

NICOLA VICENTINO'S RECONSTRUCTION OF THE ANCIENT GREEK GENERA

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THE title of this Study Session suits my subject, because what we find in the writings of Vicentino are 'elements, traces, hints, glimpses, bits and pieces' of ancient Greek music theory. To ascertain what Vicentino knew about the Greek genera, and why he believed he could 'adapt ancient music to modern practice' (to paraphrase the title of his treatise), we must make a coherent picture of these dislocated elements.¹

1. INTRODUCTION

Vicentino can be an undisciplined writer. He often digresses to matters tangential to the topic at hand. But these digressions—on style, decorum, genre, singing, performance practice, and theology—are often more interesting than the topics they interrupt. To read his prose, then, is to follow the natural flow of his ideas as they occur to him, and this experience is not without charm. However, Vicentino can also be a sloppy thinker. With respect to science, even by sixteenth-century standards, he lacks precision in language, shows little interest in organizing data, and disregards the need for systemic accuracy. To follow his theory is to scavenge for its traces, a disagreeable exercise akin to trying to reassemble a jigsaw puzzle with some pieces rough-hewn and others mislaid.

According to Charles Caleb Colton, «imitation is the sincerest of flattery.» Therefore I first enumerate what I will not discuss, just as

¹ For an outline of the treatise, see Table 1.

Vicentino closed the «Book on Music Theory» by listing what he had omitted from Boethius' *De institutione musica*.² I will not discuss the existing scholarly literature.³ I will not talk about mannerism or humanism, although these issues form the context of my remarks. I will not talk about rules of text underlay, described by Don Harrán, nor about the solmization of the genera, even though it was based on a relatively modern bipolar system of hexachords.⁴ I will not describe the public debate on the genera (Rome 1551), when Vicentino lost two gold *scudi* to Vicente Lusitano.⁵ Nor will I describe in detail the archicembalo,⁶ except for its first tuning, the one that incorporates the inflections associated by Vicentino with the chromatic and enharmonic genera. I will discuss what Vicentino knew about the ancient Greek genera, how he came to know it, and why he was keen on a revival.

2. STRUCTURE OF THE GENERA

According to tradition, of the three ancient Greek genera, only the natural, noble diatonic survived into modern practice: the other two had long been abandoned as artificial and impracticable.⁷

The diatonic genus divided the tetrachord into one semitone and two whole tones. The chromatic comprised two semitones and a minor third, the enharmonic two dieses and a major third.

Vicentino insists that each step is a constitutive element of its genus, and therefore that one step suffices to define a genus.⁸ Among the larger

² Ed. G. Friedlein, Leipzig 1867; repr. Frankfurt am Main 1966. Trans. C. M. Bower and ed. C. V. Palisca, *Fundamentals of Music* = Music Theory Translation Series, New Haven and London 1989.

³ See Table 2.

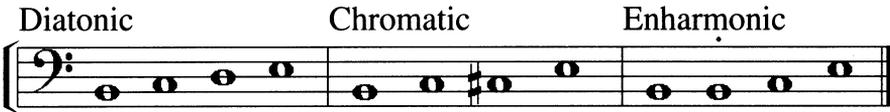
⁴ Vicentino's solmization for chromatic and enharmonic modes, an extremely complex scheme, is outlined in I, 5 of *L'antica musica ridotta alla moderna prattica* = Documenta musicologica, erste Reihe: Druckschriften-Faksimiles 17, ed. E. E. Lowinsky, Kassel - Basel 1959. Trans. M. R. Maniates, *Ancient Music Adapted to Modern Practice* = Music Theory Translation Series, New Haven and London 1995/6. The bipolar system relies on two hexachords: soft [F] and hard [G]; the natural [C] is merely a pivot between the two. See, for example, *L'antica musica*, I, 4.

⁵ Vicentino, who lost the debate, gives his version of the events, along with copies of most of the documents, in *L'antica musica*, IV, 43. Another version of the debate is recorded by G. Danckerts, one of the two judges, in an unpublished treatise.

⁶ Vicentino, *L'antica musica*, V, 1-6.

⁷ Example 1 presents the conventional notion of the genera. Vicentino used the superscript dot for notes inflected upward by one diesis. *L'antica musica*, I, 6, 7, 8. A tape-recording of the three genera was played.

⁸ See Table 4, especially 4.13, 4.14, 4.15.



Example 1.

steps, a major third signals the enharmonic genus, a minor third the chromatic, a whole tone the diatonic. As for the smaller steps, the two sizes of semitone (major and minor) define the diatonic and chromatic genera respectively, just as the two sizes of dieses (major and minor) define the chromatic and enharmonic respectively.

Vicentino's intervals are schematized in Tables 3 and 4. The comma, one half of a minor diesis, is not used in vocal music, though it occurs on the archicembalo. The minor semitone and major diesis are the same size; the name depends on the spelling. The whole tone is made up of a major and a minor semitone; but there are also minor and major tones, inflected either one diesis below or one above the regular whole tone. The minor third is made up of a whole tone and a major semitone; it too has enharmonic inflections, the smaller called minimal and the larger proximate. The major third is made up of two whole tones; its larger inflection is called proximate, and its minimal size is the same as the proximate minor third. Of course, leaps too may be inflected enharmonically: for instance, E to e-dot for a proximate octave, or F to c-dot, for a proximate fifth. Though Vicentino applied the genera to part-music, he understood that ancient definitions ensued from concepts of melody. A genus was identified by its linear contour. In polyphony, the ensemble merely produced four simultaneous melodies in the genera.

Vicentino considered his revival of the ancient genera as an extension, however radical, of the current state of affairs. And this was the crux of the debate with Lusitano. Vicentino argued that since modern composers used major and minor thirds and minor semitones in their melodic writing, the music of his day, contrary to received opinion, was not purely diatonic, but rather a partial mixture of all three genera. This music Vicentino called either *musica communa* (ordinary music) or *musica participata & mista* (tempered and mixed music).⁹

⁹ For ordinary music, see *L'antica musica*, III, 15, and V, 59; ordinary instruments are mentioned in III, 14, and V, 5, ordinary tuning in V, 5, 13; common improvisation techniques, common fugues, and common canons in IV, 23, 32, 33. For tempered and mixed music, see I, 6, and III, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 28, 31, 32, 33, 34, 35, 36, 39; tempered and mixed modes are mentioned in III, 39, 42; the tempered and mixed chromatic genus in III, 44; the tempered diatonic genus in I, 6; the tempered modes in III, 39; the mixed genera in I, 4, and V, 47; the mixed enharmonic genus in I, 5.

Since our records of the debate do not illuminate Vicentino's position, we can be spared the convoluted dialectics of the protagonists, and escape the boredom and mystification felt by their original audience —thus Ghiselin Danckerts, one of two judges.¹⁰ What we need to remember is that any interval smaller than the fourth defines a genus, for it is this conception, whether we agree with it or not, that helps us understand how the genera operate in a linear string, and hence how we identify the genus of a composition.¹¹

To write in the pure chromatic genus, composers must restrict each melodic part to the intervals proper to that genus: that is, minor third, major semitone, and minor semitone. They may also use the structural intervals common to all the genera: fourth, fifth, and octave. Large composite intervals, such as sixths and beyond, do not seem to have generic identity, and are therefore permitted in any genus. However, to achieve startling effects, composers may choose also to inflect by semitone any interval larger than the minor third; thus, a part could be made to leap a tritone rather than a perfect fourth. Of the tritone, Vicentino wrote: «Although troublesome to sing, this interval is indispensable whenever the words require a marvelous effect.»¹² Intervals foreign to a genus are allowed only if separated by rests. In the pure enharmonic genus, the linear intervals are: major third, major diesis, minor diesis, and the larger intervals in their standard or inflected forms. The linear strands of a composition must obey the rules of integrated counterpoint and make good harmony: a point of imitation should behave as such, and the vertical sonorities have to be consonant, with dissonances treated according to the usual rules; *i.e.*, passing notes, suspensions, syncopations, and so on.

In the pure diatonic, it is permitted to use, in addition to the larger intervals, only the melodic steps of the whole tone and the major semitone. Vicentino provided in his treatise a pure diatonic work for four voices; it has no words because «considerable harshness is felt in this music compared to that which is tempered and mixed.»¹³ In other words, the mellow sound of the modern polyphony of his day was achieved by mixing diatonic intervals proper with intervals from the enharmonic and chromatic genera —namely, major thirds, minor thirds, and minor semitones. This is why Vicentino used the adjective 'mixed.'

¹⁰ A latter-day champion of Vicentino's theories, Ercole Bottrigari, compared Lusitano and Vicentino to blind pugilists flailing the air. See *Il Melone discorso armonico*, p. 17.

¹¹ To do this, we analyze the intervals in each melodic voice of the composition.

¹² *L'antica musica*, I, 35.

¹³ *L'antica musica*, III, 26.

3. TUNING

Before considering the adjective ‘tempered,’ as in ‘tempered and mixed music,’ we must deal with Vicentino’s treatment of ancient Greek tunings. Table 5, though not exhaustive, gives us enough intervals to grasp the problem. From the top down, the intervals are listed from the smallest to the largest. In the first two columns, we find the ratios and our modern cents values for the Pythagorean system and Ptolemy’s diatonic syntonon, later known as ‘just intonation’. The third column lists the ratios found in Vicentino’s treatise, along with translations into cents. The endnotes indicate how the ratios are scattered throughout the treatise.

The ratios Vicentino gives for the major semitone, the whole tone, the minor third, the major third, the perfect or just fourth, the perfect or just fifth, the minor sixth, and major sixth, and the octave correspond to Ptolemy’s diatonic syntonon.¹⁴ All but one of these ratios make their first appearance in either Book I or II. Very curious is Vicentino’s failure to provide the ratio of the major semitone.¹⁵ For we are constantly reminded that his tuning is a superior one precisely because in the diatonic tetrachord, the semitone is *not* the minor semitone of Pythagoras.¹⁶ Clearly Vicentino not only disparages the Pythagorean system, but also champions Ptolemy’s syntonon diatonic. It is therefore decidedly odd that Vicentino fails to give this tuning a name, however incorrect or fanciful. Nor does he attribute it to Ptolemy, though he does refer to the true or just thirds and sixths of the ancients.¹⁷

The other ratios appear in Book V. Those given for the proximate minor third ($5 \frac{1}{2}$ to $4 \frac{1}{2}$) and the proximate major third ($4 \frac{1}{2}$ to $3 \frac{1}{2}$) suggest that Vicentino is straining for some sort of rational mathematical formula to define at least some of the enharmonically inflected intervals on the archicembalo.¹⁸ The 8:7 major tone is virtually the same size as the major tone on this instrument.¹⁹ So is the proximate minor third. The

¹⁴ *L’antica musica*, I, 6, 22, 24, 25, and V, 61 for the 10:9 whole tone; I, 6, 22, 24, 25, and V, 61, 62 for the 9:8 whole tone; II, 17, 21, 24, and V, 62 for the 6:5 minor third and the 5:4 major third; II, 17, and V, 63 for the perfect fourth; II, 17, 25, and V, 64 for the 3:2 perfect fifth; II, 21, 26 for the 8:5 minor sixth and the 5:3 major sixth; II, 17, 25 for the 2:1 octave.

¹⁵ The major semitone is described as the step needed to complete the perfect fourth together with the 10:9 and 9:8 whole tones in *L’antica musica*, I, 6. Though no ratio is given here or elsewhere in the treatise, this semitone must have a ratio of 16:15.

¹⁶ *L’antica musica*, I, 6, 7, 8, 9, 19, and V, 6.

¹⁷ *L’antica musica*, V, 6.

¹⁸ *L’antica musica*, V, 62. Vicentino elsewhere touts such intervals as «irrational.» See *L’antica musica*, III, 50, 51, 58, and V, 62, 64.

¹⁹ *L’antica musica*, V, 61.

ratio of the proximate major third works less well (435 compared to 426 cents). The same holds true for the 13:12 minor tone, the 14:13 major semitone, and the 21:20 minor semitone.²⁰ Here Vicentino has tried to devise workable superparticular ratios from a simple concept of the natural arithmetic series.²¹

Vicentino's efforts, not entirely successful, to enunciate ratios close to some of the intervals on the archicembalo are clustered in four chapters near the end of Book V. It is evident that Vicentino became belatedly aware of the need to rationalize the first tuning of this instrument. Although like so many of his other forays into rigorous science, this attempt remains in disarray, it does suggest that Vicentino was uneasy about the incompatibility between the tempering process, the partition of intervals visualized into segments, and the mathematical process, the calculation of intervals by whole-number ratios. After all, the importance of the archicembalo as an instrument for studying and accompanying the singing of the genera is everywhere stressed in the treatise. And thus Vicentino had somehow to reconcile it with a vocal tuning whose consonances were defined by superparticular ratios.

The archicembalo features two manuals, each with three ranks of keys.²² Within the octave on the lower manual are found the normal seven diatonic keys and five chromatic keys (ranks 1 and 2 respectively), plus seven more chromatic keys (rank 3), including E[#] and B[#] to split the diatonic semitones. The tuning of the lower manual is meantone, and thus, a closed system of 19 keys. The upper manual comprises another three ranks, of which only the first two concern us here. On the second manual, rank 4 duplicates the seven diatonic keys of rank 1, but tuned one enharmonic diesis higher, and rank 5 does the same for the five 'flats' in ranks 2 and 3 of the lower manual. The five ranks altogether make up a total of 31 keys in another closed system. It should be noted that this system is 'equal-tempered' *only* in its complete 31-note enharmonic genus. Each key listed in Table 6 is 38/39 cents away from its upper and lower neighbours. But if the upper manual were to be ignored, the lower manual by itself would sound in meantone for either diatonic or chromatic music.

Meantone is of course a temperament, but not an equal temperament: it is a quarter-comma temperament. For many theorists of this period, its fascination lay in its ability to produce thirds and sixths close to the sonorous and just species of Ptolemy's diatonic syntonon. In order to

²⁰ *L'antica musica*, V, 60, 61 for the minor tone; V, 60 for the minor semitone.

²¹ *L'antica musica*, II, 2, 4, 10, 12, 17, 21.

²² See Table 6.

integrate this tuning on a fixed instrument, it was necessary to shorten the fifth and expand the fourth, and to make other adjustments, such as a variety of split keys.²³ Theorists explored systems with 15-, 17-, 19-, and 21-note octaves. Vicentino's is a 19-note meantone system, with another 12 keys added to split in half any two adjacent keys on the first manual that are 77/78 cents apart.

Turning back to Table 5, we can now understand why the cents values in the fourth column (the archicembalo) do not always correspond to those in either columns three (Vicentino's ratios) or two (the diatonic syntonon). The reason is that the archicembalo is tuned in a refined, expanded version of a closed-system, quarter-comma temperament. Since the relevant comma is the syntonic comma of 22 cents (81:80), any intervals not within one or two cents of their just counterparts will differ from their rational expression by multiples of one-quarter of the syntonic comma (6.5 cents).

Just how well aware of all this was Vicentino? We cannot be certain. However, judging the discrepancies in his methods, the lack of precision concerning the ancient tuning he wanted to emulate, the confusion between this tuning and how it related to the archicembalo, as well as other veiled comments concerning these subjects, it is my belief that Vicentino learned what he knew about Ptolemy's diatonic syntonon and tempered keyboards from Lodovico Fogliano's *Musica theorica*,²⁴ itself hardly a model of clarity, wherein Fogliano tried to adapt the diatonic syntonon to the keyboard.

Boethius's treatise, as we know, could not have been a source for any of Ptolemy's tuning systems. Although Vicentino was more widely read than many scholars today are willing to admit, there is no evidence that he knew Ptolemy's work, even in Nicolo Leonicensi's Latin translation owned by Gian Giorgio Trissino, or any of the published humanist regurgitations of Ptolemy's theories. Although it is not possible to expound fully my reasons for citing Fogliano as the source, I may point to the adjective 'tempered' is an indicator of the symbiosis in Vicentino's mind of the archicembalo and the *mirabili segreti* of ancient vocal music.²⁵

²³ Vicentino's archicembalo had the more split keys than other known practical keyboard instruments. For his comments on blunting the fifth and expanding the fourth, see *L'antica musica*, I, 6, 14, and II, 16, 22, and V, 5, 6, 64, 66.

²⁴ Venice 1529. Facsimile = *Monuments of Music and Music Literature in Facsimile*, Second Series - Music Literature 93, New York 1969.

²⁵ *L'antica musica*, III, 52.

4. AESTHETICS OF THE GENERA

Vicentino's reading in ancient literature helped shape a singular concept of stylistic decorum, a concept that places him in the vanguard of musicians who had assimilated the prime lesson of rhetoric: namely, precepts for stylish composition. Regarding vocal chamber music he wrote: «Music set to words has no other purpose than to express in harmony the meaning of the words, their passions, and effects.»²⁶ This precept gave rise to a set of rules concerning the intelligibility of the words.²⁷ But correct prosody could not in itself project passions and imagery. The latter goal required the deployment of the intervals of the genera, from the tiniest to the largest, each assigned a gradation of tenseness or slackness depending on size, direction, and speed.²⁸

In *musica communa* for untutored ears, the recommended techniques were limited to those that imported a modicum of stylish flair and textual projection, without disrupting the docile conventions expected by the public at large.²⁹ Vicentino specified their logical disposition in the beginning, middle, and ending of a composition.³⁰ At the same time, his polemic indicates that the criteria of logic and coherence hampered music's potential for neoteric stylishness and passionate expressiveness.

For Vicentino, the structural elements of music were comparable to the columnar scaffolding of buildings and the linear design of paintings.³¹ Other elements, such as generic intervals, were ornaments —a ranking shown in his analogies to the mixture of the Vitruvian orders in architecture, and to the pictorial use of color and shading to create the illusion of perspective on a flat surface. In extraordinary music for cultivated ears, the eloquent portrayal of the words allowed, nay demanded, an incredible variety of ornaments.³² Even structural elements could be bent out of shape, as it were, so long as these aberrations depicted the text. Vicentino flaunted the chaotic effect of the genera by elevating it to an aesthetic dictate for stylized style. The human voice was the main vehicle of emotive resonance. And the intricate inflections of the genera provided the most flexible means of imitating vocal utterance. Singers, said Vicentino, had to overcome their innate laziness,

²⁶ *L'antica musica*, III, 29.

²⁷ *L'antica musica*, III, 29, 30.

²⁸ *L'antica musica*, I, 15-42.

²⁹ *L'antica musica*, I, 4, and III, 15.

³⁰ *L'antica musica*, IV, 14-16.

³¹ *L'antica musica*, III, 15.

³² *L'antica musica*, I, 4, and III, 15.

and learn to vary their techniques of delivery, as did orators.³³ Any irrational and unruly device was acceptable if it produced a marvellous effect. Marvellous effects did more than compensate for the lack of logical coherence. They moved the listeners.³⁴ Marvellous effects were the precious secrets, the *mirabili segreti*, of ancient music.

The brutish ears of common folk could not appreciate them. Such rhetorical stylization of music was reserved for the refined ears of the discerning few. Vicentino did not deny the artificial, contrived, and affected qualities of this style. On the contrary, he made a virtue of them. The implication is clear. Receptive and discriminating listeners would understand that Vicentino's adaptation of ancient music to modern practice enabled them to participate in the lofty exercise of music as described by Plutarch, the supposed author of *Peri mousikes / De musica* (first to second-century Greece).³⁵ Plutarch contrasted the bygone music of the very ancient Greeks with the plebeian, venal, and coarse style of his own day. The subject matter of the old songs praised either the gods or the Homeric heroes, unlike the crude and disreputable themes of the new songs. And, Plutarch lamented the current neglect of the enharmonic genus, the oldest, noblest, and foremost of the genera. In his opinion, complaints that the enharmonic was artificial and impracticable merely reflected the inadequacies of singers, and hence the debasement of the art of music. It was this debasement that Vicentino sought to remedy.

5. THE MUSIC

Vicentino's hero was his patron, the Cardinal of Ferrara. Thus, it is appropriate that the most ambitious work in the treatise should honor Ippolito d'Este. The three phrases of the Latin prose text are each set in one of the genera, and in a deliberately planned order. The first phrase (mm. 1-15), «Ancient music of late has raised up her head out of the darkness,» is set in the commonplace idiom of the day, the diatonic style as ordinarily misunderstood. And one may infer that the darkness is the diatonic degradation of ancient music. In the second phrase (mm. 15-28), «So that, with sweet and antique numbers, to compete with ancient deeds,» the chromatic genus projects the meaning of the words, especially

³³ *L'antica musica*, IV, 42.

³⁴ *L'antica musica*, I, 10, 24, 35, and II, 16, 27, and III, 5, 48, 49, and IV, 15, 42, and V, 1.

³⁵ In *Moralia*, 14: 352-455. Ed. and transl. B. Einarson and P. H. de Lacy, London and Cambridge Mass. 1967. Also transl. and ed. A. Barker, *Greek Musical Writings 1: The Musician and His Art*, Cambridge and New York 1984, p. 205-57.

at *dulcibus*. The image of the last phrase (mm. 24-48), «Your great deeds, Hippolytus, she might send high above the heavens,» is projected by the super-celestial sublimity of the enharmonic genus.³⁶

In two Italian madrigals for four voices, *Dolce mio ben* and *Madonna, il poco dolce*, Vicentino writes the music down in such a way as to give the performers a number of options for mixing the genera. Untangling the snarl of the directives on how to read the parts and determining exactly how the genera actually operate in the each piece are very complex tasks. It is not possible to deal with them in this essay. However, the options, which entail omitting and combining various sets of written accidentals, have something to do with Vicentino's notion of ancient Greek performance practice.

The sincerity of Vicentino's belief cannot be doubted. The feasibility of his technical system is another matter. The appreciation of the result is yet another. Edgard Varèse once said: «There is no avant-garde. There are only people who lag behind.»

³⁶ A tape of the example was played featuring an electronic archicembalo tuned on the Ensoniq EPS sampler by Durrell Bowman, a graduate student in musicology at the University of Toronto.

Mu - si - ca pri - sca ca - put, mu - si - ca pri - sca ca -
 Mu - si - ca pri - sca ca - put te -
 Mu - si - ca pri - sca ca - put
 Mu - si - ca pri - sca

put te - ne - bris mo - do su - stu - lit al -
 ne - bris mo - do su - stu - lit al - tis, su - stu - lit al -
 te - ne - bris mo - do su - stu - lit al - tis, su - stu - lit al -
 6 ca - put te - ne - bris mo - do su - stu - lit al -

tis, Mu - si - ca pri - sca ca - put te - ne - bris mo - do
 tis, Mu - si - ca pri - sca ca - put te - ne - bris mo - do
 tis, Mu - si - ca pri - sca ca - put te - ne - bris mo - do
 10 tis, Mu - si - ca pri - sca ca - put te - ne - bris mo - do

Example 2.

14 su - stu - lit al - tis Dul - ci - bus ut

18 nu - me - ris, dul - ci - bus ut nu - me - ris pri - scis cer -
ris, dul - ci - bus ut nu - me - ris pri - scis cer -
ris, dul - ci - bus ut nu - me - ris pri - scis cer -

22 tan - ti - a fa - ctis, Dul - ci - bus ut nu - me - ris
tan - ti - a fa - ctis, Dul - ci - bus ut nu - me - ris
tan - ti - a fa - ctis, Dul - ci - bus ut nu - me - ris
scis cer - tan - ti - a fa - ctis, Dul - ci - bus ut nu - me - ris

Example 2 (cont.).

[27]

26 pri - scis cer - tan - ti - a fa - ctis Fa - cta tu - a,
 pri - scis cer - tan - ti - a fa - ctis Fa - cta tu - a, Hyp -
 pri - scis cer - tan - ti - a fa - ctis Fa - cta tu - a,
 pri - scis cer - tan - ti - a fa - ctis Fa - cta tu - a,

31 Hyp - po - li - te, fa - cta tu - a, Hyp - po - li -
 po - li - te, fa - cta tu - a, Hyp - po - li -
 Hyp - po - li - te, fa - cta tu - a, Hyp - po - li -
 Hyp - po - li - te, fa - cta tu - a, Hyp - po - li -

36 te, ex - cel - sum su - per ae - the - ra mit -
 te, ex - cel - sum su - per ae - the - ra mit -
 te, ex - cel - sum su - per ae - the - ra mit -
 te, ex - cel - sum su - per ae - the - ra mit -

Example 2 (cont.).

The image displays a musical score for Example 2 (cont.), consisting of two systems of music. Each system includes four staves: a vocal line (treble clef) and three instrumental lines (alto, tenor, and bass clefs). The lyrics are in Latin and are written below the corresponding staves. The first system begins at measure 40, and the second system begins at measure 44. The lyrics for the first system are: "tat, Fa - cta tu - a, Hyp - po - li -". The lyrics for the second system are: "te, ex - cel - sum su - per ae - the - ra mit - tat." The instrumental parts provide harmonic support for the vocal line, with the bass line often moving in parallel motion with the vocal line.

40 tat, Fa - cta tu - a, Hyp - po - li -

te, ex - cel - sum su - per ae - the - ra mit - tat.

44 ex - cel - sum su - per ae - the - ra mit - tat.

Example 2 (cont.).

TABLE 1
 Don Nicola Vicentino Ancient Music Adapted to Modern Practice
 (*L'antica musica ridotta alla moderna prattica*) Rome 1555

Title Page and Portrait		1 page
Letters of Dedication and to the Readers		1 page
Book on Music Theory (<i>Libro della theorica musicale</i>) Boethian fundamental on the ancient Greek genera: 5 diagrams	16 chapters	8 pages
Book I on Music Practice (<i>Libro primo della prattica musicale</i>) melodic intervals with diatonic, chromatic, and enharmonic sizes: 1 diagram, 38 music examples	42 chapters	40 pages
Book II on Music Practice (<i>Libro secondo della prattica musicale</i>) rudiments of intervallic progressions and combinations: 28 music examples	31 chapters	32 pages
Book III on Music Practice (<i>Libro terzo della prattica musicale</i>) modes and cadences of the three genera in modern vocal polyphony: 55 music examples, including #44 <i>Alleluia. Haec dies</i> , #51 <i>Soav'e dolc'ardore</i> , #52 <i>Dolce mio ben</i> , #53 <i>Madonna, il poco dolce</i> , #54 <i>Musica prisca caput</i>	56 chapters	59 pages
Book IV on Music Practice (<i>Libro quarto della prattica musicale</i>) compositional procedures, designs, genres, and styles: 5 diagrams, 24 music examples	43 chapters	53 pages
Book V on Music Practice (<i>Libro quinto della prattica musicale</i>) construction and tunings of the archicembalo, and how to find all intervals on the two manuals: 2 diagrams, 58 music examples	66 chapters	96 pages
Table of Contents (<i>La tavola del libro della theorica</i>) (<i>Le tavole delli cinque libri della prattica musicale</i>)		11 pages
[Drawings of the archicembalo]		8 pages
	254 chapters	309 pages

TABLE 2

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- G. Bains, *Memorie storico-critiche della vita e delle opere di Giovanni Pierluigi da Palestrina*. 2 vols. Rome 1828.
- J. M. Barbour, *Tuning and Temperament: A Historical Survey*. East Lansing 1953; repr. New York 1974.
- K. Berger, *Theories of Chromatic and Enharmonic Music in Late 16th Century Italy*. Ann Arbor 1980.
- E. Bottrigari, *Il Melone discorso armonico* (Ferrara 1602). Facsimile ed. G. Vecchi, *Il Melone e Il Melone secondo* = Biblioteca Musica Bononiensis II/29. Bologna 1969.
- P. R. Brink, *The Archicembalo of Nicola Vicentino*. Ph.Diss. Ohio State University 1966.
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TABLE 3
Chart of the Steps from the Comma to the Proximate Major Third

comma	,	I, 14
minor diesis	. [,]	I, 15
major diesis/minor semitone	..	I, 16-18
major semitone	...	I, 19-20
minor whole tone	... .	I, 21
whole tone	... ..	I, 22-23
major whole tone	... . . .	I, 24
minimal third	..... ..	I, 25
minor third	..... ...	I, 26-27
proximate minor third/[minimal major third]	..... ....	I, 28
major third	..... .....	I, 29-30
proximate major third	..... .....	I, 31

TABLE 4

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
B	Ḃ	B̂	B#	C	Ċ	C#	Db	D̂	D	Ḋ	D#	Eb	Ê	E	Ė
4.1.	Vicentino's comma: pitches 1-2, 15-16.														
4.2.	Vicentino's minor diesis: pitches 1-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, etc.														
4.3.	Vicentino's major diesis/minor semitone: pitches 1-4, 3-5, 4-6, 5-7, 6-8, 7-9, 8-10, 9-11, 10-12, etc.														
4.4.	Vicentino's major semitone: pitches 1-5, 3-6, 4-7, 5-8, 6-9, 7-10, 8-11, 9-12, 10-13, 11-14, 12-15.														
4.5.	Vicentino's minor whole tone: pitches 1-6, 3-7, 4-8, 5-9, 6-10, 7-11, 8-12, 9-13, 10-14, 11-15.														
4.6.	Vicentino's whole tone: pitches 1-7, 3-8, 4-9, 5-10, 6-11, 7-12, 8-13, 9-14, 10-15.														
4.7.	Vicentino's major whole tone: pitches 1-8, 3-9, 4-10, 5-11, 6-12, 7-13, 8-14, 9-15.														
4.8.	Vicentino's minimal third: pitches 1-9, 3-10, 4-11, 5-12, 6-13, 7-14, 8-15.														
4.9.	Vicentino's minor third: pitches 1-10, 3-11, 4-12, 5-13, 6-14, 7-15.														
4.10.	Vicentino's proximate minor third/minimal major third: pitches 1-11, 4-12, 5-13, 6-14, 7-15.														
4.11.	Vicentino's major third: 1-12, 3-13, 4-14, 5-15.														
4.12.	Vicentino's proximate major third: 1-16.														
4.13.	Vicentino's diatonic tetrachord: pitches 1, 5, 10, 15.														
4.14.	Vicentino's chromatic tetrachord: pitches 1, 5, 7, 15.														
4.15.	Vicentino's enharmonic tetrachord: pitches 1, 3, 5, 15.														

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TABLE 5
Tuning Systems

	PYTHAGOREAN diatonic ditonaion	PTOLEMAIC diatonic syntonon	VICENTINO	ARCHICEMBALO [Figure 7]
minor semitone		25:24 = 71		78
minor semitone	256:243 = 90	135:128 = 92	21:20 = 85	
minor semitone	2187:2048 = 114	16:15 = 112	[16:15 = 112] 14:13 = 128	116
Major semitone				
Major semitone				
minor tone			13:12 = 139	
minor tone		10:9 = 183	10:9 = 183	155
whole tone				
whole tone	9:8 = 204	9:8 = 204	9:8 = 204	194
whole tone			8:7 = 231	232
Major tone				
minor third	32:27 = 294	6:5 = 316	6:5 = 316	310
minor third			5:5:4:5 = 347	348
prox. minor third		5:4 = 386	5:4 = 386	387
Major third	81:64 = 408			
Major third			4.5:3.5 = 435	426
prox. Major third				
fourtn	4:3 = 498	4:3 = 498	4:3 = 498	503
tritone	729:512 = 612	45:32 = 590		581
[prox.] tritone				619
fifth	3:2 = 702	3:2 702	3:2 = 702	697
minor sixth	128:81 = 792			
minor sixth		8:5 = 814	8:5 = 814	813
Major sixth		5:3 = 884	5:3 = 884	890
Major sixth	27:16 = 906			
minor seventh	16:9 = 996	16:9 = 996		
minor seventh		69:5 = 1018		1006
Major seventh		15:8 = 1088		1084
Major seventh	243:128 = 1110	256:135 = 1108		
[prox.] Major seventh		48:25 = 1129		1123
octave	2:1 = 1200	2:1 = 1200	2:1 = 1200	1200
prox. octave				1239

TABLE 6
 Vicentino's archicembalo in the first tuning
L'antica musica, V, 5
 (based on the string lengths given in Lemme Rossi's *Sistema musico*,
 p. 86)

1F	1200*	[A]	1B	581*	[D [♯]]
3E [♯]	1161		5B ^b	542	
4E	1123*	[A ^b]	2B ^b	503*	[D]
1E	1084*	[G [♯]]	3A [♯]	464	
5E ^b	1045		4A	426*	[D ^b]
2E ^b	1006*	[G]	1A	387*	[C [♯]]
3D [♯]	968		5A ^b	348	
4D	929*	[G ^b]	3A ^b	310*	[C]
1D	890*	[F [♯]]	2G [♯]	271*	[B [♯]]
5D ^b	852		4G	232	
3D ^b	813*	[F]	1G	194*	[B]
2C [♯]	774*	[E [♯]]	5G ^b	155	
4C	735		3G ^b	116*	[B ^b]
1C	697*	[E]	2F [♯]	78*	[A [♯]]
3B [♯]	658		4F	39	
4B	619*	[E ^b]	1F	0*	[A]

Numbers in front of letter names indicate the ranks on which the keys are located. There were two keyboards on the archicembalo: the first keyboard comprises ranks 1, 2, and 3; the second, ranks 4, 5, and 6. The sixth rank is omitted here, because its comma keys, 19/20 cents each, are irrelevant. The six comma keys inserted by Vicentino were on E, D, B, A, G; the ones on C and F could not be fitted in.

Asterisked cents values correspond to the string lengths given by Rossi for meantone tuning on the keyboard (*sistema participato*). The letters in square brackets are Rossi's keys. See Rossi, *Sistema musico*, p. 83.

Rossi's meantone tuning is a closed system with 19 keys.