glorifies his royal patron, Rāmarāya, first ascribing to him a grand mythic lineage, and then specifically comparing him to Yudhiṣṭhira, the legendary king of the Pāṇḍavas from the epic Mahābhārata:

Rāmarāya, supreme king of kings, was born due to the great tapas [sacrifice] of his parents. And when Krṣṇarāya [the last legitimate monarch] gave his daughter to him, her ancestors were glorified. He has two younger brothers, the famous kings Timmarāja and Śrīvenkaṭādri, just as noble Yudhiṣṭhira had Bhima and Arjuna as his powerful arms. (I.8–9)

Ramaswami Aiyar calls this “flattery” of Rāmarāya merely “fanciful” (1932, xiii), and of course he is correct that Rāmāmātya is not merely reciting a dis-
interested list of facts. But the praise of his patron nonetheless accomplishes something quite important. The SMK seems to have been intended in part, like many texts commissioned by kings, as a demonstration of Rāmarāya’s royal authority. Rāmarāya was in particular need of such legitimacy. He was an outsider from the Aravīdu clan, who had married into the ruling Tuluva family. He became the de facto ruler of Vijayanagara only after a prolonged conflict among successors (and thanks to the military support of the sultan of neighboring Bijapur) in which he took the nephew of the previous king into his custody in 1543 and commenced his rule of the empire as a regent. When the boy-king came of age, Rāmarāya placed him under house arrest; the rule of Rāmarāya thus began in name as well as fact only in 1550 (Eaton 2005, 92). The SMK, finished only months later, was likely commissioned soon after this dubious seizure of power. It casts the coup as an act of heroism (I.11), presents Rāmarāya’s alien lineage as a mark of royal distinction, affirms his patron’s familial connection (through marriage) with the previous dynasty, yet also asserts his uniqueness and superiority (I.8). Comparing Rāmarāya to the legendary kings Rāma (I.13) and Yudhiṣṭhira (I.9) claims more than strength—it puts him in the same breath with mythic exemplars of legitimate royal power.

After all, Rāmarāya would have known all too well that military might alone was not enough to legitimize a Vijayanagara king. Years earlier, at the peak of his career as commander of the Vijayanagara army, he had already tried and failed to seize the throne (Stein 1989, 113). His father-in-law, Krṣṇadevarāya, the last king of Vijayanagara with broad political support, had been known as sāhitti-samarāṅgaṇa sārvabhauma, a “universal monarch in the fields of literature and war,” an appellation that celebrated his military conquests and intellectual sensitivities in equal measure. His cultured court witnessed the zenith of Vijayanagara power, and his reign set a high standard of enlightened kingship. Thus, Rāmāmātya specifically distinguishes Rāmarāya’s refined sensibilities from the military victories that would have theretofore been his only claim to authority:

His arms can conquer the King of Snakes, so there’s no wonder he rules the earth, but it’s amazing that his mind, subtle as an atom, could contain the Lord of Mount Śeṣa, who is the entire universe. . . Rāmarāya spent his time in that palace, enjoying the presence of men whose minds were like embodiments of Śeṣa, masters of music, art and literature. (I.10, 19)

Again, this praise does more than simply flatter the king. It also serves to frame a text that will propose some significant revisions to the music-theoretic canon and thus was in need of a very similar kind of scholarly legitimacy. The distinctive encomium that Rāmāmātya places in the mouth
of Rāmarāya grants just this kind of authority. Unlike the authors of previous treatises, who were mostly known for their scholarly prowess alone (cf. SR, I.9–21), Rāmāmātya is specifically praised for his practical knowledge as well:

In this world, some create theories, while others understand practice, but I’ve seen no one else like you who is knowledgeable in the essence of both. (I.26)

Rāmāmātya’s authority is strengthened by his family tradition of scholarship:

Kallapadeśika, a treasury of knowledge greater than the author of Dattilam, was your grandfather, and so the texts of divine music pulse through your lineage. (I.27)

This Kallapadeśika is most likely Kallinātha, the celebrated author of the influential Kalānidi, a commentary on Śāṅgadeva’s SR, composed at Vijayanagara a century earlier (Ramaswami Aiyar 1932, xi–xii). By citing his own illustrious grandfather, Rāmāmātya was also proclaiming his genealogical legitimacy and scholastic authority—authority not only to review but also to revise the theory of music to fit current practice. He thus appears quite worthy when he receives the commission from Rāmarāya:

In musical texts there are differences of opinion regarding meanings and usages. Harmonize theory and practice, and offer a treatise on music filled with beauty. As in the past, when Patañjali analyzed Pāṇini’s grammar and developed rules for words, you must respect the views of Bharata and other [music theorists] as you produce a lucid model of svara-s. (I.28–29)

The royal commission of a traditional Sanskrit text legitimates Rāmarāya; the patronage of such a king likewise ratifies the authority of the SMK.

Note that Rāmāmātya’s charge is not to create something radically new to replace the past but rather to proceed by “respect[ing] the views” of canonical music theorists. His revisions are further grounded in tradition by citing a highly respected precedent for scholarly commentary: Patañjali’s second-century BCE clarification of Pāṇini’s canonical sūtra on Sanskrit grammar. These citations of venerable models establish an interpretive frame in which the appropriate revision of particular details (whether grammatical rules, tonal relations, or royal lineages) are sanctioned as a central part of maintaining the continuity of a centuries-old, authoritative tradition. The resonances with Rāmarāya’s claims to kingship—starting a new dynasty in the interest of preserving a greater tradition of imperial glory—may or may not have been obvious or even intentional. But the very frame of the SMK, established in this first chapter, legitimizes change not as anarchic, modern, or progressive but as canonical, authoritative, and traditional.
Chapter II: Svara-s

Chapter II reconceives the tonal schema outlined in the SR. We pause here to consider two important terms for understanding Rāmāmātya’s revisions: svara and śruti. Either one might roughly be translated into English as “note,” but this would obscure their crucial differences. Svara-s are sustained, pleasing, distinctive sounds (cf. SMK, II.26). There is an ordered sequence of seven svara names, roughly akin to movable do solfège, which is still in use today: sa ri ga ma pa dha ni. Śruti-s, on the other hand, traditionally numbered at 22 from sa to sa, are never individually sounded and almost never called by distinctive names. Instead, they form the silent matrix of possible locations for svara-s. Each svara is sounded at the upper limit of a range spanning the śruti-s just below it (cf. Rowell 1992, 151; Widdess 1995, 206). The śruti at which the svara is sounded is called the ādhāra śruti, or “anchor” śruti. But the remaining, unsounded, non-anchor śruti-s are not just empty units of measure. These silent, underlying śruti-s constitute the svara (cf. SMK, II.31b–32a) and are frequently described as belonging to the svara. For example, the svara called sa ordinarily has four śruti-s, referring to the tonal region between it and the next lower svara, ni; ni in turn ordinarily has two śruti-s between it and the next lower svara, dha. This model is depicted in the top of figure 1 as oblong white shapes, with bulges at the anchor śruti-s. In the SR, each svara is measured by the number of śruti-s that belong to it: either two, three, or four. As we will see, in Rāmāmātya’s system, svara-s are defined by their pitch, not by their theoretical śruti content.

In the tonal schema of the SR, any tone could serve as a tonal center. In Rāmāmātya’s new system, tones seem to be reckoned only in relation to sa. The new system is thus capable of accommodating a much wider range of scales, with intervals (such as those that we now would call augmented seconds and diminished thirds) that were impossible to render in the tonal schema of the SR. In chapter II, Rāmāmātya shifts from the theoretical 22-śruti gamut of the SR, in which tones were measured and named relative to one another and in which scales may be reckoned from various tonics, to a 12-fret gamut, likely measured relative to a constant system tonic (sa). Yet Rāmāmātya achieves these changes through incremental nomenclatural revisions, all the while periodically citing the authority of the SR.

Music in General

The first six verses of this chapter are a standard statement of music’s greatness, copied verbatim from the introductory section of the SR (I.25b–29). Rāmāmātya omits the tantra-inflected section of the SR in which music is
presented as a means of gaining liberation (*mokṣa*) from the agony of bodily embodiment. Instead, he focuses on the worldly rationale for the study of music: simply that everyone, including divinities, humans, and even animals, is enchanted by music. Sensitive sixteenth-century readers of musical śāstra would have noticed another conspicuous omission here. The SMK, unlike most of its major precedents in the Sanskritic tradition, omits the generic discussion of ancient obsolete concepts such as *grāma* and *jāti* that were typically rehearsed before discussing melody (te Nijenhuis 1977, 20). These concepts have no function in Rāmāmātya’s new schema.

In verses II.7–9, Rāmāmātya prepares the ground for his revisions of received intonational tradition by quoting the SR (IV.1b–3b) to assert that the concern of the SMK is not the celestial music (*gāndharva*) practiced by supernatural beings according to unchanging theory but human music (*gāna*) composed according to custom. It sets the stage for a discussion of music focused on human pleasure and local convention rather than spiritual liberation. But Rāmāmātya goes further than the SR, taking this opportunity to drive home the primacy of practice over theory:

> *Gāndharva* music is practiced with an adherence to theory, but if there is no contradiction when a theory is dispensed with, then practice is paramount to theory. In *gāna* music, practice ought to be more important than theory, but this practice should be abandoned if it doesn’t create something pleasant. So in this world, *gāna* music progresses in accordance with practice. (II.9b–12a)

He justifies this claim in reference to the SR. Its author, he says,

> who was versed in matters contained in all the musical śāstra-s, considered (in his chapter on instruments) the primacy of practice in *gāna* music, or rather, that the śāstra-s themselves value the importance of practice. Therefore, a śāstra that contradicts practice should (not be followed). While the laws of *graha, amśa* and *nyāsa* [prescriptions for melodic action], and the arrangement of the other *svara*-s are the domain of the śāstra-s, they do not contradict the basis of practice. But wherever there are inconsistencies between theory and practice, this [theory] should be abandoned. Like Śāṅgadeva who resolved in regard to *deśī rāga*-s that theory ought to conform with what is expressed in *gāna* music. Establishing the primacy of practice substantiates theory. (II.12b–17)

Having already established (in chapter I) a frame that allows for canonical revision, Rāmāmātya further establishes the observed conventions of practice as the guiding principle for musical śāstra. Rāmāmātya is now well positioned to revise ancient theory according to contemporary practice. His rationale for this, we stress, is *not* cast in modernist, progressive terms. Rāmāmātya does not claim to start fresh, to reject a stifling tradition, or to move forward. On
the contrary, Rāmāmātya justifies his radical changes by reference to the very śāstric tradition he seeks to update.

**The Tonal Schema of the Saṅgīta-ratnākara**

In II.18–30, Rāmāmātya reviews the tonal theory laid out in the SR. He intersperses his own summaries with direct quotes from the SR that describe the production of nāda, or vibration, in the body of a singer. Among other things, Rāmāmātya rehearses the conventional wisdom about the relationship between śruti-s and svara-s, so central to the ancient tonal system of the SR that Rāmāmātya is revising. As we will see, by the end of chapter III, Rāmāmātya replaces śruti measures with fret measures. But leading the reader gently along the way, for all the reasons outlined in chapter I, he must first pay tribute to the venerable śāstric tradition recorded in the SR, in which śruti and svara are closely intertwined.

Rāmāmātya leaves out the section in the SR about the cryptic two-vīnā proof of the 22 śruti-s found in the ancient Nātya-śāstra of Bharata (XXVIII.37). Instead, he asserts ambiguously, “The proof of this is clearly evidenced by the vīnā” (SMK, II.27a). Again, a śāstric dictum is radically reinterpreted in order to support Rāmāmātya’s new approach to tuning the vīnā, measuring notes in relation to frets rather than śruti-s. He then, in II.27b–30a, briskly summarizes the canonical assignment of śruti-s to svara-s: sa, ma, and pa have four, ri and dha have three, and ga and ni have two.

Rāmāmātya then reproduces SR I.3.25b–27a, in which the author acknowledges the confusion about whether śruti-s are locations for svara-s or the material of svara-s. The problem seems to stem from the fact that each svara contains more than one śruti. If only one of these śruti-s (the ādhāra śruti—henceforth “anchor śruti”—the highest of each group) is sounded, what is the function of the others? “I state that the fourth śruti [the anchor śruti at which sa is sounded] absorbs the previous three śruti-s. And it is agreed that such a śruti is activated by its preceding śruti-s” (II.30b–32a). Thus ends the straightforward rehearsal of the canonical outlines of music. From here, Rāmāmātya gradually begins to insert his innovations.

**Rāmāmātya’s New Tonal Schema**

The SMK lays out a new set of svara names, relationships, and melodic functions, which we are calling a new tonal schema. Although it is difficult to precisely reconstruct how the tonal schemata of the SR and the SMK would have sounded in practice, circumstantial evidence suggests that the pitches of several of these nominally identical svara-s would have been rather
different—some suggestions of these differences are evident in the relative vertical position of svara-s in figure 2, though these are not measured along any absolute pitch scale. As the tonal schema in the SMK is notionally identical to the one used in modern Carnatic music, it certainly is tempting to assume that these svara-s sounded the same four and a half centuries ago. We will postpone the issue of acoustic reconstruction until later. For now, we maintain our focus on the conceptual changes wrought by the SMK in order to highlight the rhetorical means by which Rāmāmātya persuades the reader to accept his system as canonical.

The SR describes a system of 7 pure (śuddha) svara-s and 12 altered (vikṛta) svara-s. Rāmāmātya’s first change is to reduce the number of altered svara-s from 12 to 7:

Given that Śāṅgadeva spoke of twelve altered svara-s in the SR, why have only seven been described here? It is true that in theory, twelve distinct altered svara-s are acknowledged, but in practice there are seven altered svara-s distinct from the pure svara-s. If we leave out the anchor śruti, a difference in sound is evidenced [between the seven acceptable altered svara-s and the seven pure svara-s]. (II.32b–35b)

Rāmāmātya is here suggesting a criterion for the acceptability of the seven acceptable altered svara-s: their anchor (or sounding) śruti is different from those of the corresponding pure svara. However, the five remaining unacceptable altered svara-s do not change their anchor śruti. In these cases, they exchange their lower śruti-s with neighboring notes (and thus contain a different number of total śruti-s) but sound the same relative to a fixed pitch.

Let us consider an example, shown in figure 1. In the SR, pure sa is so named because it contains the ordinary number of śruti-s (four), which are located above pure ni, which in turn contains two śruti-s. But these śruti measures can change, producing altered svara-s. In the SR, the dominant metaphor for these alterations involves one svara “taking” śruti-s from another. Thus, when pure ni “takes” two of the four śruti-s belonging to pure sa (so that ni now has four śruti-s and sa has only two left), its region of śruti-s expands, and it sounds higher. In this case, it is renamed sweet (kākali) ni. And since sweet ni sounds at a different pitch from pure ni, sweet ni is one of the altered svara-s that Rāmāmātya accepts. But what happens to sa as a result of this exchange? In the SR, sa then takes a different name (acyuta sa, or unlowered sa) because it has only two śruti-s left—though it is sounded at the same pitch. Similarly, when ri “takes” one of the śruti-s of sa, its name changes to altered ri, even though its anchor śruti (and thus its pitch) remains the same (see III.44b–49a). Though this may seem odd in contrast to modern Hindustani and Carnatic practice, it is no stranger than the convention of calling
Figure 1. Interval concepts in the SR and the SMK.
C a “major second” in relation to B-flat, and a “minor second” in relation to B. In the system of the SR, the names and even the functions (Widdess 1995, 211) of svara-s depend on their relationship to their neighboring tones and how many śruti-s they contain.

Rāmāmātya acknowledges that this shuffling of śruti-s produces a theoretical difference in śruti content but no difference “in practice”:

In the remaining [redundant] five altered svara-s, by taking a śruti from the previous svara, and leaving out its own first śruti, the differences in the previously mentioned svara-s are theoretically very close. In practice, however, no difference is perceived because of the fixity of the anchor śruti. (II.36a–37b)

If the anchor śruti of a note doesn’t change when it theoretically takes svara-s from its neighbors, it may sound different relative to its new lower neighbor, but it still sounds the same relative to sa, regardless of whether the preceding svara is relatively high or low (cf. Shringy and Sharma 2007, 143). Rāmāmātya seems to be describing a new tonal schema in which svara-s are heard in relation to a fixed system tonic, regardless of their interval with the note just below. But as always, Rāmāmātya does not simply claim that the old system was deficient, nor does he say that he is revising the tonal system in relation to sa. He describes this in terms of what is perceived, listing the five pairs of svara-s that were distinct in the SR but practically identical in a system with a fixed system tonic:

Why there is no difference is explained by current practice: unlowered sa cannot be differentiated from pure sa. No difference should be accepted between unlowered ma and pure ma. There is no separation of altered ri and pure ri. Altered dha is not higher than pure dha. No difference is perceived between the altered pa of three śruti-s and the altered pa obtained from the ma śruti. Since these five [redundant svara-s] are [already] included in the fourteen previously mentioned, I make no distinction between them. (II.38a–42a)

The lack of (ap)perceived difference in these cases is by no means obvious—after all, these pairs of notes were evidently quite distinct in the system of the SR. Rāmāmātya’s new system of names actively constitutes these observations. The conflation of these pitches already presumes—and, circularly, affirms—that they are no longer measured by inherent śruti content or heard relative to their lower neighbors. It seems to imply that they are heard relative to a fixed point of tonal reference. In any case, these five conflations (marked by gray rounded boxes in fig. 2) are the first step in Rāmāmātya’s new tonal schema. The changes in tonal schema made in the following section are summarized in the first two columns of figure 2. We suggest keeping this figure handy throughout the next section.
In II.44b–49a, Rāmāmātya returns, albeit briefly, to the canonical śruti model of the SR to affirm the relative placement of the remaining seven (acceptable) altered svara-s, which are summarized in the middle column of figure 2. He reckons them, for now, just as they are in the SR: in śruti-s. As we will see in chapter III, however, their precise śruti measures are made not only irrelevant but also impossible in Rāmāmātya’s system of tuning the vīnā.
Lower-Neighbor Ni, Ma, and Ga

Rāmāmātya begins the next revisions innocuously enough:

In accordance with what is seen in popular usage, I will delineate alternate names for some of the fourteen svara-s. (II.49b–50a)

On the surface, the following is merely a question of names. But Rāmāmātya is about to reassign the melodic functions of three altered svara-s that, in the SR, were lowered versions of sa, pa, and ma. He now calls lowered sa a kind of ni, lowered pa a kind of ma, and lowered ma a kind of ga. This is rather akin to calling C “B-sharp” when it functions as a lower neighbor to C-sharp. Since Rāmāmātya is adjusting the tonal system so that it is measured only relative to sa (never relative to any other note), the note just below sa functions melodically as a lower neighbor (just as B-sharp is heard as a leading tone, and not a lowered tonic, in the key of C-sharp). This is what Rāmāmātya means by niṣādatvam, or “ni-ness”—its melodic function between dha and sa.

Due to its known niṣāda-ness [niṣādatvam] in this world, lowered-sa is referred to by the name lowered-sa ni. Due to the usage of lowered-ma as a ga, I employ the term lowered-ma ga. Because the world identifies lowered-pa with ma, it is called lowered-pa ma. (II.50b–53a)

Were one to adhere strictly to the śruti measures of these notes (which Rāmāmātya does not), these new tones would all allow one-śruti diatonic melodic motion, which was unheard of in older treatises.

Ma now has two possible positions (pure ma and lowered-pa ma). But significantly, by removing these lowered versions of sa and pa, and eliminating their redundant śruti-based names, Rāmāmātya has left us with only one theoretical position for each of these two svara-s. To this day, in both North and South India, these remain the only two notes with only one (pure) version.

New Enharmonic Svara-s: Higher Versions of Ri and Dha

Next, Rāmāmātya introduces four enharmonic svara-s—that is, svara-s that sound the same pitch as others but are named differently for their scalar function. These svara positions—high and very high versions of ri and dha that overlap with the two lowest positions of ga and ni, respectively—endure to this day in Carnatic music theory. These are indicated on figure 2 in the column “new enharmonic svara-s (4),” enclosed in double ovals.

This may seem to be a strange move after dismissing five redundant svara names on the grounds that there is no difference perceived between them. Why introduce four new duplicate names for identical-sounding tones? It is a necessary step in order for Rāmāmātya to organize contemporary practice
into pitch-sets that have precisely one type of each *svara*. For example, in the tonal system described in the SR, a tonal path from C to D-sharp to E to F could only be described as motion proceeding through two separate varieties of *ga*—rather like calling the middle two notes E-flat and E. But Rāmāmātya is working toward a system of classifying rāga-s into distinctive pitch-sets along five dimensions: each must have precisely one type each of *ri*, *ga*, *ma*, *dha*, and *ni*. This allows him to account for melodic action between, for example, D-sharp and E (6-śruti ri and lowered-*ma ga*), as in modern Carnatic Rasikapriya or in the sixteenth-century practice of Deśākṣi (IV.30b–31, V.30).

In some instances when it is observed that a *ri* falls in the range of pure *ga* [E♭], it is known by the name 5-śruti *ri* [D] and if it falls in the range of common *ga* [E], then in accordance with what is observed, it is called 6-śruti *ri* [D♯]. Similarly, when a *dha* stands in the range of pure *ni* [B♭] it is called 5-śruti *dha* [A] in accordance with what is observed, and in some instances, if it stands in the range of fine *ni* [B] it is called 6-śruti *dha* [A♯]. (II.53b–57a)

Recall that the SR permitted only 2-, 3-, and 4-śruti intervals; in addition to the śruti intervals noted in II.50b–53a, Rāmāmātya here explicitly includes 5- and 6-śruti intervals as well. *Ri* and *dha* are specially suited for these names, as they are located above *sa* and *pa*, *svara*-s that, in Rāmāmātya's system, never shift position.

By the end of chapter II, Rāmāmātya has established 18 *svara* names: 7 pure *svara*-s, 7 altered *svara*-s, and 4 enharmonic *svara* names. But he counts only 14 distinct positions used for all of the rāga-s in practice: “These fourteen *svara*-s definitely exist in rāga after rāga” (II.65b). In the SR, 19 *svara*-s are each counted separately, on the basis of both the position of their anchor śruti and their śruti content (I.3.45b–46a.) Thus, the fact that two *svara*-s would sound at the same pitch doesn’t negate their distinctive identities and melodic functions. In the SMK, the absolute śruti count of a *svara*, in a fixed tonal reference frame, is the key determinant of its identity. *Svara*-s sounding the same pitch, even with variant śruti-measures and variant names (e.g., 6-śruti *ri* and *common ga*), are conflated in his final tally of 14. Though he claims that his changes are simple accommodations of what is obvious and conventional, he is also leading us toward a certain kind of hearing. By conflating some pairs of *svara*-s, invoking new distinctions between others, and renaming obsolete melodic functions, he directs us to hear tonal relations in a certain way that would have been impossible to express in the system of the SR.

Rāmāmātya has thus far presented these changes in the nominal shell of the ancient system that reckons the identity of a *svara* by its śruti content. But in chapter III, Rāmāmātya goes further, settling on only 12 distinctive values
articulated on frets. These frets eventually take the place of śruti-s as the generative origin of the intonation of svara-s.

Chapter III: The Vīnā

In this chapter, Rāmāmātya describes the method of setting frets on a vīnā. This is by no means the first mention of frets in a South Asian music treatise (see SR, V1.262 or Ghuniyat al-Munya [ca. 1375]). But these frets, properly set, come to replace śruti-s as the key measure of svara-s in Rāmāmātya’s tonal system. In fact, the very structure of parallel frets creates difficulties for śruti-s. Though Rāmāmātya doesn’t mention it explicitly, the canonical system of śruti-s described in the SR is impossible to render on a vīnā tuned as he prescribes. As Ramanathan (1992, 80) points out, the layout of this fretted vīnā requires a departure from the prescribed numbers of śruti-s (see fig. 3). Rāmāmātya may well have been aware of this fact; it would certainly explain why he remains silent on the matter of śruti-s when presenting his tuning method. This silence elegantly fulfills two conflicting desiderata: to perform continuity with a śāstric tradition and to present a new way of thinking about intonation that could apply to fretted vīnā-s.

The Structure of Rāmāmātya’s Vīnā

Rāmāmātya mentions three kinds of vīnā in common use: Madhya-melā, Acyutarājendra-melakā, and Śuddha-melā. The bulk of this section describes the tuning of the Śuddha-melā vīnā, which is tuned as follows:

- String I—(very-low-octave) sa
- String II—(very-low-octave) pa
- String III—(low-octave) sa
- String IV—(low-octave) ma

He also describes the tuning of the three side strings, very much like the unfretted strings called cikāri on a modern sitar, and tālam on a modern Sarasvatī vīnā. They are tuned to sa, pa, and (low-octave) sa. These unfretted strings would almost certainly have served to reinforce a steady reference pitch, regardless of rāga, just as they do on modern sitars and vīnā-s. They further are called śruti strings—apparently, as in one modern usage of this term, in reference to the fixed anchor śruti of sa, rather than any specific microtones that constitute svara-s. In any case, the presence of these strings strengthens the case that Rāmāmātya was describing a single tonal system measured relative to an unchanging sa.

Next, Rāmāmātya describes the layout of svara-s on the frets, which is summarized in figure 4. Interspersed in this description are the assertions
Figure 3. Śruti discrepancies on fretted vīṇās.

- 1, 2, and 3 are pure intervals.
- 4 is a common interval.
- Below are putative śruti intervals:
  - svara-s on sa string (SMK III.36-39)
  - putative śruti intervals between svara-s on sa string (SMK II.27-65)
  - putative śruti intervals between svara-s on ma string (SMK II.27-65)
  - svara-s on ma string (SMK III.41-43)
that the fifth and sixth frets (and presumably higher frets, too) on strings II and III are useless (III.35–36a, 39b–40), because the svara-s are reproduced on strings III and IV.24

The next line of the manuscript reads, cryptically: “This is the method of a mela.”25 This seems to imply that the method of generating mela-s (pitch-sets) is derived from the setting of frets on a vīnā. Note that the frets set thus far yield only 12, not 14 notes. This accords with the later North Indian system of pitch-sets called thāt-s, which also refers to specific arrangements of frets (Brown 2003–4).

The Theoretical Basis of Rāmāmātya’s Tuning System: Svayambhu Svara-s

Before he begins describing his method for setting frets on the vīnā, Rāmāmātya must explain the theoretical basis for his method and distinguish it from the canonical sruti-based descriptions of intonation. Rāmāmātya’s method proceeds by tuning according to what he calls svayambhu svara-s, which he defines as follows: “The svayambhu svara-s are those not determined by one’s own judgment” (III.44b).
Svayambhu svara-s are central to understanding Rāmāmātya’s tuning method. He seems to have coined the term, and it furthermore seems to have later fallen out of use in the precise sense that he used it. Its literal meaning is “self-existent” or “self-born,” sometimes used to refer to things not contrived by humans—for example, natural rock formations that resemble śiva-liṅgam-s.26 Modern commentators have often taken this term to refer to string harmonics (especially those sounding a fifth above a given note) or samvādi-s (consonant intervals a fourth or fifth apart) (e.g., Ramaswami Aiyar 1932, liii; te Nijenhuis 1976, 4; Grieg 1987, 359). The confusion about this term is exacerbated by the word’s ambiguous etymology, its varied usages by later theorists, and a typographical error in Ramaswami Aiyar’s widely known English translation.27

However, the Sanskrit text of the SMK would seem to support a rather different understanding of svayambhu svara-s, a concept that is quite distinct in principle from fourths, fifths, octaves, śrutī-s, or ratios. The word appears seven times in the text. All but one of these (47b–48a, discussed following) is unambiguous: svayambhu-s are simply the svara-s that one finds available along a properly fixed fret. For example, if we fix the second fret to produce pa (G) on the ma (F) string, then pure ga (E♭♭) becomes available as a svayambhu on the sa (C) string, and pure ni (B♭♭) becomes available as a svayambhu on the pa (G) string. As Rāmāmātya says, these svayambhu-s are those svara-s not determined by sva-buddhyā, literally “from one’s own discriminating judgement.” That is, these svayambhu-s are there, ready to be played on the fret, without any judgment required.

It should be noted that this is not a purely algorithmic method of tuning. In addition to all of the physical imperfections inherent in tuning real three-dimensional strings (i.e., of non-infinitesimal width), discriminating judgment is also implicitly required in adjusting the angle of each fret—each presumably is to be placed perpendicular to the neck of the vīnā.28 More important, Rāmāmātya’s method still implicitly requires “discriminating judgment” in order to tune the open strings of the vīnā in the first place to sa, pa, sa, and ma. Rāmāmātya evidently assumes that any competent vīnā player would be capable of doing this by ear and makes no effort to fix their values using ratios, śrutī-s, svayambhu-s, or any other method. This, together with the vague wording of steps (1) and (4), suggests that Rāmāmātya may assume that sa, pa, and ma are especially easy to discern by ear.

But svayambhu-s are never identified as intervals. In fact, Rāmāmātya clearly distinguishes his practical method of tuning by svayambhu-s from the canonical understanding of consonances (samvādi-s) as 8- and 12-śrutī intervals (which probably sounded like perfect fourths and fifths, respectively), described in the earliest extant Sanskrit sources on music (e.g.,
Nāṭya-śāstra, XXVIII.24 and Dattilam, I.19). He precedes his description with this statement:

Two svara-s separated by a distance of eight or twelve śruti-s should always be understood as mutual samvādi-s. This principle is well explained by statements in the SR.

Now another method [mārga-antara] of determining the values of svara-s is explained. (III.45b–47a)

This is the last we hear of samvādi-s or śruti-s. Rāmāmātya’s method of properly setting the frets in place requires tuning only pairs of svara-s with the same value (for example, pure dha on both strings II and IV). Rāmāmātya makes no distinction between octaves for the purposes of tuning: either one of a pair of notes with the same name has the same pramāṇa, or “value,” regardless of its octave. As Rāmāmātya says in II.65b–c, nominally identical svara-s at various octaves simply “repeat.” They are not samvādi-s, or svayambhu-s, or even notionally separated by intervals at all.

Setting the Frets of the Vīnā

The tuning system proposed by Rāmāmātya begins with the svara-s already available on the open strings (sa, pa, and ma) and proceeds to set each of the frets by tuning other notes to octaves or unisons of already-available svayambhu-s. Each time a fret is set, new svayambhu-s become available on the other strings, and the process continues until he has frets for 12 svara-s. Step 1, step 2, and so forth given in the following method are indicated in figure 4 by numbers in parentheses.  

Step 1: Set Fret 2.

The low pure pa produced on fret 2 of string IV is known to be svayambhu. (III.47b–48a)

Pa is already available as a svayambhu on the open string II. We adjust fret 2 of string IV so that it produces a pa, which is an octave above (to be precise, in Rāmāmātya’s terms, equal to) the open sounding of string II.

Therefore all svara-s produced on fret 2 are svayambhu-s, and their values can be determined without discrepancy. (III.48b–49a)

Once the fret is set in place, the svara-s it articulates on each of the four strings are all fixed and accurate, given by the placement of the fret.

Step 2: Set Fret 4. Among the svayambhu svara-s now available on fret 2 is the pure ni (B♭) produced on string II. We adjust fret 4 until the pure ni produced on fret 4 of string IV is identical with this svayambhu svara.
The very low pure ni produced on fret 2 of string II has the same value as the low pure ni found on fret 4 of string IV. (III.49b–51a)

Once fret 4 is set in place, the svara-s it affords on each of the four strings, like those on fret 2, are available as svayambhu-s (III.51b–52a).

**Step 3: Set Fret 6.** We use the same technique to fix fret 6, tuning the (low) lowered-sa ni (~B) on fret 6 of string IV to the svayambhu (very low) lowered-sa ni on fret 4 of string II. The fixing of fret 6 in turn produces four more svayambhu-s (see III.52b–55a).

**Step 4: Set Fret 5.** Rāmāmātya seems to find the method of fixing this fret so obvious as to not require explication; thus we can only speculate about how it might be done. At any rate, once it is fixed,

Fret 5 produces sa and ma, so all svara-s generated from this position are svayambhu-s. (III.55b–56a)

There is also a new svayambhu svara produced on string IV: fine ni (III.56b–57a).

**Step 5: Set Fret 3.** We then fix fret 3, by tuning the very low fine ni on fret 3 of string II to the svayambhu low fine ni now available on fret 5 of string IV (see III.57b–58a).

**Step 6: Set Fret 1.** Finally, we fix fret 1, following the same method: the low pure dha on fret 3 of string IV is equal to the very low pure dha generated by fret 1 of string II (see III.59b–60).

**Justifying a 12-Svara System**

Had he continued up the neck of the vinā with his method of tuning, he could have generated any number of new tones with distinctive pitches: 14, 17, 22, or more. Why does Rāmāmātya stop here? He simply states,

This method of aligning six frets generates all the measurable svara-s, and Rāmāmātya has demonstrated the determination of these values. (III.61–62a)

He had also asserted this earlier after listing the svara-s produced on each fret (III.43b–44a). But the set of “measureable svara-s” amounts to only 12. The two dubious svara-s (sweet ni and in-between ga) have been left out, since separate frets for in-between ga and sweet ni would “cause a muddle” (saṅkirṇa-bhāvena):

Earlier I spoke of a total of fourteen svara-s, but now I provide a thorough explanation of the twelve svara-s. Why are two (extra) frets not described for the
production of sweet ni and in-between ga? If frets were separately fitted for sweet ni and in-between ga, playing them would be unpleasing because it would cause a muddle. Therefore separate frets are not described. (III.64b–67b)

It is unclear whether this means a tonal muddle or an ergonomic muddle. In fact, Rāmāmātya’s new system depends so thoroughly on the material frame of frets that it is hard to distinguish them. He also claims that it is possible to produce these svara-s, if necessary, from nearby frets:33 “Learned musicians maintain that the sweet [ni] śruti can be produced from the lowered-ma ga fret” (III.68) and that some musicians accept the higher versions of ga and ni as acceptable substitutes: “Due to their minute difference in pitch, other practicing musicians understand lowered-ma ga and lowered-sa ni to be substitutes in lieu of sweet ni and in-between ga” (III.70–71a). He then, in a by-now familiar rhetorical move, justifies his break from the tonal schema of the SR by returning to the SR itself for justification: “This is like the statement expressed by [Śaṅgadeva] that in all cases, the sweet ni and in-between ga svara-s are used sparingly” (III.71b–72a).34

But there is another remarkable shift here, which Rāmāmātyā passes over in silence. All of the measureable svara-s have been produced without any mention of śruti-s. The six fret positions have now replaced the 22 śruti-s as the means by which svara-s are both measured and generated. In the SR, 19 svara-s were separately enumerated, many of which have the same anchor śruti-s, and therefore would sound at the same pitch relative to a fixed tone. The SR accorded each of these svara-s a distinct identity by virtue of how many śruti-s it contained (either two, three, or four). In the SMK, however, despite the 18 svara names listed in chapter II (ranging widely in śruti content from one to six) there are only 12 distinctive pramāṇa-s measured on frets. Each svara has a distinctive designation in a closed system of functions and names, yet its identity depends on its having one of 12 distinctive values articulated on a properly fixed fret.

**Twelve or Fourteen Svara-s, Fifteen or Twenty Mela-s?**

Rāmāmātya admits that both a 12-svara and a 14-svara system were possible, without making any attempt to reconcile them. At the end of the section on mela, Rāmāmātya cites an unresolved difference of opinion among vīnā players. Rāmāmātya maintains this ambiguity even when it leads to ambiguities in his mela system. He says that the five mela-s distinguished by in-between ga and/or sweet ni may actually be considered to be interchangeable to those with the near-equivalent lowered-ma ga and/or lowered-sa ni, respectively, reducing the total number of mela-s to 15.35 He further marks these notes as
odd by placing the five dubious mela-s that apparently are distinguished by their use at the end.

The characteristics of the twenty mela-s have been considered in the main text. But two viewpoints will be discussed based on vīnā practice. In the case of treating both in-between ga and sweet ni separately, the first view is that there are definitely twenty mela-s. But in substituting in-between ga and sweet ni with lowered-ma ga and lowered-sa ni respectively, the second view deems there to be fifteen mela-s. The remaining five mela-s are said to be absorbed into the fifteen mela-s. (IV.63–66b)

These pitch-sets (either 20 or 15, depending on whether one distinguishes the two odd notes or not) are laid out in chapter IV. In principle, these mela-s account for every rāga known to Rāmāmātya. Chapter V describes the modal attributes of these rāga-s.

**Does the SMK Prescribe a System Tonic?**

The circumstantial evidence for a fixed-sa system tonic in the SMK is quite strong: the disappearance of the ma-grāma (already reported in the Kalāṇidhi), the side strings tuned to sa and pa, the dismissal of altered svara-s that sound identical relative to sa, and the exclusion of sa and lowered pa as varieties of ni and ma. But Rāmāmātya never explicitly mentions a drone or tonicity.

The tidy picture of a single tonal center in Rāmāmātya’s system is further complicated by the descriptions of rāga-s in chapter V. In addition to their scalar patterns, rāga-s are described according to their amśa, graha, and nyāsa svara-s: the svara-s on which melodies begin, end, and come to rest. In every case, Rāmāmātya gives the same svara for all three, suggesting that this svara bears a great deal of tonal weight. Often this weighty svara is sa, but not always. This is a strong hint that many rāga-s in practice may have had functional tonal centers other than sa, even within a sa-centric tonal schema.36 N. Ramanathan (1992) suggests one solution: these graha svara-s may have referred to a process of transposition whereby ri was temporarily renamed sa, ga was temporarily renamed ri, and so on. Further speculation about functional tonics would require more scholarly work on modal practice in sixteenth-century Vijayanagara.

**Tonal Translation, Pythagoreanism, and the Question of West Asian Influence**

The tuning system described in chapter III seems to invite translation into modern terms. V. N. Bhatkhande, for example, translated the svara-s of the
SMK into those that would have been familiar to Hindustani musicians in the early twentieth century, rendering, for example, Rāmāmātya’s pure ga (E♭♭) as a Hindustani pure re (D) (1972, 25). While Bhatkhande himself was not terribly concerned with measuring precise pitch-values, others have attempted to translate Rāmāmātya’s svara-s into cents (equal-tempered twelve-hundredths of an octave.) Despite the wide margin of error that acoustic reconstructions must allow, it is clear that Rāmāmātya’s pure svara-s would have sounded quite different from those described in the SR. His pure ri, ga, dha, and ni were almost certainly lower than the svara-s called by those names in the SR, sometimes by as much as a semitone (see Forster 2010, 545, 550, 573; te Nijenhuis 1976, 4.)

Several latter-day commentators on the SMK have gone beyond acoustic reconstruction and translated Rāmāmātya’s tuning system into a series of ideal ratios (e.g., 9:8 for pure ga and [9:8]² = 81:64 for below-ma ga). This interpretive tradition is so strong in the secondary literature that one author of the present essay mistakenly replicated these erroneous claims in an earlier article (Rahaim 2011, 666.) Some have gone even further, claiming that Rāmāmātya’s tuning was “Pythagorean” all along (e.g., te Nijenhuis 1974, 26). In light of the many well-documented Islamicate features of Vijayanagara court life, some have even speculated that this putative Pythagorean intonation was inherited from West Asian theorists of nisbat, or string-length ratios (Ramaswami Aiyar 1932, lii; Brhaspati 1969, 41; Grieg 1987, 354; te Nijenhuis 1974, 25; 2010, 37). To be sure, there were older Arabic and Persian texts in circulation in sixteenth-century India (e.g., the Kitāb al-Adwar) that reckoned scale degrees by ratios. And several Indian theorists writing after Rāmāmātya (e.g., Kāmilkhānī, Hṛdayanārāyana, Qāsim Dost ‘Ali al-Bukhārī, Ahobala) did indeed describe their tuning system in terms of string lengths (Brown 2003, 199; Storey 1977, 414).

It is important to note, however, that the SMK itself never mentions ratios. Like his Arab and Persian contemporaries (Grieg 1987, 366; Mohammadi 2006, 43–44), Rāmāmātya seems to have been largely unconcerned with arithmetic accounts of consonance. His tuning system requires no ratios, no intervals, no consonance—only svayambhu (the unmeasured notes found ready for use once a fret is set) and tonal identity (i.e., unisons and octaves.) The only mention of consonance in the whole treatise (samvādi, in 45b–47a) is unconnected with the actual tuning process. Numerical measure is conspicuously absent precisely where a Pythagorean would find it most obvious: in measuring the placement of frets. This false ascription of Pythagorean influence in retrospect would be a mere detail were it not for the fact that the SMK has been widely understood by historians as a catalyst for a radical shift in musical epistemology, not just as a practical tuning manual. From the
point of view of intellectual history, the difference between hearing a tone as self-evident and hearing it as an expression of a ratio is as crucial as the difference between imagining the earth as the unmoving center of the universe and imagining it orbiting the sun—even when the practical measurements yielded by these various models happen to coincide. Pythagoreanism, after all, is more than a handy method for setting frets—it is a totalizing view of a rational, harmonious cosmos, organized by number (Godwin 1988, 11–13; Brown 2003, 191). Rāmāmātya, in contrast, seems to consider independence from rational discrimination to be a special virtue of his method (44b–45a).

**Sounding Śāstric, Reading Sāstra-s**

The very presence of Sanskrit—its sound, its appearance in writing, the elite audience it interpellates—not only bears but serves as “the stamp of orthodoxy” (Sawhney 2009, 9). The production of Sanskrit texts was a crucial part of legitimizing kingship at the Vijayanagara court, and the need for orthodox textual production would have been particularly acute as Rāmarāya claimed the throne. But this śāstric orthodoxy does not simply amount to a mechanical repetition of past assertions; it accommodates a great deal of creative revision. Rāmāmātya ends up with a very different tonal schema, free from enumeration, measured relative to sa, and capable of accommodating a wide range of intervals and scale types. Yet he never claims to replace or improve the system of the SR, never claims to make it new. Though the tuning system in chapter III eliminates the need to measure svara-s numerically by śruti-s, Rāmāmātya never explicitly claims that his system has made śruti-s obsolete. As with the question of the system tonic, he simply remains silent on the matter.

This selective silence is part of the orthodox sound of the SMK—and its sound certainly does matter. The life of a text like the SMK would almost certainly have been both oral and literate, including verbal citation from memory as well as silent study. Even when Rāmāmātya’s system is logically incommensurable with that of the SR, it rings out in familiar terms, smoothly blended with what would have been familiar couplets. Since both the SMK and the SR were composed in the standard śloka meter of four octo-syllabic units (pāda-s), it was not hard for Rāmāmātya to seamlessly interweave verbatim passages of the SR with his own work. Though these citations often take on fresh meanings in their new contexts, there is no clear sonic cue that marks the end of a quotation and the beginning of an original claim. Surely, in light of Rāmāmātya’s rather different tonal schema, the sense of continuity between the SR and the SMK is an “illusion” (Powers and Widdess 2001, 173). But the feeling of continuity is also quite concrete, quite palpable;
Rāmāmātya smoothly merges his revisions into the rhythmic flow of śastraic discourse without any audible rupture.

The dialectical flow of this revision-in-continuity is obscured if we approach śāstra-s as either religious texts authored by infallible Hindu sages or secular texts authored by disinterested secular scholars. The SMK is not exactly one or the other. Though clearly not a work of secular humanism, the blanket term “Hindu” would also, among other things, obscure its omissions of the SR’s tantric content in favor of Vaiṣṇava imagery (see Eaton 2005, 83, on Vijayanagar’s shift from Śaivite to Sufi, Jain, and Vaiṣṇava institutional patronage). Though Rāmāmātya was writing at a court marked by cosmopolitan Islamicate conventions, served by Persian soldiers, Jain merchant, Portuguese diplomats, and Turkish cannoneers, in the middle of a vernacular literary efflorescence, he did not have to look beyond the Sanskrit canon to justify his revisions. His authority to adapt theory to practice is bolstered by references to Patañjali, Śārnagadeva, and even his own patron, Rāmarāya. Even at its most radical, the SMK maintains continuity with a canonical past and establishes its orthodox credentials in a narrative frame inflected by myth, just as the SR did in its own time.

The SMK is by no means unique in this regard. As recent scholarship has shown, even ostensibly secular twentieth-century music reform projects were undergirded by mythic visions: ancient origins, grand civilizational struggle, a dawning new age (Neuman 2004, 17, 92–93; Bakhle 2005, 4, 117; Weidman 2006, 6). This in itself should not surprise us or lead us to either celebrate or denigrate such projects. Nor does it make them particularly glorious, irrational, or contradictory. Whether secular reason is understood to be inextricably entangled with religious and ethical commitments (Mahmood 2009, 861) or transcendent-inclusive of a mythic infrastructure (Wilber 1995, 51), there is a high analytic price in categorizing music-theoretic work as simply religious or secular, traditional or modern, irrational or rational. We have worked instead toward an integral view of musical śāstra that reads even the strictest taxonomy, deduction, and logic as processes intertwined with narrative, authority, and rhetoric.

In this light, even the twentieth-century Pythagorean reconstructions of the SMK can be read as a kind of śāstraic process. The same might be said of the work of “Indo-Occidentalists” (Jairazbhoy 2008) who creatively invoke links between ancient śruti measures and modern music, or music reformers like V. N. Bhatkhande (who, for example, reads SMK II.9–14 to mean that celestial gāndharva music is not the concern of humans [1972, 18]). Surely, these scholars project their own concerns onto the past, as do we all. In so doing, they are not so far off from śastraic authors like Rāmāmātya, Kallinātha, Śāṅgadeva, and Mataṅga, whose job has always been to “harmonize the-
ory and practice” (SMK, I.28). Improvising within well-established discursive spaces, they reconstrue the canonical models of their forebears in order to suit their own times and their own purposes. And though the present essay is oriented toward textual criticism and intellectual history rather than śāstric prescription, we cannot claim that our own reading of the SMK is simply and unproblematically descriptive. In carving out a space for musical śāstra independent from religious scripture and secular science, we foreground the creative, poetic, rhetorical work of music theorists: the work of actively constituting and projecting—rather than simply describing—a world of music.

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Notes

1 We stress that these two stances, while quite distinct from each other, are not essential characteristics of writers but rather contingent attitudes that constitute the text at hand (see Berger 2009 for more on stance). Various stances on reading the Gospel of Thomas, for example, might constitute it as a tedious homework assignment, an exotic transgression from canonical norms, or a normative source of sacred instruction. Many writers can comfortably take either of the stances suggested here, at different times, without contradiction—compare Daniélou (1954, 11) with Daniélou ([1943] 1995, 84).

2 The effects of this colonial encounter, of course, are difficult to assess without a solid understanding of the musical knowledge systems of the sixteenth and seventeenth centuries (cf. Pollock 2011, 1; Brown [Schofield] 2008, 336; Slawek 2007, 509). This need is part of what motivates the current study.

3 As we will see, the epistemology of the SMK is neither exclusively empirical-inductive nor exclusively rational-deductive.

4 We have used Roman numerals for chapters throughout per the canonical traditions of citing śāstra.

5 South Indian court scholars and poets were often given special names that referred to their patrons. For example, the great poet Bhaṭṭu Mūrti was called Rāma-rāja-bhūṣana, “an ornament for Rāmarāya,” thereby foregrounding the poet’s relationship to his esteemed patron and glorifying both the king and his cultured court. Rāmāmātya’s appellation seems to follow a similar pattern, as the titles -āmātya/-mantri both refer to a minister. Thus, our author’s actual name remains anonymous while his nom de plume comes to us only as a reference to his royal sponsor. K. C. D. Brhaspati’s (1969) claim that Rāmāmātya (the author of the SMK) and Rāmarāya are actually the same person is difficult to maintain in light of the section of the SMK in which Rāmarāya and Rāmāmātya have a conversation (I.25–29).

6 In Bhatta’s 1963 translation into Hindi of what purports to be V. N. Bhatkhande’s, the text omits chapter III. The relation of this volume to the earlier Marathi edition
and the reason for the omission remain unclear to us. However, Bhatkhande certainly appears to have known the material that was included in that chapter, since he mentioned in a lecture both the vīnā and the system proposed by Rāmāmātya for fixing its frets (Bhatkhande 1972, 23).


For an overview of the śāstric tradition, with special reference to saṅgīta-śāstra, see Rowell (1992, chap. 6).

As Sheldon Pollock puts it, “The work Sanskrit did do was beyond the quotidian and the instrumental; it was directed above all toward articulating a form of political consciousness and culture, politics . . . as celebration of aesthetic power” (2006, 14). After roughly 1100 CE, however, this already-polyvalent relationship was further complicated by the adoption of Persian as a court language of prestige in the North and the advent of emergent vernacular literary traditions particularly in the South. In languages like Telugu and Kannada, skilled poets now composed expressive literary works and gave new voice to budding regional polities. But as much as these texts offered something fresh and different, they also represented a regionalized articulation of the age-old Sanskrit paradigms of literary aesthetics, poetic tropes, religious beliefs, and sociopolitical ideologies. It is important to note that this process of literary vernacularization occurred primarily in the realm of expressive genres like kāvyā, whereas the scientific language of śāstra remained almost exclusively bound to the refined, precise idiom of Sanskrit. Scientific literature, including several musical treatises, were indeed composed in Persian during this period in South Asia, and this fertile area of study is in need of deeper investigation.

10 It is possible, however, to discern the implicit influence of other treatises. For example, Rāmāmātya’s grandfather Kallinātha’s Saṅgīta-kalānīdhi set an important precedent for Rāmāmātya’s break with the SR, by asserting, for example, that only the sa-grāma was in use in fifteenth-century Vijayanagara. Also, the (no longer extant) Saṅgīta-sāra of Vidyāraṇya (an earlier treatise often linked to the founding of Vijayanagara) is mentioned in the Saṅgīta-sudhā (a seventeenth-century Tanjore treatise) as the first treatise to propose mela-s as a method of rāga taxonomy, though this may well have been a mistaken attribution. In any case, it is not possible to be certain that the idea of mela was first proposed in the SMK (cf. Ramanathan 1992, 83).

11 Śrīrāṅga is the local form of Viṣṇu worshipped in Śrīrāṅgam, a vital hub for the Śrīvaiṣṇava tradition that gained significant support and patronage from the Tuluva kings of Vijayanagara—most famously, the celebrated emperor Krṣṇadevarāya (r. 1509–29), who was an ardent proponent of this particular brand of Vaishnava devotion. The mythic metaphors associated with the great god Viṣṇu resonated with the model of divine rule that South Indian kings had embraced and promoted for centuries.

12 See, for example, the opening of the Jawāhir al-Mūsiqāt-i Muḥammadi of Shaykh ʿAbd al-Karim Ibn-i Shaykh Farid-i Anšāri al-Qādiri-yi Jawnpūri (ca. 1650), which
describes “the beginning of Āwāz [sound] which came into existence from the entity of God, the highest glory to Him, the presence of the world of heavens” (Mohammadi 2006, 46).

13 Kallinātha was not merely a “treasury” of fixed knowledge but also identified ways in which ancient theory seemed to contradict the contemporary practices he observed at Vijayanagara (see Brhaspati 1969, 20; Shringy and Sharma 2007, xix–xx; also cf. note 10 in this article on Vidyārānya’s nonextant Saṅgīta-sāra on melā-ś).  

14 Bharata is the legendary author of the musical treatise Nāṭya-śāstra.  

15 When defining both these terms, Rāmāmātya quotes directly from Śārṅgadeva: cf. SMK, II.24b–26b/SR, I.3.23a–25a (śvāra) and SMK, I.22a/SR, I.3.8a (śrutī).

16 We have described here the dominant conception of the relationship of śrutī to śvāra that obtained in describing the tonal schema of the SR. At other times, as in discussions of consonance, this relationship was quite ambiguous and even explicitly controversial (as in the Brhaddeśī of Maṭāṅga). There are certainly moments when ancient theorists would treat sruti-s as empty intervals (cf. Lath 1978, 203–5.) For a detailed analysis of the relevant verses in SR, see Shringy and Sharma (2007, 134–36; cf. Ramaswami Aiyar 1932, 48).

17 For more about the system outlined in the SR, see Powers and Widdess (2001).

18 This quote, unlike the others, is taken from the fourth book of the SR, a relatively pragmatic description of song forms (prabandha).

19 This refers to SR’s sixth chapter on instruments (vādyam-adhyāya), not translated in the current Shringy editions.

20 Rāmāmātya conspicuously omits SR I.3.6, which suggests an esoteric, and ostensibly Tantric, etymology for the word nāda.

21 The literature on tone perception generally treats tonal schemata as implicit perceptual processes rather than explicit nominal differences, like the systems in the SR and SMK. But this term, by highlighting the mutual dependence of percepts and concepts, actually fits our purposes well. Rāmāmātya’s key basis for renaming these svara-s rests on perceived distinctions and conflations of pitch and function and likewise directs the reader toward a new way of hearing tonal relations.

22 In modern terms, we might understand this process of notes “absorbing” each others’ śrutī-s as dealing in mutual tonal relationships between svara-s rather than an absolute relationship with sa, though neither Śārṅgadeva nor Rāmāmātya puts it quite this way. Even Śārṅgadeva’s system already was showing signs of accommodating a system tonic (see Ramanathan 1992, 78). It’s unclear to what extent the awkwardness of the śrutī system for fretted instruments was a consequence of it being specially suited for arched harps (Jairazbhoy 1995, 90–91). Rāmāmātya’s new system, however, was adapted for a vīnā much like the modern instruments that bear the same name, fretted lutes (Powers 1970, 13). Here, open strings provide absolute pitch references, with side strings, sounding a constant reference pitch (sa) against which pitches are always measured. However, it would be an exaggeration to say that a fretted instrument requires a fixed system tonic (modulation is common on guitars, for example).
The term “lowered pa” (cyuta pa) does not appear in the SR but rather “altered pa” (vikrt pa). Rāmāmāya calls it lowered pa, presumably for consistency with lowered sa and lowered ma.

Rāmāmāya makes a similar assertion at III.62b–64a: “the actual svara-s produced on the frets in these registers are useful only on string IV, but not the other three strings.” This suggests first of all that sixteenth-century Vijayanagara śuddha-mela vīṇā players (like twenty-first-century sitarists, vīṇā players, and bīnkara-s) tended to play melodies only on the highest string, when possible. For example, it would seem that one would play the phrase ([below-pa] ma [shuddh] dha [below-śa] ni [shuddh] ri sa) entirely on string IV (as one might do on a modern sitar) rather than play (ma dha) on string III and (ni ri sa) on string IV (as one might do on a modern oud). Second, it suggests that Rāmāmāya may not have tested the tuning of these “useless” frets. Cris Forster points out that, when tuning according to Rāmāmāya’s method, the lowered-pañcama ma fret on string III typically yields a somewhat different pitch from the lowered-pañcama ma fret on string IV; likewise, the pure ri fret on string II will be different from the pure ri fret on string III (2010, 570–71).

This, along with the other summary statements at the end of sections, may well have been the addition of a later copyist. It may also have been an error; the next chapter is about mela-s.

Śvayambhu has several other related meanings as well. The twelfth-century Panditāradhyā Charitra mentions a śvayambhu vīṇā, which according to P. Sambamurthy was sounded by the wind instead of by human hands. This latter fact would account for the name, though Sambamurthy himself seems to have been influenced by Ramaswami Aiyar’s reading of śvayambhu as string harmonics (Sambamurthy 1982, 206–8). Śvayambhu is also an epithet of several divinities, such as Brahma, the first manifested being (Stutley 2006, 141). The epithet originally applied to Prajāpati, but as he became identified with Brahma in the Purāṇa-s, the epithet was also transferred (Basu 1986, 38). Less often, śvayambhu identifies Puruṣa, the Cosmic Being whose dismemberment created the universe; thus śvayambhu can indicate both the first-born (Brahma) and the self-manifested (Puruṣa) (ibid., 58). Śvayambhu is also an epithet applied to Buddha, Śambhu (an aspect of Śiva), and the Sun (119, 164, 255).

Ramaswami Aiyar mistakenly gives “another method of determining the values of śvayambhu-s” (1932, 53) rather than svara-s, implying that the śruti measures rehearsed in the previous section were the first method of determining the values of śvayambhu-s. But the Sanskrit text in Ramaswami Aiyar’s own edition makes clear that Rāmāmāya is actually distinguishing between tuning by consonances measured in śruti-s and “another method”—his śvayambhu-based method (cf. SMK, III.47a: svara-pramāṇatām kartum mārga-antaram atha ucyate).

To do so with precision is no trivial task in practice (cf. Euclid [ca. 300 BCE] 2007, I.12).

These śruti measures are sometimes (as in the Nātya-sāstra and the Dattilam) also given as 9 or 13, apparently including the measured svara on both ends. Rāmāmāya’s count of 8 or 12 seems instead to measure a distance in śruti-s between
the svara-s at issue. This discrepancy further highlights the ambiguous relationship of śruti to svara.

30 The first three steps must be done in sequence. Setting the sixth fret in step 3 relies on setting the fourth fret in step 2, which relies on setting the second fret in step 1. The next three steps, however, do not rely on any of the even-numbered frets having been set, though they do rely on each other in turn. Thus, the steps could conceivably be carried out in the following order: 4, 5, 6, 1, 2, 3.

31 The method is ambiguous here. In Ramaswami Aiyar’s Sanskrit edition, Rāmāmātya definitely refers to the pa on string IV as svayambhu, not the pa on open string II. A Pythagorean hermeneutic might construe this as a hint that pa is svayambhu by virtue of being a harmonic overtone of sa (cf. te Nijenhuis 1976, 4). It seems to us, however, that it is far more parsimonious to assume that Rāmāmātya intends us to tune pa to pa (svara-s that have the same pramāna), as with the rest of the svayambhu tunings, especially in light of the fact that he has already distinguished his method from tuning by samvādi-s. An argument in favor of Pythagorean temperament in the SMK would need to demonstrate that this svayambhu pa—unlike every other instance of svayambhu—is svayambhu precisely by virtue of being a samvādi of sa, and definitely not by having the same pramāna as the given pa on string II. Another possible route in for a committed Pythagorean would be the unspecified method of setting the fifth fret in step 4.

32 Two ways that would fit with the pattern in steps 2, 3, 5, and 6 would be to tune the fifth-fret sa (from the pa given by open string II) to either of the open sa-s (strings I or III), or to tune the fifth-fret ma (from string III) to the open ma (string IV). It seems unlikely that (as a Pythagorean reading would have it) he would have been implying that ma should be tuned a fourth above sa when either of these two unisons was available.

33 This is a rather unusual claim: Rāmāmātya says that these notes can be produced from the fret just above where their fret would be. Modern-day sitār and vīnā players can produce notes higher than that produced by a fret by increasing the tension of the string on a lower fret with the left hand: deflecting the string horizontally or applying more pressure vertically. However, it is hard to imagine how the tension of the string could be reduced even more than it is when straight in order to produce a lower note on a higher fret. We wonder, then, whether Rāmāmātya actually observed musicians rendering these svara-s on these frets, or whether this was simply a way out of a theoretical pickle. It may also have been a scribal error; the claim would certainly make sense in reference to the common ga and fine ni frets.

34 Cf. SR, I.5.6b, quoted verbatim in the SMK. In the SR, sweet ni and in-between ga are not only to be used sparingly but are assigned the lowest status of all the notes, even explicitly designated as belonging to the lowest caste (śūdra). In Shringy’s translation of the SR, he suggests that the reason is that they are “degraded from the position of full-fledged svaratva (i.e., the capacity to be an independent musical note)” (Shringy and Sharma 2007, 154).

35 However, even if we do accept the equivalencies between these odd svara-s, he seems to make some mistakes in the citing mela equivalencies: Samavarali and
Shuddh Varali, said to be equivalent apart from the odd svara-s, have different ma-s; Vasantabhairavi and Hejjui likewise have different ni-s, Samant and Kannada Gowla have different ri-s and different ni-s, and Kambhoji and Sarang Nat have entirely different pitch-sets. There may indeed be a pattern here, but we have not found it.

36 Perhaps similar to the function of dha in the modern Hindustani rāga Mārvā, or ma in modern Hindustani Lalit.

37 Bhatkhande translates the enharmonic svara-s into Hindustani terms (so that shuddh ga, for example, is rendered as shuddh ri) even though this leads to cases of mela-s with two ri-s, two ga-s, two dha-s, or two ni-s. He also renders the “extra” notes antara ga and kākali ni in 12-note terms. Antara ga is consistently translated into modern pure ga (E). He seems more ambivalent about kākali ni; though Sāmanta mela and Kāmbhoji mela are both assigned this note in the SMK, Bhatkhande assigns a lower (komal) ni (B♭) to the former and a higher (shuddh) ni (B) to the latter. This difference in nomenclature evidently leads to at least one typo as well—he translates the shuddh ni of Rāmāmāya’s Revagupti mela (A) as a twentieth-century Hindustani shuddh ni (B).

38 One problem with this assumption about the link between string length and perceived consonance is that there is more to hearing in-tuneness than just frequency. Timbre, for example, profoundly informs perceptions of consonance (Sethares 2004). Furthermore, linear fret distances on a vīnā are distorted by the tensing of the string; every svara articulation produces a triangle between the finger, the nut, and the bridge. Te Nijenhuis herself provides the most eloquent caution against putting too much stock in acoustic reconstructions: “[T]he pitch of the basic notes used in the various ragas depends solely on the instrumentalist’s individual interpretation” (1974, 29).

39 These all assume that the 9- and 13-śruti consonances in the SR correspond to the sa-ma and sa-pa consonances of Rāmāmāya and that both are roughly the same as perfect fourths and fifths, respectively.

40 Vijayanagara’s outdated construal as a “Hindu” holdout against “Muslim” invaders is hard to maintain in light of recent scholarship (Stein 1989; Wagoner 1996; Eaton 2005) that depicts a cosmopolitan medieval Deccan in which courtiers of various religions and ethnicities moved quite fluidly between courts with little regard for official religion. Rāmarāya’s own grand political ambitions led him to make close strategic alliances with the rulers of the Deccan sultanates, who were mutual political rivals. Powers and Widdess speculate that augmented seconds described in the SMK may have been an influence from West Asian musicians (2001, 174), who may even have been in residence at Vijayanagara. The mention of raga-s such as hejjui indicate that maqam-s were already being accommodated by the rāga system, just as previous Indo-Persian treatises had long given equivalences between rāga-s and maqam-s. For now, however, we must remain agnostic about these matters until more evidence about musical practice at Vijayanagar comes to light.
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