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MTO 20.2 Examples: Jonathan Wild, Vicentino's 31-tone Compositional Theory

(Note: audio, video, and other interactive examples are only available online)
http://www.mtosmt.org/issues/mto.14.20.2/mto.14.20.2.wild.php

Figure 1. Intervallic makeup of the whole tone and the diatonic semitone in Vicentino's 31-tone system. The whole tone is divided notionally into five minor enharmonic dieses and the diatonic semitone into three. Alternative spellings for pitches usually notated with an enharmonic dot are shown beneath the line diagrams. Vicentino's names for various subspans of the tone appear at bottom left; the interval of two minor dieses is interpreted either as a minor semitone or as a major enharmonic diesis, depending on its context.

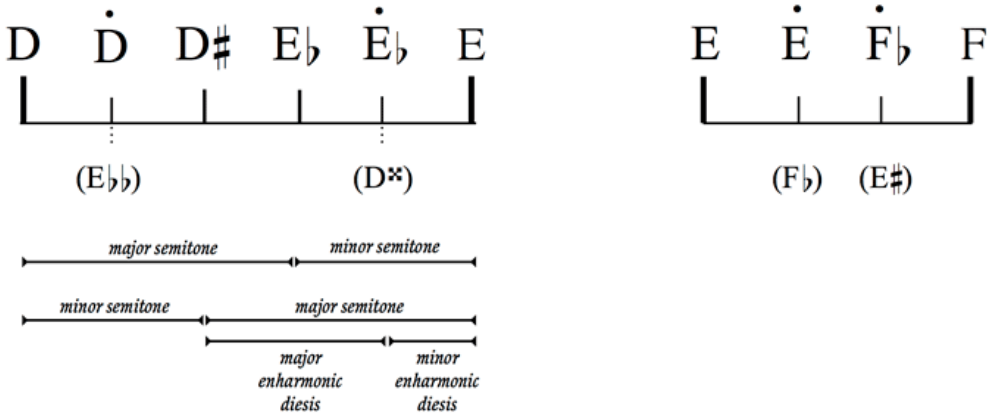


Figure 2. An octave span of the two manuals of the archicembalo. In (a-c), ascending from the bottom of the figure, a cumulative display of the logical components of the 19-key lower manual: (a) the usual 12-note meantone gamut; (b) split keys on every black note provide alternative accidentals; (c) new keys between E–F and B–C extend the chain of 5ths sharpwards from A♯. In (d), at the top of the figure, the 17-key upper manual is depicted, with arrows indicating its ascending circle-of-5ths connections to and from the lower manual; despite their spelling, these 5ths between manuals (B♯–Ġ♭ and Ḃ–G♭) are as good as all the others. The upper manual covers pitches between Ġ♭ (= F𝄪) to Ḃ (= C♭) in the circle of 5ths; the remaining five pitches on the split keys (unlabeled here) would be tuned as pure 5ths relative to the lower manual.

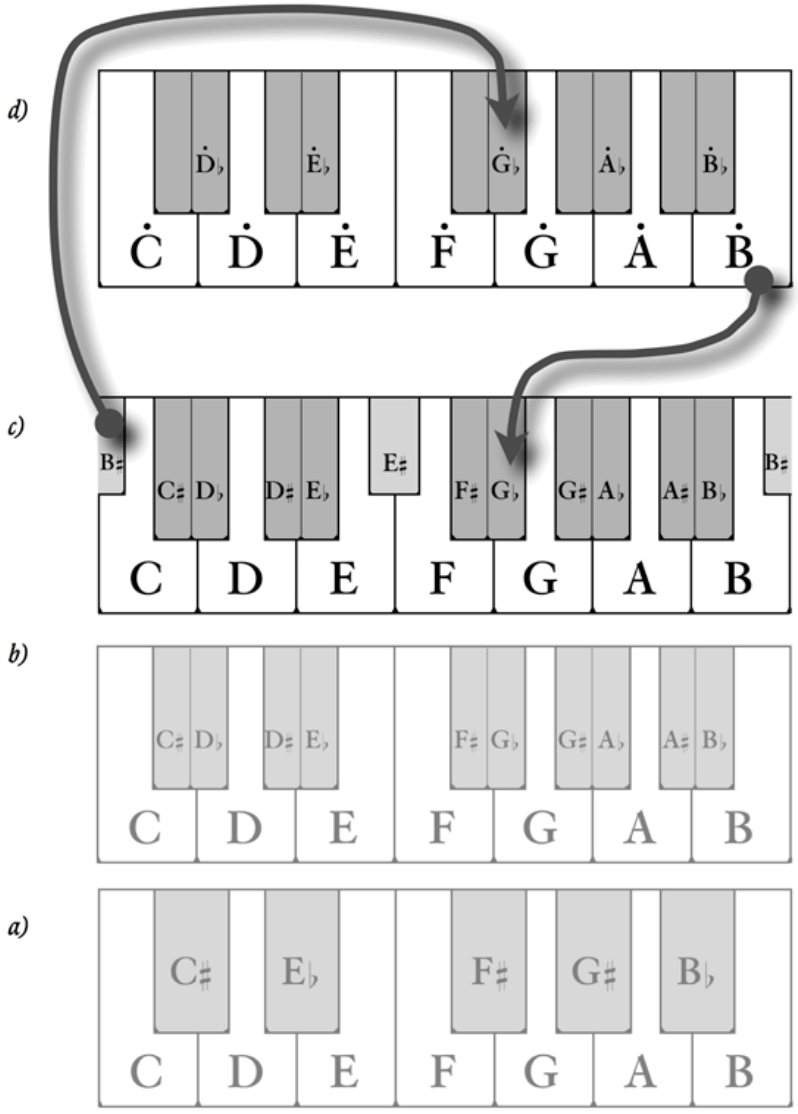


Figure 3. The three genera as they are embedded in Vicentino's 31-tone tuning, with interval names given as they appear in L'Antica musica. Each genus is shown here to scale, the visual proportions matching the size of the intervals involved. Beneath each genus appears its decomposition of the ascending perfect 4th into minor enharmonic dieses (the step-interval of the 31-note scale), summing in each case to 13 parts; beneath that are the intervals, in cents, between each of the upper notes and the A at the bottom of the tetrachord. Note that the minor semitone and the major enharmonic diesis are the same size: two minor dieses (77.419 cents).

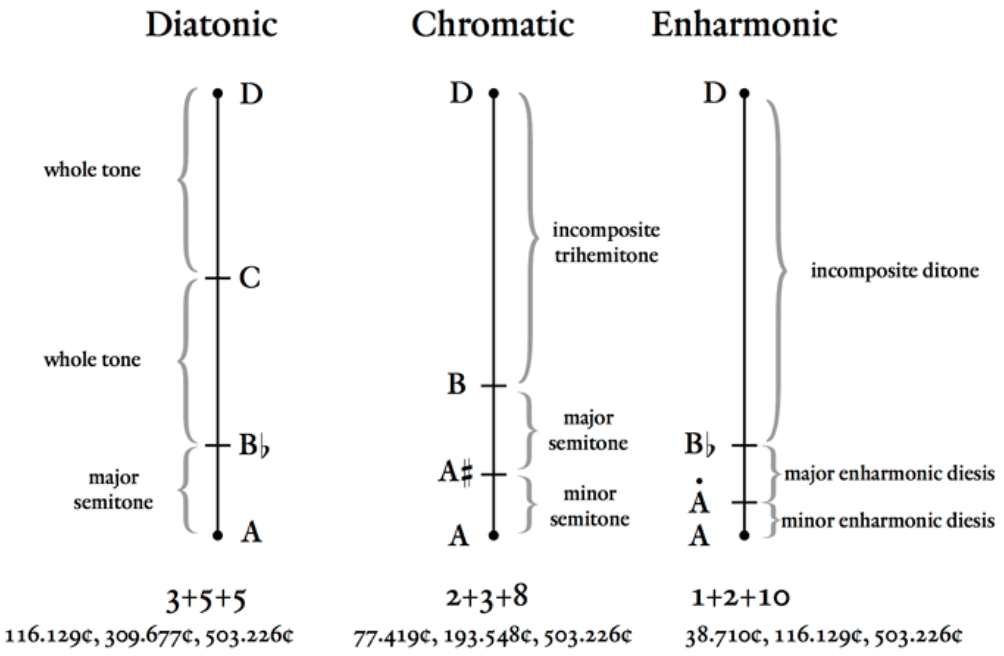


Figure 4. The subdivision of a natural whole tone proper to the enharmonic genus. Three minor enharmonic dieses and one major are arranged in such a way that the subdivision begins and ends with a minor diesis. The result is that only one of the sharped or flatted pitches may be present; and the pitches of the filled-in whole tone alternate between those written with an enharmonic dot and those without a dot.

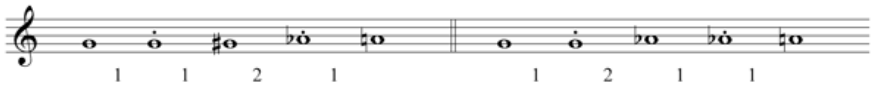


Figure 5. Chart of enharmonic subdivision schemes for whole tones and semitones of five kinds, depending on their boundary pitches. An example of each kind of whole tone and semitone is given in the second column. Each kind of whole tone admits two ways of arranging the three minor dieses and one major diesis, both in ascent and descent.

WHOLE TONES:		ascending		descending		
Natural	F–G	mMmm	mmMm	mMmm	mmMm	
Chromatic (sharps)	F♯–G♯	Mmmm	mmMm	mMmm	mmmM	
Chromatic (flats)	G♭–A♭	mMmm	mmmM	Mmmm	mmMm	
Natural enharmonic	Ḟ–Ġ	Mmmm	mmmM	mMmm	mmMm	**
Enharmonic chromatic	Ġ♭–Ȧ♭	Mmmm	mmmM	Mmmm	mmmM	

SEMITONES:					
Natural	E–F	mM	mmm	Mm	mmm
Chromatic (sharps)	D♯–E	mM	Mm	mM	mmm
Chromatic (flats)	E♭–F♭ *	mmm		mmm	
Natural enharmonic	Ė–Ḟ	mmm		mmm	
Enharmonic chromatic	Ė♭–Ḟ♭ *	mmm		mmm	

*: Vicentino spells F♭ as Ė and Ḟ♭ as E♯ in these sections.

**: The descending division of the natural enharmonic whole tone breaks the pattern apparent in Figure 6 below.

Figure 6. Chart depicting admissible divisions of different kinds of whole tone. Vicentino defines five categories of whole tone intervals in the 31-tone system according to whether their starting and ending pitches are written as naturals, "natural enharmonic" pitches, sharps, flats, or flats inflected enharmonically. In each case the tone is divided unequally into three minor dieses and one major diesis, and in each case there are two admissible ways to execute this division. The larger arc in each image represents the single step of a major diesis. The diagrams for each of the five types of whole tone have been slid horizontally so that similar accidentals are vertically aligned. This lets us see that the pitches skipped over, whatever their relative position in the whole tone being subdivided, are always naturals, sharps, or flats. Pitches written with a dot (either "natural enharmonic" or with an enharmonic dot in conjunction with a flat) are always included; thus the aural structure of a correctly divided whole tone depends on its notation and absolute pitch level.

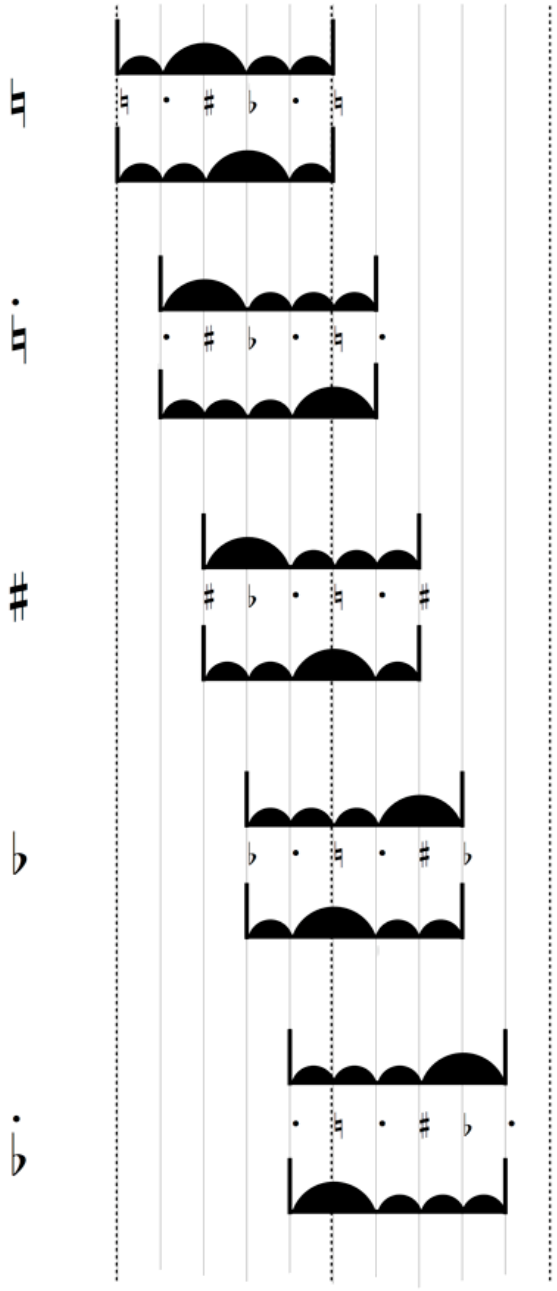


Figure 7. The three species of 4th in each genus. Each species retains its abstract structure (e.g. *aba*) from the diatonic when mapped to the other two genera, but the step intervals *a* and *b* are transformed from tones and semitones into the characteristic intervals of the other genera. Between angle brackets the number of scale steps (31sts of an 8ve) of each interval is given, always summing to 13 (a perfect 4th). The species of 4th are shown here at their traditional pitch heights.

	Diatonic *a*: whole tone *b*: major semitone	Chromatic *a*: semitone (M or m) *b*: minor third	Enharmonic *a*: enharmonic diesis (M or m) *b*: major third
1st species: *aba*	A B C D ⟨5 3 5⟩	A B♭ D♭ D♮ ⟨3 8 2⟩	A Ȧ D♭ D♮ ⟨1 10 2⟩
2nd species: *baa*	B C D E ⟨3 5 5⟩	B D D♯ E ⟨8 2 3⟩	B D♯ Ė♭ E♮ ⟨10 2 1⟩
3rd species: *aab*	C D E F ⟨5 5 3⟩	C D♭ D F ⟨3 2 8⟩	C Ċ D♭ F ⟨1 2 10⟩

Figure 8. The four species of 5th in each genus. Each species retains a similar abstract structure (e.g. *abaa* → *abaaa*) to the diatonic when mapped to the other two genera, but the step intervals *a* and *b* are transformed from tones and semitones into the characteristic intervals of the other genera. Between angle brackets the number of scale steps (31sts of an 8ve) of each interval is given, always summing to 18 (a perfect 5th). The species of 5th are shown here at their traditional pitch heights.

	Diatonic *a*: whole tone *b*: major semitone	Chromatic *a*: semitone (M or m) *b*: minor third	Enharmonic *a*: enharmonic diesis (M or m) *b*: major third
1st:	*abaa* D E F G A ⟨5 3 5 5⟩	*abaaa* D E♭ G♭ G♮ A♭ A ⟨3 8 2 3 2⟩	*abaaaaa* D Ḋ G♭ G♮ Ġ G♯ Ȧ♭ A♮ ⟨1 10 2 1 1 2 1⟩
2nd:	*baaa* E F G A B ⟨3 5 5 5⟩	*baaaa* E G A♭ A♮ B♭ B♮ ⟨8 3 2 3 2⟩	*baaaaaa* E G♯ Ȧ♭ A♮ Ȧ B♭ Ḃ♭ B♮ ⟨10 2 1 1 2 1 1⟩
3rd:	*aaab* F G A B C ⟨5 5 5 3⟩	*aaaab* F G♭ G♮ A♭ A♮ C ⟨3 2 3 2 8⟩	*aaaaaab* F Ḟ F♯ Ġ♭ G♮ Ġ A♭ C ⟨1 2 1 1 1 2 10⟩
4th:	*aaba* G A B C D ⟨5 3 5 5⟩	*aabaa* G A♭ A♮ C D♭ D♮ ⟨3 2 8 3 2⟩	*aabaaaa* G Ġ A♭ C♮ Ċ C♯ Ḋ♭ D♮ ⟨1 2 10 1 1 2 1⟩

Figure 9. Unused permutations of intervals comprising the 5th in the chromatic and enharmonic genera. Whereas all permutations of the diatonic species of 4ths, 5ths, and 8ves, and all permutations of the chromatic and enharmonic 4ths are used in Vicentino's theories, the chromatic and enharmonic 5ths in Figure 8 above could be generalized to include these. Berger believes the chromatic 5th shown here, and the last of the enharmonic 5ths shown here, to be the correct structures intended by Vicentino for the G–d 5th instead of the structures that appear in *L'Antica musica*; see my notes 29 and 31 for discussion.

The abstract templates (*aaabaaa* etc.) could be realized in more than one way depending on the distribution of major and minor dieses (major and minor semitones in the case of the chromatic genus). Here I have chosen ways that correspond most closely to Vicentino's practices.

Chromatic:	***aaaba***	e.g. G A♭ A♮ B♭ D♭ D♮	⟨3 2 3 8 2⟩
Enharmonic:	***aaabaaa***	e.g. D Ḋ D♯ Ė♭ Ġ G♯ Ȧ♭ A♮	⟨1 1 2 10 1 2 1⟩
	aaaabaa	e.g. D Ḋ D♯ Ė♭ E♮ G♯ Ȧ♭ A♮	⟨1 1 2 1 10 2 1⟩
	aaaaaba	e.g. G Ġ G♯ Ȧ♭ A♮ Ȧ D♭ D♮	⟨1 1 2 1 1 10 2⟩

Figure 10. Vicentino's seven chromatic 8ves, formed by combining the species of chromatic 4th and 5th analogously to his interpretation of the diatonic genus. At the bottom is Karol Berger's proposed amendment for the seventh 8ve species (see my note 38). The size of each scale step, in 31sts of an 8ve, is shown beneath the staff, and the authentic or plagal divider is indicated with a dotted line.

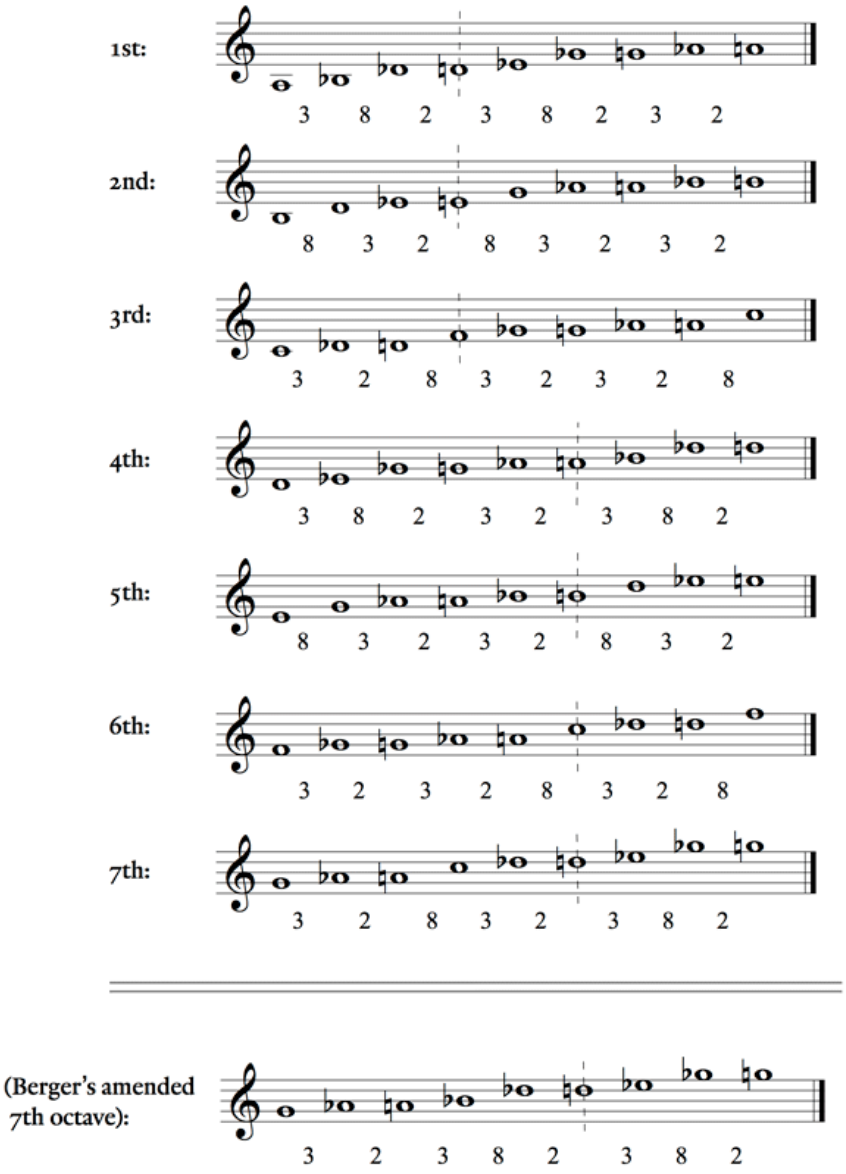


Figure 11. Vicentino's enharmonic 8ve species appear in the highlighted cells of this table. The left-hand column shows the enharmonic 8ves that should have resulted, if Vicentino had followed his procedure from the other genera: the first three 8ves would be constructed as plagal structures, and the remaining four authentic. Aside from the sixth 8ve, which presents special difficulties of interpretation, the last four 8ves appear to be based on plagal analogies to the diatonic: for example, the G–g 8ve uses the third 4th below the fourth 5th, similar to an interpretation of the diatonic G–g 8ve as a G–c/c–g plagal structure rather than the expected G-d/d-g. Asterisks mark locations in the enharmonic 8ves where further modifications to the 8ve species have been made in L'Antica musica (see my note 42). Clefs are original.

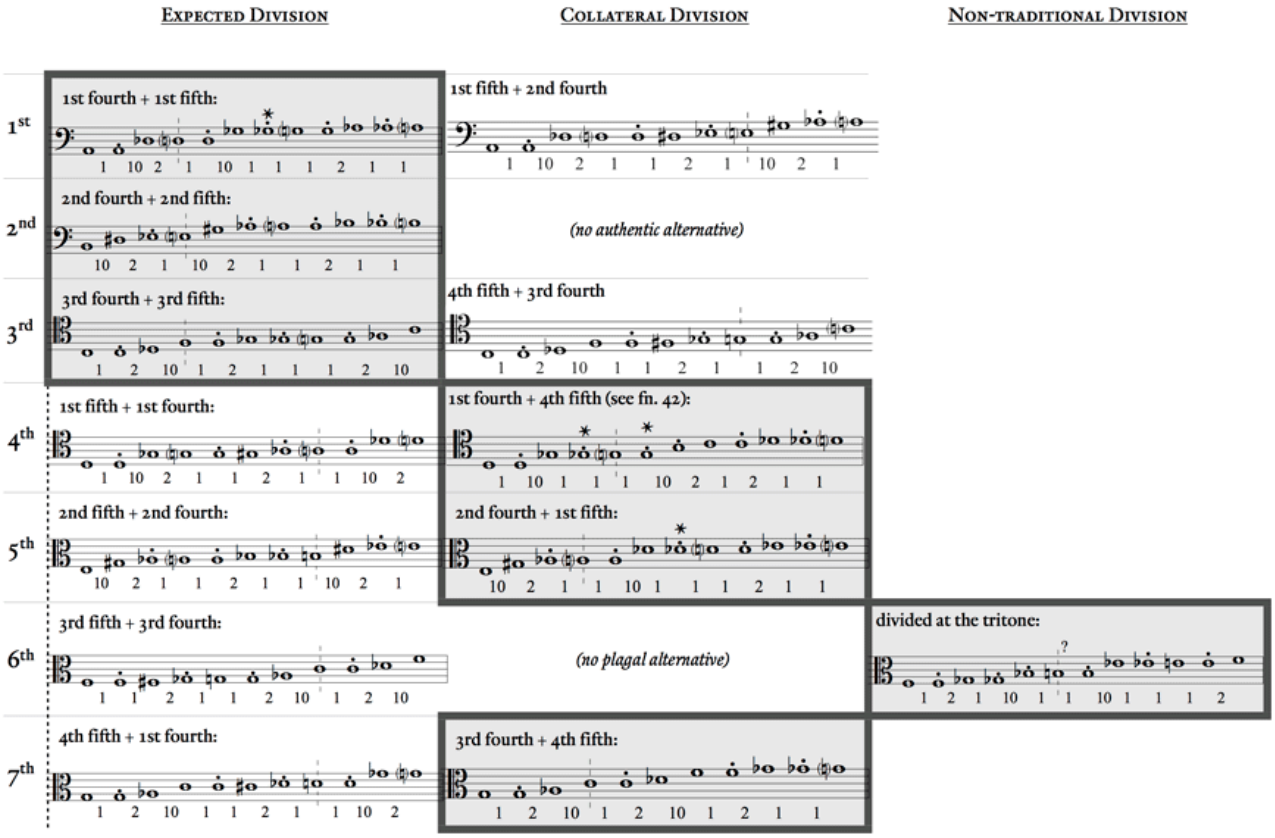


Figure 12. The eight modes of the enharmonic genus as they appear in *L'Antica musica*. They follow the traditional scheme of paired authentic and plagal structures on the four finals D, E, F, and G.

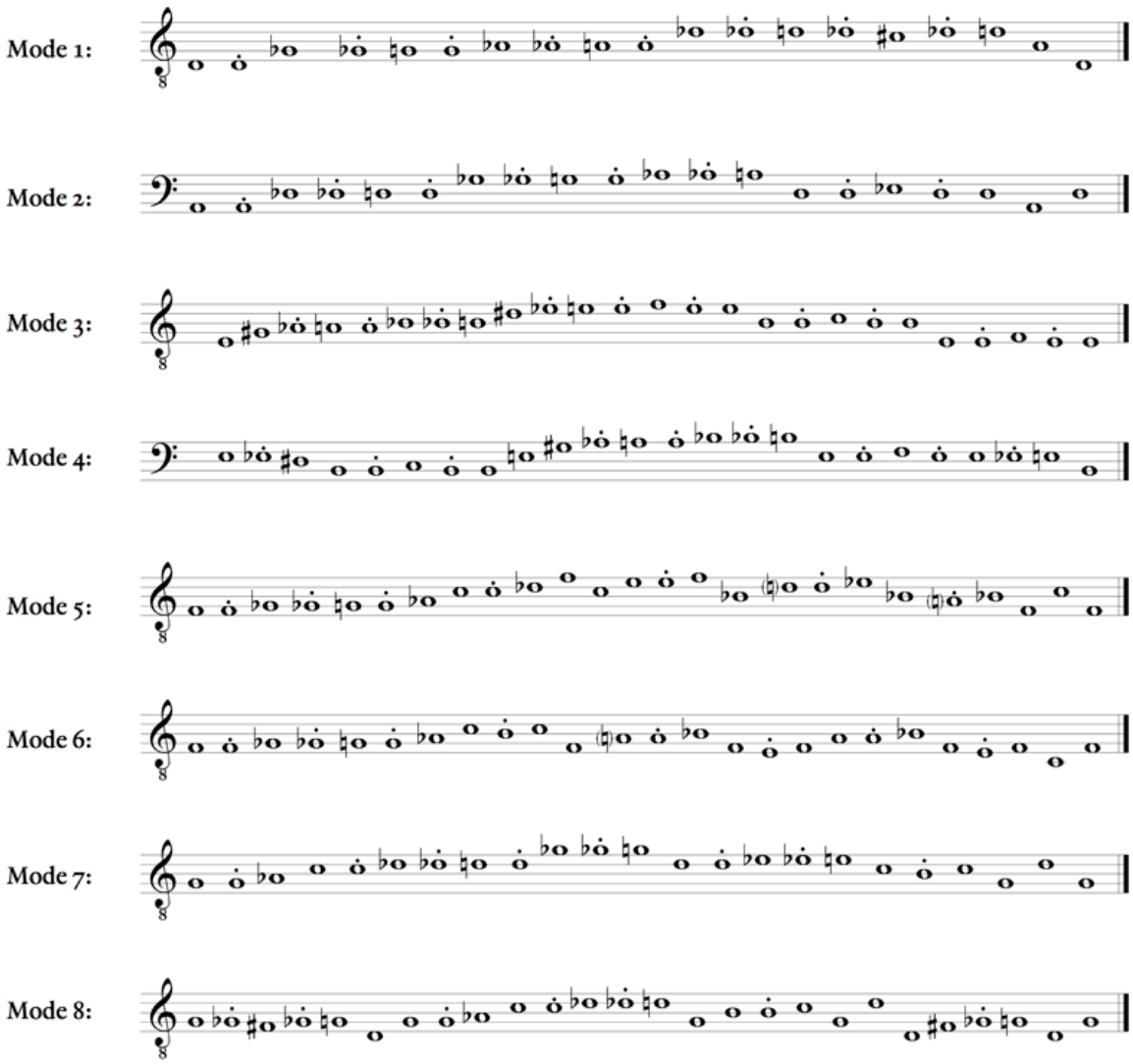


Figure 13. Examples of "unruly" division of the 4th and 5th, ascending and descending, showing the size of each step interval in 31sts of an 8ve. Reproduced from *L'Antica musica* f65. Regarding the locations marked * and **, see note 49.

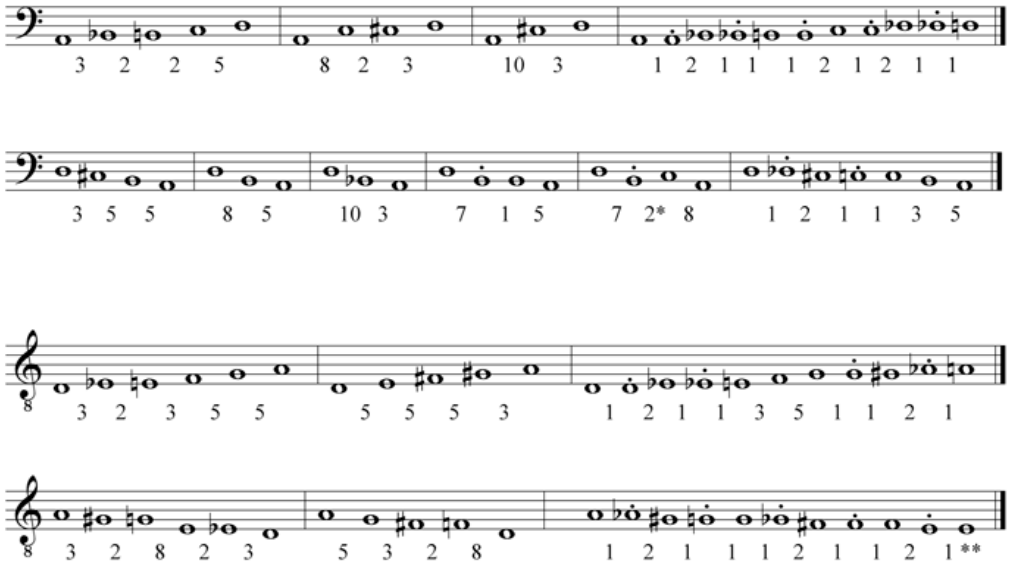


Figure 14. The ending of Vicentino's motet *Musica prisca caput*

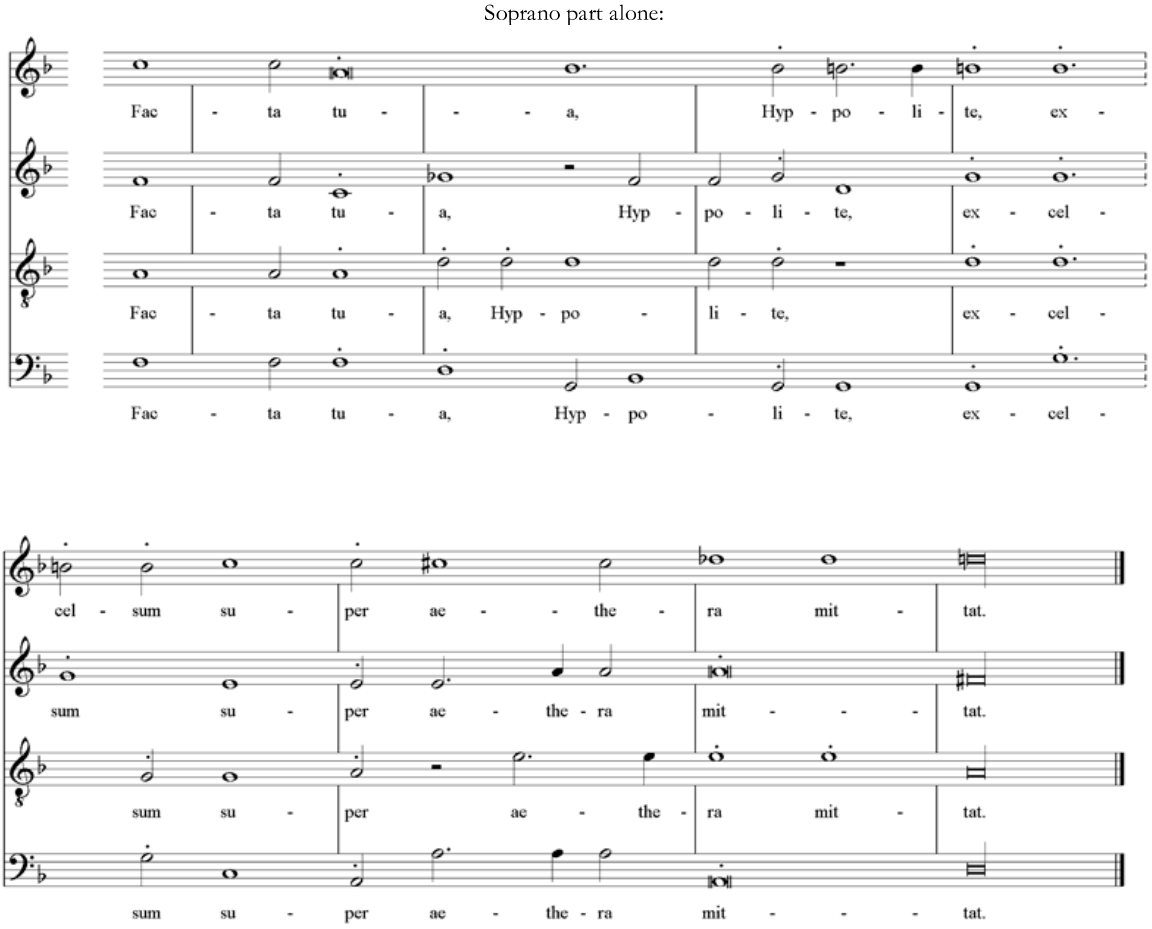
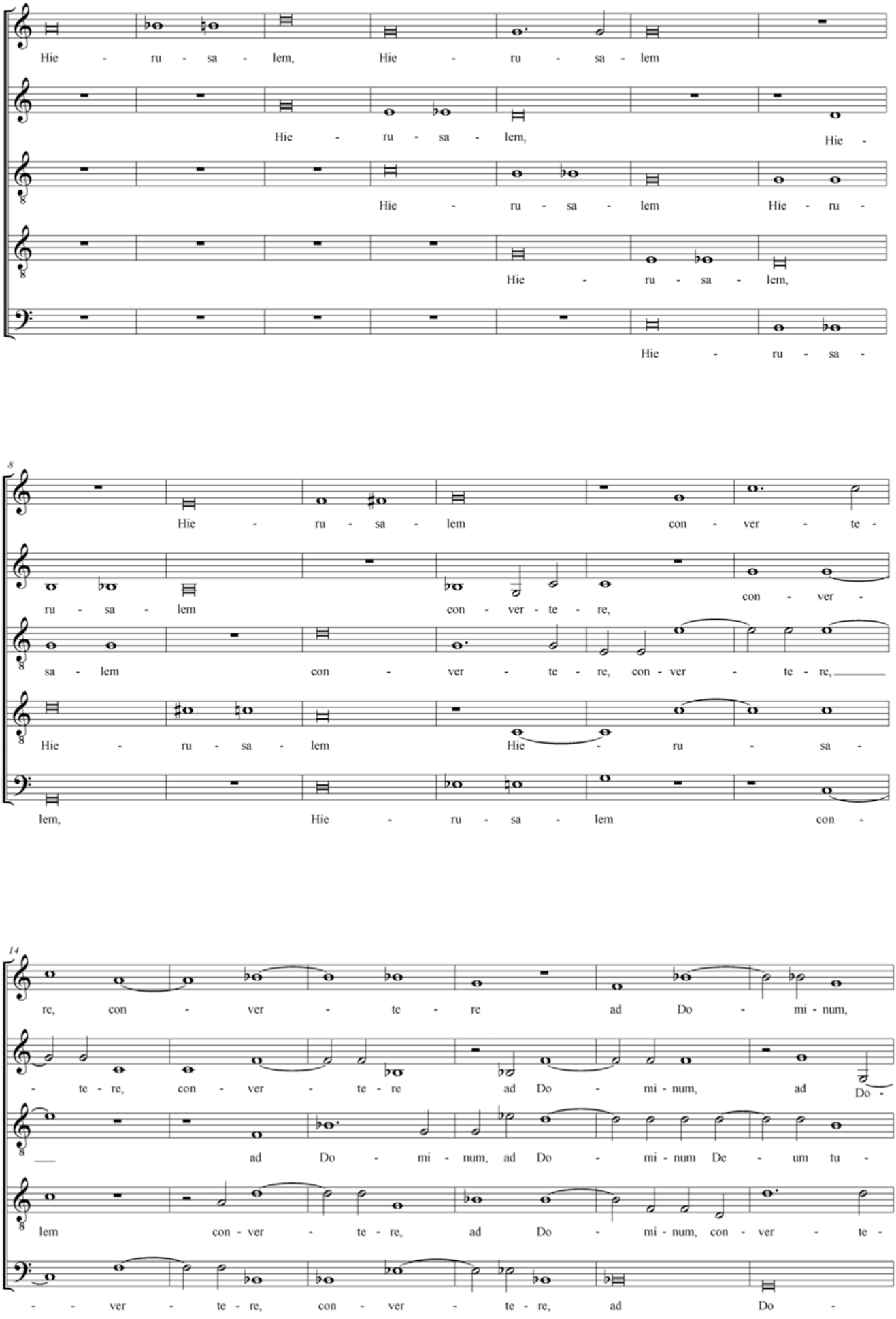


Figure 15. Vicentino's chromatic composition *Hierusalem*


Hie - ru - sa - lem, Hie - ru - sa - lem
Hie - ru - sa - lem, Hie -
Hie - ru - sa - lem Hie - ru -
Hie - ru - sa - lem,
Hie - ru - sa -
8
Hie - ru - sa - lem con - ver - te -
ru - sa - lem con - ver - te - re, con - ver -
sa - lem con - ver - te - re, con - ver - te - re,
Hie - ru - sa - lem Hie - ru - sa -
lem, Hie - ru - sa - lem con -
14
re, con - ver - te - re ad Do - mi - num,
- te - re, con - ver - te - re ad Do - mi - num, ad Do -
ad Do - mi - num, ad Do - mi - num De - um tu -
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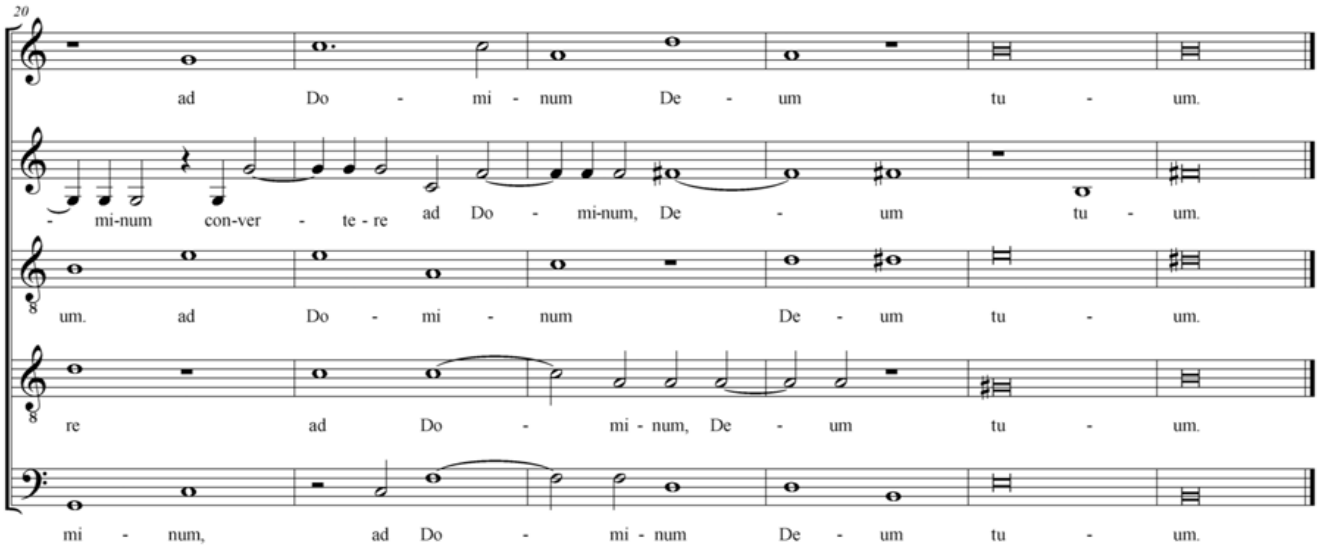

Figure 16. Chromatic species in the second tenor part of *Hierusalem*, which Vicentino describes as "completely chromatic, without any mixture from other genera" (222). In such a work, every melodic motion in the piece should correspond to a step interval of some chromatic species. 4ths, 5ths, and 8ves may be considered neutral; they do not indicate the presence of any other genus. Here, every non-neutral melodic motion (except for two discontinuities between phrases, marked by dashed zig-zag lines) is interpreted as a portion of a chromatic species. (There is more than one possible interpretation; here, wherever there is not a complete chromatic 4th (or 5th), I have preferred the 4th that would also include nearby notes in the melody, and preferred those 4ths bounded by natural notes. For example the final two notes could have been part of a third-species 4th F♯–G–G♯–B or a second-species 4th G♯–B–C–C♯ instead of the first-species G–C 4th shown.) Vicentino does not comment on the one or two non-chromatic intervals in the piece—apart from those that occur between notes on either side of a rest, like the major 6th and major 2nd in this tenor part, there is a direct minor 6th in the first tenor. In an earlier example described as completely chromatic (Maniates's ex. 44, *Alleluia*), Vicentino acknowledges a few non-chromatic intervals—major 3rds, principally—which he has retained for their good effect, "on account of the intensity of the words" (195).

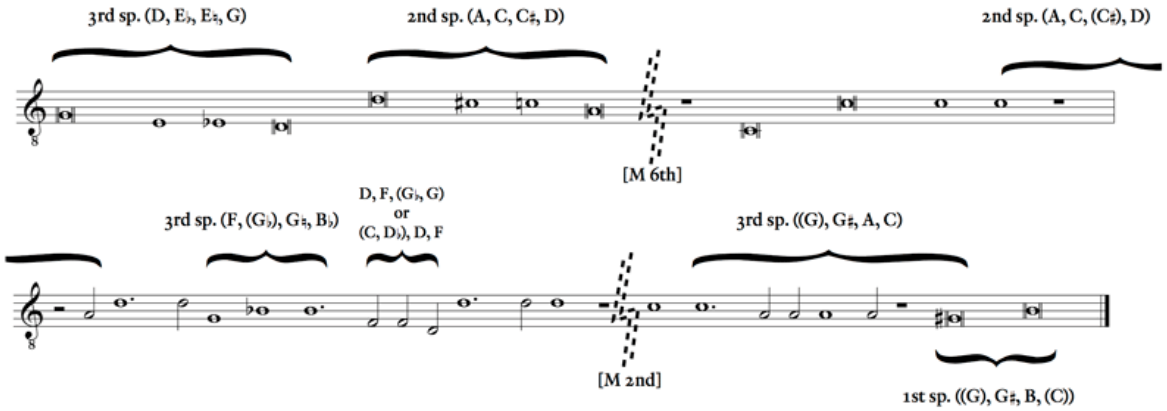

Figure 17. All major triadic successions (up to root motion by ascending augmented 4th) that can be written entirely with melodic intervals from the chromatic genus (diatonic and chromatic semitones; minor 3rds) and perfect 4ths/5ths. Only those progressions marked by an asterisk appear in the compositions *Hierusalem* and *Alleluia*.

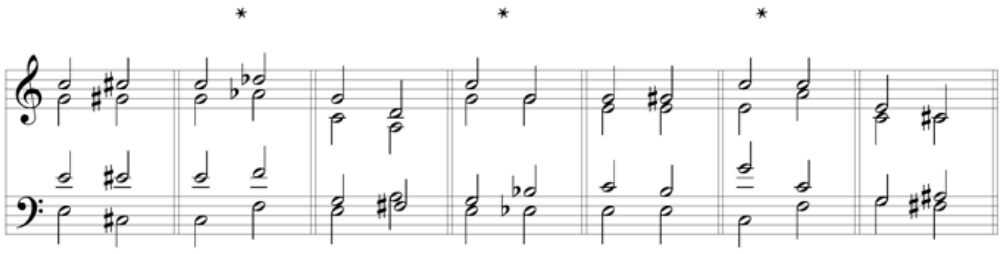

Figure 18. Vicentino's composition *Soav'e dolc'ardore*. Braces show connections by minor or major enharmonic dieses (only one connection per triadic succession is shown when more than one voice moves by a diesis). The final connection highlighted in the soprano line, from A♯ to A♭, is not an enharmonic diesis; note 57 discusses the voice-leading in this succession.

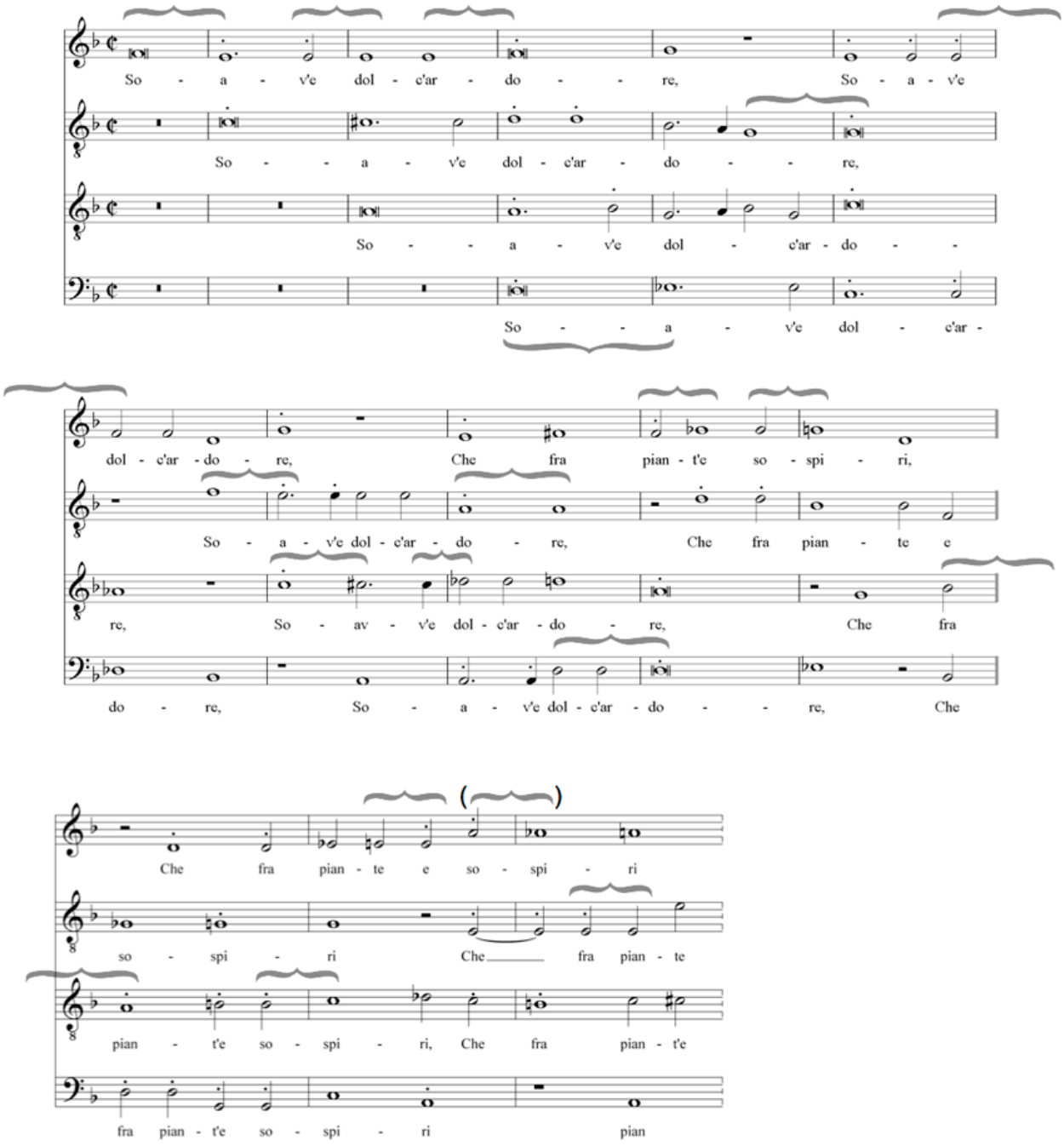

Figure 19. Ending of Vicentino's composition *Dolce mio ben*