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978-0-521-88415-0 - The Renaissance Reform of Medieval Music Theory: Guido of Arezzo between Myth and History

Stefano Mengozzi

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## Introduction: Guido's hexachord: old facts and new questions

Was there a hexachordal season in the long history of Western music? Was there ever a period, perhaps five, seven, or eight centuries ago, during which the octave scale – that normative segment of musical space that we take so much for granted – did not possess the cognitive and normative weight that it undoubtedly has had since the Enlightenment? Could it be that the octave scale acquired its all-pervasive, dictatorial power through a slow and erratic historical process, and that an alternative scale of six notes was in fact the governing segment of musical practice and musical perception for much of the pre-modern era?

On the face of it, the hexachordal hypothesis seems eminently plausible. Around the year 1032, in his *Epistola ad Michahelem*, the Benedictine monk Guido of Arezzo (c. 995–1050) proposed a new method for sight singing based on the six syllables *ut, re, mi, fa, sol, la*, which corresponded to the first syllables of each verse of the Hymn of St. John “*Ut queant laxis*.”<sup>1</sup> In the melody of the hymn, each of the first six lines began one diatonic step higher than the last one, the first line beginning on *C* and the last one on *a* (see Example I.1).

Thus, the *ut-la* syllables highlighted the major sixth *C-a* (later called “hexachord,” i.e., “six strings”), an interval that features only one semitone, *E-F* (*mi-fa*), at its center (see Table I.1).

In Guido's intentions, the six syllables, often called *voces* by medieval theorists, were to help budding singers become familiar with the intervallic context surrounding each syllable, thus each pitch of the gamut. They learned, for instance, that *ut* always has a major third above, *mi* a major third below and a minor third above, and so on. When practicing a new melody, they would associate the notes on the page with the correct syllables, which in turn would trigger the memory of the correct intervals to be performed.

<sup>1</sup> The text of the hymn is by Paul the Deacon (end of the eighth century), whereas the melody is not documented prior to Guido's *Epistola* and may thus have been composed by Guido himself. See J. Chailley, “*Ut queant laxis* et les Origines de la Gamme,” *AcM* 56 (1984), 48–69. For an excellent introduction to Guido's musical pedagogy, see D. Pesce, ed. and trans., *Guido d'Arezzo's Regule Rithmice, Prologus in Antiphonarium, and Epistola ad Michahelem, A Critical Text and Translation with an Introduction, Annotations, Indices, and New Manuscript Inventories* (Ottawa: The Institute of Mediaeval Music, 1999, hereafter *PesceGA*), pp. 1–38. See also “Guido of Arezzo,” in *NG* 2, vol. 10, pp. 522–6.

The image shows three staves of musical notation for the hymn 'Ut queant laxis'. Each staff begins with a treble clef and a key signature of one flat (B-flat). The notes are written on a four-line staff. Below each staff, the Latin lyrics are written, with hyphens indicating syllables that span across multiple notes. The lyrics are: 'Ut que-ant la - xis Re - so - na - re fi - bris Mi - ra ge - sto - rum', 'Fa - mu - li tu - o - rum, Sol - - - ve - pol - lu - ti', and 'La - bi - i re - - a - tum, San - cte - Jo - an - nes.' The melody consists of a series of half notes and quarter notes, with some longer notes indicated by horizontal lines.

Example I.1. The hymn *Ut queant laxis*, possibly composed by Guido himself. My thanks to Murray Steib for assisting me with this example.

Table I.1. Correspondence between opening pitches and opening syllables for each of the six verses of the hymn *Ut queant laxis* (T = whole tone; S = semitone)

Ut queant laxis	Ut = C	T
Resonare fibris	Re = D	T
Mira gestorum	Mi = E	S
Famuli tuorum	Fa = F	T
Solve pollutum	Sol = G	T
Labii reatum	La = a	

In the fourteenth-century, Jacques de Liège referred to this technique as *solfatia*, after the syllables *sol-fa*; Renaissance theorists called it *solfisatio* or *solmisatio*, which led to the modern English term “solmization.”<sup>2</sup> There is evidence that by the end of the eleventh century the six syllables were being transposed on the segment G-e (with *mi-fa* on B-C), in addition to C-a. The placement of the six syllables on the major sixth F-d with B flat (with *mi-fa* on A-B flat) is already documented in Southern England/Northern France around the year 1100 (more on this below). Thus, in a relatively short time medieval theorists extended the *ut-la* syllables to all the pitches of *musica recta* and positioned them on three possible locations within the gamut (see Table I.2 below): on C-a (the hexachordal segment

<sup>2</sup> Jacques de Liège, *Speculum musicae*, ed. R. Bragard, CSM 3, 6 vols. (Rome: American Institute of Musicology, 1973), vol. 6, pp. 162–286 [*passim*].

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Table I.2. The medieval diatonic system (Greater Perfect System), showing the series of pitch letters and the syllabic *deductions*<sup>3</sup>

[illegible]

<sup>3</sup> Medieval pitch designations translate into the modern system as follows:  $\Gamma = G_1$  (first line in Bass clef);  $A = A_1$  (first space in Bass clef);  $a = a_2$  (top line in Bass clef), and  $aa = a_3$  (above middle C).

later called *proprietas per naturam* or *per proprium cantum*), on G-e (*proprietas per b quadratum* or *b durum*), and F-d with B<sub>b</sub> (*proprietas by b rotundum* or *b molle*). However, because the gamut features two C's, three G's – including the lowest pitch, marked with a Γ (“gamma”) – and two F's, theorists from approximately the thirteenth century onward recognized seven *proprietates* (“properties”) and as many *deductiones* (“deductions”) where the former indicated a portion of the gamut spanning a major sixth, and the latter the unit of six syllables superimposed to it.<sup>4</sup>

Table I.2 is essentially a transcription of the frontispiece (from thirteenth-century England), one of the earliest illustrations of the gamut articulated into letters and syllables. One of the notable consequences of this arrangement was that some pitch letters, such as Γ *ut* or A *re*, belonged to only one *proprietas*; others (such as C *fa-ut* or E *la-mi*) to two of them; and others yet (such as c *sol-fa-ut* or d *la-sol-re*) to three of them. Pitch letters corresponding to two or three syllables could be used as points of “mutation” (*mutatio*) from one *proprietas* to the next. In order to solmize the octave from F to f, for instance, a singer would begin with the *proprietas per b molle*, with *ut* of F, and would switch to the *proprietas per naturam* on d, exchanging *la* for *re* and continuing on with *mi-fa* on e-f.<sup>5</sup> This basic menu of diatonic pitches, including letters and syllables, was called the system of *musica recta* or *musica vera* (“true or real music”). Any chromatic inflection of these basic pitches – i.e., notes indicated with a flat or a sharp – was considered part of *musica ficta* (“feigned music”).<sup>6</sup>

Also, by the end of the eleventh century at the latest, musicians had introduced the practice of mapping the nineteen pitches of Guido's gamut (Γ-dd) onto the nineteen joints of the left hand in spiral order from the tip of the

<sup>4</sup> On the uses of the term *deductio* in medieval music theory, see the *LmL*, fasc. 6, cols. 783–6. I have discussed the subtle differences between *proprietas* and *deductio* in my “Virtual Segments: The Hexachordal System in the Late Middle Ages,” *JM* 23 (2006), 440–58.

<sup>5</sup> Guido does not envision the technique of hexachordal mutation in his writings, although by the late-eleventh century theorists had recognized the possibility of transposing the *ut-la* syllables on the segment G-e, in addition to C-a. See *PesceGA*, pp. 27–8.

<sup>6</sup> For a general introduction to these concepts, see K. Berger, *Musica ficta: Theories of Accidental Inflections in Vocal Polyphony from Marchetto da Padova to Gioseffo Zarlino* (Cambridge University Press, 1987), pp. 2–11; and J. Herlinger, “Music Theory of the Fourteenth and Early Fifteenth Centuries,” in R. Strohm and B. J. Blackburn, eds., *Music as Concept and Practice in the Late Middle Ages*, *The New Oxford History of Music*, vol. III, part 1 (Oxford University Press, 2001), pp. 246–9. The topic of *musica ficta* has been much debated for its direct relevance on issues of musical analysis and performance. See, for instance, M. Bent, “Diatonic *ficta*,” *EMH* 4 (1984), 1–48; P. Urquhart, “Cross-Relations by Franco-Flemish Composers After Josquin,” *Tijdschrift van de Vereniging voor Nederlandse Muziekgeschiedenis* 43 (1993), 3–41; and T. Brothers, *Chromatic Beauty in the Late Medieval Chanson: An Interpretation of Manuscript Accidentals* (Cambridge University Press, 1997).

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thumb to the tip of the middle finger (at later time *ee la*, if recognized as a regular pitch, would be assigned to the nail of the middle finger, opposite to *dd sol*, or simply above the fingertip; see Fig. I.1).<sup>7</sup> Eventually, these nineteen positions on the Hand were called *loci* or *loca* (“places”). The Hand was a sort of musical “palm pilot” by which singers could quickly review the correct association of letters and syllables and the intervals between them. It was certainly used for collective musical instruction: as the master pointed to particular places on the Hand with his right index, his choirboys would mentally convert labels and places into sounds and sing the corresponding intervals. Versions of musical Hands appear to have existed in pre-Guidonian times.<sup>8</sup> However, in his writings Guido neither mentions, nor shows this mnemonic device, even though he undoubtedly contributed to its development.<sup>9</sup>

By all indications, then, Guido’s method of sight singing with the *ut-la* syllables amounted to proposing a new articulation of the gamut based on the idea of a transposing “hexachord.” While this is technically correct, it is important to understand that from the outset the hexachordal articulation of the gamut rubbed against an earlier principle of organization that was solidly grounded on the notion of octave duplication. To this pre-existing principle points the practice of indicating the diatonic pitches via the first seven letters of the alphabet, A–G.

An examination of the origins, the subsequent history, and the inter-relationships between these two methods of pitch designation – the six syllables and the seven letters – soon reveals that they amounted to two quite different representations of musical space. If the sets of *ut-la* syllables pointed to a model of pitch organization set up into overlapping segments,

<sup>7</sup> For a more detailed description of the Hand, see K. Berger, “The Hand and the Art of Memory,” *MD* 35 (1981), 87–120; K. Berger, *Musica ficta*, pp. 2–11; and A. M. Busse Berger, *Medieval Music and the Art of Memory* (Berkeley: University of California Press, 2005), pp. 85–94.

<sup>8</sup> For instance, as a way of visualizing the four tetrachords of the *enchiriadis* gamut (see below) and for memorizing chant formulae. See J. Smits van Waesberghe, *Musikerziehung: Lehre und Theorie der Musik im Mittelalter*, *Musikgeschichte in Bildern*, vol. III/3 (Leipzig: VEB Deutscher Verlag für Musik, 1969), pp. 122–3; and C. Meyer *Mensura monochordi: la division du monocorde (IXe–XVe siècles)*, (Paris: Klincksieck, 1996), pp. 241–4. Smits’ study also features numerous reproductions of “Guidonian Hands” (pp. 123–43; I discuss this topic in more detail in Chapter 3). On the hand as a mnemonic aid for chant formulae, see T. A. Russell, “A Poetic Key to a pre-Guidonian Palm and the Echemata,” *JAMS* 34 (1981), 109–18.

<sup>9</sup> On this point, see *PesceGA*, p. 20 (n. 68), and K. Berger, “The Hand and the Art of Memory,” 115–18. It is unclear whether medieval musicians thought of Guido as the inventor of the Hand. The chronicler Siegebert of Gembloux, writing around 1100, appears to set a direct link between the Hand and Guido of Arezzo (Berger, “The Hand and Art of Memory,” 116–18). Medieval music theorists, however, remain silent on this issue.

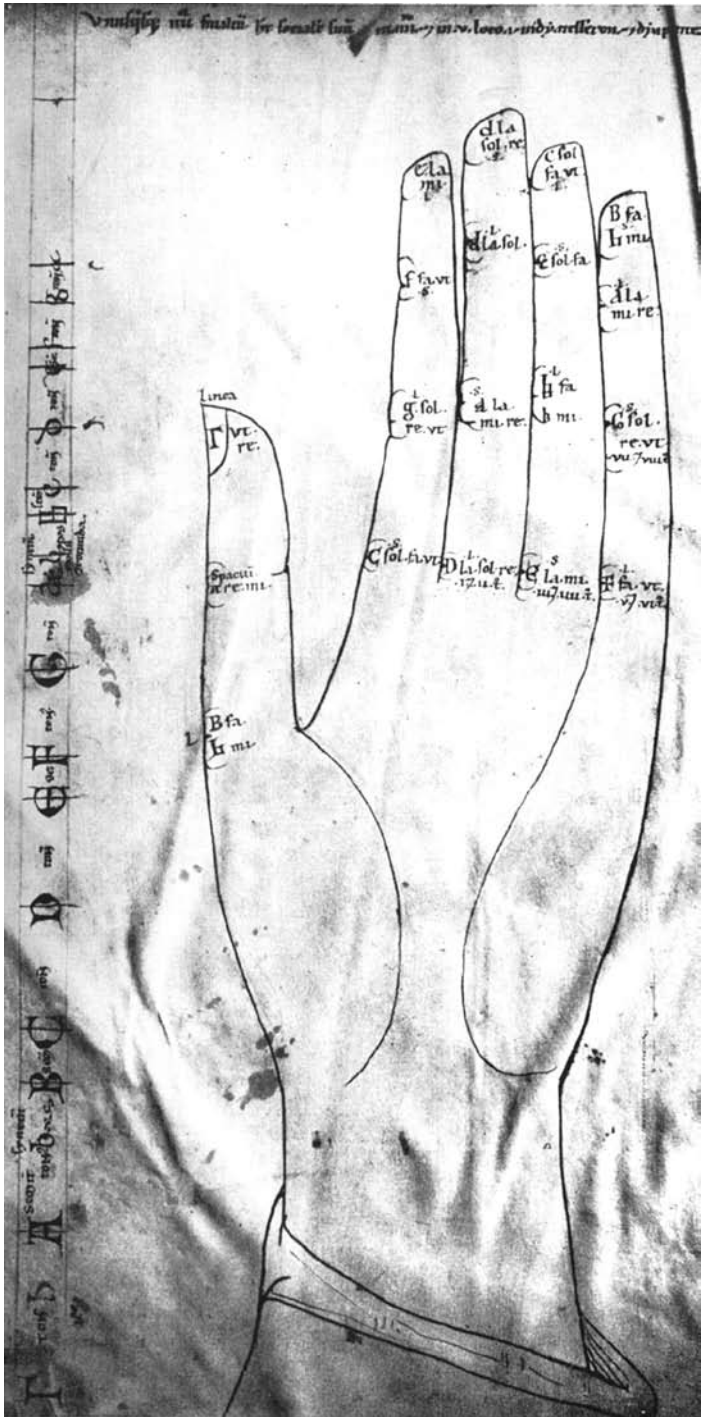


Fig. I.1. A Guidonian Hand (from Vienna Österreichische Nationalbibliothek, cpv 51, fol. 2v; twelfth century). This particular representation is relatively unusual in that it features a low Bb, with *re* on  $\Gamma$  and *mi* on A.

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the series of pitch letters from A to G established a competing model that was continuous, linear, and cyclical, in the Middle Ages just as it is today. Until about the year 1000 theorists used other forms of alphabetic notation to indicate the diatonic pitches that did not reflect the principle of octave duplication.<sup>10</sup> Pseudo-Odo's *Dialogus de musica*, written near Milan around 1000, is the oldest extant treatise to use the seven letters A-G and to duplicate them to express the equivalence of pitches at the octave.<sup>11</sup> A few decades later, Guido adopted Pseudo-Odo's letter system without reservation, and called the pitches marked with the A-G letters (along with Γ) as *graves* (low), those marked with a-g as *acutae* (high), and those marked with aa-dd as *superacutae* (very high). Throughout his treatises, Guido designates the pitches consistently and exclusively by means of the seven letters.

The A-G letters were also known as *claves* ("keys"), because they were used as "clefs" positioned at the beginning of the musical staff to indicate unequivocally the notated pitches (thus they allowed the reader to "unlock" staff notation in the same way as a key opens a lock, as many medieval theorists pointed out). Occasionally, in a number of late authors, the term *clavis* refers to the combination of a letter and a syllable.<sup>12</sup> The fact that these letters represented points of division on the monochord has led some authors to limit their significance to the domain of speculative music. In fact, both the monochord and the seven letters had important practical applications. Alma Colk Santosuosso has listed about forty musical sources notated with letter notation (without syllables), from the eleventh to the fifteenth centuries.<sup>13</sup>

The long coexistence of these two different models of diatonic space – the cyclical one defined by the A-G letters and the segmental one projected by the *ut-la* syllables – poses a core set of questions that reverberate through the following chapters: Were these two models complementary, or rather alternative to each other? Were they equally important to the medieval understanding of musical space? Why did these two models exist at all?

<sup>10</sup> See, for instance, the notational system used in the late ninth century by Hucbald in his *De musica institutione*. See Y. Chartier, ed. and trans., *L'œuvre musicale d'Hucbald de Saint-Amand* (Saint-Laurent, Québec: Bellarmin, 1995), pp. 73–5.

<sup>11</sup> The *Dialogus* already documents the practice of using upper, lower, and double case to mark the same sound at different octaves (i.e., A, a, and aa).

<sup>12</sup> The vast semantic territory covered by the term *clavis* has been charted in F. Reckow, "Clavis," in *Handwörterbuch der musikalischen Terminologie*, ed. H. H. Eggebrecht (Stuttgart: F. Steiner, 1971), and more recently in M. Bernhard, ed., *Lexicon musicum Latinum medii aevi* (Munich: Bayerische Akademie der Wissenschaften, 1992), fasc. 5 (2001), cols. 525–44.

<sup>13</sup> See A. Colk Santosuosso, *Letter Notations in the Middle Ages* (Ottawa: The Institute of Mediaeval Music, 1989).



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Most important, how did medieval authors understand the relationship between them, and which specific factors – musical, methodological, cultural – impinge upon such understanding through time? The answers to such questions transcend the limited domain of medieval music-theoretical thought and carry profound implications for our own reconstruction and interpretation of centuries of musical practice. Indeed, they concern the very nature of our relationship with the European musical past.

In recent times, the scholarly pendulum has swung in the direction of attributing a stronger structural significance to the *ut-la* syllables than to the A-G letters. The fact that the three-hexachord system was a central aspect of musical practice throughout the sixteenth century and beyond has led many scholars to conclude that it also provided a primary means of pitch organization and conceptualization during the Middle Ages and the Renaissance. According to this view, the enormous interest generated by Guido's introduction of the six syllables resulted not just in a new and accessorial method for sight singing, but ultimately in an entirely new way of articulating and conceptualizing the gamut – a new diatonic order grounded on the perceived primacy of the major sixth as a *de facto* musical scale. The “hexachordal season” of European music was indeed very real.

In line with such seemingly inescapable conclusions, many musicological studies from the last four decades have repeatedly reminded us that the musical space of the pre-modern era was radically different from the one we normally inhabit. Consider, for instance, the following statements:

In the later Middle Ages, the three-hexachord system, the overlapping of the “hard” (G-e, g-e'), “natural” (c-a, c'-a'), and “soft” hexachords (f-d, f'-d'), was the presentation and the conceptual form of the tonal system.<sup>14</sup>

The composers [of the Renaissance] ... seem to have developed more abstruse ways of using the hexachord toward the end of the sixteenth century. As a means of expression it is sometimes more covert than overt: in either case, unless we have a knowledge of the gamut, we cannot hope to understand what the composer was attempting to communicate.<sup>15</sup>

In the opening of the motet [Johannes Lupi's “Ergone conticuit”] the altus and bass voices in the soft hexachord are placed against hard and natural hexachord passages in the superius and tenor.<sup>16</sup>

<sup>14</sup> C. Dahlhaus, *Studies on the Origin of Harmonic Tonality*, trans. R. Gjerdingen (Princeton University Press, 1990), p. 171.

<sup>15</sup> L. Pike, *Hexachords in Late-Renaissance Music* (Aldershot: Ashgate, 1998), p. 18.

<sup>16</sup> Urquhart, “Cross-Relations by Franco-Flemish Composers after Josquin,” 20.



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Example I.2. C. Monteverdi, “Cor mio mentre vi miro,” (from *The Fourth Book of Madrigals*, 1603, bars 1–5).

The opening phrase [of Claudio Monteverdi’s “Cor mio, mentre vi miro,” from the *Quarto Libro di Madrigali*] purposively outlines the chordal spectrum of the one-flat hexachord. Beginning with a D-g dominant-tonic progression to g (“Cor mio”), the harmonies move mainly in a circle-of-fifths ordering to close within the phrygian cadence to A: in modern terms the sequence D, g, F<sup>6</sup>, C, F<sup>6</sup>, B<sup>b</sup>, (d6/4), A ... The soprano melody of these five bars moves downward from a’ to e’, the b<sup>b</sup> serving as a catalyst to the descent. D-minor would appear to be the melodic and harmonic goal of the first phrase, as is confirmed at the beginning of the second ... [see Example I.2].<sup>17</sup>

These excerpts, along with numerous others to be discussed in Chapter 1, embrace a foundational view of the Guidonian hexachord that is at odds with the model of musical space that is familiar to modern listeners. We are asked to understand – thus to *hear* – the vocal parts and the harmonic progressions of Renaissance polyphony as the product of a hexachord-based conceptualization of musical space, in the same way as classical harmony and phrasing imply the notions of pitch class and octave equivalence. Notice that such a thesis does acknowledge that the phenomenon of octave duplication had a role to play in medieval musical practice and theory; at the same time, however, it maintains that the hexachordal bonds uniting the diatonic sounds were both stronger and syntactically more significant in the domain of musical practice. In this perspective, the octave (*diapason*) possessed more of theoretical or speculative significance; to practical musicians of that age the octave span existed only as a composite segment, a “6 + 2” of sorts, which still did not have the paradigmatic value that it came to possess at later times.

The relative primacy of the hexachord over the octave is all that is needed to justify hexachordal modes of analysis. Still, this argument leaves modern

<sup>17</sup> E. T. Chafe, *Monteverdi’s Tonal Language* (New York: Schirmer, 1992), pp. 59–60.

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listeners in an impossible position: if the three-hexachord system was indeed the “conceptual form of the tonal system” in the Middle Ages, and if composers “communicated” to their listeners by assigning the musical notes to particular “hexachordal degrees”, then the octave-based musical mindset of modern listeners can only be a crippling obstacle in appreciating the grammatical and syntactical well-formedness of early music. Such a conclusion precipitates a cognitive crisis of staggering dimensions, as it forces us to give up any legitimate expectation we may nurture of understanding the grammatical nuts-and-bolts of early music as we should, i.e., through our ears. At best, we can strive to painstakingly reconstruct that grammatical meaning on the musical score, through our eyes, charting the way in which alien minds once processed that shared musical meaning. Of course, we could still *enjoy* the music of medieval and Renaissance masters and respond emotionally to it. But we would have to give up any pretense or presumption that what *we* hear is even remotely close to what *they* heard no matter how hard we try – quite a paradoxical outcome indeed, considering that the theory of hexachord-based musical structure has been pursued in recent years as a legitimate attempt to better understand the musical space of the pre-modern era.

Consider, for instance, Eric Chafe’s analysis of the beginning of Monteverdi’s “Cor mio” quoted above (see Ex. I.2 above). The author observes that the opening six chords of the madrigal “outline the chordal spectrum of the one-flat hexachord” (F-G-A-Bb-C-D), as a medieval theorist would presumably have recognized it (much more on this in the following chapters).<sup>18</sup> At the same time, however, Chafe identifies the first two chords as a “D-g dominant-tonic progression to g,” and D-minor as the apparent “melodic and harmonic goal of the first phrase.”<sup>19</sup> The result is a sort of “harmonic schizophrenia,” at least from the perspective of a modern listener: how can a chord function as a “dominant” and be part of a “hexachordal grouping” at the same time? Or how can we even trust our harmonic inferences (D as a melodic and harmonic goal) when the presumed

<sup>18</sup> In Chafe’s harmonic system, each “hexachord” (harmonically reinterpreted) consists of six major or minor chords ordered along the circle of fifths. Thus the chords F-C-G-d/D-a/A-e/E are obtained by considering the six pitches of the “natural hexachord” (C-a) as chordal roots. See the chapter “Basic Issues in Seventeenth-Century Tonality” in Chafe’s book, pp. 21–37.

<sup>19</sup> Chafe later qualifies this point by proposing that the piece “is not cast in the key of d as it is commonly understood today,” but rather in a d mode in which [round b] and [square b] coexist while remaining conceptually separate by virtue of belonging to different “hexachordal groupings” (*Monteverdi’s Tonal Language*, p. 66). Again, this is an analytic application of the basic tenet that the octave (d-mode) is in fact the result of constitutive and overlapping hexachords (“flat and natural areas”).