INSCRIBING MEDIEVAL PEDAGOGY:
MUSICA FICTA IN ITS TEXTS

by

CLÓVIS AFONSO DE ANDRÉ
May 9th, 2005
Major Professor: Dr. Michael Long

A dissertation submitted to the
Faculty of the Graduate School of
The State University of New York at Buffalo
in partial fulfillment of the requirements for the
degree of

Doctor of Philosophy
in
Historical Musicology

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To
my wife and kids
Lúcia, Lucas, and Pedro

and

my brother
Paulo de Tarso A. de André
(in memoriam)
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ABSTRACT

This dissertation focuses on the medieval and Renaissance understandings of \textit{musica ficta} with respect to considering its repertorial and theoretical contexts, from the ninth to the sixteenth century. Contrary to common understandings that \textit{musica ficta} was linked primarily to the rules of counterpoint, and therefore to polyphony, the author argues that \textit{musica ficta} was the product of earlier monophonic contexts that called for solutions mainly through solmization.

The entire process of solmization is laid out, first regarding \textit{recta} solmization and then moving to \textit{ficta} solmization. The three main procedures for clarifying hexachords (mutation, permutation, and transmutation) are discussed. Each is addressed in detail; types and subtypes (such as 'explicit,' 'implicit,' and 'indirect' mutations), species (\textit{recta-} and \textit{ficta-}mutations), cases ('regular' and 'irregular' mutations, permutations by leap and stepwise, transmutations in upper- and subsemitone situations, as well as in propinquity) are identified and defined. The dissertation introduces to \textit{ficta scholarship} notions of transmutation and of solmization by means of octave equivalence. In the latter, a momentary shift between two hexachords of the same kind (say, two $\overline{0}$-hexachords in different octaves) may be solmized without an actual change between them (i.e., without mutation).

'Transmutation' is conceived as an umbrella term that encompasses other types short-range
shifts between hexachords, in which one borrows a note from a different hexachord in order to permit the solmization of a transitional step that falls outside of its limits. This may happen, for example, when a note from an $\text{\textalpha}^{\text{-}}$-hexachord is solmized within a $\text{\textgamma}^{\text{-}}$-hexachordal gesture, in order to momentarily reach a $\text{\textbeta}^{\text{-}}$ above $\text{\textalpha}$. These concepts and terminology as promulgated in the language of medieval didactic writings are also considered in terms of contemporaneous rhetorical and philosophical practices, in an attempt to tease out the conceptual background that may have informed the approaches to solmization and the realization of \textit{musica ficta} taken by theorists, pedagogues, and performers.
EDITORIAL NOTES

— Double-quotes and single-quotes — Double-quotes have been used for direct quotations, and single-quotes for emphasis on terms (musical, philosophical, rhetorical), usually not quoted from any particular source. This procedures seeks to solve misapprehensions of those emphasis as quoted words or short sentences. Double-quotes have also been used for titles, incipits, or quotations of literary texts set to music—e.g., "Hymn to St. John" (as generic title), or "ut queant laxis" (either as incipit or as title).

— Dates of historical treatises — Two signs have been used in dates that involve more than one single year: a dash, or a slash. A dash indicates the span of years in which the treatise was written and/or rewritten. For instance, Pietro Aaron's Toscanello receives the date "1523-29." In this specific case, Aaron's treatise first appeared in 1523, but was revised and received a supplement (Aggiunta) published in 1529. A slash indicates that a treatise was written on some date between the given span of years (i.e., the exact date is uncertain, although the span of years in which it was written can be determined). For instance, Johannes Gallicus's Ritus canendi receives the date "1458/64," for the exact dates of its completion or inception are not known, although it happened some time between those years. A letter (uppercase or lowercase) after a date indicates that an author has
produced, in the same date, two or more works. If the chronological order for those works is known, then a lowercase letter (following alphabetical order) will be used. If the chronological order for those works is not known, then an uppercase letter will be used (usually taken from the first word of the title). In the bibliographical entries, the date appears immediately before a list of sources used for consultation, which is appended to each entry, primarily for treatises that originally circulated in manuscript form.
SYMBOLS
(QUICK REFERENCE LIST)

Musical symbols

— Pitches and steps —

\( \bar{A} \) thru \( \bar{G} \) . . . . . . . . . . pitch-classes

\( a \) thru \( g \) . . . . . . . . . . pitches (boldface)— may use uppercase, lowercase, or prime-signs as needed according to modern nomenclature

\( a \) thru \( g \) . . . . . . . . . . step-letters (regular typeface) — may use uppercase, lowercase, or letter doubling as needed according to medieval nomenclature

— Ficta-signs —

\( \flat \) . . . . . . . . . . . . . . . \( fa \)-sign; or \( b\)-rotundum, \( b\)-molle

\( \natural \) . . . . . . . . . . . . . . \( mi \)-sign; or \( b\)-quadratum (or quadratum), \( b\)-durum

\( \ast \) . . . . . . . . . . . . . . \( mi \)-sign

— Accidentals —

\( b \) . . . . . . . . . . . . . . . flat-sign

\( \# \) . . . . . . . . . . . . . . . natural-sign

\( \# \) . . . . . . . . . . . . . . . sharp-sign

xviii
— Solmization —

syllable . . . . . . . . Always given in italics, above the staff. In most cases the solmization is mine. If original to a source, an appropriate reference is given in the text or in the caption of the correspondent illustration.

= . . . . . . . . Equals sign is used in mutations.

[ ] . . . . . . . . Brackets are used in ‘implicit’ mutations, enclosing the syllable that is not uttered. For example, \([sol=] =re\) indicates that \(sol\) is being abandoned and is not uttered, while \(re\) is now uttered in its place, and is the valid syllable for a given note.

/ . . . . . . . . Slashes indicate ‘permutation.’ For example: \(fa/ \rightarrow mi\), where \(fa\) is the last syllable of a hexachord being abandoned, and \(mi\) is the first syllable of the hexachord being assumed.

( ) . . . . . . . . Parentheses indicate ‘transmutation.’

These signs are used in the following fashion:

\([\text{syllable=}]\) . . . . . . implicit mutated syllable (non-uttered)

\(=\text{syllable}\) . . . . . . implicit mutant syllable (non-uttered)

\(\text{syllable=}\) . . . . . . mutated syllable (uttered)—in explicit or implicit mutations

\(=\text{syllable}\) . . . . . . mutant syllable (uttered)—in explicit or implicit mutations

\(\text{syllable}/\) . . . . . . permutated syllable

\(/\text{syllable}\) . . . . . . permutant syllable

\((\text{syllable})\) . . . . . . transmutant syllable

\(\text{syllable}\) . . . . . . syllable solmized through octave equivalence
BIBLIOGRAPHICAL ABBREVIATIONS

AM . . . . . . . . . . Antiphonale monasticum pro diurnis horis. 1934.

Anon. ad Herennium . . . . Anonymous. Rhetorica ad Herennium. No dates are given in citations of this work.


xx
Aristotle. Abbrev. Title . . . . Aristotle works are given with his name and an abbreviation of title (e.g., Rhet. for Rhetorica, Top. for Topica, Meteor. for Meteorologica, etc.). No dates are given in citations of his works.


CS . . . . . . . . . . . Coussemaker, E. de, ed. Scriptorum de musica medii aevi, 4 vols. 1864–76.

GS . . . . . . . . . . . Gerbert, Martin, ed. Scriptores Ecclesiastici de musica sacra potissimum., 3 vols. 1784.


LmL . . . . . . . . . . . Bernhard, Michael. Lexicon Musicum Latinum Medii AEvi. 6 vols. (each one with different date).

LU . . . . . . . . . . . The Liber usualis. 1934.


TLL . . . . . . . . . . . . . *Thesaurus linguae latinae*. 1900– .


GENERAL ABBREVIATIONS

a. . . . . . . . . . . . . ante, before
abl. . . . . . . . . . . . . ablative (declension)
acc. . . . . . . . . . . . . accusative (declension)
bk. . . . . . . . . . . . . book, Liber (followed by an arabic numeral—referring
to a book of a treatise, according to the division
presented in the sources; plural: bks.) *
ca. . . . . . . . . . . . . circa, around, about, approximately
cent. . . . . . . . . . . . century (used mainly in author-date citations)
ch. . . . . . . . . . . . . chapter, caput, capitulum (followed by an arabic
numeral—according to the division presented in the
sources; plural: chs.) *
dat. . . . . . . . . . . . . dative (declension)
ex. . . . . . . . . . . . . exeunt, end of, late
f. . . . . . . . . . . . . folio (plural: ff.)
ff. . . . . . . . . . . . . 'and following '(this meaning is used when it is placed
after numbers of a page, folio or chapter—e.g., f.
A ff., means, 'folio A ff. and following'—this
abbreviation must not be confused with the plural
'folios', which is also indicated by ff., but is placed
before numbers)
i. . . . . . . . . . . . . inter, between
in. . . . . . . . . . . . . ineunte, beginning of, early
ind. . . . . . . . . . . . . indicative (verb tense)
lit. . . . . . . . . . . . . literally
med. . . . . . . . . . . . . medio, mid
p. . . . . . . . . . . . . pagina, page (plural: pp.); post, after (this latter meaning
is used exclusively for dates of historical
treatises)
p.a. . . . . . . . . . . . . paulo ante, a little before
pl. . . . . . . . . . . . . plural
p.p. . . . . . . . . . . . . paulo post, a little after
pres. . . . . . . . . . . . . present (verb tense)
Ps. . . . . . . . . . . Pseudo- (prefix abbreviation used in citations)
pt. . . . . . . . . . . pars, part (followed by an arabic numeral—referring to a part of a book and/or treatise, according to the division presented in the sources; plural: pts.) *
r. . . . . . . . . . reigned
sing. . . . . . . . . . singular
s.l. . . . . . . . . . sine loco, without place
s/n . . . . . . . . . . sine numero, without number
subj. . . . . . . . . . subjunctive (verb tense)
s.v. . . . . . . . . . sub verbo, sub voce; meaning 'under the entry' (plural: s.vv.)
tr. . . . . . . . . . treatise, tractatus (followed by an arabic numeral—referring to a part of a larger work, according to the division presented in the sources; plural: trs.) *
INTRODUCTION

This dissertation considers *musica ficta* in its repertorial and theoretical contexts, from the ninth to the sixteenth century. My purpose is, first, to present alternative guidelines for analyzing, reading, and transcribing medieval and Renaissance compositions with respect to *musica ficta*, and, second, to identify and provide an interpretation for 'rhetorical' imagery and concepts within a number of theoretical texts dealing with solmization and with *musica ficta*.\(^1\) Since most of the historical texts presented *ficta* in practical terms rather than speculative ones, musical and theoretical references are analyzed primarily from the standpoint of the performer. The first part of the dissertation emphasizes solmization (concepts, variables, and procedures) both as a determinant of and as a means through which *musica ficta* is implemented, while *ficta*-signs are presented as indicators for hexachordal solmization. Connections between the procedures and terminology on one side, and rhetoric and philosophy on the other, are also introduced within those discussions. These serve as anticipations of chapters seven and eight, which are more exclusively dedicated to tracing those connections. My interpretations of and solutions for *musica ficta*,

---

\(^1\) The term solmization, from the Latin word *solmisatio*, is here used specifically for music-reading practices, usually via a set of syllables, based on any structure smaller than octave—e.g., hexachordal structures. Therefore, for the sake of proper differentiation, solmization is here opposed to solfège—a term reserved only for octave-based structures that led to modern music-reading.
involving its presentation and associated terminology in historical treatises, also reflect the opposition between *musica speculativa* and *musica practica*, generally expressed in the opposing definitions of *musicus* versus *cantor*—as can be attested in the following words by Margaret Bent.

The application of musica ficta was considered part of the performer's art; this is why the terminology of singing teaching rather than that of speculative theory is used for most contemporary statements on the subject: some references also occur in vernacular writings of a non-technical nature.

(NG 1, 12: 803)

Solmization, as the primary technical tool used by performers for reading and deciphering the pitch content of an individual voice, is similarly considered from a generally practical perspective. This concept has already been explored in noteworthy works by Henderson (1969), Gaston Allaire (1972), Andrew Hughes (1972), Toft (1992), and in pivotal articles by Edward Lowinsky (1945, 1956), Margaret Bent (1972, 1984, 1996), Daniel Leech-Wilkinson (1984), Zager (1989), and others. Most scholars (as illustrated in Margaret Bent's assessment quoted above) admit that the bulk of theoretical discourse on *musica ficta* owes more to *musica practica* understandings than to *speculativa* argumentation. Paradoxically, most have either devalued, neglected, or dismissed solmization as a procedure for solving *ficta* occurrences at large—as illustrated in another statement by Margaret Bent.

It [i.e., hexachordal solmization] cannot in itself solve individual ficta problems just as, conversely, no ficta solution can be rejected on grounds that it can't be solmized.

(Bent 1996, § 18)
While neither she nor other authors dismiss solmization as an analytical tool, they have not underscored its role regarding *musica ficta* (both as determinant and as means). In my opinion, such positions arise from a reluctance to exercise reading procedures based on hexachordal models (rather than octave ones), and from a tendency to interpret *musica ficta* mainly within its polyphonic contexts (as if it was the product of and particular to those contexts). Moreover, modern scholars have not provided close interpretive readings of historical texts with respect to their rhetorical and philosophical substrata, and have chosen to grant excessive weight to those passages that, prone to purely technico-pedagogical understandings, are able to generate clear-cut rules and terminology. As a result, many of the so-called 'rules of *musica ficta* ' (according to modern scholarship) have been based on contrapuntal concerns, particularly *causa necessitatis* ('for the sake of necessity') and *causa pulchritudinis* ('for the sake of beauty'), as commonly understood. I will argue, however, that most of the basic concepts of *musica ficta* were already applied consistently to monophonic music, and were initially more dependent on the understanding of solmization and of purely melodic contexts (over which the individual performer had greatest control), than on polyphonic/contrapuntal ones (properly controlled by composers, theorists, or perhaps even scribes).²

² The monograph by Thomas Brothers (1997), and the articles by Albert Seay (1969) and by Karl-Werner Gümpel (1990) present invaluable concepts and interpretations to the use of *musica ficta* within monophonic contexts, although the significance of the latter two have been apparently overlooked by many scholars, and despite Brothers's declared resistance to solmization as a main tool for analysis.
Determining the moment in modern scholarship when the role of solmization seems to have been devalued is not the specific concern of this dissertation. One must observe, however, that even before such influential and reputable studies on musica ficta as the most recent ones by Karol Berger (1987) and by Thomas Brothers (1997), other scholars shared a tendency to understand and transcribe ficta-signs as mere accidental inflections (corresponding to our modern flats and sharps), with the exception of the sign b on the f"-position, called 'extra manum' ('beyond the hand')—i.e., 'beyond the established gamut'.

This approach disregards (consciously or not) the primary function of all b-signs, which is to enforce a solmization-syllable (fa), and not to indicate any specific pitch or accidental. Karol Berger does state that musica ficta occurs when solmization syllables are feigned, that is, when one employs steps that fall outside the medieval (Guidonian-inspired) 'gamut', or that are necessarily solmized with a syllable not assigned to them in that 'gamut'. Yet, he ultimately interprets the ficta-signs themselves as accidental inflections, as rather conspicuously emphasized in his title (Musica ficta: Theories of Accidental Inflections in Vocal Polyphony).

Brothers's title also broadcasts an understanding of ficta-signs in line with our modern concept of accidental inflections. In his Chromatic Beauty in the Late Medieval Chanson: An Interpretation of Manuscript Accidentals, Brothers rejects solmization as a

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3 Scholars have interpreted the term 'hand' (i.e., the 'Guidonian hand', in its musico-technical medieval context) both as a graphical representation and technical reference to the standardized medieval step system (modernly called 'Guidonian gamut', or simply 'gamut'). Thus, the term 'hand' ('manus') denotes the limits of the gamut from G to e" (or, in post-Guidonian nomenclature, from ut to la), in which steps were assigned to the joints, pads, and fingertips of the palm—cf. (NG 1, 17: 458–9; New Harvard, 356).
foundation for the interpretation of ficta in thirteenth- and fourteenth-century music.\textsuperscript{4} One of the texts on which he bases his case is drawn from Walter Odington's \textit{Summa de speculatione musice} (first half of the fourteenth century). The passage is both rhetorically and philosophically quite rich; it is also straightforward, systematic, and didactic, and these features have given it some prominence in the writings of many scholars of ficta, since it provides a useful basis for laying out 'rules' for a technico-pedagogical approach.

Brothers's conclusions are based, however, on a particular reading of Odington's text.

\begin{quote}
Due autem voces mobiles, scilicet b acuta et bb superacuta sunt proprie voces monocordi; reliquas vero vocant falsas musici, non quod dissonae sint, sed extraneae, et apud antiquos inusitae.
(Odington in. 14th cent., pt. 5, ch. 4; CS 1: 216; \textit{Corpus Scriptorum de Musica} 14: 98)
\end{quote}

These two changeable tones, \textit{b} and \textit{bb}, are called proper degrees of the monochord; however, the rest of the changeable tones are called false music, not because they are dissonant, but because they are outside [of the regular disposition of the monochord] and were not used by the ancients.

(Brothers 1997, 2–3)

Brothers's understanding (apparent from his translation and bracketed insertions), forms part of the conceptual background for his contention that \textit{musica ficta} could not have been used in any manifested accord with solmization, because it was simply "not used by the ancients." For him, \textit{musica falsa} or \textit{ficta} had not been successfully integrated with the theoretical foundation for the use of hexachords, or with the explanations of the medieval

\begin{quote}
\textsuperscript{4} Conflicting with my understanding of Berger's work, Brothers reads Berger as a defender of solmization, and remarks that:

[Karol Berger's interpretation] puts an emphasis on solmization that I would resist. At the very least, it should be observed that this point of view does not ring true for the thirteenth and fourteenth centuries.
(Brothers 1997, 2 n.4)
\end{quote}
But his interpretation does not reflect the original meaning of this particular quotation which might be better (and more literally) represented by the following translation.

Now, two mobile steps, namely ½ and ¾, are properly [called] steps of the monochord; the remaining [mobile steps], however, are called *musicas falsas*, not because they may be dissonant, but [because they are] from outside [the monochord], and among the ancients [are said to be] unusually [constituted].

(my translation)

In many instances my choice of words does not appear to differ significantly from Brothers's translation (e.g., "mobile" instead of his "changeable"), but such nuances are often necessary to preserve the clarity and precision of the original text, as well as its metaphors and ambiguities. It is fairly clear that "*inusitate*" cannot stand for "not used" (as Brothers would have it), but rather denotes 'out of the ordinary', 'unusual', 'scarcely used', or simply 'not preferred', even if used when necessary or fit. Reading Odington's text beyond

Commenting upon Anonymous 2's use of the word "beauty" in relation to *musica ficta* and to the so-called "*cantinelli coronati,*" Brothers says:

[T]he larger context of this passage suggests that the theorist uses the word not in the sense of systematic regard for rational order but, rather, just the opposite, as a way of valuing departure from such systematic ordering. [...] It is easy to ground the necessity rule i the codifications of music theory, which pays attention to the measurement of the vertical intervals. For monophony, that grounding is not so easy; to the contrary, with monophony, musica ficta more obviously violates modality and hexachordal organization of pitch. If the application of musica ficta in monophony cannot be easily integrated with theory, what better way to justify it than by simply acknowledging the potential for beauty? (Brothers 1977, 4–5)

In this dissertation I hope to demonstrate that *musica ficta*, hexachordal structures, and solmization procedures are not only compatible, but that the use of *musica ficta* depends on the proper understanding and practice of those organizations in medieval theory.

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5 Commenting upon Anonymous 2's use of the word "beauty" in relation to *musica ficta* and to the so-called "*cantinelli coronati,*" Brothers says:
the limits of Brother's extracted quotation reveals that the "remaining [steps]" refer exclusively to $E_\flat$, $f_\#$, $c_\#'$, $e_\flat'$, and $f_\flat'$—an understanding that Brothers seems to have overlooked, for he takes the phrase to embrace the entire set of all possible ficta-steps (i.e., of the entire ficta-gamut).

My approach to this passage (and others from historical treatises which I will treat in close detail) exemplifies three interpretive or exegetical methodologies which will be called upon in my work. First, the interpretation of what Odington means by "remaining [steps]" (according to my translation for "reliquas [voces]") depends on information stated in other parts of his text, as seen above. This kind of interpretation (whether derived from explicit or implicit content of Odington's treatise) constitutes what may be called a 'denotation' or, as formal logic names it, an 'extensional' interpretation. Second, the interpretation of a term or expression such as "inusitate" may or may not depend on what is explicitly stated in the text. It will, however, depend on the status of the term, situation, or description to which it refers (as represented in the previous paragraph by my interpretation of the term "inusitate"). This second approach (or 'intensional' interpretation) is constituted through 'connotation'; one of its characteristics is that it may result in either technical, non-technical (say, a social or cultural interpretation related to the reconstruction of some shared understanding, contemporaneous with the text), or both types of 'reading'. Third, the interpretation of terms that yield to nuances (e.g., "voces mobiles") usually depends as much on non-literal as on literal meanings, and also illuminates both technical and non-technical aspects of a text's content. The difference between the second and third mode
of approach is that in the latter, full comprehension of technical aspects is dependent on assessments of the other parameters. For the purposes of this dissertation, this third interpretive approach will be called a 'socio-rhetorical' interpretation, and its intent is to establish definitions as well as relations between text signifiers and signifieds, all informed by both technical, rhetorical and philosophical aspects. I have avoided the term 'semiological' interpretation, since technical linguistic analysis is not the object of this dissertation.

At the same time, no study has yet been dedicated to investigating the rich philosophical and socio-historical implications of the highly charged language of ficta theory, specifically its reliance on qualitative terminology such as 'false, true, fictive, real, vice, etc.' By way of example, it seems appropriate to present a quotation drawn from the treatise entitled Scolica enchiriadis—which served as the original stimulus for my exploration of this dissertation topic.

D[iscipulus]. Quomodo fit haec absonia in ptongis?

M[agister]. Si aut ignavius pronuntientur aut acutius, quam oportet. Primo namque hoc vitio in humanis vocibus et sonorum qualitas et tota leditur cantilena. Quod fit, ubi, quod canitur, aut segni remissione gravescit aut non rite in sursum cogitur. Quod vitium in quibuslibet musicis instrumentis nequit fieri, eo quod disposito semel ptongorum ordine vox sua sonis singulis manet. Alia fit dissonantia, quando sonus a sono falso metitur, id est alius pro alio. Tertia dissonantia, quando sonus non

D[isciple]. In which way do these discordant things occur in the phthongi?

M[aster]. If they are pronounced either lazier or more energetically, than it is proper. First, because by this vice in human voices, both the quality of sounds and the whole song (cantilena, i.e., plainchant) is harmed. That happens whereby what is sung either gets worse by idle remission, or is unfitly imagined upwards (that is, 'unfit' to religious usage). That Vice is incapable of occurring with any one musical instruments; because the voice [of the instrument] remains with its own individual sound, once
respondet sono, quoto loco oportet. Et haec
duo vitia ex eadem quidem causa nascuntur;
se in hoc differunt, quod illud in eadem fit
neuma, hoc vero in praeclinendo et
respondendo.
(Anon. SE a. 900, pt. 1; Schmid 1981,

it has been arranged in order of phthongi.
Another dissonance occurs, when the sound
is measured by [means of] a false sound, that
is, [when] one [sound is mistaken] by
another [different sound]. A third dissonance
[occurs], when one sound does not answer to
[another] sound, in the place where it is
proper. And these two vices, indeed, spring
from the same cause; although they differ in
this, that the former occurs in the same
neuma (i.e., within a melisma of a chant),
[while] in fact, the latter [occurs] in singing
and answering (i.e., in monophonic
passages such as in responsories or
antiphons, or in polyphonic passages such
as in organa).
(my translation; cf. also Erickson 1995, 34)

As Margaret Bent has pointed out (NG 1, 12: 803; NG 2e, s.v. 'Musica ficta,' §2.i),
the word vitium ('vice') is among the first terms employed to indicate a kind of practice that
would later be described as musica ficta, or musica falsa—the latter being a term "more
common in the 13th century" (NG 1,12: 802). The word vitium, literally meaning 'fault' or
'defect', but also 'vice', 'sin', and 'corruption', clearly points to concepts and metaphors that
relate to the idea of social structures and norms (whether manifested in ethics, politics,
theology, rhetoric, or in other disciplinary approaches). It has been generally accepted that

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6 Among the earliest treatises that made use of the word "vitium" (or of its derivative
declensions or adjectives), within the context of musica ficta, one can find the following: Scolica enchiriadis
70–72); Alia musica (Anon. Alia mus. ca. 890, [chs. 19–20]; Heard 1966, 197, 199; GS 1: 140; PL 132:
945; Chailley 1965, 193, 203); two, apparently related treatises whose author(s) was (were) formerly
identified as Odo, one entitled Dialogus de musica (Ps.-Odo ex. 10th cent. D; GS 1: 251, 263, 264; PL
133: 757, 758, 771, 772), and the other entitled Musicae artis disciplina (Ps.-Odo ex. 10th cent. M; GS 1:
272; PL 133: 781); Tonarius (Odo d'Arezzo ex. 10th cent., preface; GS 1: 249; PL 133: 756): Prologus in
Tonarium (Berno Augensis p. 1021, chs. 9, 11, 14; GS 2: 73, 74, 77; PL 142: 1110, 1111, 1114); De
both terms (vitium and the later musica ficta) were presented in association with polyphonic contexts, and linked specifically to polyphonic practice and performance, and the relations between voices. However obvious the association with polyphony turns out to be, the association with plainchant practice and transmission cannot be dismissed. It is my contention that the word vitium can also be associated with plainchant-'corruption' (of the kind due, perhaps, to malpractice or transmission), and that such an association establishes a link to the 'corruption' of individual voices in plainchant and in polyphony. For this, the contemporaneous language of social relationships and aggregations of each time period, and perhaps their political or ethical strictures, must be taken into consideration, in order to attempt a deeper and more historically apposite understanding of the meanings and context of musica ficta.

This approach extends beyond the purely technical to the metaphysical, just as social relations and the medieval concern with individuation were also matters of metaphysics. Indeed, if the use of ficta stands as a metaphor for certain social phenomena, then the proper use of a ficta-sign might be determined, or at least suggested, not only by theoretical rules, but also by determination of its correspondent social relation(s). In a polyphonic setting, each voice could be understood as a single individual (or even as a distinct group of similar individuals). One voice would then relate to the other(s) in a way that reflects (or could

musica (Hermannus Contractus a. 1054; GS 2: 140, 144; PL 143: 430, 433); De musica (Aribo Scholasticus ca. 1070’s; GS 2: 198, 203, 225; PL 150: 1308, 1313, 1341; Smits van Waesberghe 1951b, 2, 14, 47); De musica cum tonario (Affligemensis ca. 1100, chs. 14, 15, 18, 22; GS 2: 248, 249, 253–254, 260–261, 263; PL 150: 1411, 1418, 1425–1426, 1428; Smits van Waesberghe 1950, 101, 104, 118–119, 142, 146, 156).

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reflect) the relation between two individuals within a given society. Such a metaphor is expressly set forth in Nicole Oresme's fourteenth-century treatise on currency, in which an ethical prince stands at the center of societal harmony as the tenor stands as the foundation of a polyphonic musical structure, with the other voice parts standing for the well-balanced and properly functioning society.\footnote{Michael Long has discussed this aspect of Oresme's translation and commentary on De moneta in "The Clink of Coin: Musical Structure and Hard Currency in 14th-Century Europe," paper delivered at the International Musicological Society Congress, Leuven, Belgium, August, 2002.} We might extend the basic metaphor with reference to specific styles of polyphonic relations (imitation, homophony, etc.). Societal balance, like music, may be disrupted by dissonant clashes. In order to restore the stability of relations at large, or resolve the clash between individuals, the dissonance may (or may not) be changed into a consonance by means of musica ficta (i.e., by means of 'vices'). Moreover, as stated in Scolica enchiriadis, those vitia in music should be understood "just as [the rhetorical 'vices' called] barbarisms and solesisms" (Vitia nimirum sunt, sed sicut barbarismi et soloecismi).\footnote{Cf. (Anon. SE a. 900, pt. 1; Schmid 1995, 70; GS 1: 177; PL 132: 987; [trans.] Erickson 1995, 41; cf. Atkinson 1988, 194)—this fragment is quoted in a more contextualized passage in chapter 8.} Whether the compromising voice performs a 'vice' or sings 'falsely' or 'fictively,' the terms and the act they represent—set in motion by a stronger and apparently intractable agent—bear both ethical and political implications, related (as I hope to demonstrate) to the language of Classical and medieval philosophy and rhetoric.
Chapter 1 – The Gamut, Musica Vera and Musica Ficta

This chapter undertakes an overview of the Medieval Gamut and its relations to the terms Musica Recta and Musica Ficta. It consists of a brief presentation of the Medieval Gamut with regard to its range and solmization-syllables, and their use in both musica practica and in musica speculativa, mainly based on the Guidonian tradition inherited and followed by later authors, and leading to the expansion of its limits toward what is today called musica ficta. The main purpose is to introduce some basic concepts and terminological items used in the course of the dissertation. Most of the material here presented has already been subjected to the scrutiny of several scholars, and is generally known among musicologists. This chapter, however, will offer some new approaches, close readings, focus on details, and on terminological definitions that are particular to this dissertation, providing background information to the understanding of what musica ficta is, and how it works.
Chapter 2 – Principles of Hexachordal Solmization

First, terms such as deductio and proprietas will be defined in the context of Guidonian solmization and its predominance (considering both musica practica and speculativa). Following, instructions will be presented on how to identify hexachords, and how to solmize a piece of music, both according to different levels of learning (as they were identified in historical treatises), and to melodic gestures that serve as indications of hexachordal structures. Additionally, I will introduce the concept of the octave equivalence between hexachords, which is not explicitly stated in medieval or Renaissance treatises. Nevertheless, there are situations in which the equivalence will be shown as inevitably practiced and implicitly understood. Finally, there will be a brief discussion about speculative evidence in theoretical works that oppose the use of the Guidonian hexachordal paradigm for solmization.

Chapter 3 – Mutation: The Basics

This chapter discusses 'mutation' by means of statements in a number of historical treatises, presenting its concepts and cases ('explicit' and 'implicit' mutation), as well as a subcase of the latter (named 'indirect' mutation in this dissertation). As the most basic procedure of hexachordal change, mutation is also the conceptual basis that permits the integration of musica ficta into the restricted recta-gamut, since ficta is also a practice that implies change. This chapter will also introduced the terms
'mutated'-syllable and 'mutant'-syllable, following statements given in historical treatises. Additionally, a few instances that relate mutation to rhetoric will be inspected, introducing background information for the discussions undertaken in chapter 7.

Chapter 4 – Mutation: 'Irregular' Type, 'Ficta' Species, and Position of Ficta-signs

Continuing with the discussion started in the previous chapter, a different types of mutation ('irregular') will be examined together with the species called 'ficta'-mutation. Nuances between them and their counterparts ('regular' and 'recta' mutations) will also be discussed, together with the function of ficta-signs relative to their physical position within the music, demonstrating their primary function as enforcers of specific hexachordal solmizations.

Chapter 5 – Permutation

'Permutation' will be shown as a procedure capable of implementing abrupt shifts between hexachords, since it involves a motion between two notes that pertain exclusively to different hexachords. Examples of emblematic situations that require the use of 'permutation' are cases of chromatic stepwise inflection and dissonant leaps (such as tritones); these will be discussed individually. Other cases that invite
a 'permutation' are leaps in which two hexachords are not promptly indicated, but which can generally be solmized by means of alternative solmizations that allow for certain kinds of mutations (according to what was seen in chapters 3 and 4). Since it is one of the most difficult procedures, it was not discussed by many authors of historical treatises.

Chapter 6 – Transmutation

'Transmutation' is the last procedure of hexachordal change to be discussed, and as the other two procedures it also includes different cases, such as the upper-semitone inflections (or upper-neighbor note) represented by fa-super-la situations, and subsemitone inflections. The latter is usually related to polyphonic contexts by means of 'propinquity' motions dictated by counterpoint (at least since the fourteenth century), but may be found in purely monophonic contexts as well. In this chapter (also as done in previous chapters), relationships between specific cases of transmutation and selected rhetorical figures will also be explained. The term 'transmutation' is in fact a proposition given in this dissertation as an umbrella term that encompasses particular momentary inflections that fall outside a given predominant hexachord, but return to it without promoting its decharacterization.
Chapter 7 – Figures of Solmization and Figures of Rhetoric: The musical discourse

This chapter will be entirely dedicated to tracing several relationships between the three basic procedures of hexachordal change (mutation, permutation, and transmutation) and basic concepts and figures of rhetoric (especially metaphor, allegory, and metonymy). Although parallels will be traced between these procedures and figures, relationships with other figures will also be inspected, following the concepts exposed in previous chapters. The objective is to broaden the scope of understanding about these procedures as they are implemented in practice and as they are discussed in theory.

Chapter 8 – Terminological Issues: Forging Terms, Definitions, and Concepts in Modern Scholarship

This chapter will be dedicated to discussing and analyzing basic definitions of \textit{musica ficta} and the application of ficta-signs as a generic term for \textit{mi-} and \textit{fa-}signs. Modern scholarship has interpreted that different rules (and their underlying conceptualizations) were meant for different audiences. In light of this, definitions and concepts of basic definitions of \textit{musica ficta} will consider enunciations and understandings in modern scholarship, as well as evidences contained in early music theory. The adoption of the term 'ficta-signs', preferred in this work instead of 'accidentals' or any other alternative, will be discussed and justified on the basis of
philosophical and rhetorical grounds, as well as on usage and functions of the 'signs', as explained in previous chapters.
(i) The Gamut: A Presentation and Overview

The medieval system (gamut) was the result of a gradual manipulation that culminated in works from the end of the tenth century and early eleventh century, in particular Pseudo-Odo's treatise *Dialogus de musica* (ex. 10th cent. D) and Guido d'Arezzo's writings (datable to ca. 1020's-1030's).\(^9\) Toward the end of the twelfth century, the system (as presented in *Fig. 1.1* below) had settled and, once that happened, was maintained (virtually unaltered) up to the sixteenth century—the additions proposed in this period (especially those during the Renaissance) were usually presented as expansions of an otherwise well-established system.\(^10\) The system was mainly designed to render

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\(^9\) The author of the *Dialogus de musica*, here mentioned as Pseudo-Odo, has been once attributed to Odo of Cluny (GS 1: [d4r], 251; SR 1950, 103), and has more recently been declared to be anonymous, or even authored by a certain Odo d'Arezzo. The treatise may also be divided into two parts: its prologue, and the treatise itself—these seem to have been written independently, probably by two different anonymous authors. References in (Jacobsthal 1897, 228; Huglo 1969; 1971; SR 1998; 1998–1999).

\(^10\) Previous attempts to supply adequate identification, expansion, and establishment of such a system (notedly applied to the plainchant repertoire) can be traced back to Hucbald's *De musica* [formerly called *De harmonica institutione*] (ca. 900), and the anonymous treatises *Musica enchiriadis* and *Scolica enchiriadis* (both written before 900). It is noteworthy that these late ninth- or early tenth-century treatises
theoretical explanations (inherited through Boethius) adequate to the needs and features of musical practice, especially that related to the plainchant repertoire. While borrowing preexisting means (useful to performers) for learning and reading music, it also provided a vocabulary of step-designations for use in theoretical discussions.

**FIGURE 1.1 - Recta-Gamut (post-Guido d'Arezzo)**

**Medieval System**
(steps: letters plus hexachord-syllables)

<table>
<thead>
<tr>
<th>7</th>
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<th>3</th>
<th>2</th>
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<tr>
<td>G</td>
<td>F</td>
<td>E</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>A</td>
</tr>
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The graves have also been credited as being the earliest sources containing discussions on a number of fundamental matters in Western music: beginnings of a true diastematic notation, descriptions of modes according to their finales and their ambitus, descriptions of polyphonic singing, and (in the case of Hucbald's treatise) a systematic and definite integration of the synemmenon tetrachord into the system, merging the Greater and Lesser Perfect Systems (although with deviations from the Greek model)— (Babb 1978, 7–9, 29–39; NG 1, 8: 758–759, s.v. 'Hucbald'; Phillips 1984, 1–2, 120–162; Erickson 1995, xx–xxii, xxiv–xxxvi; NG 2e, s.v. 'Hucbald of St. Amand,' access 8/21/2003). Guido's own range (only up to dd—i.e., modern d") and use of syllables for teaching music will be discussed below in this chapter, but it must be noted that the few additions and variants implemented thereafter did not impose significant changes or departures from Guido's model, either with respect to range or designation for each step.
As the extant historical treatises reveal, the most standard learning/reading practice (i.e., 'solmization') that survived through the Middle Ages and Renaissance was the one associated with Guido d'Arezzo (ca. 991/2 – † p. 1033) and his pedagogical ideas.\(^{11}\)

Step-syllables (*ut*, *re*, *mi*, *fa*, *sol*, *la*) were proposed by Guido for solmization, and theorists used identifications (designations) that merged the step-letters (from Γ to ee, or in modern terminology from G to e''), derived from Pseudo-Odo's propositions, with those syllables—e.g., Γ-ut (i.e., Gamma-*ut*, for our modern pitch G), c-*sol-fa-ut* (for e').\(^{12}\)

Regarding the step-letters, the *Dialogus* has been deemed the first work to successfully describe musical divisions in an 'ascending' scale-like manner imposed upon the monochord.\(^{13}\) The divisions were calculated, presented, and defined according to a stepwise scheme, from A to aa (including Γ as the whole, free string of the monochord), providing the idea that basic intervals started with the tone and semitone, and only after proceeding to the diatessaron, diapente, diapason, and the ditone (i.e., fourth, fifth, octave, and major third). This kind of division has been identified as a design proper to *musica practica* treatises, whereas in more pure *musica speculativa* treatises presentations of

\(^{11}\) In this dissertation, the term 'solmization' (from the Latin 'solmisatio') is reserved for the medieval and Renaissance activity of learning and reading music, and 'solfege,' for the modern one.

\(^{12}\) In the present work, the term 'step' has been chosen to denote individual letter-plus-syllable designations, following medieval and Renaissance practice, whereas 'pitch' has been reserved for letter-only designations, following modern patterns and concepts. In this dissertation, modern pitch-letters appear in boldface, medieval step-letters appear in regular typeface, and step-syllables, in italics—**FIG. 1.1**.

monochordal divisions started with the *diapason* and *bis-diapason* (i.e., double-octave), then proceeding to *diapente* and *diatessaron*, and only after deducing the tone, etc.—this latter type has thus been named 'descending.'\(^{14}\)

Following Boethius's transmission of Greek tradition, the monochord seems to have been used mainly for speculative pedagogical purposes, i.e., calculations of both a mathematical and acoustical nature which served to demonstrate the numerical and intervallic relations between their proportions. However, it had also served practical purposes even before the *Dialogus*: the monochord was used as an instrument for the primary teaching of music to performers, and possibly as a performing instrument. Despite the apparent independence promoted by the abstract, Guidonian-based model of solmization (which shall be explained in detail in the course of this dissertation), the monochord was still maintained as a primary, rather than auxiliary, pedagogical device.\(^{15}\) With the calculations on the monochord facilitated by the *Dialogus*, and the assimilation of Guidonian solmization, the monochord took on the additional function of a musical 'ruler,' i.e., a device that could be used for checking the correct intonation of specific intervals learned by other means.\(^{16}\)

Although in many previous treatises the main object of discourse was that of theoretical speculation, generally with little regard to the performer, Pseudo-Odo's *Dialogus*  

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\(^{15}\) In accordance with the interpretations of Cecil Adkins (1963, 337–372; 1967, 36, 43).

\(^{16}\) The function of the monochord as a performing instrument is still debatable, but it may be noted that, in the famous *Le voir dit*, Guillaume de Machaut gives a list of instruments that appeared in a performance to which he attended. The monochord is given among the listed instruments.
de musica (ex. 10th cent. D) displays a marked concern with the practice of music. The purpose of the treatise was itself pedagogical: it aimed to instruct performers, thus preventing further corruption of the repertoire and allowing for its correction as well.

When you earnestly and diligently inquired whether our doctrines would be of value for all melodies, I took as my helper a certain brother who seemed perfect in comparison with other singers, and I investigated the Antiphoner of the blessed Gregory, where I found that nearly everything was accurately recorded. A few items, corrupted by unskilled singers, were corrected, both on the evidence of other singers and by the authority of the rules.

(SR 1998, 199; cf. SR 1950, 104)

As shown in the quotation above (from the prologue of Pseudo-Odo's treatise), the author ascertains that the musical rules and their establishment ("doctrina") are to be justified and checked by practice (i.e., by fidelity to the musical text of plainchant). It is consistent with these concepts that Guido d'Arezzo devised a method of solmization that could enable memorization and consequent reproduction of two basic intervals: the whole tone (T), and the semitone (S). The method—adopted by the majority of medieval and Renaissance practical musicians (especially, but not exclusively, singers)—was built upon hexachords of the same structure and specific solmizations syllables were attached to each step of the hexachord. The basic intervallic structure of the model hexachord was T-T-S-T-T, and its correspondent solmization syllables (ut, re, mi, fa, sol, la) were acrostically drawn from the first syllable of each half-line of the hymn to St. John "Ut queant laxis"—FIG. 1.2.
The syllables themselves did not indicate fixed pitches (nor did the Pseudo-Odonian step-letters, for that matter), but rather intervals (i.e., tones and semitones) within a six-step diatonic span (hexachord). The interval of a tone would occur between any two consecutive syllables, except between mi and fa, where there should always be a semitone.  

17  In Guido's original version, incidentally the solmization syllables ut, re, mi, fa, sol, la fell respectively under the pitches c, d, e, f, g, and a. Though the Hymn to St. John may have been pedagogically useful, it has also been deemed unidiomatic in terms of plainchant. The text for the "Ut queant laxis" hymn probably dates from the eighth or ninth century, and Guido may have made changes to a previously known melody, or possibly composed it anew—since his Epistola ad Michahelem (ca. 1032) is probably the first document to mention and present such a melody. The correlation between the Guidonian syllables and the pitches from c to a is especially significant because virtually the same syllables are used in the modern fixed-do system of solfege and of pitch identification—largely accepted and practiced in most occidental countries. (The movable-do system of solfege, and the identification solely by means of pitch-letters has been characteristic only within the German and English traditions.) Nevertheless, there are a few manuscripts that present the hymnal melody in a transposed version, beginning on Γ·ut (G) instead of on C·ut (c)—a summary is presented in chapter 2 (iii). For opinions of scholars concerning these matters, cf. (Oesch 1954, 66–67; Pesce 1999, 19–38, 547–548; NG 2e, s.v. 'Guido D'Arezzo,' access 1/15/2004); for reproductions of the Ut queant melody, cf. (GS 2: 45; PL 141: 425; Pesce 1999, 466, 549–554).
For any given melody, if the range was that of a major 6th or less, and the intervallic structure (configuration) of that span could be matched to the one proposed in Guido's hexachord, then only one underlying hexachord would be represented and would be enough for its solmization. If, however, the melody did not follow that configuration, and/or the range fell beyond a major 6th, then the solmization could be effected only by a series of hexachords properly interlocked. This is a more specific understanding of the term 'solmization,' which has been linked more generally to the activity of learning and reading (or imagining) music, generally by means of the Guidonian-based hexachord syllables (ut, re, mi, fa, sol, la) not as indicators of specific step-letters or pitches since it is a movable method; hexachordal solmization will be discussed in subsequent chapters.  

Pesce's edition/translation of the Epistola, the second verse of the hymn is given in the following manner: "Mira gestorum, famili tuorum" (instead of "famuli")—there is, however, no mention or explanation regarding such a change of spelling, cf. (Pesce 1999, 466–467, 547–548, 551).

18 Though the terms 'solmization' and 'solfege' are both found in medieval (as well as Renaissance) treatises through the words 'solmisatio' and 'solfisatio,' the modern term 'solfege' has been related to a practice that is quite different from that applied (in modern times) to 'solmization.' 'Solfege' is also meant as a learning and reading activity that, though influenced by the Guidonian tradition, has expanded the hexachord-set to include seven syllables (i.e., an heptachord), which do individually account for specific pitches when the fixed-do method is employed (or even when the learning/reading is done via pitch-letters). The extra syllable of this heptachordal system, designated si in the modern fixed-do method (and turned to ti in the modern movable-do method), was justified as a deduction from the initial letters of the words Sancte Johannes (from the Hymn to Saint John), and was probably devised within the French tradition, as attested by Janowka in his Clavis ad thesaurum (Janowka 1701, 119, s.v. 'Solmizatio')—cf. (NG 1, 14: 788, s.v. 'Pitch notation'; NG 2e, s.v. 'Pitch notation,' access 1/14/2004). The syllable si has then been attached to the pitch-class B, and the syllable do, attached to C, has gained widespread currency instead of ut—except in the French tradition, where ut continues to be used. (Further assessments and a survey of the actual use of the Latin word solmisatio and related terms—e.g., solfisatio—are given later in chapter 8.)
The alphabetical indication of steps (i.e., step-letters) can be traced back to the Greek tradition, from which Boethius derived his own letter designations in *De institutione musica* (ex. 6th cent.), which in turn informed later works—e.g., Hucbald's *De musica* (ca. 900). But it was only with Pseudo-Odo's *Dialogus* (ex. 10th cent. D) that a sequence with step-letters from A through G (repeating the same order at the octave) was proposed and later canonized; a proposition that imprinted a *musica practica* character on the system. This Pseudo-Odonian model was used by Guido as a foundation for several of his own propositions, although it was still dependent on the Greek model and was limited to the span from Γ to a, i.e., from G to a', where a' was regarded as the highest sound (corresponding to the Greek *nette hyperbolaion*). Guido is credited with extending the system at least up to dd (d''); ee (e'') is likely an even later addition to the system. Also, the presence of a pitch

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19 According to Duchez (1979, 166–167), the study of Boethius's musical treatise apparently began only shortly before the mid-ninth century. In this light, Hucbald's treatise may be rendered possibly as one of the first works to follow and promote the ideas of Boethius, at least with respect to step-letter designations, even if deviating from that model.

20 In his *Micrologus* (ca. 1026–28), Guido implies that the four steps he was adding (the *superacutae* b, b, cc, dd) were already being used in practice, even if considered superfluous. Even in the manuscript *F-Pn* lat. 7211, a twelfth-century copy of Guido's *Epistola ad Michahelem* (ca. 1032), although there is a hexachord based on g', the pitch e'' (equivalent to the step ee-la) is not present, thus making that particular hexachord incomplete—cf. **FIG. 1.1**, and (Santosuosso 1991) for a copy of the relevant passages in manuscript *F-Pn* lat. 7211 (f. 99v–100r). For some of the relevant sections concerning extension (or even restrictions) of the gamut within Guido's propositions, see his *Micrologus* (Guido d'Arezzo ca. 1026–28, ch. 2; B-Br II 784, f. 3v; GS 2: 4; PL 141: 382; Smits van Waesberghe 1955, 93–95; [trans.] Babb 1978, 59–60), and the *Epistola* (Guido d'Arezzo ca. 1032; *F-Pn* lat. 7211, ff. 99v–100r; GS 2: 45–46, 48–49; PL 141: 425–426, 429–430; [trans.] SR 1950, 123–124; [trans.] SR 1998, 217; [ed. and trans.] Pesce 1999, 462–479, 508–517)—some commentaries on these subjects, as they appear in the *Micrologus* and the *Epistola*, as well as in other treatises by Guido, may be found in (Babb 1978, 52; NG 2e, s.v. 'Guido D'Arezzo,' access 1/14/2004; Pesce 1999, 25–29).
between a and b (that is, b♭) had already been part of the Greek system (corresponding to the trite synemmenon), and both Boethius and Hucbald, following that tradition, had discussed the synemmenon tetrachord and its inclusion of a note equivalent to b♭ (but not b♭'). In Pseudo-Odo's Dialogue, however, the monochord was used to deduce F (equivalent to f), from which proceeded the deduction of the step-letter♭ (equivalent to b♭), thus justifying its presence not as a mere part of the synemmenon tetrachord, and defining it as a fourth relative to F (anticipating its main function as ♭-fa). 21 It seems that the step-letter♭♭ (i.e., ♭♭-fa, equivalent to b♭'—cf. FIG. 1.1) was adopted into the theoretical system on the authority of Guido's writings. 22 With regard to the two varieties of 'b' present in the medieval system, historical treatises identified them by means of assigning different shapes to the letter itself (and also different syllables to each of them), as well as


different descriptions, designations, and concepts. One variety was represented by the sign \( \text{b} \), and described as a 'round' or 'soft' form of the letter 'b' (i.e., a \( b\text{-rotundum} \), or \( b\text{-molle} \)). The other variety was represented by the sign \( \text{b} \), and described as a 'square' or 'hard' form of the letter 'b' (i.e., a \( b\text{-quadratum} \) or \( -quadrum \), or else \( b\text{-durum} \)). In terms of modern pitch-equivalents, \( b\text{-b} \) corresponds to \( b\text{-rotundum} \) (which represents the \textit{trite synemmenon} according to the Lesser Perfect System, or \( b\text{-fa} \) according to the post-Guidonian designation paradigm), whereas \( b\text{-b} \) corresponds to \( b\text{-quadratum} \) (which represents the \textit{paramese} according to the Greater Perfect System, or \( b\text{-mi} \) according to the post-Guidonian designation paradigm).\(^{23}\) As will be seen later, treatises (especially those that followed the Guidonian tradition) often used the merging designation \( b\text{-fa} \ b\text{-mi} \) in their discussions, which of course referred not to one single step, but rather to the two steps that alternately occupied the same place (\textit{locus}) in the 'hand'—i.e., in the gamut.\(^{24}\)

Although the solmization procedures and the entire concept of the medieval gamut with its hexachordal syllables were based on Guido's writings (at least as attested by later historical treatises), neither their implementation nor their originality can be unequivocally

\(^{23}\) In historical treatises, the step-letter 'b' could be presented with no special shapes/designs differentiating between the two varieties. However, that would happen only when that 'b' was paired with a correspondent step-syllable. Thus the designation \( b\text{-fa} \) could be notated simply as \( b\text{-fa} \), and \( b\text{-mi} \), simply as \( b\text{-mi} \). Also, it may be noted that treatises were not necessarily coherent (and frequently were not) in their graphical design of b's.

\(^{24}\) Throughout the present work, the designation will be given in the form \( b\text{-fa} / b\text{-mi} \), and will be addressed as a 'double-step.'
credited to him. In fact, the use of hexachordal step-syllables was among the last known propositions of Guido d'Arezzo, appearing only in his *Epistola ad Michahelem* (ca. 1032)—probably his last work. In terms of solmization there were also other types and sets of syllables proposed both before and after Guido d'Arezzo, and also others by Guido himself. The 'ut, re, mi, fa, sol, la'-set of solmization syllables seems to represent only one of several propositions appearing in Guido's *Epistola ad Michahelem* (ca. 1032). Among the surviving forty-seven manuscripts that presented the usual set of solmization syllables, nine contain another text ("Trinum et unum") set to the "Ut queant laxis" melody, showing only one minor melodic variant for the word "intende" at the end of the third verse.

Below, FIG. 1.3 shows a setting of that alternative text ("Trinum et unum"), which yields the syllable-set 'tri, pro, de, nos, te, ad.' The transcription is based on the twelfth-century

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25 About these and other Guidonian propositions Claude V. Palisca states that "none of these innovations can be securely attributed to him" (Babb 1978, 49)—for an overview and similar statements cf. (Henderson 1969, 17–36; NG 1, 7: 805–807, s.v. 'Guido of Arezzo'; NG 2e, s.v. 'Guido of Arezzo,' access 1/14/2004).

26 Before Guido, syllable-sets that may have been considered for solmization were those applied to tetrachordal structures. In the Greek tradition, one finds the tetrachord-based syllables τε−τα−τη−τω, initially as transmitted by Aristides Quintilianus (ca. 400, bk. 2; [Greek and Latin texts] Meibom 1652, 2: 90–97; [comments and translation] Mathiesen 1983, 33–34, 53–55, 140–146; [comments] Henderson 1969, 9–17)—cf. also diagrams, text and commentaries with regard to the anonymous treatise edited by J. Friedrich Bellermann (1841, 22–27, 80–81), where the same tetrachordal set is also discussed, although with variants. One finds also the noeane/noeagis sets of syllables, whose first source of transmission to Western Europe was probably the work of Aurelianus Reomensis (*Musica disciplina*, ca. 840–50), and was, in the words of Claude A. Palisca, "a system of solmization derived from the Byzantine intonations or enechemata" (Babb 1978, 6)—cf. also (Bailey 1974, 5–15; Strunk 1977, 19–36; Babb 1978, 10; NHarvard 1986, 116-119, 263-264, 541, s.vv. 'Byzantine chant,' 'Echos,' 'Noeane, noeagis'; NG 1, 3: 553-566, 6: 163, 17: 458, s.vv. 'Byzantine rite, music of the,' 'Enechema,' 'Solmization').

manuscript F-Pn lat. 7211, in which the "Trinum et unum" example is preceded by a setting of the "Ut queant laxis" hymn—both in heightened notation.28

FIGURE 1.3  -  "Trinum et unum" from Guido d'Arezzo's Epistola ad Michahelem (F-Pn lat. 7211, ff. 99v–100r), presented in the $\text{\#}$-hexachord (i.e., hexachord durum).

Although Guido d'Arezzo himself may well have composed the melody for the preexistent text of the "Ut queant laxis" hymn, and proposed its subsequent pedagogical use, the same cannot be assured with respect to its actual implementation, nor to the

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28 Henderson (1969, 20–26) provides a description of syllable-sets in fifteen manuscripts (from mid-eleventh to the end of the twelfth century) that contain the Epistola. In these manuscripts, five provide settings to the "trinum et unum," and one (F-Pn lat. 7211) includes a setting of yet another (shorter) text (also to a different and shorter melody). The text is: "Trinitas protege Deus nos supplianter Te rogantes a malis," which yields the same 'tri, pro, de'-set, except for the minor change in the sixth syllable from $\text{\textit{ad}}$ to $\text{\textit{a}}$ (as underlined above)—cf. (F-Pn lat. 7211, f. 100r, in Santusosso 1991; Henderson 1969, 24). According to the survey provided in Dolores Pesce's edition, that is the only manuscript that presents the Trinitas protege text and setting (Pesce 1999, 547). A presentation about these and other syllable-sets (both Guidonian and non-Guidonian) is given in the work by Henderson (1969, 17–36)—cf. also (Smits van Waesbergh 1953, 98–105; Oesch 1954, 63–70).
implementation of the setting of the "Trinum et unum" text and its correspondent syllables, nor even of the proposition of a full system of seven hexachordal deductions as shown in FIG. 1.1 (Medieval System or Recta-Gamut, post-Guido d'Arezzo). In his Musica practica, Ramos de Pareja (1482, pt. 1, tr. 1, ch. 7, ff. b3r–v; Wolf 1901, 18–19; [trans.] Miller 1993, 63–65) also mentions both sets of solmization syllables, crediting only the 'ut, re, mi'-set to Guido d'Arezzo, while indicating no source or author for the 'tri, pro, de'-set—but implying that both sets were still in use during his time.30

(ii) Musica ficta versus Musica recta

Since the syllables were not attached to any specific step-letter (or any fixed-pitch), they could be sung on any step-letter within the system, and not only on those shown in FIG. 1.1. To be sure, that figure is a representation of the gamut of musica vera (true music) or musica recta (right, rightful, proper, conscientious, virtuous, straightforward, correct music), whereas theoretically the gamut of musica falsa (false music) or musica ficta

29 The copy of the Epistola contained in F-Pn lat. 7211 seems to be the only one to include a diagram of hexachordal deductions similar to the one presented in FIG. 1.1. The diagram, however, shows syllables drawn from the 'tri, pro, de'-set, and the deductions are made over the span from Γ to dd (or, from G to d", in modern pitch-equivalents), thus the last hexachord starting on g (i.e., g') is left incomplete—cf. (F-Pn lat. 7211, f. 100v, in Santosuosso 1991; Henderson 1969, 25; Pesce 1999, 27n, 547).

30 Cf. assessments by Palisca (NG 1, 7: 807; NG 2e, §2 (v), s.v. 'Guido of Arezzo') and by Henderson (1969, 31–33).
(feigned, imagined, invented, fictitious music) comprises everything that does not fit into that
strict pattern.

Following the usage of most modern scholarship, the opposing pair of qualifying
terms 'ficta' and 'recta' will be adopted throughout the present work. In medieval and
Renaissance musical theory, however, there was a handful of terms being used instead of
today's common musica ficta and its near antonym musica recta. The medieval term
musica falsa, for which musica ficta came to substitute in modern scholarship, was often
opposed to musica vera. Some theorists, especially but not exclusively medieval (and
apparently not the majority among them), tended to use both musica recta and musica vera
as synonyms, or at least with closely related meanings, although there seem to have been
more authors who reserved the adjective recta for discussions of mensural notation. A
substitution for falsa (though it was not the only qualification in use) began to occur
(tentatively) only in the later part of the thirteenth century. The adoption of the term ficta
not only was not shared by all authors thereafter, but the abandonment of the term falsa

31 Karol Berger, in his Musica ficta (1987), shows an exception to the above mentioned tendency
in modern scholarship, for he has preferred to use the terms 'ficta' and 'vera' as a more appropriate opposing
pair. His choice is perhaps also more accurate with regard to the early uses of the term ficta, for when it
came as a replacement for falsa, the term vera was kept as its opposite—seemingly, there was no immediate
conceptual need for change regarding this latter term.

32 Some medieval authors (especially those from the thirteenth century) also used the term falsa
in order to explain the 'inappropriate' mensural interpretation of middle notes in ligatures—cf. Franco de
Colonia, Ars cantus mensurabilis, ca. 1250 (F-Pn lat. 16663, f. 79r; GB-Ob 842, ff. 53v; GS 3: 7; CS 1: 124; Reaney and Gilles 1974, 45), or more frequently to describe the 'inappropriate' use of imperfection in
various circumstances (in reference to plicae, or to alterations, or to longae, etc.)—cf. Magister Lambertus,
Tractatus de musica, ca. 1260's/1270's (I-Sc L.V. 30, f. 25v; CS 1: 271), Anonymous St Emmeram, De
expositione musicae, ca. 1279 (Sowa 1930, 17, 24, 49, 113; Yudkin 1990, 93, 104, 145, 254).
gained force only in the Renaissance. The following quotations will provide a brief account of how *musica ficta* and related terms were defined, in this case from the mid-thirteenth century to the early-sixteenth century. Notice, particularly, that in the second quotation, from the anonymous St. Emmeram author—writing around 1279—*falsa* is employed as a primary term, but always paired with *ficta*, as an alternative synonym.

Falsa musica est, quando de tono facimus semitonium, et e converso.

( Garlandia med. 13th cent.; CS 1, 166)

False music is when out of a tone we make a semitone, or vice versa.

(mmy translation)

Si quaeatur, quid sit falsa musica sive ficta, dicimus, quod falsa musica est variatio vocum necessaria de tono in semitonium vel e converso per falsam mutationem sive fictam. Alii sic describunt: falsa musica est illud, quod est imponibile * in aliquo propassu, et fit <in> cantu organico ad melodiam faciendam.

(St. Emmeram ca. 1279; Yudkin 1990, 274; Sowa 1930, 124)

If it is asked what false or contrived [*ficta*] music is, we say that false music is the necessary variation of notes from a tone to a semitone or the reverse by a false or contrived [*ficta*] mutation. Others describe it thus: False music is that which can be imposed in a certain situation, and it occurs in organal melody to make a musical sound.

(Yudkin 1990, 275)

*Sowa gives the word "impossibile" instead of "imponibile"
[interpolations mine]*

Falsa musica est quae non potest inveniri in Gamma manus secundum artem plani cantus [...]. Vel sic: Falsa musica est adventicia scientia inventa causa adiutorii.

(Petrus palma ociosa 1336; Wolf 1913–14, 513)

False music is that which cannot be found in the Gamut of the hand, according to the art of plainchant [...]. Or else: False music is the adventitious science [i.e., unusual, or extraneous knowledge or skill] devised for the sake of help.

(mmy translation)
Musica ficta is the feigning of syllables or the placement of syllables in a location where they do not seem to be-to apply mi where there is no mi and fa where there is no fa, and so forth. Concerning musica ficta, it is necessary to know first of all that it is never to be applied except where necessary, because in art nothing is to be applied without necessity.

(Prosdocimus 1412, tr. 3, ch. 1; CS 3: 198; Herlinger 1984, 70, 72)

Coniuncta is when an irregular semitone is made out of a regular tone, or an irregular tone out of a regular semitone, or else:

Coniuncta is the apposition of b-rotundum or b-quadrum in an irregular place.

(Musica ficta is song that has been produced as a result of the regular tradition of the hand.

(my translation; cf. Parrish 1963, 15, 33)
defining musica ficta as step-occurrences that could not be found in any place within the established medieval system (the 'hand'). In other words, musica ficta was virtually a parallel system of steps that was forged and effected outside the standard gamut. Those steps, then, were extra manum occurrences. This term can be rendered in at least five different translations: 'outside the hand,' 'in addition to the hand,' 'free from [the measure of] the hand,' 'without the hand,' or 'beyond the hand.' Each of these translations for 'extra manum,' however, imply different concepts that, ultimately, may affect the understanding of both practice and theory associated with musica ficta. 'Extra manum' may be used to represent all those steps that are external to the hand (in modern terminology, any of the pitches from f'' and above, or from F♯ and below), as well as all those that may lie in between the regular steps represented in the hand (i.e., any of the pitches that are modernly called accidentals—except for b♭ and b♭'). It might also refer to any of the modern pitches presented in FIG. 1.1, provided they were not solmized with any of the regular step-syllables (i.e., not solmized with recta-syllables). If a step on the letter D was solmized with the syllable ut (D-ut), it would constitute a step not to be found within the hand (i.e., a ficta-step, or extra-manum step), for the only syllables available on a recta-D are sol and re—thus,

33 The 'hand,' or more properly called the 'Guidonian hand,' apparently served as a mnemonic device for solmization, by being a representation of the gamut (i.e., of the post-Guidonian system—see FIG. 1.1). In that capacity, all twenty-two steps of the gamut were placed on twenty different places (loci) of the left hand, occupying the pads of palm and fingers. Each place (locus) was assigned for one single step, except for the double-steps that occupied single loci: ♭-fa♯-mi occupied the locus on the tip of the minimum, and ♯♭-fa♭-mi occupied the locus on the lower pad of the annular—in those double-step loci, as shall be seen in the following chapters, the context of the melody was enough to provide a decision on which step should be chosen for solmization. See Berger's "The Hand and the Art of Memory" (1981).
D-sol and D-re are recta-steps. Extra-manum steps are always included in a ficta-hexachord, which should always maintain the same intervallic structure (configuration) as the other recta-hexachords. Also, the very existence of an extra-manum step presupposes some intervallic relation with a preexisting step-letter within the recta-gamut. Thus, extra manum should really be understood in the sense of 'sprung from the hand.'

As for the term musica falsa (alternately, falsa musica), Johannes de Garlandia (fl. ca. 1240) may have been one of the first theorists to have explicitly assumed, used, and defined this adjetival construction as a representation for that set of extra-manum steps, while justifying the need for their use. In his case, the term accounts for a practice of

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34 There is another explicit use of the term musica falsa recorded in the treatise Summa musice. Christopher Page defends that this treatise was written ca. 1200 by two authors, identified as Perseus and Petrus, who presented musica falsa as an alternative term for musica irregularis—which the authors appear to have considered the primary term. (The value-word 'vitium'—i.e., 'vice,' translated below as "fault"—is also presented as a complementary qualifier, which helps to establish a liberal-arts context to the discussion, since that word is related to the disciplines of the trivium, especially dialectic and rhetoric.)

Et assimilatur hoc vitium propositioni falsae, quae a dialectico multum vitatur. Musica irregularis et talis iure musica falsa vocatur, et multum vitetur. Item in formatione cantus novi non apponitur inutiliter repetitio intervalli eiusdem [...].
(Perseus and Petrus ca. 1200, cap. 23; GS 3: 238; Page 1991, 199)

This kind of fault may be compared to a false proposition of the kind which is rigorously avoided by the dialectitian. Such irregular music is rightly called musica falsa and it should be scrupulously avoided.
(Page 1991, 122)

Differing from the tendency which Garlandia represents in his time, the authors of this treatise consider musica falsa as something to be avoided, unnecessary, and unjustifiable. Page's date for the treatise is however debatable, especially if one considers the several quotations from Aristotle's works contained in the treatise. Aristotle's writings were still in the process of early dissemination in 1200 meeting great resistance on the part of the Church. That resistance would recede, eventually allowing Aristotle's ideas into Christian theology, only after the works of St. Thomas Aquinas (1226–1274) became accepted.
deliberate step change (i.e., from tone to semitone, and vice versa) within a realm whose existence was assumed in practice (i.e., extra manum steps), but was not completely validated or accepted in earlier theory. The theoretical validation of falsa musica granted the adjective 'falsa' a force of a substantive, i.e., transformed the qualifier into agent, or (in Aristotelian terms) allowed the 'accident' to be transformed into 'substance.' In that substantival capacity, the term 'falsa' could now be perceived as an active determinant of the quality of music, which could not be accepted and therefore needed to be challenged, based on moral, theological, and correlated philosophical grounds. Also, the validation by musical theory (in the application of the concept of falsa musica to measured music or to plainchant) was further enhanced by the introduction of other rhetorically and philosophically acceptable terms, for example: vitium (vice), corruptio (corruption), coniuncta (conjunct), irregularis (irregular), inusitata (out of the ordinary), and others.

It is necessary to keep in mind that historical discussions and attempts to define the procedure now called musica ficta frequently evoked dualities of the kind vice-virtue, falsity-truth, fiction-reality, etc., that conveyed a myriad of moral and social connotations, and were intended to enhance the proper understanding and use of the concepts being defined. Earlier authors (mostly before the twelfth century), for example, tended to be more ambivalent in their definitions, and generally identified the practice of musica ficta as a series of 'musical deviations' effected either deliberately or haphazardly, or because of custom or ignorance—in other words, arguing that those were as 'errors' from which the music should be summarily cleansed in order to obtain a correct version. Some tentative
terminological standards can be identified in those early texts, but the profusion of terms indicates the desire to provide a better understanding by amplification of meaning (i.e., by employing *synonymia*) within discussions infused with both rhetorical and philosophical contents, excerpted below. (Underlines have been added to facilitate visualization of the key-terms referring to the practice of *musica ficta*, and its related theoretical concepts.)

In maximum saepe *errorem vulgaris* cantores labuntur, quia vim toni et semitonii, aliarumque consoniorum minime perpendunt. Id enim unusquisque eorum eligit, quod primum auribus placuerit, vel quod facilius ad discendum pronuntiandumve provenerit: itisque magnus *error* in multis cantibus, cuius modi sint. [...]. Illus itaque cantores si de aliquo cantu interrogaveris, cuius modi sit, illico respondent, quod nesciunt, ac si perfecte conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc sciant, quasieris, titubantes dicunt: quia sit similis in principio et in fine aliis cantibus eiusdem modi; cum de nullo omnino cantu, cuius modi sit, illico respondent, quod nesciunt, ac si conoscerent. Quodsi ab eis argumentum, unde hoc scien...
tur, totaque in eo modo consona inveniatur, eamque emendari opus non sit. Incipe itaque eam in G. littera, hoc est, in octavo modo, et regulariter in eo stare probabis. (Ps.-Odo ex. 10th cent. D; GS 1: 256; PL 133: 763–764)

But let us inquire whether it might not begin in another mode, in which all will be found consonant and in which there will be no need for emendation. Begin it, then, on G, that is, in the eighth mode, and you will find that it stands regularly in that mode. (SR 1998, 205–206; cf. SR 1950, 110–111)

Dissonantia quoque per falsitatem ita in canendo subreptit, cum aut de bene dimensis vocibus parum quid demunt gravantes, vel adiiciunt intendentes, quod pravae voces homininum faciunt; aut cum ad praeeditam rationem plus iusto intendentes vel remittentes, neumam ciususlibet modi aut in alium modum pervertimus, aut in loco qui vocem non recipit, inchoamus. Quod ut exemplo pateat, in Communione Diffusa est gratia, multi propterea, quod erat incipiendum in .F. uno tono deponunt cum ante .F. tonus non sit; sicque fit ut finis Communionis eiusdem ibidem veniat ubi nulla vox est. Cantoris itaque peritiae esse debet quo loco vel modo quamlibet neumam incipiat, ut ei vel si motione opus est, affines voces inquirat. Hos autem modos vel tropos graece nominamus protum, deuterum, tritum, tetrardum. (Guido d’Arezzo ca.1026–28; Smits van Waesbergh 1955, 134–138; B-Br II 784, ff. 8v–9r; GS 2: 10–11; PL 141: 389–390)

False notes also creep in through inaccuracy in singing; sometimes performers deviate from well-tuned notes, lowering or raising them slightly, as is done by untrue human voices. Also by ascending or descending more than is right for the prescribed interval, we pervert a neume of a certain mode into another mode or we begin at a place [in the scale] which does not admit [that] note.

To make this clear by an example, take the communion Diffusa est gratia. Many put propterea, which should begin on F, a whole tone down, although there is not a whole tone just below F. As a result the end of this communion comes where there is no note. The place and mode where each neume begins should be left to the judgement of the singer, so that if it needs to be transposed [si motione opus est], he may search out related [affines] notes. These modes or tropes we name, from the Greek, protus, deuterus, tritus, and tetrardus. (Babb 1978, 66)

[Interpolations in the original translation]

Principales chordae dicuntur quae in troporum dispositionibus principatum sortiuntur, sicut in autento proto principales

The principal strings [i.e., steps] are named among the first [ones] that are assigned in the disposition of tropes [i.e., protus,
sunt istae: prima finalium, prima superiorm, prima excellentium. Finalis est merito principalis inprimis: quia, si secundum convenientiam, quam ipsa praedocet, cantum incipimus et usque ad finem procedere non possumus, ostendit illum esse aut vitiosum, aut iuxta alium modum gubernandum. Quidam cantant illam antiphonam *Alliga domine in vinculis* secundum tercium tonum, secundum finalis convenientiam incipientes eam in G., sed quia defectus occurrit chordarum ut cantari non possit, cogitemus eam aut secundum alium modum iubilandam, aut penitus esse mendosam. Sed falsam esse dicere prius non debemus, quam secundum omniun finalum convenientiam incipientes exploremus, si in ullo modorum inoffensam reperiamus eam; sicut istam iuxta prini finalis convenientiam inchoantes in F. sine scandulo percantabimus.

(Aribio ca. 1070's; Smits van Waesberge 1951b, 13–14; GS 2: 203; PL 150: 1313–1314)

Since in the ordinary neumes the intervals cannot be ascertained, and the chants that are learned from them cannot be securely committed to memory, many inaccuracies creep into them. These Guidonian neumes, on the other hand, indicate all the intervals unambiguously. Not only do they completely obviate error, but, once learned perfectly, they will not allow one to forget how to chant from them. [...].
Sed et in communione *Beatus servus levis* error habetur, qui per unum podatum incongrue prolatum efficitur. Hunc autem quidam sic corrigunt, quod *Dominus* a trite diezeugmenon [c] in mese cadere faciunt, et *invenerit* in parhypate meson incipiunt et *super omnia* in lichanos meson; ali autem ita emendant quod *invenerit* iuxta usum incipiunt, et penultimam eius in mese incoantes in lichanos meson emittunt, et ultimum in hypate meson, incipientes in parhypate meson exire faciunt, *super omnia* secundum priores corrigunt. Mihi autem facilior correctio videtur, si ultima syllaba *invenerit* in lichanos meson per unisonum cantetur, quod et Guarino et Stephano in musica subtilibus placet.

Sed si quis obiiciat deesse in quibusdam locis semitonia, dicimus non esse ibi necessaria semitonia, ubi ipsi videtur. Saepe etenim ex cantorum ineptia evenit, quod inter alias cantuum depravationes semitonia proferunt ubi proferre non debent, et interdum negligunt ubi negligere non debent.

(Johannes Affligemensis ca. 1100, ch. 14; Smits van Waesberghe 1950, 133, 137–138; GS 2: 257, 258; PL 150: 1422, 1423)

In the communion *Beatus servus* too an error is easily made by performing a single podatus unsuitably. Some correct it thus: they make *Dominus* fall from the trite diezeugmenon [c] to the mese [a], and they begin *invenerit* on the parhypate meson [F] and *super omnia* on the lichanos meson [G]. Others so emend it that they begin *invenerit* as is the custom, but after beginning its penult on the mese [a] they end it on the lichanos meson [G]. Beginning its final syllable on the hypate meson [E], they make it end on the parhypate meson [F]. Then they correct *super omnia* in the same way as do the former. Yet to me it seems an easier correction if the last syllable of *invenerit* is sung to a unison on the lichanos meson [G], as pleases Guarinus and Stephanus, who are musically discriminating.

If anyone protests that semitones are missing at certain points, we rejoin that semitones may not be necessary where it seems to him that they are. Singers from ineptitude often make, among other corruptions of the chant, semitones where they should not be made and now and then omit them where they should not be omitted.

(Babb 1978, 147, 148–149)

[Ellipsis mine; interpolated pitch-letters in the original translation]

In **FIG. 1.4**, below, based on the Worcester antiphonary from the thirteenth century, notice that the antiphon *Domine qui operati sunt* begins on c, and presents the «-rotundum at *taber-na-culo* (a rightful step-letter in Pseudo-Odo’s system)—the wavy-tailed notes represent *plicae*. If the non-emended version (as Pseudo-Odo described) did begin on F, then, at *taber-na-culo*, it should produce an E a tone lower than F, creating an extraneous
step within Pseudo-Odo's system. According to Pseudo-Odo, such a step would be an inconceivable 'error' produced by 'mediocre' ("vulgares"), or 'faltering' ("titubantes") singers. However, if *Domine qui operati sunt* was made to begin on G (as Pseudo-Odo proposed), the second note for the syllable -na- would be placed on an F (a step rightfully found within the system).

**FIGURE 1.4** - "Domine qui operati sunt"—according to the version given in the thirteenth-century Worcester antiphonary (GB-WO F. 160; Mocquereau 1922, 2: 395).

![Figure 1.4](image)

In **FIG. 1.5**, below, the surviving version of the antiphon *Alliga Domine in vinculis* (from the *Antiphonale monasticum*) is in agreement with Aribo's suggested correction. The

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35 Further explanations concerning *Domine qui operati sunt* are given by Strunk (SR 1950, 111–112) and James McKinnon (SR 1998, 206). In these works, the reproduction of the Worcester version places the b-rotundum immediately before the two-note ligature of *taber-na-culo*, whereas in the original that sign was placed before the syllable in, as shown in **FIG. 1.4**. The function of this pre-positioning of the b-rotundum (as will be seen in a later chapter) is to enforce the solmization of a particular hexachord (in this case, the F-hexachord) beginning already at the first syllables of the phrase *in tabernaculo tuo*—the previous hexachords were: the C-hexachord on the word *Domine*, the C-hexachord, from *qui operati* to *habitabunt*. Since these changes from one hexachord to another might entail the singer to take a breath, the earlier positioning of the b-rotundum will prevent an unwanted (and unnecessary) breath in the middle of the word *tabernaculo*. (The whole process of solmization, from the deduction and grouping of hexachords, to how and where to change from one to another, will be explained in the following chapters.)
defectus (defect) of which he speaks would be found in an indirect tritone outlined on the word "na-ti-o-nes," if the antiphon was truly sung according to the third mode, with an initial note beginning on g.

FIGURE 1.5 - "Alliga domine in vinculis"—according to the version given in the Antiphonale monasticum (1934, 911).

In Aribo’s correction, he suggested a change to the first mode, in order to avoid the tritone, and (in accordance with that) a change to f as the first note—the presence of b₅s (in fact, b₇-fas) does not really affect the mode, as they are necessary not only to avoid tritones, but also to avoid hexachordal mutation (as shall be seen in chapters to follow). Both changes were certainly necessary, for if there was just a change to the first mode, and the initial note was maintained on g, then all es in FIG. 1.5 would have to be changed to f₃s (on the syllables: nati-ō-nes gen-ti-um, et re-ges earum in com-pedibus). These, of course, find no correspondent steps in the standard medieval gamut, and would then constitute further
instances of what Aribo might have qualified as "vitiated," "erroneous," "false," or "impaired," or even another kind of "defect" or "falseness." No doubt these qualifications are just alternative designations for what today may be called *musica ficta*, though Aribo (at least in this case) does not recognize them as necessary nor as justifiable occurrences.

In the communion *Beatus servus*, mentioned in the text by Johannes Affligemensis, the deviations from the theoretical system were even more pervasive than he seems to have attested (see **FIG. 1.6**, below). By invoking the 'inaccuracies,' 'errors,' the tendency for 'corruption' of chants, and 'omissions' (i.e., 'negligence') on the part of 'inept' singers, Affligemensis condemns the alterations improperly imposed on the chant by means of unjustifiable habits, and proposes another, simpler way to avoid deviations. Further, he asserts that some of those habits might lead to inappropriate placement of semitones where they are really not needed. The alterations shown in **FIG. 1.6** might seem excessive, considering that at the end (as in the beginning), the interval between F and G is made to follow the regular whole-tone paradigm, even if it had been an unusual semitone for most of the chant. (The version given in this example reproduces Charles Atkinson's own reconstruction of the chant—slurs indicate ligatures, a wavy glissando-like sign indicates a *quilisma* [cf. *venerit*, beginning of the second staff], and modern accidental signs are applied directly to individual notes).³⁶

³⁶ In Babb's translation (1978, 148–149), the different versions of *Beatus servus*, which are reconstructed according to the detailed descriptions by Johannes Affligemensis, show only one deviation on the last syllable of *invenerit* (f♯g) in the same way as shown in **FIG. 1.6**. In Atkinson's interpretation (1988), the use of the *musica ficta* in this chant is established as an enactment of 'vices of language,' especially with regard to 'barbarisms' and 'solecisms' (following the descriptions given in the anonymous
It may be construed, from those four quotations above, that earlier authors (here represented by Pseudo-Odo, Guido d'Arezzo, Aribo, and Johannes Affligemensis—ex. 10th cent. to in. 12th cent.) did not always approve of *musica ficta* and its necessity. From a brief interpretation of the contexts, however, some nuances of understanding may be revealed about how far these earlier authors took their disapproval or acceptance of *musica ficta*. Some, like Pseudo-Odo and Aribo, seem to have been more willing to condone those 'deviations,' based on effectiveness of previous practice, even if they advised against it and

*Scolica enchiriadis*. In Atkinson's modern reconstruction (not a transcription), the inclusion of signs between the notes of those two-note ligatures is highly unlikely (cf. *invene-rít vi-gi-lan-tem* ... *di-co vo-bis*), and is nowhere to be found in the sources.
eventually took the time to propose 'emendations.' Of the two, Aribo's discourse seems to be more condescending, for while he makes use of strong words such as "vitiosum" ("vitiated" or "vicious") and "defectus" ("defect"), he also lightens their weight by stating that one should seek to understand nuances and consider ("explorare," i.e., "explore") corrections without uproar or blemish ("sine scandalo," i.e., "without scandal"), and even considers that one should not be hasty in attributing 'falseness' to music without seeking those alternative nuances. Pseudo-Odo's statements are less lenient, for while he seems more flexible than Aribo with regard to chants that do not conform to systematic theoretical standards, his attitude derives from futility, from the declared impossibility of altering long-established practices, especially since the practical (acoustical) results seem at least acceptable. In any case, Pseudo-Odo does not abstain from qualifying as "mediocre" ("vulgares," i.e., "vulgar") those "faltering" ("titubantes") performers who run astray from the safe ground of theory, due to mispreparation or even choice. Guido, however, seems to have been completely against the use of such "false notes," although he also admitted that such occurrences were, unfortunately, common in his day. As Guido's statements made clear (not only in the quotation above but throughout the Micrologus), he was very much critical of those performers who, with their "untrue voices" ("prvae voces"), "deviate" (from "demere"), "pervert" (from "pervertere"), or "subvert" the chant (the latter as implied by the verb "subreperere," although Babb's translation does not emphasize this sense). Like Guido, Johannes Affligemensis was unwilling to accept deviations from the theoretical standards, and is even less willing to condone nuances, which he takes the time to analyze in
order to prove that they are responsible for the "many falsities [that] subvert the chant" (loosely interpreted from "in cantibus plurimae falsitatis subrepant").\textsuperscript{37} Finally, one must notice that all of the four quotations deal with plainchant, whose repertory would usually be kept within the limits of the theoretical medieval system of steps. Even so, all of those authors admit that practice frequently crossed over and beyond those limits, integrating the realm of \textit{musica ficta} into plainchant—even if they criticized its practice.

For the purposes of this dissertation, since the gamut (shown in FIG. 1.1) was the representation of the realm of \textit{musica recta}, and since the realm of \textit{musica ficta} was everything that did not fit within that system, they will be referred to, respectively, as \textit{recta}-gamut and \textit{ficta}-gamut (even though the extension of such an imaginary \textit{ficta}-gamut varies from author to author, and from epoch to epoch). As mentioned briefly in the commentary about the term \textit{extra manum} (above), within the Guidonian tradition, \textit{ficta}-steps were represented (or obtained) in one of three ways: (a) by applying new syllables (ranging from \textit{ut} to \textit{la}) to any set of places (i.e., to virtually any \textit{diatonicum} group of six contiguous step-letters) within the previously established \textit{recta}-gamut (in other words, creating new steps by changing the syllable of preexisting steps to new syllables); (b) by conceiving new steps between the preexisting steps of the \textit{recta}-gamut; (c) by conceiving new steps, in new \textit{loci}, outside the gamut. In any of these cases, the new \textit{ficta}-steps always bear some relation

\textsuperscript{37} This aspect of resistance against (or reluctant acceptance of) \textit{ficta}-occurrences may be used to support Christopher Page's date of the \textit{Summa musice}: ca. 1200, for its authors may have been writing very much within the same tradition that runs from Pseudo-Odo, Guido, Aribi, and J. Affligemensis—a tradition which seems to have survived, virtually unbroken, until the early thirteenth century.
to preexisting steps (modifying, appending, adding), and necessarily establishing new hexachords (ficta-hexachords). In the first case, for example, E-la-mi (e), a-la-mi-re (a), and ½-fa (b½) were all part of the recta-gamut, while E-sol (e), a-sol (a), and ½-sol (b½) were all steps on a ficta-gamut, and pertained to ficta-hexachords. In the second case, one could conceive of steps such as C-mi (c♯), B-fa (B♭), E-fa (e♭), all part of the ficta-gamut. In the third case, as seen earlier, any steps including ff-fa (f") and above, or FF-mi (F♯) and below, were steps said to pertain to the ficta-gamut—even if some of those could find correspondent steps in other octaves of the recta-gamut. It is necessary to remember, especially with regard to the latter case, that the recta-gamut contained only seven hexachords, having no hexachord beginning on FF (which would account for a FF-sol) or on c-sol-fa superacuta (which could account for a ff-fa). Notice that ficta- and recta-steps are not limited to step-letters: each step ought to be considered with its whole designation (letter-plus-syllable), i.e., a step ought to be considered within its own hexachordal context. Thus, the actual sound (pitch) of a given step is not important in determining whether or not it pertains to the ficta-gamut, but whether its designation can or cannot be found among those established for the recta-gamut. For example, ½-fa (representative of the trite synemmenon, and equivalent to the modern b½) is always a recta-step, but the same sound can be understood as a ficta-step if it is solmized as ½-sol, or b-sol, etc. It should be

38 As time went on, however, some theorists proposed the integration, in the recta-gamut, of some ficta-steps, specifically those matching the designation of a recta-step in another octave—cf. note 41.

39 These considerations, about the understanding of a step within its own hexachordal context, will become clearer in subsequent chapters.
noted also that in the medieval recta-gamut the 'b rotundum' or 'b molle' (whose sign is b) occurred only in the higher places—i.e., in those regions denominated acutae or superacutae. In other words, three different B\text{-}s (gravis, acuta, superacuta) were included in the recta-gamut (and considered recta-steps, provided they were solmized with the syllable mi), but only b-fa (B\text{♭}) and \textquote{\textfrak{b}}-fa (B\text{♭}') were considered recta-steps; B-fa grave (B\text{♭}) was considered a ficta-step.\textsuperscript{40}

Nonetheless, a few authors seemed to disagree with this understanding, particularly as indicated by their attempts to propose expansions to the existing recta-gamut. On the one hand, toward the beginning of the sixteenth century some writers defended the interpretation that if a step has a correspondent in any octave of the recta-gamut, then it may as well be considered a regular recta-step—e.g., B\text{♭} (B-fa grave), or even f\textquoteright (ff-fa), a position encountered in the works of Adam de Fulda (ca. 1445–1505), Johannes Cochlaeus (1479–1552), and Stefano Vanneo (ca. 1493–p. 1539), among others.\textsuperscript{41} On the other hand, 

\textsuperscript{40} My use of letters framed by an underline and an overline, particular to this dissertation, is here used for the representation of module of a pitch-letter (similar to what would be the module of a number in the mathematical sense). Whenever such a symbol appears, no octave is determined, and if it appears as a designation to a hexachord (e.g., \textfrak{C}-hexachord), it will stand for its initial letter (the letter that takes 'ut' as its solmization-syllable).

\textsuperscript{41} Adam de Fulda, mentioning that one can regularly find steps both below Γ or above ee at least as early as Du Fay, includes in his treatise a diagram showing both an F below Γ (in this dissertation designated as FF, equivalent to the modern F) which he names "hyperexiapathon", and ff above ee (also ff in this dissertation, equivalent to modern f\textquoteright), which he names "origneboleon"—cf. (Adam de Fulda 1490, ch. 8–9; GS 3: 350–351). Cochlaeus, in his Tetrachordum musices, implies that a B-fa (B\text{♭}) may be an acceptable recta-step, since the syllable fa is indeed found in other octaves of the step-letter B—cf. (Cochlaeus 1511–14, tr. 2, ch. 10, ff. C i; [trans.] Miller 1970, 46), whose first paragraph has been quoted earlier in this chapter. Stefano Vanneo goes even further, and includes one full octave below the standard gamut (i.e., starting on a G, equivalent to G\textsuperscript{♭}), and another full octave above (i.e., expanding to a step.
since the standard gamut did not include a low B\textsubscript{fa} (modern B\textsubscript{b}), there were also a few medieval authors who preferred to disavow even b\textsubscript{b} and b\textsubscript{b}' (b\textsubscript{fa} and b\textsubscript{b}-fa) of their place within the \textit{recta-}gamut, because of this lack of a correspondent octave among the lower notes.

In this order of the letters, B\textsubscript{rotundum} is not included. In fact, it is evident to everyone that it is not any of the \textit{graves}, since it is indeed nowhere placed among them. But neither is it any of the \textit{acutae}, since it is united to none of the \textit{graves} by means of a proportion \textit{dupla}. On the other hand, it has been invented not for the purpose of determining the propriety of the \textit{finales}, but for the purpose of preserving euphony on the majority of the chants, as far as among them it might lessen or remove the tritone, which is framed by the B\textsubscript{quadratum}.

(Anon. Tr. Cist. ca. 1147; Guentner 1974, 27–28)

Vanneo also presents an illustration of the back of the hand, in which the new G (i.e., G') is considered to be the new "\textit{Gammaut}," and is assigned to a position just above the wrist, whereas the other steps are assigned to the knuckles. Karol Berger presents a brief discussion on this tendency toward expanding the \textit{recta-}gamut, including some relevant quotations or references to these and other late fifteenth-century and early sixteenth-century theorists—(K. Berger 1987, 13–16). He also states that "Ciconia in his \textit{Nova musica} […] considers B\textsubscript{b} [i.e., B\textsubscript{b}] to be part of the regular gamut" (K. Berger 1987, 16). It is true that Ciconia presents at least two diagrams of the monochord in which he includes a b\textsubscript{rotundum} between low A and low B, but his statements are somewhat contradictory—cf. (Ciconia ca. 1400, bk. 1, chs. 16–18; Ellsworth 1993, 76–85). In chapter 16 ("\textit{De litteris monocordi}"—"On the letters of the monochord"), Ciconia provides a very brief presentation (two short paragraphs and one diagram of the monochord) of a gamut that goes only from G to D \textit{supercuta} (according to his terminology in this chapter). Ciconia also ascertains the inclusion of this B\textsubscript{b} equivalent by stating that "[t]he authors of music notated twenty-two letters in the monochord" ("\textit{viginti et duas litteras auctores musice in monocordo exaraverunt}")—cf. (Ciconia ca. 1400, bk. 1, ch. 16; Ellsworth 1993, 76, 77). Shortly after, using a different terminology in chapter 19 ("\textit{De divisionibus monocordi}"—"On the divisions of the monochord"), he states that "b synemmenon does not have a tone, a diapente, and a diapason below itself" ("\textit{b synemmenon sub se tonum et diapente et diapason non habet}"")—cf. (Ciconia ca. 1400, bk. 1, ch. 19; Ellsworth 1993, 84, 85).
This statement, by the anonymous author (or authors) of the *Tractatus Cantum quem Cisterciensis ordinis ecclesiae consuerant*., is found within a description of the modes, and denotes a contemporaneous resistance to the idea of modal transposition. The author (or authors, of this and other treatises within the same tradition) appear to have considered the reintegration of $\overline{B}$-rotunda (at least the usual higher ones) into the system only in the presence of extreme, unavoidable melodic situations (like an upcoming tritone). Otherwise, those $\overline{B}$-rotunda were considered virtually extraneous steps that could as well fall into the ficta category, at least within the line of thought followed in this mid twelfth-century treatise. Wherever a ficta-step was needed—according to either tradition—the music would have to provide convenient enough indications (explicit or not), for the performer to deduce it, based on knowledge and experience.

In order to indicate any such unusual (or 'fictitious') hexachordal-syllable assignments, the scribe or the composer would provide the score with the so-called ficta-signs: $\frac{1}{4}$ for fa, and $\frac{1}{2}$ for mi (at least as far as explicit indications are concerned). Of course, there are graphic variants to them (these vary by personal choice on the part of the scribe, or according to the notational tradition each one followed), but their basic shape can generally be recognized without difficulty in music notation, and their respective descriptions as b-rotundum (or molle) and b-quadratum (or durum) hardly change in the majority of historical theoretical discussions. Two other signs, however, might appear as indications for the hexachordal syllable mi, instead of the usual $\frac{1}{4}$: $\#$ and $\ast$. These latter mi-signs seem to have appeared only after the beginning of the fourteenth century, or
perhaps shortly before the third decade of the century. These signs (or at least \( \sigma \)) may in fact have originated within the propositions and definitions of Marchettus da Padova with regard to *musica ficta* (or rather generically termed *musica colorata*, as he preferred) and his own division of the whole tone into five equal parts.\(^{42}\) Thus, at least based on Marchettus's treatises, the signs \( \sigma \) and \( \star \) were meant to indicate a specific division of the whole tone, which would not yield to the same interval with the surrounding steps as the

\(^{42}\) According to Marchettus's description in the *Pomerium* (1318/19, bk. 1, pt. 1, tr. 4., ch. 4), the sign for square b should be differentiated from another sign which he idiosyncratically named *falsa musica*. The former should take the shape \( \frac{1}{2} \) (also describe in the *Lucidarium*, 1317/18, tr. 8, ch. 1), and the latter should take the shape \( \sigma \)—describe as having an upward stem on its right and a downward stem on its left. Marchettus's *falsa musica* sign (which he seems to have originally devised) served his unique propositions for dividing the tone into five equal parts—it should be employed to divide the whole tone into a *diesis* and a *chromaticum* semitone (the latter, in his terminology, was equivalent to four *dieses*). When employed in accordance with Marchettus's proposition, the *falsa musica* sign would be indicating a *chromaticum* semitone above the note to which it is applied—i.e., interpreting in a modern context, the sign would serve as an indication that the 'pitch' should be raised chromatically by four of Marchettus's *dieses*—cf. Marchettus's *Lucidarium* (Marchettus 1317/18, tr. 2, chs. 6–8, and tr. 8, ch. 1; [ed. and trans.] Herlinger 1985, 140–157, 270–281; [ed.] GS 3: 73–75, 89), and also his *Pomerium* (Marchettus 1318/19, bk. 1, pt. 1, tr. 4; [ed.] Vecchi 1961, 68–74; [ed.] GS 3: 134–136; [trans.] Renner 1980, 52–60). (For the sake of reference, notice that Gerbert [GS 3: 89] designates the relevant section in *tractatus octavus* of Marchettus's *Lucidarium* as chapter 2, while Herlinger gives it as chapter 1.) Despite the description given by Marchettus, in the editions of *Pomerium* available to this date (GS 3: 136; Vecchi 1961, 73–74), the sign is graphically presented as \( \frac{1}{2} \) (Gerbert), and as \( \# \) (Vecchi)—cf. (Renner 1980, 59), for a translation according to Vecchi's edition. In Herlinger's edition of the *Lucidarium*, he used the fourteenth-century manuscript I-Ma D.5 inferiore as the main and most reliable source, which also included a copy of the *Pomerium*—Herlinger (1985, 23–24) speculates that the copy of this manuscript (apparently the earliest) may even have been overlooked by Marchettus. This manuscript is the only one that presents musical examples with a consistent differentiation between the square b and *falsa musica* signs, "precisely as Marchettus prescribed" (Herlinger 1985, 27). Of the eighteen manuscripts consulted by Herlinger, only three make a clear graphic distinction between the two signs, but in most manuscripts (whose dates range from the early fourteenth to the early sixteenth century), signs such as \( \frac{1}{2} \), \( \sigma \), \( \# \), or \( \star \) were used indistinctively for both square b and the *falsa musica* sign, sometimes even two signs in the same manuscript were used with no the distinction regarding their function within Marchettus's propositions—cf. (Herlinger 1985, 21–62).
sign for \(b\)-\textit{quadratum} (\(\text{b}\)). Despite these differences, and while the sign \(\text{b}\) does not appear to have been truly adopted, the sign \(\text{\textbullet}\) seems to have gained currency from the early Ars Nova through the Renaissance, as an indication for the hexachordal syllable \(mi\), and as a rightful substitute for \(\text{b}\)—virtually no differentiation was made between the latter two in terms of musical practice.\(^{43}\) In any case, it seems only natural that signs would have been used or omitted in accordance with regional determinations of the limits of one gamut or the other, as well as the predilection (regional or personal) for one shape or the other. Now, since it is the position of the semitone (\(mi\)-\textit{fa}\)) that indicates the hexachord to be read, these signs were more than enough to specify or represent the whole hexachord. For instance, if the semitone is placed between \(b\) and \(c'\), the syllables of the \(\text{\textbullet}-\text{hexachord}\) will apply; if the semitone falls between \(a\) and \(b\), then the syllables of the \(\text{\textbullet}\)-hexachord will apply. Therefore, in solmization, a great emphasis was placed on the identification of the semitone, and the signs that framed the hexachordal semitone (i.e., the signs for \(mi\) and \(fa\)) were used in order to clarify that position within a melodic gesture. In other words, solmization depended on identifying (with a good degree of certainty) where the semitone lies within a melodic gesture. When the position of that internal semitone was easily recognizable, there would be no need to indicate it by means of a sign for \(mi\) or \(fa\) (i.e., by means of one of the \(\text{\textbullet}\) signs).\(^{43}\) For further and very informative commentaries on the use and possible chronology of all of the signs, see the unparalleled survey provided in Karol Berger's \textit{Musica ficta} (1987, 17–29). Also, it must be noted that in some sixteenth-century original publications (especially of Germanic origin), and occasionally in earlier manuscripts, the \(b\)-\textit{quadratum} can take the form \(\text{i}\), or else resemble the shape of a \textit{brevis} with very short stems going up and down on both sides, and in some cases it may even be confused with the modern natural-sign (\(q\)), but these are likely due to particular calligraphic choices or scribal idiosyncrasies.
ficta-signs). A sign was however necessary (either for a recta- or for a ficta-step) when the position of the semitone was unclear (or ambiguous), or when it had to be changed within the course of a musical work, or else when its place was unusual with regard to the prevalent gamut. The latter case applied only to ficta-steps, while the two former cases could involve either recta-steps or ficta-steps.

Indeed, two are the signs of false music [i.e., ficta-signs], namely, \( \flat - \text{molle} \) et \( \sharp - \text{quadratum} \). Where \( \flat - \text{rotundum} \) is placed, [the syllable] \text{fa} is said; however, where \( \sharp - \text{quadrum} \) [is placed], [the syllable] \text{mi} will be said. And thus one species [of interval] can be transmuted into another, as it was seen in the chapter on proportions [of intervals].

Here, "to be transmuted" (from "transmutari") refers to a generic process of change from a tone into a semitone—or vice versa—in much the same way as the term \textit{musica falsa} was described in the mid-thirteenth-century treatise by Johannes de Garlandia, quoted above.\textsuperscript{44} In the recta-gamut, b and bb were the only places where two different varieties of steps were available (\( \flat - \text{fa} / \flat - \text{mi} \) and \( \sharp - \text{fa} / \sharp - \text{mi} \)), necessary since two different varieties of intervalllic configurations surrounded those places: if there was a semitone below and a tone above, the step should be solmized \text{fa}, but if there was a tone below and a semitone above, it should be solmized \text{mi}. Thus, these were also the only places that could serve as representations of such a radical 'change' and their correspondent signs (round-b and

\textsuperscript{44} Later in this dissertation, the term 'transmutation' will be employed in another, more specific meaning—cf. chapter 6.
square-b) were a natural choice for use as *ficta*-signs. Another aspect of the relevance and emphasis placed on the semitone lies in the fact that theorists (and practitioners) were prompted to its identification, since it was considered a difficult interval both in singing, as well as in calculating its exact ratio (i.e., both in practice and in speculative music).

Namque semitonium ipsum magis artificiosum et ipsa proportione atque prolatu natura et arte difficilius est tono. (Gaffurius 1496, bk. 1, ch. 3, f. a iiiijv)

For indeed, the semitone, itself more artificial and by its own proportion, is more difficult than the whole tone, [as it is] revealed by nature and by art. (my translation; cf. Miller 1968, 30; Young 1969, 21)

To be sure, the concept of *musica ficta* (and therefore the identification of *ficta*-steps) is as much dependent on the establishment of the medieval gamut (i.e., on that specific collection of steps) as it is dependent on solmization. Now, although solmization need not follow the Guidonian paradigm, most of the same procedures and concepts used in the Guidonian hexachordal solmization are also applicable to other kinds of solmization, at least during the medieval and Renaissance periods, even before Guidonian solmization became the norm. The dependence (even if only partial) of *musica ficta* on proper solmization, led to the incorporation of many of the basic procedures of solmization into writings about *musica ficta*. For example, 'change' became the underlying pivotal concept that permeated both, whether understood as a 'modification' from tone into semitone (and vice versa), or as a 'shift' between two different hexachords.

In the following chapters of this dissertation, solmization procedures will be explained mainly through the Guidonian paradigm and a systematization proposed in order to explain how *musica ficta* was practiced and conceived. The conceptual relations between
sollmization and *musica ficta* (and supplementary understandings of their processes) will be illuminated by references to some particular figures of rhetoric. It will also become evident that *musica ficta* (as a feature of 'sollmization' in its generic sense, that is, as a process of reading notated music, whether or not it followed hexachordal parameters) was a practice that not only can be applied to polyphony (usually the context in which modern scholarship has formulated its guidelines toward *ficta*), but to monophony as well.
PRINCIPLES OF HEXACHORDAL SOLMIZATION

(i) Deduction of Hexachords

The deduction of the Guidonian hexachord consisted in applying the solmization syllables ut, re, mi, fa, sol, la to any sequence of six consecutive steps that conform to the structure T-T-S-T-T, thus providing the mi-fa interval as the only internal semitone.

Deductio est vocum de uno loco ad alium per aliquam proprietatem ordinatam ductio. 
[...] Proprietas est propria quaedam vocum deducendarum qualitas. 
(Tinctoris 1495; CS 4: 181, 186; Parrish 1963, 18, 50)

Deductio is the conduction of voices (i.e., syllables) from one place to another through some ordered proprietas (i.e., 'propriety'). 
[...] Proprietas (i.e., propriety) is a certain quality proper of deduced voices. 
(my translation; cf. Parrish 1963, 19, 51)

According to these assertions by Johannes Tinctoris (in his Terminorum musicae diffinitorium), the deduction (i.e., deductio) is a process through which one realizes, or finds (either in performance or in theory) a hexachord, by applying the syllables used in solmization to adjacent steps (or places)—this is the meaning implied in the phrase "de uno loco ad alium," translated above as "from one place to another." The qualification 'adjacent' is, of course, not explicit in Tinctoris's text, but there is basically no other way to find and conduct an "ordered proprietas" (i.e., an intervallic structure, or order). In the generic
sense, "proprietas" is itself a term that stands for any intervallic structure, but in the context of Tinctoris's work, it is the one structure within the Guidonian hexachordal tradition that determines seven hexachords within the gamut, and that makes use of the correspondent sequence of six solmization syllables. In the particular sense, "proprietas" suggests the necessity for qualification of specific regions within the gamut, where the sequence of syllables will contain one or the other variety of b (one may thus conceive of the 'molle proprietas' for all those hexachords that contain a $\flat$-molle, and of the 'durum proprietas' for those hexachords that contain the $\sharp$-durum), or else regions where no variety of b is found (the 'natura' or 'naturalis proprietas'). "Deductio," in its turn, stands not only for a process of finding hexachords, but of finding a defined, particular hexachord—for the objective of the process of finding (deducing) is to determine and choose one hexachord at a time. In fact, Tinctoris's definitions show a broad enough scope to invite generalizations, for in the entries given above he does not mention a particular 'order' of syllables (or pattern), only that there is one common to all unities, and he also does not state if they are hexachords, tetrachords, heptachords, or some other number of 'places'; he suggests, however, that unities can be grouped according to "proprietas" (i.e., according to 'certain proper qualities').

45 Notwithstanding the broadness of the above definitions, other passages in

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45 This interpretation of terms is indebted to the work of Carl Parrish, one of the first scholars to translate Tinctoris's *Terminorum musicae diffinitorium* (1495) in its entirety, and the first to provide an English translation—the only previous translation was one in French done by Armand Machabey, and published in 1951. Parrish, however, chose to translate and understand 'proprietas' simply as 'hexachord,' and also declared that there existed a synonymical relation between 'deductio' and 'hexachord,' in the context of Tinctoris's works. In a footnote (quoted below) referring to the entry on 'Deductio,' Parrish explained some of the nuances he conceived for his translation.

(cont. ...)
Tinctoris's work may attest to the fact that he was referring to 'unity' and 'order' within the
Guidonian tradition (i.e., the Guidonian hexachord and its particular intervallic structure).

A la mi re acutum est linea cujus clavis est
A, et in qua tres voces scilicet la, mi et re

canuntur: la per naturam ex loco C fa ut; mi
per b molle ex loco F fa ut gravi; et re per b
durum ex loco G sol re ut gravi.

[...] Manus est brevis et utilis doctrina ostendens
compendiose qualitates vocum musicae.

(Tinctoris 1495; CS 4: 178, 185; Parrish
1963, 6, 40)

The two entries above (for manus and for the step a-la-mi-re), given in Tinctoris's

The word deductio is one not often found in early treatises, and seems to be used by Tinctoris as a
sort of synonym for "hexachord," a word which he never uses [...]. In place of it, he employs
three other terms, each with a slightly different meaning: 1) proprietas, 2) b durum (also b molle
and natura [...]), and 3) deductio. The distinction appears to be as follows:

1) proprietas is the name for the particular arrangement of intervals in any
hexachord, regardless of its position in the gamut;
2) b durum, b molle, and natura are those beginning on g, f, and c respectively,
regardless of the octave range in which each occurs;
3) deductio is one particular hexachord in a particular range.

In his treatise on the hexachord system, Expositio manus (Coussemaker IV, p. 8), Tinctoris says
that there are seven deductions: those on G, c, f, g, c', f, and g'. A somewhat similar use of the
word deductio is found in the anonymous treatise, Quatuor principalia, c. 1380, formerly attributed
to Simon Tunstede (Coussemaker IV, p. 219).

(Parrish 1963, 83; ellipses mine)

There should be no doubt that Tinctoris used these terms in the sense interpreted by Parrish, even
though his wording may obscure the relation between the terms and prevent the expansion of meanings to
include the ideas of 'process' (in the case of 'deductio') and 'intervallic structure' (in the case of 'proprietas').
Terminorum musicae diffinitorium, are signs of a definite compliance to the Guidonian tradition. Other particular signs that his theoretical thought was based on the Guidonian hexachordal solmization are found in the definitions for the other steps within the \textit{recta}-gamut, which are given at their appropriate alphabetical position in that encyclopedic work. Tinctoris is not the only one to have used the terms \textit{deductio} and \textit{proprietas} in the sense and context given above, for one can find other assertions regarding these concepts, both before his time and in contemporaneous literature.

It must be noted that these above mentioned \textit{proprieties} are the ordinary ones, according to which, in the art of \textit{deductions} of the left hand, step-syllables and step-letters (\textit{voces et claves}—lit., voices and clefs) are appropriated (i.e., made proper) in this fashion: Gamma-\textit{ut}, [placed] on the ruler or on the line [of the staff], has one step-letter and one step-syllable. G is the letter, \textit{ut} is the syllable. It is sung through \textit{\textless quadrum} and descends to itself.

\textbf{A-re}, in the space, has one step-letter and one syllable; \textit{a} is the letter, and \textit{re} is the syllable. It is sung through \textit{\textless quadrum} and descends to \textit{ut} of gamma-\textit{ut}.

\textbf{\textless mi}, in the line, has one step-letter and one syllable; \textit{b} is the letter, \textit{mi} is the syllable. It is sung through \textit{\textless quadrum} [and descends] to \textit{ut} of gamma-\textit{ut}.

\textbf{C-fa-ut}, in the space, has one step-letter and two step-syllables; \textit{C} is the letter, \textit{fa} and \textit{ut} are the two syllables. Fa is sung through \textit{\textless quadrum} to \textit{ut} of gamma-\textit{ut}; \textit{ut} is sung through \textit{natura}, and descends to itself.

\textit{(my translation)}

The above quotation, from Johannes de Garlandia's \textit{Introductio musice}, shows one
of the first statements that used the terms *deductio* and *proprietas* with the same meaning as
the one disclosed in Tinctoris's works, and pointing to the same kind of practice and
context. In Garlandia's sentences singing 'through ½-*quadrum*' means making use of a
hexachord that belongs within the *durum proprietas* (for only such a hexachord would
contain that particular variety of b), and singing 'through *natura*' means making use of a
hexachord that belongs within the *naturalis proprietas* (for only such a hexachord would
contain no variety of b). The indication 'descends to itself' denotes that those particular
steps, namely Γ-*ut* and C-*ut*, are the starting and returning points of the hexachords to which
they belong. Another quotation that pertains to the same tradition of concepts is given by
the anonymous treatise of Franconian tradition entitled *Tractatus de discantu*.

Nota quod quando dicit continet duas voces,
vel tres, vel quatuor, debes intelligere
seriatim prolatus, sicut sunt in *deductio*
de *ut*, *re*, *mi*, *fa*, *sol*, *la*.
(Anon. 2 ex. 13th c.; CS 1: 309; Seay
1978, 22)

Notice that when it is said [that] it [a step]
contains two syllables (*voces*), or three, or
four, you ought to understand the
arrangement step by step, as in the
*deductio* of *ut*, *re*, *mi*, *fa*, *sol*, *la*.
(my translation; cf. Seay 1978, 23)

In addition to these accounts of related meanings of the terms *deductio* and
*proprietas* (and the practical use associated with them), one finds other references to them
as early as the mid-thirteenth century, and they seem to disappear by the end of the fifteenth
century. 46 This apparently limited time-frame for actual assertions regarding those terms,
validating their meaning and use according to what has been exposed above, should not

46 Several other references regarding the term *deductio* are given the *Lexicon musicum Latinum
medii aevi* (LmL, 6: 784–786). All of them are confined to the time-frame given above: mid-thirteenth
century to end of the fifteenth century.
preclude their contextualized application in the present discussion, since other time periods sharing in the same Guidonian tradition also utilized the same concepts, although these particular terms may not have been used systematically, nor with such a clarity as in other periods. Thus, the terms *proprietas* and *deductio* will be hereby used with the following meanings: *proprietas* as a quality shared by hexachords; and *deductio* as a process of finding hexachords, but not as a hexachord in itself.

Within the gamut (FIG. 1.1), Guidonian tradition established three basic types of hexachord, described according to the variety of b they contained (or its absence): (a) a *durum* (hard) hexachord was any hexachord containing the *durum* variety of b (i.e., a b-*quadrum*); (b) a *naturale* (natural) hexachord was any hexachord containing no variety of b; and (c) a *molle* (soft) hexachord was any hexachord containing the *molle* variety of b (i.e., a b-*rotundum*). This kind of description, proper to historical treatises, emphasizes the place where one (who wishes to solmize) needs to look in order to locate the semitone within the hexachord (i.e., the position of the syllables *mi* and *fa*), since the identification of the semitone was essential for solmization—as discussed in chapter 1. In modern musical pedagogy, however, there is a tendency to organize and study scales and their pitches. Accordingly, it seems appropriate to have a description of hexachords based on their first steps (those which would bear the syllable *ut*); thus, the designations for those three basic types of hexachord can be as follows: *G*-hexachord, *C*-hexachord, and *F*-hexachord, which may also be called *recta*-hexachords.
Now, *ficta*-hexachords are also determined by the position of the syllables *mi* and *fa*, but none of their steps are found in the regular gamut (i.e., the *recta*-gamut)—i.e., they are all classified as *ficta*-steps, despite the fact that there are sound-equivalences between some *recta*-steps and *ficta*-steps. In the case of *D*-hexachords, all steps (except *F*-mis) have sound-equivalents in the *recta*-gamut—given a *D*-hexachord starting on the step-letter D: the pitches *d*, *e*, *g*, *a*, *b* are respectively equivalent both to the *ficta*-steps *D*-ut, *E*-re, *G*-fa, *a*-sol, *b*-la, and to the *recta*-steps *D*-sol-re, *E*-la-mi, *G*-sol-re-*ut*, *a*-la-mi-*ut*; while *f* is the equivalent to the *ficta*-step *F*-mi, and *f* is the equivalent to the *recta*-step *F*-fa-*ut*. A similar case applies to *B*-hexachords, for which all steps (except *E*-fas) have sound-equivalents in the *recta*-gamut—given a *B*-hexachord starting on the step-letter *b*: the pitches *b*, *c*′, *d*′, *f*′, *g*′ are respectively equivalent both to the *ficta*-steps *b*-ut, *c*-re, *d*-mi, *f*-sol, *g*-la, and to the *recta*-steps *b*-fa, *c*-sol-*fa*-ut, *d*-la-sol-re, *f*-fa-*ut*, *g*-sol-re-*ut*; while *e* is the equivalent to the *ficta*-step *e*-fa, and *e* is the equivalent to the *recta*-step *e*-la-mi. These *ficta*-hexachords (*D*-hexachords and *B*-hexachords) are the only ones in which all of their steps (except one) have sound-equivalents in the *recta*-gamut. Notice that this correspondence between *ficta*-steps and *recta*-steps may be established only via their actual sound (they are, in modern terms, pitch-equivalents). There are three main points to be summarized here: (a) all steps in a *ficta*-hexachord are denominated *ficta*-steps, whether or not they have sound-(pitch)-equivalents in the *recta*-gamut; (b) not all *ficta*-steps are necessarily equivalent to modern accidental inflections (for the classification of *ficta*-steps depends on particular letter-plus-syllable designations that are not found in *recta*-steps, and
not in their actual sound); and (c) in the deduction of an entire *ficta*-hexachord, it is enough to find only one syllable in a step where it is not regularly found in the *recta*-gamut (the other *ficta*-steps are deduced or implied accordingly, as long as their solmization can be effectively kept within the limits of that *ficta*-hexachord).

In all instances, the determination (or *deductio*) of any hexachord (*recta* as well as *ficta* ones) may be expressed by a syllable associated with a step-letter; or in other words, any step (with the appropriate letter-plus-syllable designation) would serve as a determinant of a particular hexachord. For example, any *durum* or *g*-hexachord is expressed by saying *ut* on any *g*, *re* on any *a*, *mi* on any *b*, and so on, up to *la* on any *e*, and similarly the *naturale* or *c*-hexachord is expressed by saying *ut* on any *c*, up to *la* on any *a*, as well as any *molle* or *f*-hexachord is expressed by saying *ut* on any *f*, up to *la* on any *d*. Notice that the solmization of any one of those syllables would be enough to express the solmization according to one sole hexachord, for in any given step-letter (or pitch) one given syllable can pertain to only one hexachord. Medieval and Renaissance musicians may have certainly faced the problem of how to indicate a syllable within the score, allowing for the performer to solmize the appropriate hexachord intended by the composer, and which would be the most functional syllable to be indicated. To solve this problem, in concordance with the emphasis placed on the semitone, it would seem reasonable and sufficient to indicate the semitone itself, by means of signs that would either denote the syllable *mi* or the syllable *fa.* For example, if a sign indicating the solmization syllable *mi* (represented by a sign based on the *b-durum*, in the shape of either \(\downarrow\), \(\times\), or the like) is placed before any one *b*, it will
indicate that the hexachord whose solmization is being effected is the $\text{G}$-hexachord, for it is the only hexachord where a $\text{G}$ is solmized $mi$—in modern terminology, those $\text{G}$s are equivalent to 'non-inflected $\text{G}$s'. Likewise, if a sign indicating the solmization syllable $fa$ (represented by a sign based on the $b$-rotundum, via the shape $b$, or the like) is placed on the space or line of any one $\text{F}$, it will mean that the hexachord being effected at that moment is the $\text{F}$-hexachord, in which case the $\text{F}$ on that line or space is to be solmized $fas$, and will necessarily establish a semitone with the step below—in modern terminology, these $\text{F}$-$fas$ are equivalent to 'accidentally inflected $\text{F}$s'. Although the above explanation sounds obvious, it is very important to stress that the primary function of those signs (either $mi$-signs or $fa$-signs: generically called $ficta$-signs) is to indicate a solmization syllable (not necessarily a modern accidental inflection), thus properly indicating the hexachord to be solmized.$^{47}$

Historical treatises were also careful to group hexachords according to the varieties of $b$ they contained—i.e., according to their proprietas. Among the three basic types of hexachord, those that contained the $b$-$durum$ variety (the $\text{G}$-hexachords) were said to have a durum proprietas (or hard quality); those that contained no $b$ variety (the $\text{C}$-hexachords) were said to have a naturale proprietas (or natural quality); and those that contained the $b$-$molle$ variety (the $\text{F}$-hexachords) were said to have a molle proprietas (or soft quality). These groups could be expanded into families that not only included the three basic types of

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$^{47}$ The conceptual differences between 'ficta-signs,' 'accidentals,' and other possible terms will be discussed in chapter 8 (ii) and (iii).
recta-hexachords, but included ficta-hexachords as well. The durum family may be defined in two ways: (a) it consists of all hexachords whose deduction is usually effected through the indication of a mi-sign (♭, or ♮, or ♯); or (b) it consists of all hexachords that contain the step-letter b-quadratum (equivalent to $\overline{B}_4$) in any octave of the gamut—e.g., $\overline{C}$-hexachords, $\overline{D}$-hexachords, $\overline{A}$-hexachords, etc. Similarly, the molle family may be thus defined: (a) it consists of all hexachords whose deduction is generally effected through the indication of a fa-sign (♭); or (b) it consists of all hexachords that contain the step-letter b-rotundum (equivalent to $\overline{B}_5$) in any octave of the gamut—e.g., $\overline{F}$-hexachords, $\overline{B}_5$-hexachords, $\overline{C}_5$-hexachords, etc.\(^{48}\) It might be noted that the two definitions for each of those families (durum and molle) mean virtually the same thing (they are simply two different approaches used for explaining the same proprietas). Any hexachord indicated by means of one of those signs (either for mi or fa) will necessarily include among its step-letters one of the corresponding varieties of b (either b-durum or b-molle, respectively); conversely, when there is a need to indicate the semitone (of a hexachord whose step-letters include some variety of b), the choice of indication will necessarily fall on the mi-sign (if the hexachord includes a b-durum) or on the fa-sign (if the hexachord includes a b-molle). The naturale

\(^{48}\) Regarding the expansion of the medieval system of steps and hexachords, some limits to each family may already be envisioned. On the molle-family side, a limit for hexachordal expansion may be found before the $\overline{C}_5$-hexachord is reached (and any other hexachords beyond), for it would yield to $\overline{B}_5$-mi-fa, which is a virtual impossibility. On the durum-family side, a $\overline{F}_5$-hexachord (and beyond) is also a virtual impossibility, for it would yield to $\overline{B}_5$-mi-fa. These steps are not only difficult (though not impossible) to explain theoretically (by means of hexachordal deductions, or other paradigms available to medieval and Renaissance theory), but also an adequate notation (indication) for them would be feasible only in very particular situations—one of those is found in Adrian Willaert’s *Quid non ebrietati*—cf. (Levitan 1938–39; Lowinsky, 1956; Bent 2002, 22–25, 106–111, 125–129, 204–206).
family, which comprises only hexachords that include no variety of b, is said to consist only of one type of hexachord: \( \overline{C} \)-hexachords. There are only two such hexachords in the recta-gamut (one starting on C-fa-ut, the other starting on c-sol-fa-ut), but there may be other ficta-hexachords of this type (starting on C-letter places other than the ones belonging to the recta-gamut). Recta \( \overline{C} \)-hexachords do not make use of any sign to indicate their semitone, but ficta \( \overline{C} \)-hexachords (being outside of the gamut) do need signs in order to be deduced: a common case in medieval and Renaissance notation is the use of a fa-sign (♭) on the place of the step-letter ff, thus producing the ficta-step ff-fa (equivalent to \( f^\# \)), which implies the existence and solmization of a ficta \( \overline{C} \)-hexachord starting on cc-ut (a step whose sound is the same as the recta-step cc-sol-fa). In any of these cases, note that a sign does not function as an indication of a single tone. Since it indicates a syllable (which exists only within the context of a hexachord), the sign ultimately functions as an indication for an entire hexachord. Regarding the definitions given above for the durum and molle families, one exception may be found in reference to recta \( \overline{G} \) and \( \overline{F} \)-hexachords: they may be indicated by an actual sign only when the choices for solmization become unclear or doubtful. When the melodic context clearly implies the solmization of one of these hexachords, those signs are unnecessary—thus, definition (a) in both cases (for the durum and molle families) is more fitting to ficta-hexachords of each family than to recta ones. The recognition and solmization of hexachords is, as suggested above, not dependent solely on the indication of ficta-signs, but also on a proper inspection of the melodic context. Concerning recta-hexachords of any type, it may be said that a melodic gesture is generally
sufficient to imply the solmization of one of them. In the recognition and consequent solmization of ficta-hexachords, however, two factors must be always taken into account: the melodic gesture, and the ficta-signs that might be present (including an appropriate interpretation of those signs, according to their position, relatively to ligature, syllabic divisions of the text, tempora, clefs, phrases, etc.).

(ii) Stages of Solmization

Before entering into discussions about the recognition of hexachords (whose first factor, the 'melodic gesture,' will be undertaken in section [iii]), it may prove informative to read a late-fifteenth-century report on how solmization practice was taught, carried out, and which levels of knowledge and skill were being recognized or ideally expected. Based on that report (from Gaffurius's Practica musice), it appears that both practical and speculative musicians (from performers to composers, scribes, and even theorists) were schooled in the same kind of basic music-reading: solmization based on hexachordal structures. It also seems that the expected stages involved in basic music-training in Gaffurius's time were not so different from those expected in modern times. In a first stage, musicians started by solmizing each note (or in the modern practice solfeging); then in the next stage they went on to vocalizing the notes, and finally in the third stage (seemingly after a higher level of comprehension had been reached) they should be able to read their part with full attention to all its texts (musical and literary).
Moreover, the voces [steps], which the notes [figures in staff notation] indicate, are usually pronounced in three ways. The first way is by solmizing, i.e. by articulating syllables and names of sounds, namely ut, re, mi, fa, sol, la: as here.

As a rule to be preferred, they teach such a way of pronouncing them [i.e., the notes] to initiating boys.

The second way: by uttering only sounds and steps made thoroughly void of literature [i.e., text], and of syllables and articulations [i.e., phonemes]; which a trained singer is able to follow easily, in this way.

The third way: by pronouncing any articulations and the exact words, underscoring their correspondent notes of songs, as in antiphons and responsories. According to such [a way], selected members of the clergy are led to the end of a chant.

There is no doubt that these three stages differ with regard to sight-reading skills, and that each one is a prerequisite for the next. These stages might refer not only to the
schooling process, but also might extend to the qualification level of different musicians (i.e., whether a well-trained musician would be able to learn a new part without having to resort to a process of sight-reading that included the two first stages, going directly to the third stage). Now, the last sentence in the quotation above can also be read with a slightly different meaning: "According to such [a way], members of the clergy are led to the end of a selected chant." If the first translation ("selected members of the clergy are led to end of [any kind of] a chant") is accepted, it would imply some social discrimination (i.e., virtually equivalent to 'the chosen ones') within a class (the clergy, the oratores) that, by nature, is already differentiated and perhaps even privileged with regard to other social casts, and would also imply that once the last stage of training had been reached, the musician could perform anything (or nearly that) at a first reading. If the alternative, second translation ("[any] members of the clergy are to the end of a selected chant") is favored, it could mean that the third stage of part-reading is dependent on previous selection of the musical work itself—it is likely that this selected chant (to be read according to the precepts of that third stage) was not too elaborate or too complex (otherwise there would be no need for selection). From the alternative translation, one also could infer that there are chants (those that were not selected) which cannot be implemented through a third-stage sight-reading without having to resort to the first two stages (or perhaps at least to one of them), since they are probably too elaborate or complex. In any case, both translations appear to imply that the third stage was not always reached, either because there was a limit (whether by means of arbitration or by natural selection) to the actual number of accomplished
musicians able to deftly handle such a level, or because the complexity of the music did not allow for random pieces to be sung with all their musical and literary nuances at first sight (perhaps not even after a first reading).

Gaffurius is historically classified among humanistically oriented theorists who undertook the interpretation of (and eventually used) classical models as a means to support and promulgate their own aesthetic ideas, but who were not necessarily concerned with accurately reporting on the current stage of musical knowledge or practice. In the above quotation, however, the text seems very clear with regard to where the description ends, and where Gaffurius's expectations (or comments) begin. The expectations are present not in the training stages (first: basic; second: intermediate; third: advanced), but in the social groups implied by Gaffurius's allegorical representation (first: the illiterate people; second: the learned; third: the selected).

In Gaffurius's description, this kind of hexachordal solmization is clearly used for the vocal repertoire, but one can hardly deny that the instrumental repertoire would have made use of solmization (and of musica ficta), though it remains to be investigated which

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49 In his *Musica Ficta*, Karol Berger quoted the same passage from Gaffurius's *Practica musice*, and provided additional references to three later sources containing descriptions of three similar stages (or levels) of solmization: Cochlaeus's *Tetrachordum musices* (1511–14, tr. 2, ch. 6, ff. B iiiiv–v); Lanfranco's *Scintille di musica* (1511–14, tr. 2, ch. 6, ff. B iiiiv–v); and Vanneo's *Recanetum de musica aurea* (1533, bk. 1, ch. 13, ff. 12r–v)—cf. (K. Berger 1987, 7, 193n). Earlier, at the outset of his first chapter, Berger also quoted a passage from Adrian Petit Coelico's *Compendium musices* (1552, ff. B iijr–iijr) containing another, similar description—cf. (K. Berger 1987, 2, 189n). In all of these descriptions, there are implicit social references that demand acknowledgement, and which may enlighten how solmization and musica ficta was effected with regard to different social groups—or (at least in Gaffurius's case) which social groups were expected to actually go through all the stages and thus achieve a higher level of knowledge.
kind of solmization that would be, and on what level. In the quotation given below, from the
Tetrachordum musices (1511–14), Johannes Cochlaeus presents three kinds of
music-reading that are apparently similar to Gaffurius's division. These kinds, however, are
not restricted to the concept of progressive, mutually exclusive stages as in Gaffurius's, but
rather determine distinct ways of execution by different groups of performers. (Cochlaeus's
classification is, therefore, not exclusively dependent on the concept that each group
represents different skills and levels of knowledge—as in Gaffurius's socially charged
description, although his presentation is not devoid of allegorical references to social
groupings.) In his description, Cochlaeus seems to suggest the following meanings: the
first and second kinds of reading are applied to vocal music, and the third to instrumental
music. The first kind is accomplished by solmizing one's part—i.e., singing by means of
the solmization syllables (very much the same way as Gaffurius's first stage). The second
kind deals with singing the parts already with their full text—i.e., by means of the syllables
given in the poetic text (thus similar to Gaffurius's third stage). In Gaffurius's assertions
the first two kinds appear to constitute mutually exclusive stages: one in which performers
who had achieved a higher level of skill would be expected to read parts with their full text,
and another in which performers were expected to use solmization with syllables. In
Cochlaeus's assertions (quoted below from his Tetrachordum musices), however, the two
kinds appear to indicate procedures that should be executed consecutively, despite one's
skill or level of study. Perhaps both should happen in reading elaborate or complex music
(as suggested in one of the interpretations above for Gaffurius's assertions).
Triplex modulandi forma [in margin]

Contingit tamen tripliciter canere.
Primo. Solfisando: Hoc est syllabas seu
vocum nomina exprimendo. Secundo.
Notularum tenores cum textu eis supposito
pronunciando. Tertio. Sonos ac voces
tantum emittendo, absque textu et solfa.

Primus modus. cantum addiscentibus
habilis est, Sic enim ad rectam melodiam
vocum distinctione as[s]uescunt. Secundus
iis qui vel in choro vel alibi canere solent.
Tertius conuenit instrumentis."
(Cochlaeus 1511–14, tr. 2, ch. 6, f. B iiiiv)

The three ways of realizing music
Yet, singing happens in a threefold
manner. First, solmizing: that is, by
expressing the syllables or the name of the
voice. Second, by pronouncing the notes
[tones] of the tenors set with their text.
Third, uttering sounds and also voices,
without text or solmization syllables (solfa).

The first way (modus) is singing
appropriate to novices (addiscentes), thus,
with respect to a recta-melody, they are sure
to become used to the distinctions of the
voices [i.e., to the intervals]. The second, to
those who are accustomed to sing either in a
chorus or elsewhere. The third concerns [the
use] on instruments.
(my translation, cf. Miller 1970, 40)

In other words, the first kind would be more proper at a reading (perhaps rehearsal)
stage, and the second kind, at an actual performance or final reading stage of a given piece
of music. These first two kinds of reading apply to the same kind of group (singers), with
the same training and virtually with the same skills—therefore, no different social groups
are implied as in Gaffurius's stages. (Gaffurius's second, vocalization-like stage seems to
be either bypassed, or deemed unimportant in Cochlaeus's conception of vocal music
reading.) The third kind of reading, applied to instrumental music, is accomplished by
executing the tones without any syllables—that is, no solmization syllables are uttered, nor
syllables from any poem that may have been attached. (Even though this kind may be
compared to Gaffurius's vocalization-like stage, it finds no correspondence in that
description, for it is clearly associated with instrumental realization.) This third kind also
reveals a quite different group (instrumentalists) from the one which makes use only of the
first two kinds of reading (singers).
Despite the apparent restriction to singing, implied in the opening phrase "Contingit ...
tripliciter canere" (loosely, "three ways that happen in singing"), instrumental music is
unquestionably included in Cochlaeus description (explicitly asserted in the last phrase of
the quotation: "Tertius conuenit instrumentis" (loosely, "the third kind is applied to
instruments"). The presence of these two phrases allows for another interpretation: that
both vocal and instrumental 'readers' were subject to the same training (schooling
background) and performance paradigm, with the resultant performance realized in different
ways. In Cochlaeus's context, instrumental practice could refer to instrumentalists
performing either with human voices, or alone. If a performance involved both human and
instrumental voices, the latter would closely follow the vocal reading down to its solmization
syllables, even if these syllables were merely thought (i.e., not explicitly uttered) by the
instrumentalists—in this situation, their practice would be subordinate (subaltern) to that of
the singers. If the performance was that of instruments alone, both reading and perception
(conceptually and aurally) of the actual sounds would be a result of some kind of
solmization—one that doubtless would conform to the same paradigm followed in vocal
music (at least as suggested in Cochlaeus's quotation). Although it appears that one cannot
be sure of which solmization paradigm was being followed, the inclusion of instrumental
reading in the same paragraph dedicated to vocal reading suggests that both groups shared
the same educational background—complete understanding and abidance to which was,
thus, not exclusive to singers. At least within the time-frame of the thirteenth to the
sixteenth centuries, there is supplementary evidence that instrumental music would have
followed the same paradigm used by vocal music. Even where individual notations for the vocal and instrumental repertoire differed, the paradigm used was the hexachordal solmization, in which ficta-steps were conceptualized (in practice as in speculative theory) as steps that fell outside the standard collection of the recta-gamut, for their identification was dependent on hexachordal structures associated with step-letters. The quotations below may not constitute peremptory evidence nor pervasive acceptance of this line of thought, but they do attest to its existence.

Videndum est de falsa musica que instrumentis musicalibus multum est necessaria, [...].
(Garlandia p. 1240; CS 1: 166)

It must be known of falsa musica that it is often necessary for musical instruments, [...].
(my translation; cf. Hibberd 1942, 219)

[... y lo que es incantable no se puede tañer.
(Santa Maria 1565, Arte de tañer fantasía 1: ch. 11, f. 27v; quoted in Toft 1992, 152n)

[...] and that which is unsingable cannot be played [on an instrument].
(my translation; cf. Toft 1992, 11)

In the first quotation, Johannes de Garlandia makes clear that instruments must also employ musica ficta when needed. In Tomás de Sancta Maria's assertion, the interpretation of what is "unsingable" is twofold: first, it may be due to vocally unidiomatic phrases (i.e., a melody that could not be possibly uttered by the human voice—itself allowing for impossibilities resulting either from technical/register limitations, or perhaps because of aesthetic issues); second, the "unsingable" may be due to phrases composed in a way that
would not follow (or that would challenge) the proper solmization procedures applied to vocal realization. It is, of course, the second stance which is being emphasized here.50

As a conceivable result of the predominant vocal-solmization paradigm (based on the Guidonian syllables), the graphic features of music notation (vocal or instrumental) would be developed into a format that could indicate appropriate hexachordal readings (or realization), by implying hexachordal structures. It follows that composers (and/or scribes)

50 For comments and discussions that have acknowledged the use of the same solmization parameters for both vocal and instrumental music, see the works by Lloyd Hibberd (1942), Howard Mayer Brown (1976; 1984), Robert Toft (1992, esp. ch. 1). The latter introduces his point of view in a clear statement.

Apparently, these comments [on solmization and musica ficta] applied to instrumentalists as well as singers, for I have found no evidence which suggests that a separate theoretical system existed for instrumentalists.

(Toft 1992, 10–11)

Notice that in sixteenth-century music (the main period of research in Toft's work) many of the available treatises focused overtly on vocal music (plainchant or vocal polyphony), so references to instrumental music or specificities of instrumental solmization would be expectedly rare. Also, instrumental music was still very much dependent on (or subordinate to) the accomplishments of vocal music, and the few treatises dedicated to instrumental music kept the same kind of dependence (both in their discourse arrangement, and available speculative arguments). Thus, on the one hand, one may consider that the absence of an exclusive theoretical system for instrumentalists does not constitute an argument in favor of the idea that, because there is no evidence otherwise, it may be inferred that the parameters of vocal solmization applied also to instrumental solmization. These remarks may seem paradoxical in relation to the opinions defended in this dissertation. On the other hand, instrumentalists certainly began their musical education in the same way as any other performer. Even if there were separate solmization systems for instrumentalists and singers (which seems unlikely at this point), they would still have the same foundation, and one group would partake of the same precepts for the understanding and the notation of musica ficta used by the other group.

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would likely have strived to provide indications of hexachordal solmization, either in actual notation, or even before, in the compositional process.\textsuperscript{51}

(iii) Recognition and Reading of Hexachords

First, we shall examine the basic procedures involved in solmizing a piece of music, according to medieval tradition. As seen in chapter 1, the primary means for the solmization of a hexachord is the identification of its internal semitone (whether or not it is marked by means of a ficta-sign), for there is only one semitone within the intervallic configuration of a hexachord. In order to make the proper identification and perceive to what length a hexachord can be solmized (or even whether a change to another hexachord must be effected), it is the melodic context that will need to be inspected for the presence (implicit or explicit) of that internal semitone. This inspection must take two aspects into consideration: (a) one of macro proportions (concerning the melody as a whole); and (b) one of fairly micro proportions (concerning a simple melodic gesture). The melody must be inspected as whole in order to determine the solmization-realm to which the entire melody is set—i.e., whether the entire melody stays only within the recta-realm, or within that of the ficta-realm, or even if the melody gravitates between both realms. Each 'melodic gesture' must be inspected in order to determine the hexachord that will serve to its

\footnote{51 The analytical interpretation of Machaut's \textit{Rose}, \textit{lis} by Daniel Leech-Wilkinson (1984) must be mentioned as one the most compelling discussions on the role of solmization in the compositional process.}
solmization—this is virtually equivalent to inspecting whether or not a single 'melodic gesture' indicates the semitone unambiguously.\textsuperscript{52} The melodic gesture is, thus, the smaller intervallic span through which one hexachord can be solmized.

In the macro inspection, if the melody pertains to the \textit{recta}-realm exclusively, a \textit{ficta}-sign will be needed only when the melodic gestures are not clear enough with regard to the position of the semitone, otherwise no \textit{ficta}-sign is needed—even in a solmization according to a \textit{recta} $\tilde{E}$-hexachord (the only \textit{recta} type to contain the step $\flat\text{-}fa$ or its octave $\natural\text{-}fa$). If the melody includes hexachords that pertain to the \textit{ficta}-realm, then some \textit{ficta}-sign will always be needed, whether or not the semitone is clearly implied in each melodic gesture. The conspicuous statement of a \textit{ficta}-sign may be done during the course of the melody, or at the signature level, and even restated when there is a need to eliminate occasional ambiguity.

\textsuperscript{52} The concept of 'melodic gesture' given here is akin to the generic meaning of the term '\textit{neuma},' according to Guido d'Arezzo's usage—even though this was only one of its meanings, as asserted by Dolores Pesce.

The word \textit{neuma} assumes different meanings in Guido's writings. In discussions of notation, it is a notational symbol. In other contexts it means a melodic segment or an entire melody; that melody may be a representative formula for identifying mode such as "Primum querite."

(Pesce 1999, 361n)

This analysis is appended to a passage on Guido d'Arezzo's \textit{Regule rithmice}, where he asserts that similarities and distinctions between different ecclesiastical modes, and their characteristics, may be traced by observing that each \textit{finalis} of each mode has its own particular '\textit{neuma},' using later (with the same meaning) the term '\textit{formula tonorum vel modorum}' (i.e., 'formulas of tones or modes')—cf. (Pesce 1999, 358–363). In accordance with Guido's concepts, the 'melodic gesture' (or '\textit{neuma}') may be understood as an occurrence that gives way to deducing modes as much as it does to deducing hexachords.
The micro inspection of the melodic gesture is one of the means to work through (and eventually to discern between) all these macro-variables, including occasional changes from one hexachord to another. It is necessary, however, to interpret what the hexachordal possibilities are that may be drawn from different melodic gestures. The most basic case to be inspected is that of melodic gestures whose compass includes only one semitone and, therefore, call for the solmization of only one hexachord—thus, for gestures ranging from a major sixth to a minor second. Naturally, the very first situation to consider is that of a melodic gesture whose compass is a tonus-cum-diapente (major sixth), since that is the range of a Guidonian hexachord.

**FIGURE 2.1** - "Puer natus" (Introitus - mode 7)—(LU, 408). Solmization of a $\text{G}$-hexachord (i.e., hexachord durum).

\[
\text{G: } ut\quad sol\quad sol\quad sol\quad la\quad sol\quad fa\quad fa\quad fa\quad \text{sol}\quad \text{fa}\quad \text{la}\quad \text{sol}\quad \text{sol}
\]

From **FIG. 2.1**, it must be noted that in spite of lacking an explicit statement of the internal semitone, the compass (G-e) clearly denotes the use of a recta $\text{G}$-hexachord as a basis for the melodic construct, and therefore for the solmization of this phrase. The

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53 In this case, the inspection will discard those intervallical spans that contain more than one semitone or only whole-tones—e.g., the minor sixth (since it contains two semitones), the major third (since it contains two whole-tones), the major second (only one whole-tone), and the tritone. These and other intervallical spans will be inspected in this and the following chapters—including indications of hexachords of the same kind (i.e., whose uts are located an octave apart from each other), and issues about changes from one hexachord to another (mutation, permutation, transmutation).
following illustration (FIG. 2.2) shows another example in which the compass of the melodic gesture is a \textit{tonus-cum-diapente} (F-d), denoting the use of the \textit{recta} $\overline{F}$-hexachord, although this time both steps of the internal semitone ($a$-\textit{mi} and $b$-\textit{fa}) are explicitly stated.

\textbf{FIGURE 2.2} - "Omnes de saba" (Graduale - mode 5)—(LU, 459). Solmization of an $\overline{F}$-hexachord (i.e., hexachord \textit{molle}).

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure2.2}
\end{figure}

In FIG. 2.2, the occurrence of the $b$\textit{fa} (equivalent to modern $b_\flat$) does not need indication by the explicit means of a \textit{ficta}-sign, since the gesture (its compass and context as a mode 5 melody) gives away the appropriate hexachord to be solmized: a \textit{recta} \textit{$\overline{F}$}-hexachord starting on $F$-\textit{fa-ut}. From the above examples, it can also be observed that the \textit{tonus-cum-diapente} compass is too narrow a compass to be further inspected in most melodic gestures, since it needs to take one specific configuration (T-T-S-T-T) to meet the condition of denoting only one hexachord. The inspection will then fall on the intervallic spans of a \textit{diapente} (fifth) and of a \textit{diatessaron} (fourth).

In FIG. 2.3, below, the compass (C-G) of the melodic gesture will naturally reveal the position of the internal semitone of the hexachord to be solmized, even if only one of the steps that frame the semitone is explicitly shown. In order to denote the \textit{recta} $\overline{C}$-hexachord, it would also be enough if that gesture presented no Fs, or even if it was only a \textit{diatessaron} in range (e.g., from C to F without the G, or from D to G without the C—the reason for this
is because the semitone that exists between the step-letters E and F, in either of those
diatessaron compasses, cannot be found only in the C-hexachord.\footnote{Gaston Allaire, especially in one of the sections of his book entitled \textit{The Theory of Hexachords} (1972, 16–32), went on to devise a whole "theoretical basis" for solmization and for \textit{musica ficta}, in which he mentions that fourths and fifths are the most appropriate intervallic ranges of a melodic gesture to serve for the deduction of hexachords. He ultimately defends that the fourth would be the basis for such a deduction, and therefore the basis to effect solmization—he implies specifically that the lower tetrachord (\textit{ut} through \textit{fa}) of a hexachord is the most needed for such identification.}

Although other intervallic spans may serve as cues for a hexachord, the diatessaron must be emphasized as one of the most important intervals to serve in this capacity, since it is the largest interval for which any of its species (T-S-T, S-T-T, and T-T-S) fit inside one single hexachord—even if

\footnote{[I]n order to form \textit{ut} one must have a fourth. This fourth may not be written down in notes, but it must be implied. [...] The fourths and fifths are the key intervals of the hexachord system, i.e. they are the intervals that determine the hexachords, and it is not without reason that medieval and renaissance treatises define and illustrate them at length. (Allaire 1972, 24)}

One certainly has to agree with Allaire, in that fourths and fifths are indeed the "key intervals" through which one can explain the intervallic construction of hexachords, and therefore use them not only to recognize hexachords, but also to implement solmization, since these intervals will always contain one semitone. Allaire bases his assertions mainly on a late-sixteenth-century French treatise by Jean Yssandon, entitled \textit{Traité de la musique pratique} (1582), in which the author attempted a description of the three basic types of hexachords (molle, durum, and naturale) by stating what their steps at the beginning, mean, and end are (i.e., respectively at their \textit{ut}-position, \textit{fa}-position, and \textit{la}-position). Yssandon, nevertheless, was merely providing descriptions of deductions and proprieties (genres or especes, in his words), informed not only by the same kind of discourse used by many previous theorists (e.g., Garlandia, Anon. 2, Tinctoris—quoted earlier in chapter 2 [i]), but also by a tentative inclusion of his own personal and humanistic motivations. Also, it is not for the purpose of instructing readers about hexachordal solmization that ancient theorists took the time to discuss those intervals "at length" (as Allaire seems to suggest), for the hexachord (or rather, the step-designations that included solmization syllables) was merely a means of identifying the steps. Rather, those theorists did so because these intervals (fourths and fifths), included among the perfect consonances, had to be thoroughly defined and illustrated, since they are the natural divisions (formants) of a more basic and more perfect consonance: the octave (diapason), the understanding of which (and of its species) is the essential element (and link) that provides a background for the descriptions of modes, hexachords, and intervals.
the actual compass of the melodic gesture is larger, the *diatessaron* span will help deducing the hexachord.

**FIGURE 2.3** - Recognition of hexachords (fifth-span melodic gesture without an explicit semitone). Solmization of a $\overline{\text{C}}$-hexachord (i.e., hexachord *naturale*).

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\[\overline{C}: \text{re } \text{fa } \text{fa } \text{fa } \text{sol } \text{fa } \text{re } \text{ut } \text{re } \text{re } \text{ut}\]
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Medieval and Renaissance theorists were accustomed to describing these three species of the *diatessaron* by means of specific sequences of solmization syllables that revealed they could pertain to one, and only one, hexachord.

Diatessaron interpretatur de quattuor; [...], constans ditono et semitonio, ut a $\Gamma$ ad $C$.
Est autem diatessaron trimodum verbi gratia ut $\text{fa } \text{re } \text{sol } \text{mi } \text{la}$.
(Affligemensis ca. 1100, ch. 8; Smits van Waesbergh 1950, 69; GS 2: 238; PL 150: 1399)

Diatessaron means "four," [...]; it contains a ditone and a semitone, as from $\Gamma$ to $C$.
Moreover there are three species of diatessaron: ut–fa, re–sol, and mi–la.
(Babb 1978, 111)

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De consonantia diatessaron et eius speciebus.
Caput quintum.

Diatessaron est consonantia quattuor sonis duos tonos et minus semitonium circumscribentibus ducta: [...] tres igitur ut dictum est diuersas species seu figuram comprae hendit. Prima pertransit ex graui in acutum toniaeo semitoniae ac toniae interuallis harum circumscriptione

Chapter 5 — Of the consonance of the *diatessaron* and its species

The *diatessaron* is a consonance of four steps, defined by two tones and a minor semitone; [...] it consists of three different species (or figures). The first extends from low into high by intervals of a tone, a semitone, and a tone, marked off by these syllables: $\text{re } \text{mi } \text{fa } \text{sol}$ [...].
The second species of *diatessaron* proceeds from low into high by semitone and two successive tones, clearly and deliberately arranged by these syllables, namely: *mi fa sol la* [...].

The third form [species] of *diatessaron* stretches out from low into high [...]; by means of these syllables: *ut re mi fa*, namely by tone, and tone, and semitone [...].

(my translation; cf. Miller 1968, 42–43; Young 1969, 36–37)

The two treatises quoted above (Johannes Affligemensis’s *De musica*, and Franchinus Gaffurius’s *Practica musice*), dated approximately four centuries apart, attest to that kind of solmization in describing the different species of the *diatessaron*. Despite this evidence, nothing prevents a *diapente* or a *tonus-cum-diapente* to serve as cues for solmization in specific situations, for the indication for one sole hexachord is unequivocal in the case of two of the four species of *diapente* (i.e., T-T-S-T, and T-S-T-T, respectively described in historical treatises through the syllables *ut-sol*, and *re-la*), and by one of the five species of *tonus-cum-diapente* (i.e., T-T-S-T-T, described through the syllables *ut-la*).55 When the compass is not as large as a *diatessaron*, it may suffice to locate the span of a *semitonus* (minor third), for it will also unequivocally reveal the internal semitone of a specific hexachord through its two species (T-S, and S-T) traditionally

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55 The other species of the *diapente* and of the *tonus-cum-diapente* can serve well as indications that some change from one hexachord to another is underway.
described with the syllables re-fa and mi-sol. When the semitonium (minor second—i.e., the internal semitone itself) is explicitly shown, the compass of the whole melodic gesture must still be carefully observed, for it is not enough to know 'what hexachord to solmize' at one point, it is also necessary to know 'for how long the deduced hexachord can be solmized' before a change to another hexachord is needed. The following illustration (FIG. 2.4) may serve to illuminate further the above discussion. It presents a full solmization for the Hymn to St. John ("Ut queant laxis"), in which the recta E♭-hexachord is clearly indicated by the individual melodic gestures corresponding to each of the verses (the first verse begins with the words "Ut queant," the second begins with "Mira," and the third begins with "Solve"), as well as by the final melodic gesture set to the vocative-like line on the name of "Sancte Johannes." Since the melodic gestures provide solmization and recognition of one, and only one, specific hexachord, there is no need in the course of the hymn to change the solmization (i.e., to make a mutation) to a hexachord other than the one implied by its first melodic gesture.

56 As mentioned above, the ditone (major third), which has only one species (T-T), will not point to a definite hexachord, but it will present only the lower or upper part of a hexachord—i.e., its ut-mi portion or its fa-la portion. These portions of a hexachord are generally used and preferred as locations for possible mutations to a different hexachord—this will be made clear in the following chapters.

57 These features make all the more meaningful this Guidonian version of the Hymn to St. John, in regard to its role and transmission as a pedagogical tool. In most of the extant forty-seven manuscripts that contain a copy of the Ut queant laxis melody, the gestures clearly done indicate a solmization according to the low recta E♭-hexachord. In four manuscripts, the solmization must follow the recta E♭-hexachord (D-Kl 4º Mss. Math. 1; US-Malibu, J. Paul Getty Museum Ludwig XII 5 [olim Phillipps 12145]; F-Pn lat. 7211; F-Pn nouv. acq. lat. 443)—this latter manuscript also presents a transposition to the recta F-hexachord, and another version that entails mutation between two recta-hexachords (G and B♭). In only three of the forty-seven manuscripts, the melody does not conform to the solmization of only one
FIGURE 2.4 - "Ut queant laxis" (Hymnus - mode 2)—(Pesce 1999, 466; cf. LU, 1504). Solmization according to the \(C\)-hexachord (i.e., hexachord naturale).

\[\begin{array}{c}
\text{\(C\): ut re fa re mi re re re ut re mi mi mi fa sol mi} \\
\text{Ut que-ant la - xis re-so-na-re fi - bris Mi - ra} \\
\text{re mi ut re fa sol la sol fa re re sol la sol mi} \\
ges - to - rum fa - mu - li tu - o - rum, Sol - ve \\
\text{fa sol re la sol la fa sol la la sol fa re ut mi re} \\
pol - lu - ti la - bi - i re - a - tum, San - cte Jo - han - nes.
\end{array}\]

The above discussion about the inspection of melodic gestures can be summarized thus: the main compass to look for is first the diatessaron, then see if it can be expanded to the appropriate species of the diapente, or even of the tonus-cum-diapente, in order to learn how far the deduced hexachord can be solmized; if, however, the diatessaron-span is not hexachord, and needs mutations involving the \(C\) and the \(C\)-hexachord s (in two manuscripts the melody starts on \(\Gamma\)-ut: CH-Geneva, Bodmeriana lat. 77 [olim Phillipps 188845], and A-Wn 2503; and in one it starts on C-ut: F-Pn nouv. acq. lat. 443). Since in some manuscripts the melody is presented in duplicate or triplicate, it amounts to a total of fifty-five versions—some of which are non-transposed with variants, others are transpositions with or without variants (in all cases, however, these are only minor variants). This brief survey was based on Dolores Pesce's edition and translation of the Epistola ad Michaelem—for this and other assessments regarding the pedagogical role of the melody cf. (Pesce 1999, 19–38, 547–554).
conveniently presented, the *semiditonus*-span can be alternatively used as a cue for an individual hexachord.

Nevertheless, the presence or absence of *ficta*-signs still remains to be investigated in relation to medieval and Renaissance tradition. As shown above (FIG. 2.2), when a melodic gesture (compass and mode contexts) is sufficiently clear in their indication of the *recta* $E$-hexachord, then there will be no need for notating a *fa*-sign. The absence of any *ficta*-signs (either *fa*- or *mi*-signs) in that particular situation does not, however, indicate that signs are always (nor even generally) unnecessary, for this kind of absence applies only to those circumstances in which the melodic gesture is clear, or where there are no phrases involving the *ficta*-realm. In order to illustrate this issue, four treatises will be quoted below: the Berkeley anonymous (1375), Prosdocimus de Beldemandis's *Contrapunctus* (1412), Johannes Gallicus's *Ritus canendi vetustissimus et novus* (1458–64), and Tinctoris's *Liber de natura et proprietate tonorum* (1476).

A song in any hexachord originating on C is therefore sung in natural form, on F with a b, and on G with a #. In regard to these things, it must be known that two signs are found in song--the sign B mollis and the sign B quadratum--which show where fa and mi ought to be sung; they can be placed in different locations in the hand--as I shall explain later concerning *coniunctae*, but they are frequently on B-fa-B-mi. In general, it is not necessary to notate them. For that reason, note that whenever one ascends from (or from below) F-fa-ut to b-fa-#-mi, indirectly or directly, or when one descends to F-fa-ut before ascending to C-sol-fa-ut, he

Unde cuiuslibet deduc tionis cantus habens originem in C cantatur per naturam, in F per b, in G per #. Circa hec sciem dum est quod in cantu inveniuntur duo signa, scilicet signum B mollis et signum B quadrati, demonstrancia ubi fa et mi de beant cantari, et possunt poni in diversis locis manus, ut patebit inferius de coniunctis, sed ipsa frequenter sunt in B-fa-B-mi, virtualiter licet semper non signentur. Pro quo nota quod quandcumque ab vel de sub F-fa-ut ascenditur usque ad b-fa-#-mi mediate vel immediate, et iterum descenditur usque ad F-fa-ut prius quam ascendatur ad C-sol-fa-ut, debet cantari fa in b-fa-#-mi per b, nisi
Ought to sing fa on b-fa-♯-mi (by b), unless the song should end on G bassus.

(...). Concerning musica ficta, it is necessary to know first of all that it is never to be applied except where necessary, because in art nothing is to be applied without necessity.

It must be known, too, that musica ficta was invented exclusively for the sake of coloring some consonance that could not be colored except by musica ficta. From these two points it can become evident that almost all composers of song very often err with respect to musica ficta, since they very frequently use it were [sic, where] there is no necessity—as for instance when they apply the round or soft b in a natural signature—as on low Elami, [...].

(Prosdocimus 1412, bk. 5; Herlinger 1984, 70–74 [even]; cf. CS 3: 198)

The fifth tone [i.e., mode Tritus autenticus] is formed from the third type of the diapente and the third type of the diatessaron above, that is, above that diapente [...].

The sixth tone [i.e., mode Tritus plagalis], on the other hand, is formed from the third type of the diapente and the third type of the diatessaron below, that is, below that diapente [...].

In order to avoid the harshness of the tritone, however, by necessity these two tones are formed from the fourth type of
These treatises (and particularly those passages) have been frequently quoted in musicological studies as evidence for the interpretation that it was a fairly common procedure to leave those ficta-signs unnotated, or even that ficta-signs should best be avoided rather than explicitly notated. Nevertheless, in all three treatises, following their own melodic references, the authors are actually discussing signs applied to recta-realm contexts. The Berkeley anonymous describes three basic melodic gestures: (a) ranging from F to b (clearly presenting the lower diatessaron of an E-hexachord); (b) ranging from F to c (expanding that lower diatessaron to a diapente, also denoting the use of the E-hexachord); (c) ranging from G to c, that is, stopping on G in its descent from c (thus the lower diatessaron of the G-hexachord, and not the E-hexachord). There is also another,

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58 In Seay's edition, there is a minor typographical error on the word "asininum," which has been written with the spelling "asinimum"—Coussemaker's edition gives the correct spelling.

59 In a footnote to his translation of the treatise, Ellsworth (1984, 45) provides a somewhat more literal interpretation of the final descent to G. He asserts that it is a reference to a melody whose finalis would be G (i.e., the tetrardus modes), warning that if the introduction of a ½-fa was to occur, it would effect an alteration to the mode, since it "would reproduce around G the intervallic pattern of the first and second mode." Although the anonymous author of the treatise may have taken the opportunity to anticipate a presentation on modes, the passage under consideration (at the beginning of the tractatus primus) is mainly dedicated to the introducing the gamut, hexachords, and some solmizatio principles—it does not include presentations or direct references to modes, and comes after assertions that "all song in the world ought to be sung by one of" the three proprieties (natura, durum, molle); "Omnis [...] cantus mundi debet per aliquam ipsarum proprietatum [...] cantari" (Anon. Berkeley 1375, tr. 1; Ellsworth 1984, 44, [trans.] 45),
less-conspicuous melodic gesture, ranging from below F to b, which must be divided in two parts, demanding at least two different hexachords for its solmization: the F-hexachord for the F-b compass itself, and perhaps the C-hexachord for the compass below the F—there is no way of determining the precise hexachord for the lower part of the gesture, since no other steps are mentioned in the text, leaving the compass below F indeterminate. In Prosdocimus’s assertions, the recta-realm is established at the end of the quotation, where it mentions that no fa-sign should be used "ad clavem de natura"—i.e., at a melodic gesture that calls for the solmization of a C-hexachord. It is unclear whether the Prosdocimus assertion is an indication of a fa-sign (♭) placed on the E-location or on the b-location in the staff, but it is certainly unnecessary since it would change the solmization of the referred

in the translation Ellsworth gives "property" for "proprietas," instead of "propriety." In any case, whether or not there are references to modes, it does not contradict the understanding of that quotation as a description of melodic gestures (in order to indicate the need for a ♭-fa solmization)—for the identification of melodic gestures and modes are complementary elements used to inform solmization.

The indeterminacy of the compass below F is certainly justifiable, since neither is the change from one hexachord to another being discussed at this point in the work, nor is the use of the naturale hexachord. The main subject of the treatise at this point is the inspection of gestures that express the molle or durum hexachords, and how they may or not need the notation of ficta-signs—these have no meaning for the naturale hexachord, for it contains no b, and its solmization never entitles the use of a any sign.

In the quotation given above, the phrase "ad clavem de natura" has been translated by Herlinger as "in a natural signature." This translation should not be taken as a reference to some kind of 'key-signature,' or even 'clef' in the modern sense, for the latin phrase refers rather to the hexachord naturale (or more properly, to a melodic gesture that takes its solmization from the C-hexachord). In order to provide an unbiased interpretation, the Lexicon Musicum Latinum Medii Ævi gives that passage from Prosdocimus's treatise is given under: Clavis, IV (note, letter that indicates a note, name of a note, placement of a note), B (with no specific meaning), 6 (when one note encompasses both the pitch itself and its altered form [raised or lowered by a half step])—cf. (LmL 5: 536). (There were indeed ficta-signs appearing at signature positions, but those occurrences did not have the same meaning as modern key-signatures, for they were rather indications of a shift in the group of three hexachords whose solmization is expected by default—see chapter 8 [iii].)
melodic gesture, from the $\text{C}$-hexachord to the $\text{Eb}$-hexachord. If the sign was placed on the 
E-location itself, it would call for the creation of a ficta $E$-fa, but if the sign was placed on 
the b-location (thus using the solmization $fa$ on $b\cdot fa / b\cdot mi$), it would still change the original 
recta $E$-la-mi into the ficta $E$-fa (lest the recta $E$-mi could establish a melodic tritone with 
$b\cdot fa$), and consequently affect the entire realm of the melody. In the last quotation, Tinctoris 
discusses the need to avoid the tritone in tritus-mode melodies, asserting that the third 
species of the diapente (which serves as a basic formant for the tritus modes) must be 
changed into its fourth species when the tritone is presented. This situation remains 
characterized as one pertaining to the recta-realm, and so there is really no meaning for an 
explicit (pleonastic) indication of the $fa$-sign, since most tritus melodies naturally contain 
gestures expressed by the diatessaron $F$-b, or even by the diapente $F$-c, which call for a 
solmization according to the $\text{F}$-hexachord (the recta-step $b\cdot fa$ being implicit).62

62 In a paper read at the annual AMS meeting in Boston (1998), Peter Urquhart argued that the 
three theorists quoted above are the only ones to provide statements that signs are unnecessary. There is, 
however, at least one other treatise that contains assertions similar to those of Tinctoris, from Johannes 
Gallicus’s Ritus canendi, which has been quoted in this same capacity by Karol Berger [ellipses mine].

Dicunt namque nostri moderni non cantemus per $b\cdot molle$, nisi sit signatum, et alii dicunt imo 
cantemus cum dulce sit magis quam $b$ quadrum, sic musicam ut vina probare putantes. Quae 
quaeo frivola sunt haec carissimi, quaeque pueriles ac insipidae nimis opiniones? Ergo ne psalmos 
introituum de quarto tono carere debemus per $b\cdot$ quadrum, qui toti iacent in tritono, dulcesque sancto-
rum et angelicas magisquam humanas modulationes ob nostram ignorantiam duras atque rusticanas 
reddere? Si nobis non licet absque signo puerorum ac rudium bene canere, non liceat etiam absque 
signo tubarum aut campanarum manducare. [...] Sint ergo signa $b\cdot$ mollis et $b$ quadri pro pueris et 
qui non intelligent tonum ac semitonium rudibus, nos vero sectari decet rationem, [...]. 
(Gallicus 1458–64, pt. 2; CS 4: 360–361; Seay 1981, 28)

For our moderns say that we do not sing through the soft $b$ unless it is written and others say that 
we do it when it is sweeter than the square $b$, thus imagining to test music like wines. I beg you,
The quotations given here take melodic instances as the bases (or even paradigms) for the discussion of solmization, and for the appropriateness of notating ficta-signs, thus emphasizing the idea that solmization even in polyphonic music depends primarily on the melodic gesture (and not only on relations between voices). This approach promotes the idea that musica ficta (in its dependence on adequate solmization) had its origin in monophonic music, and continued to be executed primarily according to that same parameter, although ficta-occurrences (as any other element of solmization) could include interpretations according to contrapuntal rules. Also, those quotations do not indicate that a ficta-sign should be omitted when it is needed, but only when (observed the hexachordal indication given by the melodic gesture) it is not needed. Although the statements are limited to a discussion of signs applied to the double-step b-fa / b-mi (i.e., in a purely musica recta context), one can easily transfer the same precept to a context in which ficta-hexachords were involved. In a recta-context, a melodic gesture will take solmization according to one of the three recta-hexachords (either G-, C-, or F-hexachord), and it may be

my most loved ones, what sort of trifles are these, and what sort of childish and exceedingly insipid opinions? Then should we sing the psalms of introits of the fourth mode, which lie entirely within the tritone, through the square b and render the sweet and more angelic than human melodies of saints harsh and rustic because of ignorance? If we are not allowed to sing without the sign of boys and uncultivated people, it would not be permitted also to eat without the sign of the trumpets and bells. [...]. Therefore, let the signs of the soft b and square b be for boys and those uncultivated people who do not understand the whole tone and semitone. It behoves us, however, to follow reason, [...].
(K. Berger 1987, 162)

The context of Gallicus's discussion (as in the other works quoted above) is one that promotes the use of the solmization fa at the b-location when there is a need to avoid tritones, but considers that the melodic gestures involved are generally deemed enough as indications for that solmization, and that ficta-signs are virtually unwarranted.
even possible that the different gestures of a single melody will call for the solmization of all three. Still, none of these solmizations will necessarily require the presence of signs for the syllables fa or mi, provided the gestures make conspicuous indications of the semitone within each hexachord—signs are needed only when the gesture is ambiguous with regard to the appropriate (or intended) hexachord. Now, considering a ficta-context, some ficta-sign will always be needed in order to serve as an indication for the internal semitone of the ficta-hexachord intended for solmization, but it is the melodic gesture that will provide the final determination for the hexachord to be solmized. This is valid whether the melody as a whole is made of hexachords exclusive to one realm (ficta or recta), or whether it is made of hexachords that alternate between the two.

**FIGURE 2.5** - Recognition of hexachords (fifth-span melodic gesture without an explicit semitone). Solmization of a $\overline{B}_7$-hexachord (ficta-hexachord of the molle family).

\[ \overline{B}_7: \text{ mi sol sol sol la sol mi re mi mi re} \]

The illustration above (FIG. 2.5) is based on FIG. 2.3, which has been altered to include a fa-sign (b) on the E-location—thus calling for a solmization as E-fa, according to a ficta $\overline{B}_7$-hexachord. Despite the presence of a sign on the E-location, the step E-fa is not performed in the melody, for the sign is only an indication of where the internal semitone is—in this case, between E-fa and D-mi. Notice, also, that the actual positioning of the sign is not irrelevant, for it may be interpreted as an indication of which melodic gesture should
take the solmization of the ficta-hexachord being represented by that sign, or even as an
indication of where the solmization of the ficta-hexachord should start.\textsuperscript{63} When a
solmization includes a ficta-hexachord, the hexachordal possibilities are expanded beyond
the limits of the three basic hexachords (G\#-, C\#-, and F\#-hexachords)—i.e., beyond the limits
of the recta-realm, and toward the inclusion of at least one extra hexachord. The presence
of a ficta-hexachord may also imply that some transposition of the recta-realm, while
maintaining the available number of hexachords to be chosen for solmization to only three,
i.e., a group of three hexachords transposed from the three basic ones, but maintaining the
intervallic relation of fourth between them. For instance, in a hybrid recta-plus-ficta context,
the hexachords at work could be G\#-, F\#-, and B\#-hexachords; in an exclusively ficta context,
those three hexachords could consist of B\#-hexachord, F\#-hexachord, A\#-hexachord.

(iv) Equivalence Between Hexachords

It may also happen that the intervallic span of a single melodic gesture exceeds the
limits of the hexachord being solmized. Strictly following medieval theory, any step that
falls beyond the hexachordal limits should be solmized according to a different hexachord.
However, the steps involved in the gesture may pertain to hexachords of the exact same
kind—i.e., hexachords whose uts are applied to step-letters located one octave apart from

\textsuperscript{63} The position of ficta-signs as indications for solmization shall be discussed in subsequent
chapters.
each other. For instance, a melody can be composed according to a *recta* $\overline{C}$-hexachord starting on C-fa-ut, and include steps above that pertain to another *recta* $\overline{C}$-hexachord starting on c-sol-fa-ut, and even steps below that pertain to a *ficta* $\overline{C}$-hexachord starting on a fictitious CC under $\Gamma$. This is a situation in which the participating hexachords are the same (disregarding their octave), and their generic kind ($\overline{C}$-hexachord) is never abandoned—in effect, they are octave-equivalent hexachords, and no actual change to different hexachord is being implemented. (In FIG. 2.6, and throughout this dissertation, underlined solmization syllables will be used for those occasional outside steps that find octave equivalence within the main hexachord—i.e., steps that pertain to octave-equivalent hexachords.)

**FIGURE 2.6** - Octave equivalence (melodic gestures exceeding the hexachordal limits). Solmization of a $\overline{C}$-hexachord (i.e., hexachord *naturale*).

```
\overline{C}: refa fa sol mi fa mire ut ut sol la sol fa reut re la ut re ut fa mire
```

The example shows that the main $\overline{C}$-hexachord being solmized has its ut on C-fa-ut, but two steps, outside that hexachord, also occur: the *recta* c-sol-fa-ut solmized as ut, and the *ficta* A-la-mi solmized with the new syllable la. In the situation proposed in FIG. 2.6, the octave equivalence ensures that a specific hexachordal solmization is not changed when the melodic gesture exceeds the span of six steps (*tonus cum diapente*), provided the correspondent octave of all the exceeding steps can be found within that main hexachord. These octave-equivalent solmization syllables can be effected, however, only when the extra
steps demonstrate transitory or momentary digressions from the main hexachord being solmized—when the extra steps generate a melodic gesture of their own, a change to another hexachord must be implemented. Other solmizations, facilitated by the use of the octave-equivalence concept, are exemplified below in FIG. 2.7 (drawn from the beginning of Phillippe Caron's Accueily m'a belle) and FIG. 2.8 (drawn from the mode 1 Kyrie eleison from the Mass Orbis factor)—in both examples, the final melodic gesture demonstrates the need for a change (mutation) to a different hexachordal solmization. (The mutation is represented by solmization syllables bearing the 'equals' sign [=], those syllables enclosed in brackets are not to be uttered, only aurally conceived, whereas the syllables not enclosed in brackets are the ones actually solmized on those steps.)

FIGURE 2.7 - "Accueily m'a belle" (contratenor only), 3-voice rondeau by Phillippe Caron—(Mellon Chansonnier, f. 3). Solmization of an $F$-hexachord, and a subsequent mutation to a $C$-hexachord.

In FIG. 2.7, the first hexachord being solmized is an $F$-hexachord whose $ut$ falls on $F$-fa-ut, and whose $sol$ falls on c-sol-fa-ut. The fourth note, on the "m'a," falls on the step-letter C, and may be solmized with $sol$, thus constituting a ficta-step C-sol (exceeding the limits of that first $F$-hexachord), which may be conceived in two ways: either as a lower-octave equivalent to c-sol-fa-ut, or as the sol pertaining to the lower-octave ficta
\( \text{\textit{F}-hexachord, equivalent to the original recta one).} \) The same C-sol is also used later, on the word "augent," to serve as a point of departure to a new hexachordal solmization, producing the recta-step C-ut (first step of the \( \text{\textit{C}} \)-hexachord). That last sequence of steps C-C-E establishes the beginning of a new melodic gesture that departs completely from the initial \( \text{\textit{F}} \)-hexachord, thus inducing a solmization change to the \( \text{\textit{C}} \)-hexachord.

\textbf{FIGURE 2.8} "\textit{Kyrie eleison}" (mode 1), from Mass XI "\textit{Orbis factor}"—(LU, 46). Solmization of an \( \text{\textit{F}} \)-hexachord, and a subsequent mutation to a \( \text{\textit{C}} \)-hexachord.

\begin{align*}
\text{\textit{F}}: & \quad \text{mifa mi remi la ut remi fa mire} \\
\text{\textit{C}}: & \quad =fa mire ut re re
\end{align*}

In \textbf{FIG. 2.8}, the sixth step (last one on the word "\textit{Kyrie}") should be solmized to the syllable \( \text{\textit{la}}, \) thus constituting the ficta-step D-la (according to a ficta \( \text{\textit{F}} \)-hexachord that would start on an imaginary FF-\textit{ut} below \( \Gamma \)). The sound of that ficta D-la is the same as the recta D-sol-re that will provide the syllable \( \text{\textit{re}} \) (according to the recta \( \text{\textit{C}} \)-hexachord) solmized in the last gesture of that example (on the word "\textit{e-le-i-son}"). In these latter two examples (\textbf{FIGS. 2.7 and 2.8}), the first hexachord (a recta \( \text{\textit{F}} \)-hexachord) is indicated both by the melodic gesture and the signature \( b\text{-fa}, \) then showing a momentary detour to an octave-equivalent ficta-step, but returning to its recta-hexachordal path, and later, a new melodic gesture indicates a change (mutation) to a different hexachord (recta \( \text{\textit{C}} \)-hexachord).
The octave-equivalence concept finds more concrete evidence in a polyphonic, two-voice setting presented by Johannes Gallicus, and based on a version of the plainchant Ave Regina caelorum. The transcription below (FIG. 2.9) shows only the last verse ("O Maria flos virginum, Ora pro nobis, Dominum") of the contratenor from that setting.

FIGURE 2.9 - "Ave Regina caelorum," (contratenor part) excerpted from Gallicus's Ritus canendi (1458/64, pt. 2, bk. 3)—cf. (Seay 1981b, 14: 88; cf. CS 4: 395). Solmization syllables are original.

In Gallicus's original example, the contratenor is provided with fully designated steps (letter-plus-syllable), in lieu of note-shapes, placed directly on the staff in a heightened-notation fashion—the transcription below presents note-heads with the syllables placed above the staff.64

---

64 There are two editions for Gallicus's Ritus canendi: one by Coussemaker (CS 4: 298–396); and one by Albert Seay, in two volumes (Seay 1981b, 13: 1–78; 14: 1–89). For the example transcribed here, Coussemaker presented both voices of the polyphonic setting on a 9-line staff, with handwritten F-3 and C-5 clefs, and printed letters g and d (placed as additional G-7 and D-9 clefs) apparently supplied by the editor—the text is given below the staff, with one spelling variant on coelorum. Seay presented each voice on an individual 5-line staff, generally with the tenor given on the lower (F-4 clef) staff, and the contratenor...
The illustration below (FIG. 2.10) presents a clearer octave-equivalence and hexachordal outline of the passage above. The syllables submitted to octave equivalence in Gallicus's solmization have been underlined (as proposed in this dissertation), and each new hexachord have been properly indicated. The exact position of changes from one hexachord to another are also established according to the syllables prescribed by Johannes Gallicus, since one given step-designation (letter-plus-syllable) can pertain to only one hexachord. The octave-equivalent concept is also deduced from the syllables proposed by Gallicus—in this dissertation, octave-equivalent syllables are underlined. On the syllables "no-bis Do-minum," Gallicus would likely have intended a change from the Γ-hexachord whose ut is placed on Γ-ut, to the G-hexachord whose ut is placed on G-sol-re-ut, but since it is a simple change between octave-equivalent hexachords, the indication does not present an actual mutation, only an equivalence. The octave equivalence is broken on the first note (g) on the syllable "Do-mi-num," showing a momentary mutation to the C-hexachord by uttering only one of its syllables (sol). Notice that Gallicus did not choose to have that g-step solmized ut according to the last C-hexachord he used in the solmization of the upper (C-1 clef) staff—the Ave Regina caelorum text is given between the staves. Since there are some instances of crossing between the two voices, in Seay's edition the two voices may temporarily migrate to the other staff. With respect to FIGS. 2.9 and 2.10, Seay used the lower staff for the 'contratenor' on the words "O Maria flos virginum, Ora pro no-(bis)," and the upper staff from that last syllable "-bis" onward. In both editions, while the 'contratenor' of this two-voice setting is presented in that heightened-notation fashion, the plainchant tenor is given without solmization-syllables, but with non-mensural note-shapes (neumae)—puncta inclinata (reserved for melismas), and virgae (reserved for individual syllables, for the first note of a melisma, and for the entire melisma on the word "Dominum"). Earlier in the treatise (pt. 2, bk. 2; Seay 1981b, 14: 59; CS 4: 380), an individual presentation of the plainchant was provided, with solmization-syllables for each step—for a transcription of the entire plainchant with solmization, see FIG. 6.7; for the entire two-voice setting, see FIG. 6.8; for variants, and differences between Coussemaker's and Seay's edition, see notes 177 and 180.
passage. It could have been theoretically possible, since the recta-step g-sol-re-ut allows for such a solmization, and could thus avoid that momentary mutation to the $\overline{C}$-hexachord.

**FIGURE 2.10** - "Ave Regina caelorum," [contratenor only] excerpted from a two-voice setting given in Johannes Gallicus's *Ritus canendi* (1458/64, pt. 2, bk. 3)—cf. (Seay 1981b, 14: 88; cf. CS 4: 395). The solmization syllables are original to the manuscript, the explicit indications of 'octave equivalence' and 'mutation' are not.

Therefore, if no actual hexachordal change toward the $\overline{C}$-hexachord was made, the entire passage on the words "virginum, Ora pro nobis Dominum" could have been read according to a $\overline{G}$-hexachordal solmization, with the octave-equivalence approach exploited to its ultimate consequences. In this way, not only the words "vir-gi-num, O-ra pro" could be solmized according to the $\overline{G}$-hexachord starting on $\Gamma$-ut, and "no-bis Do-" solmized with syllables pertaining to the $\overline{G}$-hexachord starting one octave higher (on G-sol-re-ut), but the "-mi-num" could have been solmized with syllables pertaining to the $\overline{G}$-hexachord starting
two octaves higher than the first (on g-sol-re-ut). This alternative situation would produce an odd kind of solmization with successive octave-equivalence approaches implemented on top of each other. The solmization sequence could then be indicated by the following progression: \( \text{la sol fa mi re re mi re la sol ut re mi fa sol} \) (in this case, the syllables falling one octave higher than the first are being indicated by a single underline, and the syllables falling two octaves higher than the first by a double underline). However, the aural perception (and performance) of that alternative would be not only excessive, but difficult. It becomes evident here that the implementation of the octave-equivalence concept is meant as a momentary resource, for if it is needed over an extensive melodic gesture, then a new hexachordal context must be assumed, and the proper hexachordal change applied.\(^{65}\)

The octave-equivalence concept, in fact, is an aural resource supported by conceptions of octave (\textit{diapason}), although insufficiently addressed by modern scholarship. Now, having discussed (from a rather practical perspective) the equivalence between hexachords of the same family and kind by means of their octave relations, the theoretical approach must also be presented.

\(^{65}\) It may be speculated whether such an excessive implementation of octave equivalence could be more feasible on an instrumental than on a vocal performance. If that is the case, then the alternative solution going up to two octaves of octave equivalence could be used in the particular case of the contratenor for that two-voice version of the antiphon. Indeed, although such a polyphonic setting (discant-like) of this plainchant would be suggestive of a vocal performance, the sole compass used for the contratenor itself does not seem to be vocally fit. Apart from successive ascending or descending leaps, it virtually makes use of the entire gamut, in this passage alone ranging from A-re to dd-sol, but also going up to ee-la in another section of Gallicus’s example, which seems more appropriate of an instrumental approach—cf. \textit{FIG. 6.8}. 

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Concerning the merit or measure of consonances according to Nicomachus

[...]. The consonance whose property the critical faculty more easily comprehends ought to be classified as the very first and most pleasing consonance. For just as every single thing is in itself, so also is it recognized by the critical faculty. Thus, if that consonance which consists of the duple ratio is easier to know than all the others, then there is no doubt that the consonance of the diapason, since it precedes the others in being known, is the first of all and surpasses the others in merit. [...]. The 2 compared to 1 makes the duple ratio and produces that consonance of the diapason which is the most excellent and, because of its simplicity, the most knowable. [...].

The opinion of Nicomachus regarding which consonances are placed opposite others

[... as unity was the first principle of increasing and diminishing in arithmetic, so the consonance of the diapason is the first principle of the remaining consonances, and only after it, can they be set down in opposing division.

In historical treatises since Boethius's interpretations of the Greeks in the early Middle Ages, the octave (recognized as the most perfect consonance after the unison) was an essential element that served as a basis (or point of reference) for the discussion of any musical structure, and of all the other musical elements. Thus, in book 2 of his De institutione musica, Boethius provided unambiguous statements about the importance of the diapason as a basis for both speculative discussions and musical knowledge in general.
The Nichomachean understanding (which served as a foundation for the greater part of Boethius's work) stems from the Pythagorean root (one of the most speculative grounds in Greek musical tradition). Later in the treatise, Boethius provides assertions of a more practical nature, through his interpretation of Ptolemy's works. The Ptolemean understanding (which Boethius makes use of only those sections that fit his own, more speculative tendency) tries to integrate the Pythagorean and Aristoxenian roots. The latter presented a foundation that valued empirical verifications within Greek musical tradition.\footnote{Cf. Bower (1989, xx–xxxviii) for more complete assessments about Nichomachus and Pythagoras, versus Ptolemy and Aristoxenus in relation to Boethius's work.}

9. Demonstration according to Ptolemy that the diapason-plus-diatessaron is a consonance

\[
\text{Demonstratio secundum Ptolomaeum}
\]

\[
\text{diapason et diatessaron}
\]

\[
\text{consonantiam esse. VIII.}
\]

\[
[...], quoniam diapason consonantia talem vocis efficit coniunctionem, ut unus atque idem nervus esse videatur, idque Pythagorici quoque consentiunt. Quocirca si qua ei consonantia fuerit addita, integra inviolataque servatur. Ita enim diapason consonantiae additur tamquam uni nervo. [...].
\]

\[
\text{Quae sit proprietas diapason consonantiae. X.}
\]

\[
\text{Hoc vero idcirco evenire contendit, quoniam diapason paene una vocula est talisque consonantia est, ut unum quodammodo effingat sonum, [...].}
\]

\[
(\text{Boethius a. 510, bk. 5, chs. 9, 10; cf. Friedlein 1867, 358–359, 360; PL 63: 1290, 1291 [as bk. 5, chs. 8, 9]})
\]

10. The Property of the consonance of the diapason

\[
\text{Ptolemy argues that this occurs because the diapason is almost like a single pitch, and that it forms such a consonance by creating, as it were, a single sound.}
\]

\[
(\text{Bower 1989, 169–170})
\]
In book 5, Boethius takes the speculative approach he had set as basis for discussion in the previous books of his treatise and adds a more practical approach, introducing a reference to actual sound, and not exclusively to numbers. In the anonymous ninth-century treatise entitled *Musica enchiriadis* by contrast, the more practical, empirical approach is conspicuously expressed.

> Porro maxima symphonia diapason dicitur, quod in ea perfectior ceteris consonantia fiat, ut sive ab acutiose sive a graviore incipias, vox, quam octavo ordine in celsiorem vel humiliorem mutaveris, ad primam vocem unisona habeatur, [...].

(Anon. ME a. 900; Schmid 1981, 31; GS 1: 163; PL 132: 971)

Furthermore, the largest symphony is called *diapason*, because in itself the consonance is made more perfect than in the others, so that whether you begin on a higher or on a lower [place], the voice (*vox*, i.e., sound), which you may have mutated according to the octave into a loftier or humbler [voice], may be held [as] a unison to the first voice.

(my translation; cf. also Erickson 1995, 17; Ellsworth 1993, 165)

Clearly, the discussion and justification of why the *diapason* is "more perfect" is based on the actual perception of sound (i.e., on sound itself), not on a speculative justification by number. It is also evident that the *diapason* is considered just as consonant as the unison itself, which it may even replace—the quotation above is followed by a musical example of a three-voice parallel organum at the octave, as a perfect substitute for the monophonic version of the chant, when sung at different voice-registers (in this case, consisting of one childlike and two different adult male voices).\(^67\) In Hucbald's treatise (*De...*)

---

\(^67\) Note that already in this ninth-century treatise, the concept of change (mutation) from one sound to another is already present, though it is mentioned within the polyphonic context of organum. Notice, also, that in the translation "the voice ... you may have mutated according to the octave into a loftier or humbler [voice]," the terms "loftier" and "humbler" are literal translation from "*celsiorem*" and "*humiliorem*," which could also be translated as "higher" and "lower"—the latter translation is not employed,
harmonica institutione, ca. 900), the diapason is also explained in practical terms. His approach is even more conspicuous with respect to the octave equivalence, in that it indicates pairs of steps (first and eighth, second and ninth, etc.) in relation to the gamut that he had presented earlier (one based on the Greater Perfect System).

Itaque prima cum octava, et secunda cum nona, tertia cum decima, et ite per ordinem singulae inferiores cum singulis superioribus pulsae, dulci et concordabili suavitate omnimodis consonabunt, ac si unus, simplexque sit sonus: et haec talis concordia diapason consonantia appellatur.
(Huchbald ca. 900; GS 1: 111; PL 132: 913–914)

Thus if the first note is sounded together with the eighth, the second with the ninth, the third with the tenth, and so, throughout the range, individual lower notes are sounded with the corresponding [singulis] upper notes, they will blend with an altogether pleasant and harmonious sweetness, as though the sound were one and single. This sort of concord is termed "the consonance of the diapason."
(Babb 1978, 25)

Almost a century later, the anonymous (pseudo-Odonian) treatise entitled Musica artis disciplina (from the late-tenth century) provided an approach not only related to musica practica, but also including allegorical (and more adjectival) references, in order to help the reader toward a more appropriate aural perception (and performance) of the diapason and of its importance in relation to other musical elements.

Est autem in hac symphonia divinum, quod prima vox eius et ultima tam mirabili suavitate concordant, ut eamdem vocem una

This symphony (i.e., the interval of diapason) is however divine, for the first and the last voice (vox, i.e., sound) of this

since it could create some confusion with the already existing "on a higher or on a lower [place]," translated from "ab acutiore sive a graviore." As for the translation "may be held [as]," for the verb "habeatur," a more literal rendition could be given as "may have had," although it should be understood in the sense of "may be handled [as]" or, even preferably, "may be considered"—thus providing the freer rendition "the voice, which you may have mutated to the octave, may be considered a unison to the first voice" for the sentence "vox, quam octavo ordine [...] mutaveris, ad primam vocem unisona habeatur."
atque altera sonare videantur; licet prima virilis, et ultima sit puerilis: ita enim concordant, ac si vir cum puero eandem melodiam simili, quantum diversa natura permitit, voce pronuntient.

(Pseudo-Odo ex. 10th cent. M; GS 1: 271; PL 133: 780)

[symphony] agree so much in marvelous pleasantness, that one and the other seem to sound [as] the same voice; the first may be manly and the other childlike. Thus they indeed agree, as if a man with a boy sing (voce pronuntient) the same melody, as far as [their] diverse nature allows. (my translation)

From the early to the late Middle Ages, and throughout the Renaissance (and even after), theorists continuously and consistently assessed the merits and properties of the octave (diapason), stating that, by its nature and proportion, it is an interval so consonant that it may sound as one single sound, to a point that it even might be difficult to perceive the distinction between its two formative sounds when performed simultaneously. In this context, the anonymous author of the Musica artis disciplina treatise elaborated on the idea that such a distinction resides in the different qualities of sound of one step and the other, or more precisely, in the difference of timbres between the two steps—the higher being more childlike, the lower more manly. This, in fact, accounts not only for a means of recognizing that distinction, but also for the differences and means of producing the two sounds that make up the octave.68

In the latter quotation (and in the other quotations above in this section), although the context is one of intervals performed simultaneously, it also points, in Musica enchiriadis (see above), the assessment-allegories of "loftier" and "humbler" voice-production (respectively corresponding to the "higher" and "lower" steps) also attempt to provide further understanding of the merits and properties of the diapason, but they share no direct correspondence with those allegories provided in Musica artis disciplina. In a comparison between the two assessments, their correspondence with respect to character or timbre (loftier corresponding to the adultlike voice, and humbler to the childlike voice) is in contradiction to their correspondence with respect to pitch (higher being loftier but childlike, and lower being humbler but adultlike).

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implicitly, to understanding how an octave may be produced by one single voice. In terms of octave equivalence, once the sound and step-syllable (from within the strict limits of the hexachord) have been aurally imagined, it takes no more than a simple timbral change (or timbral mutation) for the octave to be produced. Paraphrasing the author of Musica artis disciplina, it could be thus stated: if one intends to sing the upper octave of any hexachord-limited step, one will need to make a change toward a more childlike voice; and conversely, if one intends to sing the lower octave, a change toward a more adultlike voice should be made. This practical (performing) way of identifying and producing an octave (whether melodically or polyphonically) was already present in theoretical discussions by other authors, as can be clearly interpreted, in Boethius's treatise, from a passage on the matter of comparing consonances and judging their hierarchical importance.

Quae consonantia quam merito praecedat.

XXXIII.

Sed inter omnes quas retulimus consonantias habendum iudicium est, ut in aure, ita quoque in ratione, quam earum meliorem oporteat arbitrari. Eodem namque modo auris afficitur sonis vel oculus aspectu, quo animi iudicium numeris vel continua quantitate. Proposito enim numero vel linea nihil est facilius quam eius duplum oculo vel animo contueri.

(Boethius a. 510; bk. 1, ch. 32; Friedlein 1867, 222; GB-Ctc R. 15.22 (944), f. 26r; PL 63: 11194)

32. Which consonances precede others in merit

Judgement should be exercised with respect to all these consonances which we have discussed [diapason, diapente, diapason-plus-diapente, diatessaron, diapason-plus-diatessaron, and bis-diapason]; one ought to decide by the reason, as well as by the ear, which of them is the more pleasing. For the ear is affected by sound or the eye by a visible form, in the same way the judgement of the mind is affected by numbers or continuous quantity.

(Bower 1989, 49)

In other words, the recognition of consonances is made both by means of philosophical speculation (i.e., "by the reason," "by numbers"), and by means of practice
(i.e., "by the ear," "by sound"). The importance of the diapason, however, does not lie only in its status as the most perfect, or the most pleasing consonance, but also by its service as a measuring unit or paradigm for the deduction of other intervals. Octave relations served, for instance, as a basis for the construction of the gamut, through the monochord. In *musica speculativa* treatises, the very first interval to be deduced is the diapason, by dividing the string of the monochord into two equal parts. In *musica practica* treatises, even if the monochordal divisions began with the tone, followed by a gradual, stepwise approach up to the seventh above the open string, still the diapason was used as the main underlying interval to support all intervallic deductions, and to obtain steps that otherwise would involve too complex divisions (e.g., the other steps above the seventh were deduced by dividing the string lengths of each step in half, thus obtaining their octaves, and also generating compound intervals). Any performer was systematically exposed to octave equivalence situations, that included but were in no way limited to primary learning situations. Students may have been asked to find steps on the monochord, or they may have been asked to deduce and organize hexachords according to family categories—for instance, by grouping together the *recta*-hexachords of the *durum* family, including all *G*-hexachords no matter if they began on Γ-ut, or on *G*-sol-re-ut, or on *g*-sol-re-ut, thus grouped according to 'likeness' of sound (or even 'equalness,' but not 'sameness'). The task of the performer (as the learning process of any student) most certainly involved some awareness of the sound equivalences (especially that of the octave) in order to sing and solmize—a solmization in

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which the maintenance of the same hexachord, whenever possible, was regarded not only as
the easiest way for solmization, but as a rule of necessity. In historical treatises, instead of
providing statements that a hexachord should be maintained for as long as feasible, theorists
asserted rather that changes to another hexachord (i.e., mutations) should be avoided, unless
absolutely necessary—this is evident from the quotations given below.

Et sciendum est quod quantumcunque
possumus operari cantum per has voces
universales ad omnem musicam, scilicet ut,
re, mi, fa, sol, la, debemus mutationes
evitare et eas percevere, nisi possunt evitari
vel percaveri. Sed dum venerit necessitas
mutationem agendi, tunc debet fieri et non
aliter [...]..
(Garlandia p. 1240; CS 1: 160)

And it must be known that as much as we
can perform (operari) the chant through these
universal voices (voces, i.e., syllables) in
every music, namely ut, re, mi, fa, sol, la,
we ought to avoid mutations, and beware of
them, unless they can[not] be avoided or be
kept away. But if only the necessity may
come for executing (agendi) a mutation, then
it ought to be made and not otherwise [...].
(my translation)

---

Et nota quod non debet fieri mutatio nisi
causa necessitatis.
(Capuanus 1415; La Fage 1864, 315)

And notice that you must not make a
mutation unless because of necessity.
(my translation)

Both Garlandia and Nicolaus Capuanus, although almost two centuries apart,
maintain that holding to the solmization of one single hexachord is preferable, changing
only in the face of necessity. Octave equivalence is a concept (and a practice) that would
have allowed and implemented such a solmization, although this judgement appears to be
challenged in the statement of a later theorist (Johannes Cochlaeus).

Fit autem Mutatio triplici de causa. Primo
ad concipiendum suauioris modulationis
transitum: Ad quem saepe non minus facit,
A mutation is made for three reasons:
1. In order to make a more pleasant melodic
transition, in which the quality of a tone is
2. To permit tones to go above and below a hexachord.
3. To facilitate the exchange of a fourth and a fifth in a mixture of Tones, for each Tone normally comprises an octave [... which is not reached without mutation.]

(Cochlaeus 1511–14, tr. 2, ch. 8, f. B v)

(Miller 1970, 42)

(The last phrase in the translation is enclosed in brackets, since it has not been included in Miller's version.) By stating that "an octave [...] is not reached without mutation," Cochlaeus may appear to be saying that an octave-leap cannot be sung with one and the same hexachordal syllable. However, he is neither referring to any kind of leap, nor to any kind of melodic motion. Cochlaeus is merely saying that the full span of a mode (i.e., "tone" in Miller's translation) can be covered (or solmized) only if some kind of mutation occurs either on the fourth or on the fifth, because a mode is defined (at least since the early Ars Nova) as a conjunction between a diapente and a diatessaron, or vice versa (depending on whether it is authentic or plagal). Cochlaeus's third reason for mutation could be thus paraphrased: 'Since each mode normally comprises an octave, a mutation is needed at the point where the diatessaron meets the diapente, for that octave cannot be fully covered [in stepwise motion] unless by means of mutation; therefore when there is a mixture of tones, a mutation will also be needed.'

A few decades after Cochlaeus's treatise, Hermann Finck (Practica musica, 1556) provided an explicit support to the above claims of octave equivalence in the sixth of nine "rules of solmization."
Mutation of a syllable is not always made on the [same] syllable, except [when] a leap is made without mutation from note to note, especially in large leaps, as it happens in the [leaps of] diapente and diapason, namely: from re to re, from mi to mi, from fa to fa, from sol to sol.

(My translation)

In the next section of his treatise, Finck also addressed the need for mutation, proceeding from the same line of thought that gave rise to Garlandia's and Nicolaus Capuanus.

[...] uocum mutatio non debet fieri praeter necessitatem.

(My translation)

Still later in the treatise, in the section dedicated to solmization, Finck emphasizes the concept of octave equivalence in his "rules of solmization" (quoted below is his fourth and last rule).

The same syllable (vox) is used at the octave, and the same mutation; and therefore whatever syllable is sung at one octave, is also sung at the other.

(My translation)

Here, the author clearly states that when one hexachord is used at one octave, it may also be used at another, and therefore mutation is virtually nonexistent in this case.
Refutation: Resistance to Hexachordal Solmization

The Guidonian paradigm of hexachordal structures was doubtless the most influential and accepted frame for solmization, lasting at least to the end of the Renaissance, as attested in a quotation (given below) from the watershed work of Gioseffo Zarlino (Le istitutione harmoniche, 1558).70

Imperoche Guidone Aretino nel suo Introductorio, oltra le nominate chorda, ve ne aggiunse delle altre alla somma di Ventidue, et le ordinò in sette Essachordi; et tale ordinatione fu, et è più che mai accettata, et abbracciata dalla maggior parte de i Musici pratici: essendo che in essa sono collocate, et ordinate le chorda al modo delle mostrate Pithagorie.
(Zarlino 1558, pt. 2, ch. 30, p. 103)

Thus Guido d'Arezzo in his Introduction, more than having nominated the strings (chorde, i.e., steps), appended others to [reach] the total of twenty-two, and arranged them in seven hexachords. And such an arrangement was, and [still] is overwhelmingly accepted, and embraced by the majority of the practical musicians; so that, in it, the steps are placed and arranged according to the way demonstrated by the Pythagoreans.
(my translation)

Despite the widespread acceptance of Guidonian solmization and its hexachords, there were a few theorists who opposed the monopoly held by that method. Johannes Ciconia (ca. 1370–1412) was one of those who criticized (subtly but utterly) the "Guidonists" and the use of the Guidonian "hand" (i.e., of hexachordal syllables) while defending that, instead, the letters marked on the monochord should be preferably used for solmization. Naturally, Ciconia did not declare that the Guidonian paradigm had no use, nor

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70 Despite Zarlino's assertion, there is no evidence that Guido extended the gamut to twenty-two steps, which would necessarily include ee (a step he never seems to have used), as well as b and bb (steps not consistently included in all of his treatises)—cf. (Babb 1978, 52; Pesce 1999, 25–29).
did he challenge Guido's authority (from whose treatises, especially the Micrologus and the Epistola, he provided many quotations to support his explanations about intervals, organum, and modes). Nevertheless, Ciconia did attack the so-called "ignorance of the Guidonists" ("ignorantia Guidonistrarum"), which he hoped would cease in face of the alleged proof he provided in his treatise, and that he hoped would not prevent the appropriate understanding of the material he was exposing.\textsuperscript{71} In Ciconia's assertions, given below, it appears that the "Guidonists" are those who have ill-comprehended and ill-applied the Guidonian teachings without proper knowledge of what previous authorities had taught, and without proper modern instruction about those and other paradigms.\textsuperscript{72}

\begin{center}
31. De addiscendo cantu

Si quis cantum musice scire cupit, primum quidem investigare opportet in monocordo et in cantu positionem ordinem et figuras septem litterarum gravium, acutae, et

31. On learning to sing

If one wishes to know a song of music, it is necessary first to find—on the monochord and in the song—the position, arrangement, and the symbols of the seven \textit{graves, acutae,}
\end{center}

\textsuperscript{71} Cf. Ciconia (ca. 1400, bk. 1, chs. 20, 59, 60; Ellsworth 1993, 88–89, 210–211, 216–217).

\textsuperscript{72} In a footnote to the term "Guidonists," Ellsworth provides the following interpretation:

It is not possible to identify precisely these followers of Guido—the "Guidonists." Ciconia's later references to this group (see 1.59, 1.60, and 2.31 [pp. 208–9, 214–17, 302–5]) do indeed appear in connection with material that can be located in the known works of Guido, but the reference here is too vague to allow such a direct connection with Guido. (Ellsworth 1993, 89n)

Also, Ellsworth calls attention to the fact that Guido "is the latest of the early authors cited by Ciconia" (Ellsworth 1993, 16), with Boethius, Isidorus Hispalensis, Remigius Autissiodorensis, and Berno Augiensis receiving a greater number of citations. Later theorists, explicitly cited, include Franco de Colonia, Hieronymus de Moravia, Johannes de Muris, Marchettus da Padova, but no other between these and Guido d'Arezzo are mentioned by Ciconia—cf. (Ellsworth 1993, 13–20).
Despite his animosity toward the Guidonists, Ciconia did state in the passage above that the student can choose between three methods of proper solmization in learning a new chant: the monochord, Guidonian solmization syllables (via "the hand"), and active application of consonances and their species. In this context, he called on Guido's authority to assert that most importantly a solmization method needs to be practiced long and diligently in order to be effective, a justification for his idea that virtually any method will be suitable for solmization. However, he also explicitly states his resistance to Guidonian solmization, by saying that "the Guidonian hand" can be a faulty, misleading method, and that the monochord is (and in his opinion should always be preferred as) a better substitute.  

73 In Ciconia's case, this resistance was a sign of a humanistic trend to undertake
a "renovatio antiquitatis," i.e., theorizing and explaining music based on reinterpretation of authors from Classical Antiquity and early Middle Ages, while emphasizing the misapprehension embedded in works of some late-medieval authors. Nevertheless, the prominence of the Guidonian hexachordal solmization can hardly be denied, and the partiality of such a resistance becomes evident if one considers that it may have been arisen from a conflict between Germanic trends that emphasized theoretical (musica speculativa) concerns, and Italian-influenced trends of a more practical nature. By placing an emphasis on solmization of steps derived directly from the monochord, Ciconia was seemingly vouching for an approach that, instead of being restricted to the span of the hexachord, was founded on octave arrangements (for this was the basis for obtaining and marking steps in the monochord), i.e., produced by an entirely different way of step recognition, which eventually contributed to forward the modern concept of pitch as a fixed, individual, and independent entity.

Johannes Hothby (ca. 1430–1487) also presented a different concept regarding solmization and organization of the Gamut (apparently attempting to unify Guidonian and Pythagorean traditions), which has been seen as a potential anticipation of the modern


75 The latter consideration is drawn from commentaries formulated by Peter M. Lefferts and Oliver B. Ellsworth, as responses to Mengozzi's lecture at the AMS-1998 session mentioned above. Lefferts commented that the probable Germanic background of Ciconia's work may have influenced his criticism toward Guidonian solmization (and therefore toward the use of the Guidonian hand), and consequent reliance on the monochord as a more appropriate device for solmization.
concept of accidentals (which is also related to the modern concept of pitch). He identified three different orders of hexachords (all based on Guidonian solmization syllables): the first order containing only \( \text{G} \) and \( \text{C} \)-hexachords and all the correspondent steps (i.e., virtually equivalent to the steps of *recta*-gamut, but excluding \( b \)-fa or any of its possible octaves); the second order containing hexachords in which the syllable *fa* is applied where it is not found in the first order; and the third order containing hexachords in which the syllable *mi* is applied where it is not found in the first order—both the second and third orders also include the \( \text{G} \) and \( \text{C} \)-hexachords that represent the first order.

Ramos de Pareja's *Musica practica* (1482) may also be identified as an example of the resistance to Guidonian-based solmization, especially with regard to the use of

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76 These considerations about J. Hothby are based on the survey provided by Bonnie Blackburn (NG 2e, s.v. 'Hothby, Johannes'), and on a paper entitled "John Hothby—Innovator: The Solmization System of *La Calliopea legale*" presented at the New England Conference of Music Theorists 19th Annual Meeting (Boston, 2004) by Sigrun Heinzelmann—cf. also (Seay 1955, 86–92; Berger 1987, 21, 36–37).

77 In establishing the internal semitone, Hothby had also made an allegorical classification of the steps, with regard to their surrounding intervals (i.e., a classification that considered their relation to surrounding steps). A step that established a semitone above and a whole tone below should be named a *principe* (i.e., prince), and conversely a step that had a whole tone above and a semitone below should be named a *comite* (i.e., count)—thus, the *mi* syllable was the *principe*, and the *fa* syllable was the *comite*. (Each of the other steps, which had a whole tone above and another below, should be named *demonstratore*—i.e., demonstrator.) This classification sets a clear necessity for understanding Hothby's presentation in light of societal and political relations. Hothby was apparently working in Florence, before he assumed a post at the competing city of Lucca in 1467, where he basically spent the rest of his life—cf. (Seay 1956). The Republic of Lucca had its own share of political and societal issues, having its northern boundary with the Duchy of Modena (in the hand of the Estes), and the other boundaries (south, east and west, despite a narrow western escape to the sea) with the powerful Republic of Florence (in the hand of the Medicis). The regional context of power may have had an influence (which remains to be investigated) on Hothby's allegories and musical works, as much as it had an unquestionable influence on the production of contemporaneous political works—like those of Niccolò Machiavelli (1496–1527), even if his output is dated from the beginning of the sixteenth century.
hexachords and mutation, that were necessary to make the system work. Ramos de Pareja proposed an eight-syllable set for solmization (psal-li-tur per vo-ces is-tas) that was constructed upon a stepwise scale from C to c (or, in modern pitch equivalents, from c to c').

Like the modern fixed-do system, Ramos de Pareja's set would not use different syllables when step alterations or varieties were intended: e.g., although his basic gamut did not include the b-rotundum, that step-letter could occur when needed, but it would still be solmized with the same syllable "is" that served for the b-quadratum. Apparently, one of Ramos de Pareja's purposes was to avoid or perhaps eliminate the need for hexachordal mutation. Thus, he too may be counted among that group of theorists whose propositions are interpreted as anticipations of the modern concepts of pitch and accidentals. In a chapter entitled "Reproaching the followers of Guido and accurately demonstrating the truth of things" ("Reprobans Guidonis sequaces et veritatem rei subtiliter demonstrans"), Ramos de Pareja additionally refers to the work of Johannes Gallicus (ca. 1415–1473) as one of the sources (and justification) for his own propositions.

Bene quidem dixit de his mutationibus ipse frater Johannes Carthusinus: non dico vocis in vocem mutationem, sed ab ambage in ambagem variationem. Solum refert tonos et semitonias annotare et per litteras Gregorii canere. Hoc equidem de vocibus meis dico. (Ramos de Pareja 1482, pt. 1, tr. 2, ch. 7, f. 18r; cf. Wolf 1901, 44]

Brother Johannes the Carthusian, spoke indeed well of these mutations: "I do not say a mutation from syllable to syllable, but a variation from ambages to ambages. It is of importance only to notate the tones and semitones, and to sing by means of the Gregorian letters." Indeed, I say this about my own syllables. (my translation; cf. Henderson 1969, 298; Miller 1993, 94–95)

It is noticeable that Ramos de Pareja is attempting to emphasize that one can solmize
a piece of music without the aid of mutation (i.e., change), and stresses (following Galicus) that 'mutation' is akin to 'ambages' (also spelled 'ambage'), a rhetorical figure also known by the name 'circumlocution.'

'circumlocution' (or 'ambages') refers to an idea, thing, or image, that can be implemented in three different ways: by means of 'euphemismus,' by means of successive rephrasings, by means of more or less literal restatements. The implementation by means of euphemismus is the most commonly accepted form of circumlocution, and involves a reference to a subject in some other form than saying it directly, usually to avoid discourteous, unlearned, or even vulgar meanings—e.g., the 'fear of being sexually violated by some unknown person' might be poetically mentioned as 'the

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78 The same passage from Ramos de Pareja's treatise is quoted in Henderson's dissertation, where he mentions that "Gallicus' references are in Edmond H. Croussearker, Scriptorum IV, 347, 349, 374" (Henderson 1969, 298), and interprets that Gallicus's quotation runs from "non dico" to "Gregorii canere"—I could not find the latter part of the quoted passage ("Solum [...] Gregorii canere") in Croussearker's edition (CS 4: 349, 374), as Henderson suggested. In Miller's translation, he also understands that Gallicus's quotation runs from "non dico" to "Gregorii canere," but gives the following reference with regard to Gallicus's text: "Coussearker Scriptorum IV, 347b. See J. Gallicus, Ritus canendi, ed. A. Seay, II, p. 3, note 21: non dico, vocis in vocem mutationem, sed ab ambage in ambagem; p. 4, note 23: Idcirco notae quadrae quibus nunc utimur nihil praeter illas septem repraesentant litteras A C D E F G" (Miller 1993, 94n). Thus, Ramos de Pareja's assertion qualifies more as paraphrase based on the second part of Gallicus's statements, than as a literal quotation. Even in the first part ("non dico [...] variationem"), Ramos de Pareja alters Gallicus's original: "non dico, vocis in vocem, sed ambagis in ambagem mutationes [...] attere" ("I do not say to weaken the mutations from syllable into syllable, but from ambages into ambages"—cf. (Gallicus 1458/64, pt. 2, bk. 1; CS 4: 347; Seay 1981b, 14: 3).

79 In modern English studies of rhetoric, George Puttenham (ca. 1520–1590) is frequently mentioned as the rhetorician who applied the term 'ambage' for 'circumlocution' in his The Arte of English Poesie (1589). Despite this attribution, the feminine noun 'ambages, -is' already existed in Latin, and some of its meanings (all of which may also serve for the plural noun 'ambages' in English) were: ambiguity, double-talk, digression, lie, roundabout way, circuitous paths, mysterious ways—the connection with the figure of rhetoric called 'circumlocution' is rather obvious.
robbing of one's treasure chest by a ruthless thief in the middle of a dark night.\textsuperscript{80} The implementation by means of successive rephrasings is generally used to emphasize the subject under consideration, and is also usually derived from the euphemismus—it simply restates the same subject several times, each one with a different euphemismus. The third implementation, by means of literal repetitions, is commonly taken as a rhetorical vice, since it involves a tentative explanation of a subject simply by repeating its main words, therefore producing no real explanation—as in the phrase: 'a two-voice strict parallel organum is defined as a piece of music in which two voices proceed in parallel movement to each other.' This latter type of circumlocution is usually not mentioned in rhetoric methods because it is virtually unacceptable and unusable. Ramos de Pareja's text can be interpreted in this context. His intention is to provide solmization with a conspicuous, clear understanding of the intervals (whose best indication would be his own set of syllables, with one exclusive syllable per step), and so he suggests that any procedure that would prevent the true understanding of the intervals is unacceptable and unusable. The Guidonian paradigm (with its non-exclusive syllables) is thus identified as circumlocution ("ambages"), for its immanent process of mutation could suggest ambiguity, since a sound can be uttered by two or more syllables pertaining to different hexachordal structures—even when it is an

\textsuperscript{80} Cf. G. Burton (1996–2004, s.v. 'circumlocution').
expansion of meaning, as with any of the euphemistic approaches. His innovation notwithstanding, Ramos de Pareja's propositions had no effect on actual solmization.81

The evidence provided in Ramos de Pareja's treatise suggests that Johannes Gallicus may also have had in mind some kind of resistance to Guidonian solmization. In his interpretation of Gallicus, however, Ramos de Pareja cited only understandings that could support his own propositions. Gallicus did indeed address Guido's hexachordal propositions, and speculated both about its origin and its application, but he was hardly proposing any substitutes for Guidonian solmization.

[...] quaerendum est cur Guido novam illam introducere volens canendi formam sex solas syllabas elegeit, et non potius quindecim iuxta numerum ordinis philosophorum, aut tot quot voces communis sui temporis usus habebat, seu quatuer duntaxat aut plus aut minus. Ad quod respondendum breviter, quoniam musicus erat et non cantor purus, non nesciens omne quod canitur, quatuor tantum concludi vocibus ac duobus cum

[...] one must examine why Guido, wanting to introduce that new form of singing, elected only six syllables, rather than fifteen according to the number of the philosophical order, or else as many voices as was the common use of his time, or only four, or else more, or else less. Answering briefly to that, since he was a musician and not a pure singer, [and] not ignoring all that was sung, he perceived (concludi) only four

81 Robert Henderson gives the following assessment about Ramos de Pareja's new set of syllables:

Ramos' syllables were not put to any practical use, Ramos himself uses Guidonian syllables to illustrate many of the points in his book. Why was there no acceptance? Most probably, the syllables were too new. They had nothing in common with the older, highly popular Guidonian solmization. On the other hand, they offered no advantage over the alphabetical pitch letters to which they were attached.

(Henderson 1969, 298)

Henderson's dissertation is one of the first works to interpret and call attention to the passage (quoted above) and other references from Ramos de Pareja's Musica practica, and from Johannes Gallicus's Ritus canendi, as signs of opposition to the Guidonian paradigm of solmization.
In his assessments, Gallicus does seem to refute hexachordal solmization as too
verbose (in as in his use of the term 'ambages'), and appears to be momentarily in favor of a
solmization based on the tetrachord. He understands that the tetrachord represents the
origin of musical speculation, and even identifies the tetrachord as the structure that spells
out the most important consonance for singing (the diatessaron). But by the end of the
quotation, when Gallicus suggests that one could even use a different syllable-set of six
syllables, he is actually attesting to the appropriateness of Guido's choice. In his phrasing,
Gallicus also implies that the exact set of syllables has virtually no importance, for everyone
knows (according to his claim) that it could be done by way of any syllable-set, even one of
a babbling character such as ba, be, bi, bo, bum, bam.

In another section of his work, Gallicus presented a diagram introduced by the following words: "Haec docet figura

82 For a survey and analysis of these and other sets of solmization syllables, see Henderson
(1969, 259–301); some of the sets he discusses involve four syllables, others seven, and even others eight
syllables. Henderson, however, interprets Gallicus's assessments as a resistance to Guidonian solmization.
modulari per litteras breviter ac faciliter et per ut, re, mi, fa, sol, la" ("This figure teaches how to sing briefly and easily through the letters and through ut, re, mi, fa, sol, la"). (In the quotation of the diagram, below, the letter "T" stands for "Tonus" in Gallicus's original, the uppercase "S" stands for "Semit[onium] maj[oris]," and the lowercase "s" stands for "Semit[onium] min[oris].")

TABLE I — Gallicus's solmization for the entire gamut

| T | T | s | T | T | s | T | T | s | T | T | s | T | T | s | T | T | s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Γ | A | ą | C | D | E | F | G | A | ą | C | D | E | F | G | A | ą | C | D | E |
| UT | RE | MI | FA | SOL | LA | FA | SOL | LA | MI | FA | SOL | LA | FA | SOL | LA | MI | FA | SOL | LA |

(Gallicus 1458/64, pt. 2; CS 4: 377; Seay 1981b, 14: 56)

The diagram is a representation of the entire gamut, from Γ to ee (including both ą and ą), but showing only one syllable per step-letter (all based on the Guidonian hexachord). A possible interpretation is that the diagram shows a gamut in which no mutations would be necessary, since only one solmization syllable is assigned to each step. There is no doubt that Gallicus, in his engagement with humanistic trends, had reservations about Guidonian-influenced solmization, as much as about Marchettus da Padova's work.

83 In Coussemaker's edition, the last (higher) "Semitonium" is given as "maj[oris]," but it has been corrected to "s" (i.e., "Semitonium minoris") in Seay's edition. The phrase that introduces the diagram, in Seay's edition, is given with only a minor variant: "Haec docet praesto figura Modulari per litteras Breviter ac faciliter Et per ut, re, mi, fa, sol, la" (Seay 1981b, 14: 56; underline mine).
although he was (perhaps paradoxically) also regarded as a conservative theorist. But a close reading of Gallicus's text will indicated that the diagram was neither a proposition to forge fixed-pitch syllables, nor an attempt to eliminate the need for mutation, although it seems reasonable that the diagram might have been based on the precept that 'mutation must not be made unless because of necessity'—therefore apparently enabling steps to be solmized only by means of that one syllable.\(^8^4\) In fact, the figure served merely as a simplified diagram of the gamut, in which Gallicus suggests how to identify (represent) the entire gamut, by means of an uninterrupted sequence of syllables, in a stepwise, brief and easy manner ("breviter ac faciliter"), which is still indebted (and must still adhere) to the Guidonian paradigm. Thus, the solmization of the diagram is confined mainly to mutations between the \(\overline{G}\)- and \(\overline{C}\)-hexachords, while the presence of \(\overline{b}\)-\(fas\) accounted for momentary \(\overline{F}\)-hexachord steps, apparently effected in \(fa\)-\(super\)-\(la\) circumstances.\(^8^5\) Gallicus seems to attest that, \textit{a priori}, solmization should predominantly use the \(\overline{G}\)- and \(\overline{C}\)-hexachords, except for momentary situations that call for the use of the \(\overline{F}\)-hexachord in order to provide the step \(\overline{b}\)-\(fa\), or unless specified otherwise. In that sequence of syllables one particular species of the \textit{diatessaron} is emphasized (s-T-T, thus solmized \textit{mi}, \textit{fa}, \textit{sol}, \textit{la}), which serves as the

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\(^8^4\) Cf. Gallicus (1458/64, pt. 2, bk. 2; CS 4: 376–382; Seay 1981, 14: 53–62). The precept mentioned above is a rephrasing of the following assertion by Nicolaus Capuanus: "And notice that you must not make a mutation unless because of necessity" ("Et nota quod non debet fieri mutatio nisi causa necessitatis")—cf. (Capuanus 1415; La Fage 1864, 315).

\(^8^5\) The expression \(fa\)-\(super\)-\(la\) stands as a short form of the saying 'una nota super la, semper est canendum fa' ('one note above \textit{la}, must always be sung as \textit{fa}'), or similar situations—which shall be discussed in chapter 5.
main structure underlying the entire gamut representation by Gallicus. In this sense, the syllables demonstrate how to solmize through the entire gamut and imply what the appropriate places for mutation are; e.g., in order to sing through the first F, which presents the syllable fa, one needs to aurally conceive the syllable mi on the previous E, while it is actually being uttered with the syllable la, and so, mutations should happen whenever the hexachord reaches its final syllable la.86

Although the resistance to the Guidonian paradigm has been linked to humanist trends of the Renaissance, it is worth noting that hexachordal solmization practice continued at least until the first half of the eighteenth century, even if promoted only through conservative pedagogical practices, and especially in relation to ecclesiastical singing. There is, for instance, a report showing that during the years 1734–38 some musicians had engaged in an interpretive dispute upon the viability of having key-signatures with seven flats or seven sharps. Among the arguments against it, the contenders specifically mentioned the (still current) practice of hexachordal solmization. The dispute, which gave rise to wagers involving large amounts of money, actually reflected other contemporaneous discussions on the necessity for different forms of temperament (i.e., tuning). Even if restricted to a small group of Kapellmeisters who worked at the edge of the so-called mainstream of Western-European musical practices and theoretical studies (since they were mainly of Portuguese and Brazilian origin), its placement well within the period of J.S.

86 Henderson has misinterpreted this diagram, asserting that it represents a tentative elimination of mutation, through the use of a non-mutating solmization system based on a four-syllable set—cf. (Henderson 1969, 259–263).
Bach's composition of Das wohltemperirte Clavier (1722 [vol. 1], 1738–1740 [vol. 2] and Jean-Philippe Rameau's Traité de l'harmonie (1722) is striking. The documentation of the dispute was originally compiled and intended for publication in 1760 by the Brazilian Padre named Caetano de Melo de Jesus (fl. 1734–1360), one of the contenders, and the one who actually initiated the dispute; apparently, however, it was not published in his lifetime. 87

Earlier indicators of resistance to Guidonian solmization might be interpreted from treatises that did not take the Guidonian propositions, or their later expansions, as a foundation for their theoretical discussions. Among those, two twelfth-century Cistercian treatises may be cited: Guido Augensis's Regulae de arte musica (ca. 1140), and the anonymous Tractatus Cantum quem Cisterciensis (1142/47). The former is a theoretical treatise that was apparently used as a basis for musical learning in various chapters of the Cistercian order. The latter treatise is, in fact, a preface to a Cistercian antiphonary, revised and corrected under the direction of St. Bernard of Clairvaux (1090–1153). Both treatises make no reference to Guidonian or to any definitive kind of solmization, although they seem to allow the tetrachord as a possible device for solmization, the latter treatise providing a short reference to the noeanne/noeagis set, mentioned as a way of deciding which is the mode of a chant.

Ad hos inter se distinguendos, neumata inventa sunt, singulis subiicienda

In order to distinguish these modes from

87 The first publication of that dispute has appeared only recently, under the title Discurso Apologético: Polémica Musical, edited by José Augusto Alegria ([Lisbon]: Fundação Calouste Gulbenkian, 1985).
antiphonis, quae apud quosdam stivae vocantur, et apud Graecos signantur per haec verba, nona, noe, ane, et noe ais, et his similia, quae quidem nihil significant, sed ad hoc tantum ab ipsis Graecis sunt reperta ut per eorum diversos ac dissimiles sonos tonorum admiranda varietas aure simul et mente posset comprehendi.

(Anon. Cist. ca. 1147; Guentner 1974, 37)

In fact, many twelfth-century treatises offered presentations that did not acknowledge Guido's propositions in general, let alone follow the solmization system he envisioned. However, such omissions of the Guidonian hexachordal paradigm (or any of its syllables) can hardly be taken as a definite sign of resistance to the system since Guido's propositions were still in the process of acceptance and practice. At the same time, it clearly demonstrates that early theorists (at least in the twelfth century) did not always consider following Guido as auctoritas for their discussions, and even when they did the hexachordal paradigm would still take a little longer to be adopted as a norm.88

(vi) Working beyond the limits of the hexachord

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88 In the quotation above, the plural noun "stivae" can be translated as "plough-handles." It establishes a metaphor clearly intended as a suggestion of what the author considers to be the proper character of those "neumas": the guiding force that underlies the identification and understanding of a mode—i.e., much in the same way used by Guido d'Arezzo (melodic formulae or melodic gestures that provide identification of a modes, and also of hexachords).
In the previous sections of this chapter, a method of recognizing individual hexachords by means of melodic gestures was proposed, based on intervallic spans that would signal the appropriate hexachord to be solmized. Frequently, however, when the melodic context is extended beyond the limits of those strict intervallic spans, there is a need for a change from one hexachord to another. In medieval and Renaissance theory, three procedures of change can be identified: by mutation, by permutation, and by transmutation.89

The first type of procedure, known as 'mutation' (from the Latin 'mutatio'), takes place on a note that is common to both hexachords; i.e., the common mutation-step acts as a link between two different hexachords being solmized. In this kind of change, the reading of the chosen note would be generally done by thinking of a syllable according to one hexachord, while saying (uttering) the syllable of the other hexachord. This procedure is clearly similar to the modern concept of harmonic modulation, in which a chord common to both keys is used as a link between them. At that point in which it serves a modulatory function, the chord may receive a dual label: one according to the first key, and the other according to the new key.

The second procedure of hexachordal change is known as 'permutation' (from the Latin 'permutatio'), and could be explained as a transition that takes place on two different steps that do not produce a common sound. Different from 'mutation,' 'permutation' was not

89 Additionally, the latter procedure (transmutation) may also happen even when there is no apparent hexachordal change dictated by the melodic gesture, but when there is a need to avoid tritones, or to create specific intervals in keeping with tradition, style, or voice-leading needs.
widely discussed, and a more precise formulation of its concept seems linked to various attempts to clarify old concepts, as well as to tentatively define new musical propositions brought forth by the humanistic ideals that were beginning to take shape in the early-fourteenth century. Marchettus da Padova, in his *Lucidarium* (1317/18), seems to have been the first author to explicitly enunciate the procedure of 'permutation,' although it had clearly been in use at earlier dates. 'Permutation' may occur, for instance, when we meet two steps in the same place (line or space) in the staff, but one is being solmized *fa*, while the other will be solmized *mi*—e.g., 3-*fa* (b3) immediately followed by 5-*mi* (b5), or vice versa. In this situation, 'permutation' can be described as a chromatic change (in modern terms); since no single hexachord contains steps establishing such an inflection between them, a change from one hexachord to another is unequivocally necessary.

The third procedure of change is being introduced in this dissertation under the name 'transmutation,' which will serve as an indication of a momentary hexachordal change, and, in relation to all three procedures, is the closest to today's concept of 'accidental inflection'—although not all situations that call for a 'transmutation' will translate into modern accidentals. A 'transmutation' generally occurs in a sequence involving at least three different steps (i.e., disregarding consecutive melodic unisons), for which two alternative approaches of solmization may be considered: (a) either the steps are all solmized according to an extraneous hexachord (i.e., extraneous with regard to the whole gesture in which they are included); or (b) only the second (middle) step is solmized according to an extraneous hexachord, while the solmization of both its preceding and succeeding steps follows the
hexachord of the prevailing gesture. A 'transmutation' will occur most often when that middle step can be identified as an upper neighbor-note, or as a subsemitone, or due to a 'propinquity' inflection.

The following chapters will present these three procedures individually: 'mutation' will be discussed in chapter 3 (dealing with basic concepts, cases, and processes) and chapter 4 (dealing with a more detailed analysis of its types and species); 'permutation' will be discussed in chapter 5; and 'transmutation' will be covered in chapter 6. In an attempt to interpret possible concealed meanings behind these procedures (which performers, composers, scribes, and theorists are likely to have understood), chapter 7 will approach them within a rhetorical context, tracing individual parallels with figures of rhetoric.
CHAPTER 3

MUTATION: THE BASICS

(i) Mutation (basic concepts)

The term mutation is a literal translation from the Latin *mutatio*, whose meanings range from 'change' and 'exchange,' to 'transformation,' 'modification,' and 'shift,' among others. In the context of Guidonian solmization, both in medieval and Renaissance theory, the Latin word *mutatio* denoted a transition between two different hexachords. This transition was generally necessary and inevitable, for it was determined either by melodic gestures denoting different hexachords, or by *ficta*-signs imposing a different hexachord. Consistent use of the term *mutatio*, in this context and meaning, appears only from the thirteenth century onward, although analogous versions must have been employed in pre-Guidonian solmizations, whether hexachordal or tetrachordal. For instance, changes similar to 'mutation' in the Guidonian sense may have happened in a solmization of transposed modes based on the *noeamh/noeagis* set, or in solmizations intended to correct dissonances derived from the Daseian notation—cf. (Anon. SE a. 900, pt. 1; GS 1: 175–177; PL 132: 984–988; Schmid 1981, 65–72; [trans.] Erickson 1995, 37–42). Other references may also be found in Raymond Erickson's preface to the translation of *Musica* and *Scolica enchiriadis* (1995, xxxivn, xln, 8n), and on Charles Atkinson's article "From 'Vitium' to 'Tonus acquisitus,'" in *Cantus Planus* (1990, 181–197).

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mutation must have been derived from foundations of a more philosophical nature, as

Franchinus Gaffurius has mentioned in his *Practica musice*.

Multimodas insuper sonorum
mutationes clerici protestantur. Est enim
Mutatio apud Bacchaeum Alteratio
subiectorum seu Alicuius similis in
dissimilem locum transpositio. Hinc in
moralius Mutari Gregorius inquit est ex
alio in aliud ire et in semetipsum stabilem
non esse: vnaquaque enim res quasi tot
passibus ad aliam tendit: quot mutabilitatis
suae motibus subiacet. Verum huiusmodi
mutationem Martianus transitum appellat:
quem vocis variationem in alteram soni
figuram interpretatur. Briennius autem
mutationem dixit esse subiecti systematis ac
coris characteris aliena ionem. Fit autem
Mutatio secundum genus quum scilicet in
tetrachordo diatonico lichanos vel etiam
paranetes chorda remittitur semitonio in
graue: transeundo in chromaticam figuram:
vel tono transeundo in enarmonicam: quae
nusquam accidit ex grauitate in acumen
variari vt Boetius noster in quarto explicuit.

Id quoque et Aristoteles ipse in musicis
problematibus intelligi voluit quum diceret
Quod sapit naturam acuti plerumque
pertransit in grauem: quod autem sapit
naturam grauis non permutatur in acutum.
Est et alia mutationis consyderatio in voce
ac sono: nam quum sunt in motu et fiunt
tantum voces et soni ipsi de genere creduntur
entium successiuorum vt vigessimo septimo
problemate interpres exposuit: [Petrus
apponensis, in margin] qua re vocis ipsius ac
soni generatio consistit in quodam fieri et
transmutari. Verum huiusmodi introductio
definitum a Marcheto consequitur
mutationem. Is enim inquit: Mutatio est

Ecclesiastics teach various mutations of
tones. According to Bacchaeus mutation is a
transposition of subjects or the like to a
different place. Thus Gregory says in
*Moralia* that "mutation is the movement
from one state to another which itself is not
stable, for the one tends toward the other in
the degree that it is subject to the movement
of its own mutability". But Martianus calls
such a mutation a transition, which
he explains as a "change of one tone to
another". Bryennius says mutation is "the
change of the system of a melody and of the
character of a tone". Mutation occurs in a
genus when the *lichanos* or *par*a*mete string
of a diatonic tetrachord is lowered a semitone
into the chromatic, or a whole tone into the
enharmonic; such a change never occurs by
raising the pitch, as Boethius states in
Book 4. Aristotle also wished this to be
understood when he said in musical
*Problems*: "what is naturally higher tends to
descend, but what is naturally lower does not
ascend". Mutation of tone and note is also
considered in another way, for when they are
in motion and so become a melody, they are
considered a kind of moving succession, as
Petrus Apponensis has explained in the
twenty-seventh Problem. Thus the
generating of tone and note consists of a
certain motion and mutation.

But our explanation of mutation follows
the definition given by Marchettus. He
says: "mutation is the changing of the name
of a tone to another name having the same
sound".

For if certain syllables belonging to

Following, seven treatises will be quoted, chronologically organized to provide an overview of the concept of mutatio as it was commonly explained from the Middle Ages to the Renaissance. Although there was no profound change of this concept through those periods, the quotations are progressively more elaborate, in such a gradual way that reflects the growing, humanistic concerns on the part of theorists not only to make all the procedures and processes involved in solmization more explicit, specific, and organized, but also to provide new and more precise interpretations of older concepts, including propositions that might lead to specific new terminology. Concerns with elaboration are also present in medieval writings, although they tend toward forging compromises between statements (or glosses, or rephrasings) of earlier auctoritates (on which they are heavily based), producing terminology that sometimes seems imprecise, and which necessitates careful interpretation in order to solve apparent inconsistencies, and even contradictions.
(Each quotation will be briefly commented upon before the next one is presented. Notice that all the quotations in this section are concerned only with the most basic concept of mutation, which is therefore described and identified only within the realms of *musica recta*—the expansion of the concept to include *musica ficta* will be dealt with in the next chapter.)

Mutatio autem, secundum Guidonem sapientissimum musice, diffinitum sic:

Mutatio est divisio unius vocis propter aliam sub eodem signo, eadem voce et etiam sono. Dicitur autem mutatio ab hoc verbo: muto, mutas, quoniam unam proprietatem vel vocem sub eodem sono in aliam subsequentem mutamus.

( Garlandia p. 1240; CS 1: 160)

Now, according to Guido (the most wise musician), mutation have been defined as follows: Mutation is the division of one syllable for the sake of another under the same sign, the same voice, and also sound. On the other hand, it is named after this verb: to change (*muto*, *mutas*), because we change one proprietias or syllable into another subsequent under the same sound.

This first quotation presents a simple definition of mutation making use of the word 'vox,' which is submitted to different translations in the sentence "Mutatio est divisio unius vocis propter aliam sub eodem signo, eadem voce et etiam sono," in order to avoid confusion. The first occurrence must be translated as "syllable," and the second occurrence as "voice," rendering the following version: "Mutation is the division of one syllable for the sake of another [syllable] under the same sign [i.e., the same step-letter], the same voice, and also sound"—the term "syllable" naturally refers to a 'solmization syllable' (a common translation for *vox*), and the term "voice" may refer to a different musical phrase or melodic gesture in another hexachordal context (whether in monophonic, or in polyphonic situations), or may even refer to another voice in a polyphonic situation. The phrasing of the definition given above was thereafter used as an authoritative source for paraphrases and
glosses by most theorists who explained mutation—Garlandia may have been the first theorist to use this wording in the context of mutation.

Mutatio uero ut hic sumitur nihil aliud est quam dimissio [in CS 1, divisio] uocis unius propter [in CS 1, prope] aliam sub eodem signo, et in eodem sono. Vnde sequitur quod ubicumque fit mutatio: opportet quod ibi sint due uoces ad minus. (Lambertus ca. 1260's/1270's; I-Sc L.V. 30, f. 17r; CS 1: 256)

In fact, as it is assumed, mutation is nothing more than the dismissal [in CS 1, division] of one syllable for the sake of [in CS 1, near to] another, under the same sign (i.e., letter) and in the same sound (i.e., step). Whence, it follows that wherever mutation is made, it is proper, in that place, that at least two voices (voces, i.e., syllables) exist. (my translation)

The second quotation (only a few twenty or thirty years after Garlandia's) is clearly based on the first, or perhaps on some similar version that preceded both of them. There are, however, two different wordings in the sources used in this quotation: one (Coussemaker's edition) presents mutation as a "division (divisio) of one syllable for the sake of another," and the other (a transcription of the manuscript L.V. 30, in the Biblioteca Communale degli Intronati of Siena) presents mutation as a "dismissal (dimissio) of one syllable for the sake of another." The former ("divisio") follows closely the wording of the quotation from Garlandia's treatise, after the idea that mutation may occur when a step is divided into two syllables. The latter ("dimissio") is used in later explanations about mutation (especially in humanistically influenced treatises), serving as a reference to a syllable that is being abandoned in favor of another that (applied to the same step) is being assumed in its place. This latter wording emphasizes the description of the process of mutation, while the former emphasizes the event; but even if the former is preserved, it must be noted that Lambertus avoided the apparent contradiction with regard to the word "vox,"

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by elimination of its repetition in the sentence "\textit{vocis unius propter aliam sub eodem signo, et in eodem sono}" (instead of Garlandia's "\textit{unius vocis propter aliam sub eodem signo, eadem voce et etiam sono}"). Also borrowing from another paragraph used in Garlandia’s text, Lambertus goes on further to clarify that mutation can be made only where the step contains "at least two syllables"—although Garlandia’s assertion is presented in a slightly more obscure manner.

\begin{Verbatim}
Mutatio est variatio nominis vocis seu note in eodem spacio, linea, et sono. 
Fit namque mutatio, vel fieri potest, in quolibet loco ubi due vel tres voces sive note nomine sunt diverse, que quidem sub sola una litera includuntur. 
Sed quia in \Gamma\ ut, in A re, et in \flat mi singulariter non est nisi una sola vox sub una littera, ideo in ipsarum aliqua mutatio non existit. 
(Herlinger 1985, 281, 283)
\end{Verbatim}

Mutation is a change in the name of a syllable or note lying in the same space or on the same line and with the same pitch. Mutation is made, or can be made, in any location where two or three syllables or notes are different in name but are subsumed under a single letter. Since on \Gamma\ ut, A re, and \flat mi there is but a single syllable under a single letter, there is no mutation on any of them.

In the third quotation (some fifty to sixty years after Lambertus), Marchettus da Padova betrays a proto-humanistic tendency to reiterate previous definitions with elaboration aimed at enhancing their specificity and clarity. Toward that clarification, Marchettus mentions that a mutation can take place on a step that contains two or three syllables in its solmization, but makes use of an extra assertion explaining that mutation cannot happen on steps that bear only one syllable (of course, within the limits of the \textit{recta}-gamut). Significantly for the subject at hand, this strategy makes use of a rhetorical process of ‘contraposition,’ which uses ideas that are contrary to each other (through simple opposition or paradox) to prove the subject under scrutiny—this process is sometimes
discussed by rhetoricians under its closely related figure named 'antitheton' (also known as 'antithesis').

Sciendum est quod mutacio, prout hic sumitur, nichil aliud est quam unius vocis propter aliam ad minus a se tono differentem, dimissio in eodem loco omnino, unde tonus est inter quamlibet vocem et proxime sibi superiore vel inferiorem, preterquam inter mi et fa.

[...] sciendum est quod in manu sunt 14 loca in quibus sunt coniuncciones, seu composiciones duarum vel plurium vocum, et fieri possunt mutaciones [...] Insuper ubicumque sunt due voces ad minus tono ab invicem distantes, ibi fieri possunt due mutaciones, scilicet de prima in ultimam et e converso. Et ubicumque sunt 3 voces, 6 mutaciones ibi fieri possunt, scilicet de prima in secundam, et e converso, de prima in terciam, et e converso, de secunda in terciam, et e converso. [...] Item quandocumque, cum una mutacione habendo, potest commode transire, non debent fieri due vel plures, quia frustra fit per plura quod potest fieri per pauciora.

(Anon. Berkeley 1375, tr. 1, ch. 2; Ellsworth 1984, 48, 50)

It must be known that a mutation, as used here, is nothing other than the exchange of one syllable for another--which is at least a tone away--in exactly the same place (a tone falls between any syllable and the one immediately above or below, except between mi and fa.)

[...] it must be known that there are fourteen places in the hand in which there are conjunctions--or combinations of two or more syllables--and mutations can be made [...]. Moreover, wherever there are two syllables at least a tone away from each other two mutations can be made there: from the first to the last and conversely. And wherever there are three syllables, six mutations can be made there: from the first to the second and conversely, from the first to the third and conversely, and from the second to the third and conversely. [...]. Also, whenever it is possible to change over smoothly with one mutation, two or more ought not to be made, for what can be done with few is wasted effort with many.

(Ellsworth 1984, 49, 51)

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91 This assertion about one-syllable steps is also present in the Garlandia's treatise, although in a position that is seemingly less efficient in its use as a rhetorical device—cf. (Garlandia p. 1240; CS 1: 160). Fairly at the same time, Lambertus also makes use of the assertion, in the same rhetorically efficient position as Marchettus—cf. (Lambertus ca. 1260's/1270's; I-Sc L.V. 30, f. 17v; CS 1: 256). With regard to presentations by rhetoricians likely to have been known and used by these authors, cf. (Aristotle Rhet., 2.19.1392a–b; 2.25.1402b, 3.9.1409b–1410b; [trans.] Roberts 1924, 129–131, 161–162, 184–186); (Anon. ad Herennium 4.15.21, 4.45.58, s.v. 'Contentio'; [ed. and trans.] Caplan 1954, 282–283, 376–377); and (Quintilian ca. 93/95, 9.3.81–86, s.v. 'Contrapositum'; [ed. and trans.] Russel 2001, 150–153).
In the fourth quotation (short of sixty years after Marchettus), one specification is readily noted about the syllables involved in mutation: there must be at least one whole-tone between them. This specification refers to the fact that, in the *recta*-gamut, no single step includes both syllables *mi* and *fa*, and therefore, a mutation *per se* would not be possible, except when its concept is expanded to include the *ficta*-gamut—this kind of mutation (named *ficta-*mutation) will be discussed in chapter 4. The anonymous author of the Berkeley Manuscript also summarizes that only fourteen places (in the *recta*-gamut—i.e., the hand) are available candidates for mutation, for they are the only ones that include more than one syllable, they are: (1) C-*fa*-ut, (2) D-*sol*-re, (3) E-*la*-mi, (4) F-*fa*-ut, (5) G-*sol*-re-*ut*, (6) a-*la*-mi-*re*, (7) c-*sol*-fa-*ut*, (8) d-*la*-sol-re, (9) e-*la*-mi, (10) f-*fa*-ut, (11) g-*sol*-re-*ut*, (12) aa-*la*-mi-*re*, (13) cc-*sol*-fa, and (14) dd-*la*-sol. Furthermore, in face of several eligible options for mutation, the treatise asserts that a mutation-step must be properly chosen, and that the most smooth and effortless path should be adopted. The assertion, however, is ambiguous as to whether those eligible options apply to several steps between two different melodic gestures, or whether they apply to different pairs of syllables on the same step. In both cases, the performer would need to choose the one step (or pair of syllables) that would not deny the proper flow between different melodic gestures and their hexachords. Notice that the theoretical statements from the Berkeley Manuscript can be interpreted in two ways: (a) as reinterpretations of earlier authors (for it makes use of earlier phrasings, expanding and also trying to integrate statements of earlier sources into a more cohesive and concordant whole); and (b) as anticipations of an independent line of thought (for it
presents newly clear-cut definitions, and introduces original explanations in such a way that ultimately tend to obscure the connection with previous auctoritates).  

Videndum quid sit mutatio. Mutation is the dismissal of one proprietas for the sake of another, or the variation in the name of the syllable, or of the note in the space or line under one sound and also under one sign, i.e., under one step-letter (sub una littera).

Item sciendum est quod in bfa bmi acuto et superacuto nulla est mutation. Ratio est quod omnis mutatio debet fieri sub uno signo, ut supradictum est, et in bfa bmi sunt duo signa, scilicet b rotundum et b quadratum, quae habent magnam differentiam, ut hic: b, b. Ideo nulla est

92 Both interpretations may be identified as emblematic of humanistic tendencies. The independent thought is more properly related to the Renaissance and denotes a valorization of more contemporaneous productions. Impulses of reinterpretation, working toward the integration of earlier auctoritates (not only through citation, repetition, or even glosses of texts taken at face-value), were more typical of the last part of the Middle Ages (twelfth to fourteenth centuries). These impulses reflect an effort within early Humanism (or even proto-Humanism) to forge concordances (harmonize) between apparently discordant thoughts. This can be characteristically exemplified through the Decretum (Concordantia discordantium canonum, ca. 1140) of Gratianus, which served to establish the later Corpus iuris canonici, and worked to harmonize between different precepts and decrees of the Church; or through the works of Aquinas, who sought harmonization between lay philosophical thought (Aristotelian, Neoplatonic, and others) and theological Christian thought—cf. (Balensuela 1994, 17–47; Audi 1995, 31–34, s.v. 'Aquinas, Saint Thomas,' 800, s.v. 'Thomism'; Hyman and Walsh 1973, 503–508; Cantor and Klein 1969, 15–17; Weinberg 1964, 182–187).
mutatio, quia sicut differt b \textit{rotundum} a b \textit{quadrato}, ita differt fa a mi et mi a fa. Alia ratio est quia omnis mutatio ad minus fit per tonum et in bfa bmi non est nisi semitonius, scilicet fa-mi; ergo nulla est ibi mutatio. Etiam fa et mi sunt voces \textit{mediatae} et non \textit{immediatae}. [...] Et in omnibus alius locis ubicumque sunt duae voces, ibi sunt duae mutationes: exinde in Ffaut sunt duae voces, ibi sunt duae mutationes, scilicet fa-ut et ut-fa et sic de alis. Item ubicumque sunt tres voces, ibi sunt sex mutationes; exinde in Gsolreut ubi sunt tres voces, ibi sunt sex mutationes, videlicet: sol-re est prima, re-sol secunda, sol-ut tertia, ut-sol quarta, re-ut quinta et ut-re sexta. Et nota quod non debet fieri mutatio nisi causa necessitatis.

(Capuanus 1415; La Fage 1864, 315)

In this fifth quotation (forty years after those of the Berkeley anonymous), Nicolaus Capuanus can also be interpreted in the same two ways as the previous quotation:

reinterpretations of earlier sources, plus elaboration of independent opinions. Among the steps that are singled out as ineligible places for mutation, noteworthy is the inclusion of ee-la, which was not often mentioned explicitly in historical treatises of previous centuries.

Another point is the presence of explanations about $\frac{1}{2}$-fa / $\frac{1}{2}$-mi, which cannot be taken as a place for mutation, due to its dual nature (i.e., due to being conceived as a double-step).
Additionally, near the end of the quotation, Nicolaus introduces a qualification of a subliminal rhetorical nature, applied to the solmization syllables *fa* and *mi* (representing the internal semitone of a hexachord): they are qualified as *mediatae et non immediatae* (i.e., "mediate syllables, and not immediate"). Immediate things (or meanings) are those that are close together, or are so close that they can even be found in the same place (i.e., they can be congruent, and they can exist as two versions of the exact same thing). In solmization terms, this is the case with mutation itself, for in a step (one place) that bears two syllables (two meanings), mutation can be made, and so the two syllables can be qualified as "immediate." Mediate things (or meanings), however, are not classifiable as commonalities, they share no intersection, they are separate by default, although one thing may imply the existence of the other. In solmization terms, it applies perfectly to the double-step ½-*fa* / ½-*mi*, since both *fa* and *mi* are represented in the same graphical place (whether in the Guidonian hand or on a staff), but have two different meanings, and so can only be qualified as "mediate." This kind of explanation is intersects with the figures of rhetoric called *disjunctio* and *coniunctio*—two opposing types of sentences related to *zeugma*. 93

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93 'Zeugma,' according to Lanham, is "[a] kind of Ellipsis in which one word, usually a verb, governs several congruent words or clauses"—cf. (Lanham 1996, s.v. *zeugma*); cf. also (G. Burton 1999-2004, s.v. *zeugma*). In other words, a *zeugma* happens in a sentence with two or more clauses, all of them sharing a common word (e.g., a verb, or noun, or verbal noun, etc.) that is, however, present in only one of the clauses and omitted in the other(s). For example: "Fades physical beauty with disease and age" ("Deflorescit formae dignitas aut morbo aut vetustate")—cf. (Anon. ad Herennium, 4.27.38; [ed. and trans.] Caplan 1954, 322, 323). There are usually three different types of *zeugma* identified in rhetoric, defined according to the position of the common word within the sentence: *prozeugma*; when the word is placed at the beginning of the sentence (as in the above example); *hypozeugma,* when it is placed at the end (as in "Either with disease or age physical beauty fades"—"Aut morbo aut vetustate formae dignitas deflorescit"); and *mezozeugma* (also called *synzeugma*), when it is placed in the middle of the sentence (as
*Coniunctio* happens when a word (common to all clauses in a sentence) is place in the middle—it is, in fact, referred to as a synonym for 'mezozeugma.' *Disjunctio* is also a sentence containing two or more clauses related to one and the same matter as with the *zeugma*, but each clause has its own individual verbs—this figure is sometimes considered the opposite of a *zeugma*, and is therefore used as a synonym for 'hypozeuxis.'\(^9\) The terms used by Capuanus are also related to different types of inference (interpretation, deduction) drawn from a 'syllogism,' according to the number of premises used: 'mediate inference' is one that draws conclusions from a syllogism that has two premises (in musical terms, equivalent to the double-step \(b-fa\) \(b-mi\)); 'immediate inference' is one that draws conclusions from a syllogism that has only one premise (in musical terms equivalent to a single step-letter that may, however, contain two or more different syllables)—cf. (Lanham 1996, s.v. 'mediate inference'). Now, with regard to naming mutations, the anonymous Berkeley Manuscript (quoted earlier) described which pairs of syllables may be involved in mutation in a different way; there the author said only that in a two-syllable step the mutations would be two (first to third, and third to first), and that in a three-syllable step the mutations would be six (first to second, second to first, first to third, third to first, second to
in "Either with disease physical beauty fades, or with age"—"Formae dignitas aut morbo deflorescit aut vetustate")—idem.

\(^9\) One example of *disjunctio* is: "By the Roman people Numantia was destroyed, Carthage razed, Corinth demolished, Fregellae overthrown" ("Populus Romanus Numantiam delet, Kartaginem sustulit, Corinthum disiecit, Fregellas evertit")—cf. (Anon. ad Herennium 4.27.37; [ed. and trans.] Caplan 1954, 322, 323). *Disjunctio* and *hypozeuxis* may be considered cases of 'synonymia,' if they are understood as a series of related statements, each one employing different words, but whose meaning is approximately the same. If one considers that *disjunctio* is an omission of grammatical conjunctions that could be used to link the clauses, then it ought to be made synonymous to 'asynedeton' (sometimes spelled 'asyntheton').
third, and third to second), but he mentioned no syllables or steps by name. Previous treatises (and many others during the Renaissance) would present each step by means of their full designation, followed by indications of each individual mutation. Nicolaus Capuanus, however, does the same in a more brief, hybrid way, by naming only two steps: a two-syllable step (F-fa-ut), and a three-syllable step (G-sol-re-ut), followed by indications of individual mutations restricted to only those two steps—implicitly, they would then serve as models for all the others. Finally, the last statements in the quotations from Capuanus and the anonymous Berkeley author can be interpreted by emphasizing their similarity: one says that mutation must not be made where it is not necessary, and the other says that mutation must be smoothly made. In either case, it means that mutation must be avoided if there are other alternatives, but if implemented it must be done as scrupulously and seamlessly as possible.

[M]utatio est unius vocis in aliam variatio. Omnes autem voces sunt mutabiles, sed aliae plus aliae minus.[...].

In Γ ut autem, in A re, in b mi, et in e la, mutatio nulla fit, eo quod in quolibet ipsorum locorum sola vox est. Ubi vero sola vox est mutatio fieri non potest, quoniam in omni mutatione fienda duae voces requiruntur, scilicet una quae mutatur, et alia quae per ipsum mutationem assumitur. Praeterea in ʌ fa ʌ mi acuto et superacuto, nulla fit mutatio, quia mutatio habet fieri necessario per duas voces unisono convenientes, id est quod vox illa quae mutatur et alia quae per mutationem ipsam assumitur sint in uno et eodem sono, sicut fa et ut de C fa ut, sol et re de D sol re, et

Mutation is the variation of one syllable into another. All syllables, however, are mutable (mutabiles), but sometimes more sometimes less. [...].

However, no mutation is made in Γ-ut, in A-re, in B-mi, and in ee-la, [and] that because in any one of the places themselves the syllable is alone. To be sure, where the syllable is alone a mutation cannot be made, since two syllables are required in every mutation about to be made (fiendo), namely one that is mutated, and another that is assumed [i.e., adopted] through the mutation itself. Moreover, in ʌ-fa / ʌ-mi [both] acute and superacute, no mutation is made, because a mutation has to be made necessarily through two syllables converging
sic de alis. Unde quom fa et mi in quovis loco numquam sint in uno et eodem sono, immo ab invicem distent maiori semitonio, est impossibile quod unum in alterum sit mutabile.

Nec praetereundem est quod mutationes inventae sunt propter digressum unius proprietatis ad aliam. Unde postquam aliquam proprietatem ingressus sumus, ante finalem eius vocem mutare nunquam debemus, et sic intelligitur quod rarius ac tardius ut fieri potest mutandum est; denique mutatione cuiuslibet vocis non est soni sed nominis ipsius. Unde quando solfisamus, tantum mutamus quia tunc voces nominatim exprimimus, namque solfisatio est canendo vocum per sua nomina expressio.

(Tinctoris p. 1477, ch. 7; Seay 1975–78, 2: 48, 52; CS 4: 10, 12-13)

in a unison, that is, because that syllable, which is mutated, and the other, which is assumed through the mutation itself, are in one and the same sound, like $fa$ and $ut$ from $C$-$fa$-$ut$, $sol$ and $re$ from $D$-$sol$-$re$, and so from others. Whence, [steps] with $fa$ and $mi$ are never [found] in one and the same sound in any place. More precisely, [since] they are mutually distant by a major semitone, it is impossible that one be mutable into the other.

It must not be overlooked that mutations have been invented because of a digression of one $proprietas$ into another. Whence, after we have entered in some $proprietas$, we should never mutate before its final syllable, and thus, be it known [that], insofar as it must be mutated, it can be made more rarely than tardy. Of course, mutation of any voice is not [mutation] of sound, but [mutation] of the name (i.e., syllable) itself. Whence, when we solmize, we only mutate because in this way we express the syllables by name, for in fact solmization ($solfisatio$) is to sing a syllable through its own distinct name.

(my translation)

In the sixth quotation (about sixty years later than the one drawn from Capuanus's treatise), some sentences invite clarification. For instance, in the sentence "All syllables, however, are mutable, but sometimes more sometimes less" ("Omnes autem voces sunt mutabiles, sed aliae plus aliae minus"), the qualification $mutabiles$ (as a possibility) allows for the understanding that 'any solmization syllable is prone to mutation.' Of course, the actual occurrence of a mutation will depend on the need for a hexachordal change, and on the possibility of pairing one syllable with another on the same step. In this light, the supplementary assertion "sometimes more sometimes less" might be interpreted as a
reference to "more" when there are more syllables in the same recta-step, and "less" when there are less syllables; i.e., in C-fa-ut there are less possibilities (only two: from fa to ut, and from ut to fa), but in c-sol-fa-ut there are more possibilities (up to six: from sol to fa, and vice versa, from fa to ut, and vice versa, from ut to sol, and vice versa). In the third paragraph, the assertion that "mutations have been invented because of a digression of one proprietas into another" ("mutationes inventae sunt propter digressum unius proprietatis ad aliam") is Tinctoris's way of rephrasing statements already provided by earlier theorists—e.g., Garlandia and Capuanus, quoted above, and Cochlaeus, quoted below. As mentioned in chapter 2, proprietas is taken as synonymous of hexachordal family: durum proprietas (all hexachords that contain the b-durum or its octaves), natura proprietas (all hexachords that contain no variety of b), and molle proprietas (all hexachords that contain the b-molle variety, or its octaves). In this capacity, a mutation from a G hexachord to a D hexachord would not denote a change (or digression) with regard to proprietas, since they both pertain to the durum-family (although one is a recta-hexachord, and the other is a ficta-hexachord). In all cases, however, one must remember that references to proprietas (in the above quotations) apply only to mutation within the recta-gamut, for these treatises are presenting only basic concepts about mutation. Thus, any mutation within a recta-only environment would necessarily represent a change in proprietas, since the only three types of recta-hexachords (G, G, and F) are also individual representatives of the three proprietates. If the clause was to include the ficta-gamut, it would need to provide a more generic statement, by saying that 'mutations had been invented because of a digression (a
change) from one hexachord into another,' thus allowing for changes between hexachords within the same family, as made clear the excerpt from Gaffurius's treatise (1496, bk. 1, ff. a vij; Miller 1968, 36) quoted above. Notice, however, that in most treatises mutation *per se* is first presented in its specific, restrictive sense as a procedure that applies to a *recta*-only context, and when a *ficta* context (or even a merged context) is meant, then another species of mutation is presented. Different species and subspecies of mutation (as well as the distinct types and cases that shape their differences) shall be discussed in the next chapter.

Tinctoris's quotation also elaborates on other explanations, such as on the idea that mutation must not be used unless absolutely necessary (as also stated before the Anon. Berkeley and Capuanus). Emphasizing this precept, Tinctoris goes further by asserting that if a mutation is inevitable, then the scrupulously chosen places of mutation must be as few as possible ("more rarely"—"*rarius*"), or else be delayed as much as possible ("more tardy"—"*tardius*").

Quid est mutatio? Est vniius vocis in aliam in eadem claue vnisona variatio. Vocem dico, non sonum, sed syllabam, quoniam idem est vtriusque vocis in eadem claue sonus, at non eadem syllaba: nec eadem proprietas. Mutatur itaque syllaba in syllabam et proprietas in proprietatem.

What is mutation? It is the change of one vocable (*vox*) into another on the same pitch. I call *vox* not a sound but a syllable, because the sound of each tone on the same key is the same, but the syllable and property are not the same. So one syllable changes into another and one property into another.

The two vocables *bfa* 5 *mi* are not a unison, and a mutation cannot occur on them properly. [...].

A mutation is made for three reasons:
1. In order to make a more pleasant melodic transition, in which the quality of a tone is changed no less frequently than the size of
permutata soni modulati quantitas. Secundo vt infra et supra vnnumquadque Hexachordum voces liceat intendi et remitti. Tertio ad faciliorem Diatesseron ac Diapente transitum in tonorum permixtione, Nam quilibet tonus octauam regulariter continet.
(Cochlaeus 1511–14, tr. 2, ch. 8, f. B v)
the tone.
2. To permit tones to go above and below a hexachord.
3. To facilitate the exchange of a fourth and a fifth in a mixture of Tones, for each Tone normally comprises an octave.
(Miller 1970, 42)

The seventh quotation (thirty to forty years after Tinctoris) denotes a stage of elaboration that attempts to summarize the essential aspects of mutation, at least according to Cochlaeus's understanding. In the first paragraph, in addition to rephrasing definitions based on earlier auctoritates, Cochlaeus strove to clear whatever ambiguity of meaning may have remained in relation to the term 'vox.' He then proceeded to enumerate of those aspects (considered decisive to understanding and implementing mutation). In the words "more pleasant melodic transition" ("suauioris modulationis transitum"), Cochlaeus is suggesting the same idea of seamless change implied by the anonymous Berkeley author in the clause "to change over smoothly with one mutation" ("cum una mutacione [...] commode transire"). Both clauses invite sensations and attitudes that may lead performers to obtain pleasantness or smoothness of solmization—whether that can be accomplished by avoiding mutations, implementing what has been prescribed, or even by forging an artificial situation, will depend on necessity, taste, or even ability.\footnote{The rhetorical appeals embedded in the original texts (in these as well as in most historical treatises) are certainly meant to impress subjectively whoever undertakes their study, in order to enhance the understanding with more compelling means than just objective definitions can provide.} He also mentions that mutation is done to implement a change of quality ("qualitas") on one specified sound ("sonus")—by which he
means a change in the "proprietas." Still with regard to the first item of Cochlaeus's enumeration, the words "quam permutata soni modulati quantitas" must be rendered with a different translation, generating the following sentence: "First, in order to make a more pleasant melodic transition, in which the quality (qualitas) of a tone is changed no less frequently than the quantity (quantitas) of the melodic sound"—by quantitas, Cochlaeus is referring to the number of syllables that each step utilizes in its full designation. In this light, the first statement means that 'in order to produce a seamless, natural, unambiguous mutation, one must observe the number of syllables in each step, so neither are the mutations done in a greater number (or more often) than necessary, nor are the proprietates (or the hexachords) changed more often (or in a greater number) than the step can admit.'

In the second item of his enumeration, Cochlaeus provides a more direct assertion that 'mutation is done in order to allow a solmization beyond the limits of only one hexachord,' for it is implied that melodies generally reach beyond the intervallic configuration and compass (tonus-cum-diapente) of the Guidonian hexachord. The third item also capitalizes on this new understanding.

96 In Cochlaeus's treatise, the terms qualitas and proprietias are used interchangeably. However, the term "proprietias" seems to entitle a different translation than Miller's choice of "property." A translation into "propriety" would seem more appropriate, when observing the differentiation between "proprietias" and "proprium" given by Gaffurius in his Practica musicae, a work which Miller has translated two years before Cochlaeus's treatise—cf. (Miller 1968, 33–34). Gaffurius (1496, bk. 1, ch. 4, f. a vi) specifically discusses the proper use of those terms, by saying that "proprietias" has an "abstract" sense ("abstractum"), and "proprium" a "concrete" sense ("concretum"). In his translation of Gaffurius's treatise, Miller chose to maintain the Latin form of those terms, instead of providing English renditions as he did with Cochlaeus's treatise. Nevertheless, Miller mentions that the source for Cochlaeus's treatise (at least for ch. 8 quoted above) was "almost certainly Gaffurius" (Miller 1970, 42n). (In another translation of Gaffurius's Practica musicae released roughly one year after Miller's, Irwin Young suggests that the term "proprium" should be translated into "property," and "proprietias" into 'propriety.') Throughout this dissertation, the untranslated word 'proprietas' has been preferred, having 'propriety' as its most appropriate translation when needed.
on the previous assertion, by emphasizing that melodies usually go beyond the hexachordal limits, since solmization often faces transitions between a *diapente* and a *diatessaron* (which characterize the modal contents of the music). The objective here, in fact, is to state that the performer (or even the theorist, or composer, or copyist) has to be able to aurally understand how to apply hexachordal solmization to the recognition of the appropriate mode that shapes the melody. These quotations shall then suffice as background information to more practical explanations about mutation.

As mentioned above (in the last section of chapter 2), mutation can be conceived as a procedure very similar to the modern concept of harmonic modulation from one key to another, in which one or more chords are chosen as mediators.\(^{97}\) In that type of modulation, the chosen chord (or chords) needs to be common to both keys, and therefore provides a link between them. The tonal function and label applied to the chosen chord, however, will vary with respect to which key is being considered (whether the previous or the subsequent key) at a given instant. Similarly, in order to make a mutation, one step must be chosen as mediator between the two hexachords involved in the solmization of that gesture and will need to pertain to both the previous and the subsequent hexachord, although its function and label (i.e., its individual step-designation by means of the solmization syllable) will vary with respect to each particular hexachord; i.e., the

\(^{97}\) Modern musicians who have learned some kind of 'moveable-do' solfege will also relate the process of mutation to a similar process of melodic modulation—e.g., when one must move the syllable 'do' to a pitch different than the one to which it was first applied, notably due to a tonal modulation—cf. (NHarvard 1986, s.vv. 'Fasola,' 'Solfège, solfeggio,' and 'Tonic Sol-fa'; NG 2e, s.vv. 'Fasola,' 'Solfeggio,' 'Tonic Sol-fa').
step-designation will vary in each hexachordal context by means of different solmization syllables. In many cases more than one step is eligible as a representative of mutation, but eventually only one step will be singled out to fulfill that role. For instance, if a step such as c-sol-fa-ut is chosen as an appropriate place of mutation, with a transition needed from the G-hexachord to the C-hexachord, then that step will bear the individual designation c-fa in the G-hexachordal context, and c-ut in the C-hexachordal context. Similarly, a mutation can be made from sol to ut if the melodic gestures imply that a transition has to be made, on that same step, between the F- and the C-hexachords.

Historical treatises presented mutations by explicitly describing every single mutation within a single recta-step, usually in one of three different ways: (a) sometimes the presentation spelled out the mutations for every single step throughout the entire gamut; (b) sometimes for only a few steps within a chosen octave, or some other intervallic span (implying that the others would follow the same procedure); or (c) simply for one or two steps with different designations (e.g., as exemplified in the quotation above from Capuanus for the steps from F-fa-ut to G-sol-re-ut). Through such presentations, authors emphasized not only the number (quantitas) of mutations that can be made (or admitted) within each step, but also that a mutation can occur in either direction; i.e., steps with two

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98 In the treatise Expositio manus (p. 1477), in the large part omitted in the quotation given above, Tinctoris produces yet another way of spelling out mutations. Although he additionally presents them by means of the (a)-type of presentation, Tinctoris presents all the possible mutations for each syllable, given the restrictions of the full designations of the recta-steps, mentioning a total of eighteen mutations: ut-fa, ut-sol, ut-re, re-sol, re-la, re-mi, mi-la, fa-sol, sol-la, which adds up to nine, and their converse, which adds another nine.
syllables in their designation admit two mutations (one ascending and the other descending), and steps with three syllables admit six mutations (three ascending, and three descending). The nomenclature of 'ascending' versus 'descending' is applied to the interval following the second syllable in a mutation (i.e., the syllable that is being reached or assumed), which often denotes also the direction in which the new melodic gesture will follow in relation to the previous melodic gesture. When the three lower syllables of the hexachord \((ut, re, mi)\) are reached, the melodic motion should ascend, since there is little room for a descent; conversely, when the three upper syllables \((fa, sol, la)\) are reached, the melodic motion should descend, for if the melody proceeded upwardly, then the limits of the hexachord could soon be reached or exceeded, and thus motivate the need for another mutation.\(^{99}\)

Therefore, these determinations about ascending or descending intervals (and the expected motions of the melodic gesture that occurs subsequently to the place of mutation) are essential to the concept of mutation (and to hexachordal recognition), illustrating the limits that theorists were trying to explain.

Nota quod omnis mutatio in ut, vel in re, vel in mi, desinens, talis dicitur ascendens. Similiter omnis mutatio in fa, vel in sol, vel in la desinens, talis dicitur descendens. (Garlandia p. 1240; CS 1: 160)

Notice that every mutation [with] endings in \(ut\), or in \(re\), or in \(mi\) are said, as such, [when in] ascending [motion]. Similarly, every mutation [with] endings in \(fa\), or in \(sol\), or in \(la\) endings are said, as such, [when in] descending [motion].

(my translation)

\(^{99}\) Additional explanations on those three-syllable subsets will be given in chapter 4.
Desinentes in ut vel in re vel mi semper ascendere dinoscuntur; sed omnes aliae mutationes in fa vel in sol vel in la desinentes, ubicumque fuerint, deprimuntur. (Petrus dictus Palma ociosa 1336; SIMG 15: 515–516)

[Mutations with] endings in ut or in re or in mi are always discerned in ascending [motion]; but all other mutations with endings in fa or in sol or in la are made in descending [motion] (deprimuntur, i.e., are pressed downward), wherever they may occur.

(my translation)

Et nota quod non debet fieri mutatio nisi causa necessitatis. Item sciendum est quod omnis mutatio quae fit in ut aut in re, aut in mi dicitur ascendendo, quia plus habet ascendere quam descendere; et omnis mutatio quae fit in fa aut in sol, aut in la dicitur descendendo, quia plus habet descendere quam ascendere. (Capuanus 1415; La Fage 1864, 315)

And notice that you must not make a mutation unless because of necessity. Likewise, it must be known that every mutation that is done in ut, or in re, or in mi, is said [when] in ascending [motion], because it has more to ascend than to descend; and every mutation that is done in fa, or in sol, or in la, is said [when] in descending [motion], because it has more to descend than to ascend.

(my translation)

These explanations about ascending and descending motions (of which Garlandia's seems to be the earliest) also recall Gaffurius's quotation of Aristotle on that subject given above (p. 112). Aristotle's original assessment reads:

Why is it more satisfactory to pass from a high to a low note than from a low to a high note? Is it because the former amounts to beginning at the beginning, for the mese, or leader, is the highest note in the tetrachord? But in passing from a low to a high note one begins not at the beginning but at the end. Or is it because a low note is nobler and more euphonious after a high note?

(Aristotle Problem. 19.33; [trans.] Forster 1984, 1434–1435)

The assessments (in all the above quotations) also function as rhetorical and philosophical explanations of sensations and attitudes the performer was expected to perceive and achieve, in order to facilitate the practice of mutation in particular and of solmization as a whole. The next section will provide appropriate melodic illustrations for
mutation and its processes of execution, while suggesting some guidelines that might enable the smoother way to 'mutate.'

(ii) Mutation (basic cases, processes and guidelines)

One of the first problems faced by performers during solmization is 'where to mutate,' i.e., determining the exact place of mutation. In the most basic process (or case), as asserted in the quotations above, a performer would be required to think of one syllable (from the hexachord being solmized) and immediately utter another (based on the subsequent hexachord). There were of course other ways for executing a mutation, as shall be explained below, but the 'mental' process described in the following quotations was regarded as the most effective and appropriate.

De Mentalj vocum mutatione.
Caput IX.

Quid est mutatio Mentalis? Est quando vna vocum canitur et altera mente tenetur. Aptior est haec mutatio quam prior, Exprimere nanque ambas syllabas est notam geminare: quod nec auribus gratum est, nec cantui conueniens: Immo vero in cantu mensurali omnino intolerabile in minutis presertim figuris, vbi velocitas notarum geminationem non admitteret. Quare a mutatione explicita solummodo est incipiendum. In implicita vero perseuerandum, eique asuescendum.
(Cochlaeus 1511–14, tr. 2, ch. 9, f. B vi

CHAPTER 9
Mental Mutation of Vocables

What is a mental mutation? It means to sing one vocable and to keep the other in mind. This kind of mutation is more suitable than the prior kind, for singing both syllables means singing the same note twice, which is neither pleasing to the ears nor fitting in a song. Moreover, in mensural music it is completely intolerable, especially in smaller note values in which the speed of the notes does not allow a repetition of the same note. Thus explicit mutation is considered only as a beginning, but implicit mutation is its continuation and practical application.
(Miller 1970, 43)
CHAPTER THREE
ON THE MUTATION OF SYLLABLE
which is extremely necessary
to Solmization

Musical mutation is [when] one syllable [is made] into another, in the same step-letter, [it is] a variation on the unison, due to a paucity of syllables and to conspicuous surplus of melody. With respect to that, two syllables are necessary: one is called "mutated" (mutata), which is omitted in the mutation, and the other [is called] "mutant" (mutans), which is adopted in lieu of the mutated syllable.

Therefore, mutation is twofold: Explicit (or Simple), in which both the mutant and the mutated syllable[s] are articulated, [where] one vowel is said through another name; Implicit (or Intricate) or mental is [that] in which one syllable is sung and the other is kept in the mind. The latter is more efficient than the former, for in fact to articulate both syllables, is to double the notes, because it is neither pleasing to the ears, nor convenient to singing. Indeed, in measured music (cantus mensuralis) [it is] completely intolerable, especially on the smallest note-shapes (figurae), where the speed of the notes do not allow doubling.

Given the context described by both Cochlaeus and Rhau, the "explicit" case of mutation was not the most usual procedure, and the "implicit" case of mutation was the preferred and most common. Although these two quotations were drawn from humanistic-inspired sixteenth-century treatises, there is no reason to assume that mutations
were executed by any other means. At least as early as the mid-thirteenth century, similar assertions can be found in which the 'explicit' is hardly mentioned, and the definitions of mutation *per se* are based rather on the 'implicit' case—e.g., as in the assertion, quoted above in p. 115, that "mutation [...] is nothing more than the dismissal of one syllable for the sake of another" ("mutatio [...] nihil aliud est quam dimissio uocis unius propter aliam"), provided by Lambertus (ca. 1260's/1270's; *I-Sc* L. V. 30, f. 17r; my translation). As both Cochlaeus and Rhau explain, the primary reason for favoring a "mental" or "implicit" mutation (instead of "explicit" mutation) is rather obvious: one cannot sing two syllables at the same time on the same note, unless the note is fractioned (divided) into two (which would be even more confusing when the rhythm is already prescribed—as in "measured music"). Nevertheless, there is no doubt that 'explicit' mutation is the easiest process, and the simplest manner of execution, since both syllables are uttered, one after the other. This character of ease and simplicity seems corroborated in Cochlaeus's assertion, given above, that "explicit mutation is considered only as a beginning" ("mutatione explicita solummodo est incipiendum"), which leads to the interpretation that 'explicit mutation' may have been common practice among students in their earliest stage of learning.\(^{100}\) In light of this, the viability of 'explicit' mutation is the first procedure one must consider in solmization, and since one needs to utter consecutively two syllables on the same step, one of the best places must be at note-repetition instances. Thus, the first guideline concerns the appropriate choice for a mutation-step that will enable execution of the easiest and simplest case of

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\(^{100}\) This is a stage of learning previous to that first stage of reading discussed in chapter 2 (ii).
mutation ('explicit'): in order to mutate, the reader is advised to look for places where there is a repetition of one single step consecutively, or else where there is a unison note-repetition. Such a guideline might even provide some insight regarding the interpretation (performance inflections) of note-repetitions in plainchant-melismas. Certainly neither all repeated (or repercussive) notes in a chant are definite signs for mutation, nor an 'explicit' mutation may explain all instances of note-repetition (whether in monophonic or in polyphonic performance). However, when a note is repeated and can be chosen as a step for mutation, then the first note will naturally be solmized according to the previous hexachord, and the second note according to the hexachord that follows. The next quotation, from Ornithoparchus's *Musice active micrologus* (1517) corroborates the idea that note-repetition is appropriate for 'explicit mutation' (which he calls "vocall").

> Mentalis, non vocalis mutatio facienda est, nisi due vt tres note ponantur in eodem loco mutabili. (Ornithoparchus 1517, bk. 1, ch. 6, f. C [i])

> You must make a mentall, not a vocall Mutation, unlesse two or three Notes be put in the same place that receiues Mutation. (Dowland 1609, 17)

Statements given in this and previous sections also indicate that a mutation is a change of syllables that depends on the unison. Since the performer has to be able to maintain the unison, repeated (stressed) notes are a good place for executing a mutation. The reason for this is that a mutation can only happen when the performer has a clear perception of the sound of the chosen step—thus, mutation is also dependent on the memory of the sound itself. Consequently, the best place for mutation is on a step that can be well-ingrained (aurally) in the mind of the performer (whether or not it occurs as consecutively repeated notes). In other words, a step that frequently recurs in the course of
the piece (monophonic or not) has better chances of serving as a mutation-step (for it is aurally remembered with more ease) than another step that appears only a few times in the whole work. Thus, a second guideline (concerning aural perception) may be inferred: in order to mutate, the reader should preferably choose among those steps that predominate (aurally) throughout the entire piece. In relation to modes (ecclesiastical or not), steps that are notable candidates for mutation might be found not only among those that tend to be repeated, or that tend to polarize the melody (e.g., the 'dominans' of a mode), but also those that serve as the ultimate referential steps for determining the mode itself (e.g., the 'finalis' and 'cofinalis'); this may be extended to include steps that serve to emphasize any of the primary ones.  

Although no reference was found in the course of this research (either in medieval or Renaissance treatises) that explicitly assigned mutations to dominantes, finales, cofinales, or the like, the aural prominence of these notes is frequently a sufficient reason to use them as possible mutation-steps. In another approach, it may be said that if two

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101 The Latin term 'dominans' (or its modern equivalent 'dominant'), when applied to modes, indicates those steps which are most likely to be repeated in a psalm-tone formulae, or, as mentioned above, to dominate or polarize a melody around itself. Medieval authors usually referred to these polarizing modal steps by terms such as 'tubae,' 'tenores,' and others (but scarcely 'dominans' itself). Modernly, the English equivalent 'dominant' has been adopted by some influential scholars—cf. (Apel 1958, 135–137 ff.; Hoppin 1978, 64–67); although a greater number of other scholars seem to have preferred the Latin 'tenor'—cf. (NHarvard 1986, 499–501, s.v. 'Mode'; Atlas 1998, 94–97; Harold S. Powers, in NG 2e, s.v. 'Mode,' esp. § II–III). Even though 'tenor' seems to be a more convenient term, it also seems more confusing, since that same spelling has two other meanings: as a voice-register (tenor); and as 'recitation tone.' The English spelling of the former term ('dominant') also presents confusions, mostly because of its application as a chord function (or as a functional region) in modern harmonic analyses. In this dissertation, the Latin spelling 'dominans' has been adopted since it emphasizes the meaning as a pivotal step; one that polarizes the melody around itself. Besides the 'dominans,' however, a modal melody may occasionally rely on other recurrent, circumscribing steps, which can just as well be considered for mutation.
interlocking hexachordal gestures involve any of them, and if they are considered among the possible places for mutation, then the choice will more likely fall there than on any other step. Connections between modes and hexachords—found in some treatises from the late-thirteenth and early-fourteenth centuries—are usually restricted to the use of solmization syllables as means for the description of modal structures, or as means for the denomination of referential steps within a mode. The latter situation occurs, for example, in relation to the *finales*, for which specific solmization syllables are assigned: *re* to the *protus*, *mi* to the *deuterus*, *fa* to the *tritus*, and *sol* to the *tetrardus*. There were, of course, historical treatises that described modal structures by means of solmization syllables—most emphasizing the intervallic formation or representative octave-scale of each mode. There were also other treatises showing assertions that solmization depends on the prior identification of the mode upon which the melody is composed. In all cases no mutation or specific procedures to solmize modes is given (only solmizations syllables serving as means of description). For instance, in the chapter "De solfizatione regule" (lit., "On the rules for solmization," or "Of Solfaing" according to John Dowland's translation)

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102 The earliest explicit references, in this fashion, connecting hexachordal syllables to the 'finales' ('finales'), and to the 'cofinales' or the like ('affinales' or 'confinales,' and also 'consociales' or 'sociales'), are those found in Hieronymus de Moravia's *Tractatus de musica* (p. 1272, ch. 21; CS 1: 77–78), and Jacobus Leodiensis's *Speculum musicae* (p. 1330, bk. 6, ch. 75; CS 2: 313; Bragard 1973, 6: 217). See also Harold Powers's entry in *The New Grove Dictionary* (NG 1, 12: 391–396, esp. § II.4; NG 2e, s.v. 'Mode'), and Dolores Pesce's *The Affinities and Medieval Transposition* (1987)—the latter is an invaluable work (in both assessments, references, and documentation) on modal concepts and their correlations with hexachords, solmization, and *ficta.*
of his treatise, Andreas Ornithoparchus presents a set of twelve rules, of which the first and the fifth are quoted below.

**Prima.** Solfizans cantum aliquem, pre omnibus tonum respiciat, necesse est. Toni enim cognitio, est schale: sub qua cantus decurrit, inventio.

...]

**Quinta.** Omni solfizanti videre erit necessarium, an cantus regularis existat, nec ne. Cantus enim transpositio, *mutationis* schale plerumque est occasio.

(Ornithoparchus 1517, bk. 1, ch. 5, f. B iiij–[ivj])

(underline mine, italics in original)

As in other previous quotations, the assertions from this mid-Renaissance treatise were also derived from the same precepts followed by medieval theorists, and were still being used by later generations. Notice, however, that the identification of certain modes...

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103 Ornithoparchus's set of "rules for solmization" also provided the basis for Lanfranco's, who elaborates on them, and addresses the singer more directly than Ornithoparchus. Lanfranco also divides the rules in two groups appearing in two different sections of his *Scintille di musica* (1533): one group of rules is entitled "General rules for solmization" ("Regole generali per la solfizatione"; pt. 1, f. B [i\(\dagger\)]); and the other "Of some rules for the singer" ("Di a'cune regole per lo Cantante"; pt. 3, ff. G [viii\(\dagger\)]–H [i\(\dagger\)]). Still another similar set of rules is given in Johannes Spangenberg's *Quaestiones musicae* (Nuremberg, 1536).

**Prima.** Solmisans in primis tonum cantus respiciat necesse est. Qui enim cantum sine toni agnitione canit, idem facit quod is, qui Syllogismum extra modum & figuram componit.

(Spangenberg 1536, f. B7\(\dagger\))

First rule: He who *solmizes* must first consider the mode essential to the music, for, he who gives a melody, ignorant of its mode, acts as does he who composes a syllogism in defiance of the correct procedure and form.

(Allaire 1972, 62)

(italics original to Allaire's translation)

(cont. ...)
(and not only the description of their octaves, or referential steps, by means of Guidonian syllables) has certainly additional consequences for solmization, other than the supposition that they may influence the choice of mutation-steps. To be sure, there are modes that rarely (or never) make use of the molle hexachord (i.e., that rarely have any \( \overline{b} \) in their melodies), such as the tetrardus or deuterus modes, just as there are modes that more often use the molle hexachord—such as the tritus and protus modes, especially in their arrangement as autenticus modes—unless they are transposed.

However, it is not only the proper memory of the sound that has to be considered as a mutation-factor, but also the deduction of the intervals surrounding the place of mutation and the recognition of each hexachordal gesture. These must be carefully observed, and since they might take a larger fraction of seconds to be perceived, the performer needs (or needed) to adapt him/herself to each situation. Thus, the best places for mutation are also those in which the score-reader can take time to conceive, aurally and rationally, the changes of syllables and intervals, while committing to memory the previous sound. In light of these considerations, two supplementary guidelines can be inferred. The third guideline is: if possible, the reader may choose to mutate after a rest. Thus the step before the rest will be solmized according to the previous hexachord, and the step after, according to the new

Spangenberg's text, clearly based on that of Ornithoparchus, elaborates further on the "rules of mutation" and expands their number from twelve to eighteen items. One example of Spangenberg's elaboration is given in the first item, above, in which he compares the so-called 'ignorance of the mode' (during solmization) to a kind of defiant (or false, deceptive) "syllogismus" (or else a 'sophisma'). Rhetorical tools like this may cast a more pronounced speculative background on Spangenberg's work, notably differentiated from the works of both Ornithoparchus's and Lanfranco's, whose presentations are aimed at more practical concerns.
hexachord. It seems safe to assume that this guideline holds true for rests that are not too long (perhaps no more than one or two tempora), or the memory of the previous step could be weakened. The appropriate length of the rest has to be considered in accordance with each situation (melodic, rhythmic, or even harmonic), as well as adapted to the aural and technical ability of each performer. The fourth guideline is: longer note-values allow more time for mutation than shorter note-values. This suggestion arises as the logical converse of Cochlaeus's and Rhau's statements on 'explicit' mutation. If an 'explicit' mutation cannot happen in smaller note-values, it seems to be unequivocally feasible on longer note-values. (Longer note-values, however, do not ensure the execution of an 'explicit' mutation, for it imposes a solmization that would reinflect, rearticulate a single note: a result condemned by the great majority of the theorists, unless the note is repeated.) Similar to what was said in relation to rests, the appropriate length of the note-value is informed by the situation and context of each single piece—it seems, however, that one should discard (as places of mutation) note-values smaller than a minima (unless, perhaps, when it is a minima alterata).

Hitherto, mutation has been presented only within the context of musica recta, though all the concepts and guideline-suggestions above may be applied to musica ficta as well. Nevertheless, before proceeding to more specific topics related to ficta, some practical examples may help understanding solmization, and mutation exclusively within a recta-context. In the following example (FIG. 3.1), two distinct melodic gestures denote two hexachords: the C-hexachord (first gesture), and the C-hexachord (second gesture).
FIGURE 3.1 - Mutation from a $\text{C}$-hexachord to a $\text{G}$-hexachord.

In FIG. 3.1, the mutation may stand as an example for the first, second, third and fourth guidelines given above. For instance, the one recta-step involved in the mutation (d-la-sol-re) is uttered consecutively by means of two distinct syllables (re and sol); thus constituting an 'explicit' mutation as described by Cochlaeus and Rhau and, since it is made on a repeated note, agrees with the first guideline given above. In the melody itself, which represents Mode 7, d-la-sol-re may be characterized as its 'dominans'—thus, a mutation on the 'dominans' (agreeing with the second guideline). The two hexachordal steps involved in the mutation (d-re and d-sol) are separated by a stroke indicating a caesura (i.e., a brief pause); thus following the concept that a mutation (whether or not 'explicit') may benefit from the presence of a pause (agreeing with the third guideline). At the same time, the d-la-sol-re may be understood as a lengthened step, not only because of its repetition, but also because it involves a natural prolongation at the last note of a plainchant-like phrase (as indicated by the dot). It is a mutation that involves a longer note-value (agreeing with the fourth guideline). The next three musical illustrations (FIGS. 3.2, 3.3, and 3.4) are closely derived from FIG. 3.1. All make use of the 'explicit' case of mutation (allowed by the repeated d-la-sol-re), and their first melodic gesture is the same (naturally with the same
solmization). They differ, though, in the second melodic gesture, which introduces a few melodic variations in the middle portion of the gesture (although it preserves the first step at the beginning and the last six steps), and (in FIGS. 3.3, and 3.4) also introduces the use of ficta-signs within a recta-context.

FIGURE 3.2 - Mutation from a $\text{C}$-hexachord to an $\text{F}$-hexachord.

In FIG. 3.2, there are again two hexachords used in the solmization: $\text{C}$-hexachord (for the first gesture); and $\text{F}$-hexachord (for the second gesture). Since an 'explicit' mutation involves two distinct step-syllables being uttered on a unison, each solmization syllable is represented in this dissertation as follows: the syllable pertaining to the first hexachord (with an equals sign to its right side) is written above the first step; the syllable pertaining to the second hexachord (with an equals sign to its left side) is written above the second step—thus, the mutation is read $re=sol$ in FIG. 3.1, and $re=la$ in FIG. 3.2.104 Given the

104 In this dissertation, the following representation of a solmization has been adopted. First, each hexachord is indicated by a capital letter (which indicates where the syllable $ut$ would fall) framed by a colon to its right side and two horizontal lines above and below (i.e., both an underline and an overline). As explained briefly in chapter 1 (note 40), the resulting symbol is intended as a module pitch-letter (similar to a number-module in the mathematical sense), through which no octave determination should be understood (e.g., $\text{C}$-hexachord indicates a hexachord whose $ut$ falls on any C, in any octave). Second, a row of solmization syllables is written above each step solmized according to that hexachord. Third, when a mutation happens, the row of syllables of the second hexachord is not written on the same line (or layer) of
compass and intervalllic configuration of the second gesture in Fig. 3.2, solmization should naturally be made according to the $\overline{\text{F}}$-hexachord, which elicits the syllable $fa$ on the $b$ place (producing a $\frac{1}{2}-fa$—equivalent to modern $b\flat$), even though no $fa$-sign has been notated.105

The first gesture, however, allows for two different solmization options: one according to the $\overline{C}$-hexachord (as indicated above), and the other according to the same $\overline{\text{F}}$-hexachord employed for the second gesture (which shall be now discussed). If the $\overline{\text{F}}$-hexachord solmization is adopted for the first gesture, three alternatives must be considered for the actual solmization, since the four higher notes in that melodic gesture ($f, f, g, f$) lie outside that $\overline{\text{F}}$-hexachord. First, at least the six initial notes would be solmized according to the $\overline{C}$-hexachord (as $ut\ fa,\ fa,\ sol,\ fa$), and a mutation to the $\overline{\text{F}}$-hexachord would be made on the seventh note ($d-la-sol-re$). This would constitute an 'implicit' (or 'mental') mutation, in which $d$ would be initially thought as $re$, but uttered as $la$. This first alternative seems possible, but it would not benefit from the smoothness of an 'explicit' mutation and would divide the first gesture in two parts. The $\overline{C}$-hexachord solmization would both preserve the cohesiveness of the phrase at the solmization level and maintain a seamless transition to the next phrase (not only because it would be an 'explicit' mutation, but also because it would be a mutation made between phrases, where a hexachordal change can be less conspicuously perceived). The second alternative would involve two $\text{recta} \overline{\text{F}}$-hexachords, an octave apart

the previous row of syllables (pertaining to the first hexachord), but rather one layer above. Fourth, mutation-syllables always bear an equals sign (to the right side of the syllable pertaining to the first hexachord, and to the left side of the syllable pertaining to the second hexachord).

105 By the same token, since the second gesture in Fig. 3.1 denotes a $\overline{\text{C}}$-hexachord solmization, its bs are all $\frac{1}{2}-mis$ (equivalent to modern $b\flat$).
from each other: the solmization would start with the lower $\text{F}_\text{I}$-hexachord (with the syllables *sol* and *la*, for the first two notes); then proceed with the higher $\text{F}_\text{II}$-hexachord (with the syllables *ut*, *ut*, *re*, and *mi*, for the four higher notes); and finally returning to the lower $\text{F}_\text{I}$-hexachord (for all the remaining notes of the melody). However, this second alternative would provide no common-step for mutation between the two $\text{F}$-hexachords—that is, the change from d-*la* to f-*ut* (second to third note), and back from f-*ut* to d-*la* (sixth to seventh note) has no common-step and, therefore, no actual mutation can be made. The third alternative would use the same solmization syllables suggested in the second alternative, but applied to those four higher notes according to the concept of octave equivalence.\(^{106}\)

Although octave equivalence needs no mutation to be implemented, and those four higher notes show only two steps (f-*ut* and g-*re*), it seems excessive to impose that kind of solmization concept upon forty percent of the first gesture. To be sure, octave equivalence is proposed only for ephemeral step-occurrences with conspicuous octave references within the main hexachord (in this case, within the lower $\text{F}_\text{I}$-hexachord) implemented beforehand.

For all these reasons, it seems better to use only the $\text{C}_\text{II}$-hexachord option for the solmization of the entire first melodic gesture (as indicated in **FIG. 3.2**).

Having illustrated these solmizations and related mutations, another two illustrations (**FIGS. 3.3**, and **3.4**) will be presented, still working within a *recta*-only context, but with intervening *ficta*-signs duly notated. In fact, the function of a *ficta*-sign is twofold: (a) a *ficta*-sign may contradict a melodic gesture, by forcing the solmization into a different

\(^{106}\) According to what has been exposed in chapter 2 (iv).
hexachord than the one expected (the most common situation); or (b) it may serve to elucidate the hexachordal solmization in an otherwise unclear or ambiguous melodic gesture. In other words, ficta-signs are used to enforce syllables or to implement a solmization according to a particular hexachord. This is in fact their true significance and primary function, a 'solmization significance' that enforces a 'hexachordal function.' For instance, on the one hand, if a $b$ is positioned on the staff-place of ee (equivalent to modern $e''$), it will produce the solmization $ee-fa$, which can only pertain to the $\text{Gb}$-hexachord (thus, the resulting step is equivalent to the modern, inflected pitch $e''$). On the other hand, if a $b$ is positioned on the staff-place of ff (equivalent to modern $f''$), a step that did not exist in the a recta-gamut, then it will be ascertaining (to any note-shape falling on that place) only a solmization as $ff-fa$, pertaining exclusively to a ficta $C$-hexachord (but which is still equivalent to the modern, non-inflected $f''$). Although ficta-signs may present a 'momentary accidental function,' they cannot be identified with any accidental (in its modern context). When they do enforce accidental-inflections, it happens only as a subsidiary consequence (or byproduct) of hexachordal solmization, and not as a direct result of their significance or primary function.

In FIG. 3.3 below, the hexachords that frame the 'explicit' mutation are: the $C$-hexachord (first gesture) and the $F$-hexachord (second gesture). Both gestures have the same melodic outline presented in FIG. 3.1, except for the present of a $fa$-sign (♭) placed immediately before the second gesture. In FIG. 3.1 (with no ficta-sign), the second gesture was solmized according to the $C$-hexachord; in FIG. 3.3 (with a sign enforcing a $b-fa$), the
hexachord is the one that must be solmized (since it is the only hexachord to which a $b$-fa can pertain).

**FIGURE 3.3** - Mutation from a $G$-hexachord to an $F$-hexachord, forced by a *ficta*-sign.

\[
\begin{align*}
\text{\textbf{$F$}:} & \quad \text{\textit{la sol mi sol fa resol la sol sol fa remimire}} \\
\text{\textbf{$G$}}: & \quad \text{\textit{ut re fa fa sol fa reut ut re=}} (b) (b)
\end{align*}
\]

In **FIG. 3.4**, there are two 'explicit' mutations, with three hexachords involved in the solmization: $G$-hexachord (first gesture); $F$-hexachord (first part of the second gesture); and $G$-hexachord (second part of the second gesture). Both gestures have the same melodic outline presented in **FIG. 3.2**, except for the presence of a *mi*-sign ($\flat$) that divides the second gesture in two distinct hexachordal parts. Although in **FIG. 3.4** the second gesture initially requires an $F$-hexachord, the *mi*-sign on the b-line (positioned between G-re and a-*mi*) indicates a change in the intervallic configuration, and therefore that the $F$-hexachord can no longer be utilized, thus requiring a necessary mutation to accommodate the $G$-hexachord thereafter (the only hexachord that includes a syllable *mi* on the b-position). The alternatives for appropriate place of mutation, in this situation, could be chosen on any place before reaching the actual $b$-*mi*, and after F-*ut* had been solmized (since there is no correspondent syllable for the step-letter F within the $G$-hexachord). The most appropriate place is clearly where there is a note-repetition, immediately after the *mi*-sign,
producing a change of hexachord (an 'explicit' mutation) between a-
mi (for the
F-hexachord) and a-re (for the G-hexachord), thus, mi=re. All of the other notes between
F-ut and z-mi do constitute common-steps for the two hexachords, and could as well be
utilized in the mutation; but they must be discarded as secondary alternatives, since they
show no immediate repetition, allowing only an 'implicit' case of mutation.

**FIGURE 3.4** - Mutation from a C-hexachord to an F-hexachord, then to a
G-hexachord forced by a *ficta*-sign.

Based on the last two examples above, and on the idea that the function of
*ficta*-signs is to enforce solmization-syllables and their correspondent hexachords,
a fifth guideline may now be inferred: a *ficta*-sign may serve to indicate the proximity of a
place of mutation, which can be done either after or before the actual position of the sign,
but must be done before the note whose syllable has been enforced (changed or confirmed)
by the sign—this applies whether the sign is a *fa*-sign (b), or a *mi*-sign (b, or *, or #). This
function of signs is well-attested in the Berkeley Manuscript, where three reasons for
implementing a mutation are enumerated.

148
Preterea fit tripli racione, scilicet racione vocis, racione signi, aut racione utriusque simul. Racione vocis quoniam ut est infima, la vero vox suprema, ultra ut descendere et ultra la ascendere, de quacumque voce nemo potest nisi ea dimissa et locus eius inferiori pro ascensu aut superiori pro descensu assumpta. Racione signi fit quando superveniens signum b seu # mutat incepti cantus proprietatem [...]. Racione utriusque fit propter nimium ascensum vel descensum, una cum aliquo supervenienti signorum dictorium.

(Anon. Berkeley 1375, tr. 1, ch. 2; Ellsworth 1984, 48)

Further, this [i.e., a mutation] is done for three reasons: by reason of the syllable, by reason of the sign, or by reason of both together. By reason of the syllable--since ut is the lowest and la is the highest syllable--no one from any syllable can descend below ut or ascend above la unless the syllable has been left and its place assumed by a lower one for ascending or a higher one for descending. By reason of the sign, mutation occurs when the insertion of the signs b or # changes the property [proprietas] of a song that has already begun [...]. By reason of both, mutation occurs because of too great an ascent or descent together with any insertion of the said signs. (Ellsworth 1984, 49)

(The interpolation and ellipsis mine)

The first item ("by reason of the syllable") refers to situations when a melodic gesture reaches its limits (lower at ut, or higher at la). The second clearly refers to the use of ficta-signs serving as indications (enforcers) of change between hexachords (or rather, proprietas, since here the recta-context is the only basis for discussion). The third item then establishes that both melodic gestures and ficta-signs can serve the same purpose: defining hexachords and indicating the mutations. The next illustration (FIG. 3.5)—an excerpt in its original notation from a treatise by Guillaume Guerson [also called, Guillermus Guersonus de Villalonga]—presents both 'explicit' and 'implicit' mutations, with ficta-signs used for the definition of hexachords. Its arrangement follows the author's descriptions for all mutations of each single recta-step, and shows the last mutation (re-sol) that Guerson illustrates for g-sol-re-ut, followed by the first three mutations (la-mi, mi-la, la-re) for aa-la-mi-re. These three are introduced by the words that run from the first to the
second staff, and read: "In a la mi re sunt sex mutationes" ("In [a]a-la-mi-re there are six mutations").

**FIGURE 3.5** - Excerpt from Guillaume Guerson's *Utillissime musicales regule* ([ca. 1495], ch. 3, f. b iii).

The first four notes in **FIG. 3.5** constitute the remainder of a gesture (which began on the previous folio—f. b 3) that denotes the $\text{F}$-hexachord (ending on the syllable re), followed by an 'explicit' mutation to the $\text{C}$-hexachord (beginning on the syllable sol). That gesture denoting the $\text{C}$-hexachord (which ends on the syllable sol of g-sol-re-ut) is then linked to the last gesture on the first staff, which again denotes the $\text{F}$-hexachord. The mutation between those two hexachords is made on a non-repeated note (thus an 'implicit' mutation on the step aa-la-mi-re), in which the syllable la (pertaining to the $\text{C}$-hexachord) is only mentally conceived, and the syllable mi (pertaining to the $\text{F}$-hexachord) is the one actually uttered. The next change between hexachords is also an 'implicit' mutation, indicated at the beginning of the second staff by the syllables mi (according to the
\(\text{F-}\text{-hexachord}\) and \text{la} (according to the \(\text{C-}\text{-hexachord}\)), where \text{mi} is mentally conceived and \text{la} is uttered. The last hexachordal change in the example is an 'explicit' mutation, in which the syllable \text{la} (pertaining to the \(\text{F-}\text{-hexachord}\)) is solmized in the first gesture, and the syllable \text{re} (pertaining to the \(\text{G-}\text{-hexachord}\)) is solmized in the second gesture. Notice that the compass of the last melodic gesture ranges from \text{g-sol-re-ut} to \text{dd-la-sol} (only a fifth), which could be an indication that either the \(\text{F-}\text{-}\) or the \(\text{G-}\text{-}\text{-hexachord}\) should be taken for solmization. If the melody was presented with regular notation (with no indication of syllables), and considering that the previous solmization involved only the \(\text{F-}\text{-}\) and \(\text{C-}\text{-}\text{-hexachords}\), an \(\text{F-}\text{-}\text{-hexachord}\) solmization for that last gesture might have seemed appropriate. It is the presence of the \text{mi-}\text{-}\text{-sign (}\text{sign}\)) that prevents any other solmization and enforces the \(\text{G-}\text{-}\text{-hexachord}\), in accordance with Berkeley's second reason for mutation. Similarly, the presence of the \text{fa-}\text{-}\text{-sign (}\text{sign}\)) in the first staff served as a clarification for the solmization of the \(\text{F-}\text{-}\text{-hexachord},\) although the melodic gesture itself (whose compass ranges from \text{f-fa-ut} to \text{dd-la-sol}) would be a sufficient indication for that hexachord, in accordance with the third reason given by the Berkeley anonymous. In order to make these explanations clearer, Guerson's illustration is transcribed below (\text{FIG. 3.6}), with solmization-syllables for each step, including those involved in the mutations presented in Guerson's treatise.

As attested in the quotations of Cochlaeus and Rhau above, an 'implicit' mutation is executed on a single step by mentally conceiving the syllable of the first hexachord and uttering the syllable of the second. Frequently, however, on the note that immediately precedes the place of mutation, it seems appropriate to be already thinking (i.e., 'mentally
anticipating') the syllable of that second hexachord, while the last syllable of the first hexachord is still being uttered.

**FIGURE 3.6** - Mutations ('explicit' and 'implicit') involving the three basic recta-hexachords. Solmization syllables in boldface were given in the source (Guerson [ca. 1495], ch. 3, f. b iii').

The 'implicit' mutation from the C-hexachord back to the F-hexachord (first staff) is executed on aa-la-mi-re through the syllables la and mi (according to Guerson’s determination); nevertheless, the note before (g-sol-re-ut) could as well be used for that mutation, notwithstanding Guerson's agenda to show a mutation (a first exchange of syllables) on aa-la-mi-re. Therefore, it seems appropriate that the actual mutation on aa-la-mi-re be anticipated by a virtual mutation on g-sol-re-ut, which is still being solmized with the syllable sol (according to the C-hexachord), but which can also support a non-uttered (aurally conceived) syllable re (according to the upcoming F-hexachord). On the following 'implicit' mutation (second staff, from the F- to the C-hexachord), however, the
same anticipation cannot happen, for the step that immediately precedes the place of mutation is b-fa (which, as unanimously declared by the theorists, does not constitute a proper step for mutation of any kind).  

In order to establish an appropriate nomenclature for the two syllables that are always involved in any mutation, one may look into Rhau's propositions (also on p. 134).

(Mvtatio musica, est unius vocis in aliam, in eadem clauae, vnissona variatio, ob vocum paucitatem et cantus pluralitatem reperta. Ad quam dueae necessariae sunt voces. Vna dicitur mutata, quae per mutationem relinquistur. Altera mutans, quae loco vocis mutatae assumitur.

Est igitur duplex mutatio, Explicita, in qua vox mutans et mutata ambae exprimuntur, haec alio nomine vocalis dicitur. Implicita siue mentalis est, in qua vna vocum canitur et altera mente tenetur. (Rhau 1517, ch. 3, f. C ii–v)

Musical mutation is [when] one syllable [is made] into another, in the same step-letter, [it is] a variation on the unison, due to a paucity of syllables and to conspicuous surplus of melody. With respect to that, two syllables are necessary: one is called "mutated" (mutata), which is omitted in the mutation, and the other [is called] "mutant" (mutans), which is adopted in lieu of the mutated syllable.

Therefore, mutation is twofold: Explicit (or Simple), in which both the mutant and the mutated syllable[s] are articulated, [where] one vowel is said through another name; Implicit (or Intricate) or mental is [that] in which one syllable is sung and the other is kept in the mind. (my translation)

As stated above, the first mutation-syllable should be called "mutated" ("mutata"), and the second mutation-syllable should be called "mutant" ("mutans"). In his treatise, Rhau applies this nomenclature to both 'explicit' and 'implicit' mutation—the former

\[\text{107 In this dissertation, the following representations were adopted for the solmization of syllables in the 'implicit' mutation.} \]

\[\text{The first one (which is mentally conceived, not uttered) is represented by a solmization syllable (with an equals sign to its right side) enclosed in square brackets—e.g., } [r=], \text{ or } [k=], \text{ etc.} \]

\[\text{The second one (which is actually uttered) is represented by a solmization syllable (with an equals sign to its left side) that is not enclosed in brackets (just as the second syllable in the 'explicit' mutation)—e.g., } =\text{sol}, \text{ or } =\text{mi}, \text{ etc.} \]

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occurring when both syllables are uttered, and the latter occurring when the
‘mutated’-syllable is dismissed and only the ‘mutant’-syllable is uttered. (This dissertation
will follow the ‘mutated’/‘mutant’ terminology suggested by Georg Rhau.)

In most historical treatises, the definitions given for mutation generally can be
identified with descriptions applied to the ‘implicit’ case, whereas descriptions based on the
‘explicit’ case are rarely suggested.\(^\text{108}\) Also, before Rhau’s use of the terms “mutata” and
“mutans,” there seems to have existed no consistent effort in creating an appropriate
terminology that could at once identify and define the function of each one of the syllables
involved in a mutation.\(^\text{109}\) Nevertheless, a few earlier theorists did employ descriptions and
explanations about mutation that could as well be taken as forerunners of the
‘mutated’/‘mutant’ terminology, as in the case of the statements provided in the Berkeley
Manuscript—a slightly larger portion of the passage quoted here has also been quoted
earlier (cf. p. 149).\(^\text{110}\)

\(^{108}\) Cf. above in the previous section and in the beginning of this section.

\(^{109}\) Apparently, Rhau was the first to consistently employ those terms, later used by other
theorists: Johann Spangenberg (1536, f. B5r); Johann Vogelsang (1542, ch. 5, p. 26; Federhofer-Königs
1965, 87); Hermann Finck (1556, bk. 1, ch. [8]; f. E iiiij).

\(^{110}\) In fact, in the Berkeley Manuscript the explanation is more properly applied to ‘transition’
(“transitus”) as a whole, which serves as description both to ‘mutation’ and to ‘permutation.’ In the
terminology used by the anonymous Berkeley author, the term ‘permutation’ is not used, but is described as
the process involved when one solmizes “through disjunct” syllables (“per disiunctas”)—cf. (Anon.
Berkeley 1375, tr. 1, ch. 2; Ellsworth 48). The relevant passage will be quoted below in chapter 5, whose
topic is ‘permutation.’
Further, this [i.e., mutation] is done for three reasons: by reason of the syllable, by reason of the sign, or by reason of both together. By reason of the syllable--since ut is the lowest and la is the highest syllable--no one from any syllable can descend below ut or ascend above la unless the syllable has been left and its place assumed by a lower one for ascending or a higher one for descending.

(Anon. Berkeley 1375, tr. 1, ch. 2; Ellsworth 1984, 48)

Although the above translation does not emphasize all the words that may have led to later terminology, the text is clear in describing the function/character of each mutation-syllable. Thus, the syllable pertaining to the first hexachord (the one preceding the chosen step for mutation) is 'dismissed' (from "dimissa," instead of "left" in the above translation). That is, the syllable is abandoned in order to make way for the new syllable (and the correspondent hexachord) that will be enforced from the place of mutation onward. As for the other, the syllable pertaining to the second hexachord (the one positioned subsequently to the chosen step for mutation) would be assumed (from "assumpta"; lit., assumed, adopted, acquired). In other words, that second syllable is the one actually uttered, denoting that a new hexachordal context is being adopted. However, in the Expositio manus (p. 1477), Johannes Tinctoris presents a seemingly hybrid terminology between the one appearing in the Berkeley Manuscript (1375) and the one employed in Georg Rhau's treatise (1517).
[I]n omni mutatione fienda duae voces requiruntur, scilicet una quae mutatur, et alia quae per ipsam mutationem assumitur.
(Tinctoris p. 1477, ch. 7; Seay 1975-78, 2: 52; CS 4: 10, 12)

[T]wo syllables are required in every mutation about to be made (fienda), namely one that is mutated, and another that is assumed [i.e., adopted] through the mutation itself.
(my translation)

Although the translation is similar to Rhau's 'mutated' (for the first syllable) and the Berkeley anonymous's 'assumed' (for the second syllable), Tinctoris uses the passive verb forms "mutatur" and "assumitur," whereas Rhau and the Berkeley anonymous author use verbal adjectives (which are more suitable to becoming a direct foundation for terminology than a verb per se). In any case, one wonders what could have been the reason not to take a pair of terms such as 'dismissed'/'assumed' as an appropriate reference (or description) for those mutation-syllables, and create a different pair such as 'mutated'/mutant.' Perhaps the reason might be found in the Latin form itself ('mutata'/'mutans'), which seems to refer to the maxim 'mutatis mutandis' ('having changed what should have been changed,' or 'all necessary changes having been made'). As a legal qualification, this adverbial phrase can be applied, for example, to argumentations that seek the validation of a contract in which some items have been changed, like in a definition-phrase such as: 'what has been changed for/from a first situation must to be observed, in order to inform and allow correspondent changes in the second or in the remainder of the situations.' However, these changes usually do not involve a change in the actual text of contractual clauses, only in the associated data that may serve to clarify an interpretation or to contextualize a legal contract—i.e., without changing significative parts of its content, but which may alter some
of its context (thus, a change that keeps the integrity and coherence of the text).\textsuperscript{111} In a comparison with mutation, the text of a contract may be taken as the notated melody itself, and the context as the set of deduced hexachords—thus, the above definition-phrase may be paraphrased to fit a musical context by substituting 'hexachord' or 'syllable' for 'situation.'

Finally, this section must deal with yet another case, or rather sub-case of 'implicit' mutation. As it has been defined above, an 'implicit' is realized when the 'mutated'-syllable is mentally conceived, while only the 'mutant'-syllable is the one actually uttered. Nevertheless, there is a possibility of having the utterances inverted, or even having the both syllables omitted—in either of the two situations what is significant, in fact, is that the 'mutant'-syllable is only mentally conceived. The denomination for this sub-case shall be 'indirect' mutation, since the actual utterance of syllables pertaining to the new hexachord is obtained only after the actual place of mutation. The situation in which both utterances are omitted is one that takes place on a rest, between two distinct melodic gestures—as illustrated above in the mutation between the $\overline{\text{E}}$-hexachord and the $\overline{\text{D}}$-hexachord in measure 57 (in the motetus part) of Fig. 3.7. In this 'indirect' procedure on a rest, both the 'mutated' and the 'mutant' syllables should be solmized either according to the step before the rest, or

\textsuperscript{111} In the Black's Law Dictionary, the following sentence is given as an example: "what was said regarding the first contract applies mutatis mutandis to all later ones." In modern contracts, for example, this would apply to simple changes of address, telephone number, or even addition or suppression of parties without changing the text or merit of a contract itself—cf. (Webster's 3e, s.v. 'mutatis mutandis'; Graves 2003, s.v. 'mutatis mutandis'; http://www.jurisdictionary.com/dictionary/dictionary%20m.html; Dall'Oca and Santana 2004, 113, s.v. 'mutatis mutandis'; Garner 2004, 1044, s.v. 'mutatis mutandis').
according to the step after the rest, in order to create the proper aural reference for the hexachordal change.

**FIGURE 3.7** - 'Indirect' mutation on a rest (both syllables are not uttered).
Excerpt from "Garrit gallus—In nova fert—[Neuma]," mm. 54–60—(F-Pn fr. 146, f. 44v).

The other situation, in which only the 'mutant'-syllable is mentally implied, can itself occur either as a virtual approach or as a definite approach. The former is here interpreted as an anticipated mutation alternatively conceived on the step that precedes the true place of mutation. This virtual approach has been illustrated in **FIG. 3.6** for the step g-sol-re-ut, which (in that function) precedes the actual mutation between the $\bar{C}$- and the $\bar{E}$-hexachords that takes on aa-la-mi-re. The latter instance may happen when the omitted utterance of the 'mutant'-syllable seems to be the fitting approach, in face of two circumstances: the 'mutant'-syllable has been obtained by means of the ephemeral octave-equivalence resource; and the sound of the step that follows the place of mutation has
been aurally ingrained (usually by means of a prior reiteration) in the mind of the performer, and thus may dispense with the certainty of an intervallic reference with the previous step—although these circumstances may happen separately, in order to better characterize the 'indirect' mutation they should be concurrent.

**FIGURE 3.8** - 'Indirect' mutation on a note (only 'mutant'-syllable is not uttered).

This definite approach is illustrated in **FIG. 3.8**, showing two mutations: the first, from the $\overline{C}$-hexachord to the $\overline{F}$-hexachord, is an 'explicit' mutation that takes place on the two consecutive step-letters c (from the 'mutated'-syllable *ut*, to the 'mutant'-syllable *sol*); the second, back from the $\overline{F}$-hexachord to the $\overline{C}$-hexachord, is the 'indirect' mutation on the single step-letter g, (from an uttered 'mutated'-syllable *re*, to a non-uttered 'mutant'-syllable *sol*). Notice that in whatever instance (virtual or definite) of a non-uttered 'mutant'-syllable, the 'indirect' mutation will happen on a single step whose importance is notably greater in the first ('mutated') hexachord than in the second ('mutant') one. Mutations of other species and types will be inspected in the next chapter, together with indications for hexachordal changes promoted by *ficta*-signs according to their position.
— CHAPTER 4 —

MUTATION: IRREGULAR TYPE, FICTA-SPECIES, AND POSITION OF FICTA-SIGNS

Most of what has been explained above regards only 'regular' mutation within a recta-only environment, hence the present section will undertake the presentation of two other kinds of mutation: 'irregular' mutation (mutatio irregularis), and mutation involving musica ficta or 'ficta-mutation' (or falsa mutatio, as some authors preferred). In fact, these two kinds are not established according to the same parameters, nor are they paired as opposites: the 'irregular' type is opposed to 'regular' type of mutation, and the 'ficta' species is rather opposed to the 'recta' species of mutation. A ficta-mutation happens when at least one of the mutation-syllables (sometimes both) generates a ficta-step where it is applied (denoting the use of a ficta-hexachord); whereas a recta-mutation happens only when both of the mutation-syllables denote the use of recta-steps (i.e., of steps pertaining to one of the three basic hexachords). Thus, the parameter that differentiates a ficta-mutation from a recta-mutation is established according to the gamut-quality of the step (whether a ficta- or a recta-step), relatively to each of the mutation-syllables ('mutated' and 'mutant'). In relation to the 'regular' versus 'irregular' opposing pair, there are two parameters to be considered: (a) the hexachordal subset in which each mutation-syllable is found (either the lower ut, re, mi
subset, or the upper fa, sol, la subset); (b) the melodic motion (either ascending or descending) that follows the second ('mutant') syllable. If one of the mutation-syllables is found in the lower subset, and the other is found in the upper subset, then the type executed will be qualified as a 'regular' mutation. If both mutation-syllables are found in the same subset (either the upper or the lower), then the type will be qualified as an 'irregular' mutation. If, however, the mutation-syllables were individually found in different subsets, but the melodic motion after the second ('mutant') syllable was unusual (either contradicting its position in the higher subset by proceeding through an ascending motion, or contradicting its position in the lower subset by proceeding through a descending motion), then the mutation would also be qualified as 'irregular.' Notice that when the 'regular' and 'irregular' types are considered in relation to the 'recta' and 'ficta' species of mutation, they will serve as elements that determine four different subspecies: two subspecies for the recta-mutation (regular recta and irregular recta), and another two for the ficta-mutation (regular ficta and irregular ficta)—each of which being implemented

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112 These two parameters (a) and (b) have been briefly explained on p. 131.

113 In the previous chapter, the 'regular' type can be found in all the mutations of FIGS. 3.1–3.3 and FIGS. 3.5–3.6, and in the first mutation (from the G- to the F-hexachord) of FIG. 3.4.

114 An 'irregular' type (both by the melodic motion parameter, and by the subset parameter) can be found in the second mutation (from the F-hexachord to the G-hexachord) of FIG. 3.4. The change is made between syllables of the same subset (from mi of the F-hexachord to re of the G-hexachord), and the second syllable (re) is followed by a descending melodic motion (even though it should be ascending).
according to one of the two cases (explicit or implicit) that depend on the presence or absence of note-repetition for the proper place of mutation.\textsuperscript{115}

As seen in previous sections, most theorists presented only generic definitions for mutation (based mainly on parameters that would imply the 'regular' and 'implicit' mutations) and did not discuss what happens when those conditions were not followed. Most theorists also did not discuss \textit{ficta}-mutation extensively, generally limiting their presentations to statements that a \textit{ficta}-mutation is one that involves the use of \textit{ficta}-steps. In the case of 'irregular' and 'explicit' mutations, this imprecise discourse is probably justified by the relative scarcity of melodic situations that call for those mutations, whether within the limits of \textit{musica recta}, or even when \textit{ficta}-hexachords were involved. In the remainder of this section, the 'irregular' type and \textit{ficta}' species of mutation shall be individually illustrated and discussed according to their definition-parameters.

First, it seems that the melodic-motion parameter may be explained by the following statement: when one ascends from one hexachord into another, it is highly probable that the mutation will involve the higher steps (and syllables) of the first (lower) hexachord and the lower steps (and syllables) of the second (higher) hexachord. Conversely, when the melody descends, most likely the mutation will be done from the lower steps (and syllables) of the higher hexachord, into the higher steps (and syllables) of the lower hexachord. However, in their explanations theorists rarely referred to this melodic-motion parameter in the sense of

\textsuperscript{115}The nomenclature of species, subspecies, types, and cases of mutation has been devised in this dissertation for the sake of differentiating clearly between its various structural levels, although there are no historical treatises that have made use of any of those terms.
higher and lower hexachords, for their presentations were usually concerned with intervals. Their main focus was not with the macrostructure of hexachords (or even modes), but with the more detailed microstructure of intervals.

Maximillian Guillaud, in his *Rudiments de musique pratique* (1554), presents a set of three rules that appear to discuss mutation in terms of hexachordal motions, even though his references to the three basic hexachords (C, G, and F) are somewhat oblique, implied in the generic designations of their *proprietates* ("nature," "dur," and "mol"). The quotation below shows the second and third rules presented in chapter 6 ("De *muances*"—"On mutations"), from the first part of Guillaud's treatise.\(^{116}\)

\[\begin{align*}
\text{Seconde Reigle.} & \quad \text{[Second rule.]} \\
\text{Pour monter de nature en } & \text{\textregistered} \text{ dur ou de } \text{\textregistered} \text{ mol en nature, faut tousiours chanter } \text{re} \text{ apres sol:} \\
\text{Et pour monter de } & \text{\textregistered} \text{ dur en nature, ou de nature en } \text{\textregistered} \text{ mol, faut chanter } \text{re} \text{ apres fa.}
\end{align*}\]

\[\begin{align*}
\text{Troisieme Reigle.} & \quad \text{[Third rule.]} \\
\text{Pour descendre de } & \text{\textregistered} \text{ mol en nature, ou de nature en } \text{\textregistered} \text{ dur, faut tousiours chanter } \text{la apres fa:} \\
\text{Et pour descendre de } & \text{\textregistered} \text{ dur en nature, ou de nature en } \text{\textregistered} \text{ mol, la apres mi.} \\
\text{(Guillaud 1554, tr. 1, ch. 6, f. A iiiij\textsuperscript{v})}
\end{align*}\]

\(^{116}\) In his work entitled *The Theory of Hexachords* (1972), Gaston Allaire translated these same rules from Guillaud's treatise, but presented them as "RULE V" and "RULE VI," respectively; the corrected numbering is enclosed in square brackets in the quotation below.

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Although his explanations may be applied to understanding 'irregular' mutation, Guillaud's presentation is designed to explain only the 'regular' type. Guillaud defends that a 'mutant' syllable should always be solmized re when in ascending motion and should always be solmized la when in descending motion. Another statement defending that a 'regular' mutation should be effected only by means of the syllables re and la can be seen in Hermann Finck's third rule of mutation.

III. In mutatione utimur duabus fere uocibus, in ascendendo re, in descendendo la.
(Finck 1556, bk. 1, f. E iiijr)

(3) In mutation we generally use two syllables: re in ascending [motion], la in descending.
(my translation)

But in the context of his defense for re and la, Guillaud was referring exclusively to a mutation between adjacent hexachords in relation to a circle of fifths—that is, only from the G- to the C-hexachord, or vice versa, and from the C- to the F-hexachord, or vice versa.

Rounding off Guillaud's set of three rules on mutation, this context is clarified by his first rule, quoted below.

Premiere Reigle.
Iamais proprement ne se fait muance de b mol en l dur, ne de l dur en b mol, mais tousiours de l'un des deux en nature, ou de nature en l'un des deux.
(Guillaud 1554, tr. 1, ch. 6, f. A iiijr)

[First rule.] It is never proper to the nature of the hexachords molle and durum to be interlocked; rather, the interlocking must be made between the hexachords molle and naturale, and between the hexachords naturale and durum.
(Allaire 1972, 47)

Guillaud establishes that a mutation between G- and F-hexachords is 'improper' (or rather "jamais proprement"—"never properly [made]," virtually a synonym of 'irregular'), since it would risk dealing with both l-fa and l-mi as individual steps in the same melodic
gesture, or else with tritones (either melodically or harmonically). Guillaud expands on the concept (already stated by earlier theorists) that no mutation can occur on the double-step $\flat$-fa / $\flat$-mi and provides a qualification (or restriction) of 'irregular' (or 'improper') to any mutation between those two hexachords. Such a definition clearly adds another parameter for 'irregularity' (mutation between nonadjacent hexachords), distinct from the other two (hexachordal subsets of syllables, and the melodic motion after the 'mutant' syllable).

Among Renaissance theorists there seems to have existed a tendency toward restrictions, usually discussing no more than one of these parameters. However, the tendency in medieval (and early Renaissance) treatises was to provide definitions that considered a 'greater' number of parameters. In any case, only a few treatises (either from the Renaissance or the Middle Ages) provided conspicuous references or definitions of 'irregular' mutation.

Jacobus Leodiensis (Jacques de Liège) was possibly the first theorist to discuss 'irregular' mutation in greater detail, formulating five different meanings set by means of

117 Gaston Allaire's translation (used in the quotation of Guillaud's first rule on mutation) is again misnumbered, he presents it as "RULE IV."

118 Andrew Hughes, in his entry on 'solmization,' has asserted that Jacobus Leodiensis "maintained that mutation from hard to soft hexachord, or vice versa, was rare" (NG 1, 17: 460; NG 2e, s.v. 'Solmization,' § I.3). However, there seems to exist no clear and coherent statement in Leodiensis's treatise that could endorse such an understanding. In fact, he does seem to allow for a change between these hexachords as a 'regular' mutation, as can be seen in his chapter entitled "De vocum inter se regularibus mutationibus" ("On regular mutations of the syllables between themselves")—cf. (Leodiensis p. 1330, bk. 6, ch. 65; CS 2: 289–292; Bragard 1955–73, 6: 179–184).
distinct parameters: (1) both mutation-syllables drawn from the same hexachordal subset, with steps maintained within the limits of the recta-gamut (i.e., an recta-mutation of a truly 'irregular' kind); (2) use of ficta-syllables without altering the actual sound of a correspondent recta-step (i.e., a mutation that involved ficta-steps whose syllables did not impose any chromatic inflections on the recta-steps that shared the same step-letter); (3) use of sudden (and momentary) steps extraneous to the hexachord under actual solmization (e.g., as in the creation of an upper or lower leading-note to the last note of a final or internal cadence); (4) use of fa and mi as mutation-syllables, but involving a change in the actual sound on the same step-letter, as it is proper of the intervallic difference between these syllables (i.e., a change of syllables with a chromatic pitch inflection); (5) a melodic gesture that involved leaps of sixth, seventh, and octave with no actual mutation being realized—cf. Leodiensis’s Speculum musicae (p. 1330, bk. 6, chs. 66–69; CS 2: 293–302; Bragard 1955–73, 6: 183–199). Among all these meanings, the first is the only one that refers to 'irregular' mutation (according to the definition for that term adopted in this dissertation)—although only a particular instance of it, a subspecies: a recta-only, 'irregular' mutation. The second meaning refers to a ficta-mutation (discussed below in this section, according to the terminology adopted in this dissertation), whether it is constituted by the use of one ficta-syllable and one recta-syllable, or constituted by the use of two ficta-syllables. The third meaning refers to what I am calling 'transmutation' (see chapter

119 For the purposes of and definitions adopted in this dissertation, it suffices to have just one syllable of a ficta-hexachord (among the two mutation-syllables) for the qualification of a ficta-mutation. Also, although Leodiensis is referring only to ficta-steps that are unison with recta-steps, a new syllable
6). The fourth meaning refers to what I term 'permutation' (see chapter 5), which is also related to melodic and harmonic conflicts (and false relations) that involve either the consecutive or simultaneous use of the syllables *mi* and *fa*. The fifth meaning is presented here:

![Translation](https://example.com/translation.png)

Moreover, some [people] say [that] irregular mutation occurs, when [the gesture] proceeds immediately to the sixth, seventh, or eighth syllable above or below (i.e., by leap).

(Jacquemart 1955–73, 6: 186; CS 2: 293)

Jacobus refers here to a melodic situation that is usually taken by theorists and performers as definite signs of mutation, since those intervals (sixth, seventh, and octave) exceed the limits of any hexachord. The amalgam of meanings presented by Leodiensis seems to reflect a conservatism to which he may have partially subscribed (or perhaps taken as a

(appended to a *recta*-step) may or may not impose a chromatic inflection—e.g., *c-re* in the *B*-hexachord does not impose any change of sound (i.e., no chromatic inflection) with *c-sol-fa-ut* (both being equivalent to modern *c'*) and *c-mi* (equivalent to modern *c'*) in the *A*-hexachord does impose an inflection. In the adopted meaning here, *ficta* species serves as much for the presence of a *ficta*-step that finds a correspondent unison with some *recta*-step, as for the presence of a *ficta*-step that imposes chromatic inflections. The difference may also refer to distinct procedures of change when those steps are placed consecutively: the former (in a unison situation) would be called a *ficta-mutation*, the latter (in an inflected situation) would involve a *ficta-permutation*, except if the two steps are *b-fa* and *b-mi* (or their upper octaves).

120 The solutions to these conflicts are related to the so-called *mi-contra-fa* 'rule' or 'prohibition,' whose concept is that a *mi* cannot be solmized against a *fa* when the notated interval between them delineates a perfect consonance (*diapason, diapente*, and in some situations also the *diatessaron*), whether directly or indirectly, without introducing a dissonance. As will be inspected later, some authors (esp. in the Renaissance) even considered its application on imperfect consonances, although not all authors followed this latter idea. Although *mi-contra-fa* is frequently related to harmonic situations (and may even apply to indirect situations in which 'false-relations' need to be prevented), melodic situations may also apply, especially in direct leaps, and sometimes in indirectly outlined consonances (i.e., when a consonance is mediated by other steps).
foundation to support his own discourse). More likely, at that time most of the procedures of solmization were only beginning to receive attention as independent concepts, he included all of their meanings under the same umbrella. As discussions about music became more and more specific, theorists began to discuss the procedures of solmization individually, elaborating their definitions both for the sake of instructing the readers and to providing an appropriate nomenclature for further discussions. Most of those theorists, however, did not discuss ficta-mutation at length (and sometimes not at all). They often made only brief or oblique references to it, sometimes classifying it as a subtype of 'irregular' mutation (as mentioned above among the five different meanings given by Jacobus Leodiensis). \textsuperscript{121}

\begin{quote}
Vocatur autem irregularis mutatio "falsa mutatio" propterea quia vox mutatur in vocem quae sibi non vere, sed false coniungitur; vocatur etiam falsa musica, quia vadit contra regularem vocum in gammate <dispositionem>.

\textit{(Leodiensis p. 1330, bk. 6, chs. 66; Bragard 1955–73, 6: 185; CS 2: 293)}
\end{quote}

Now, irregular mutation is called 'false mutation,' on the very account of a syllable [that] is mutated into [another] syllable, which is not itself truly, but falsely put together [i.e., when a syllable is mutated into a ficta-syllable, and not into a recta-syllable]. Indeed, it is called \textit{falsa musica}, because it goes against the regular arrangement of syllables in the gamut.

\begin{quote}
\textit{(my translation)}
\end{quote}

Although Leodiensis gives ficta-mutation (or falsa mutatio) only as a particular kind

\textsuperscript{121} Jacobus Leodiensis is again one of the first few theorists who have provided a somewhat detailed discussion on the topic of ficta-mutation through the use of terms such as falsa mutatio and irregularis mutatio.
of 'irregular' mutation, he may also be considered a theorist who provided one of the first few detailed discussions on this topic. The concept of ficta-mutation also involved a great amalgam of meanings, which vary from epoch to epoch or even from theorist to theorist. In fact, since a ficta-mutation occurs only when the ficta-realm is involved, the term falsa mutatio (or any other term with a similar meaning) was also used as a synonym for musica ficta itself. A ficta-mutation can be made in two situations: between two ficta-syllables, or between a recta-syllable and a ficta-syllable.


In the first situation, the solmization must involve a change between two ficta-hexachords, while in the second situation it must always involve one ficta-hexachord and one of the three basic recta-hexachords (G, or C, or F). **FIGURE 4.1** illustrates the latter

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122 With regard to the nomenclatures applied to mutation, the terms 'irregular' (or 'improper') and 'ficta (or 'falsa') were gradually presented with independent definitions, even if such an independence did not happen thoroughly within the writings of Leodiensis.
situation in its second mutation (from the $\bar{G}$-hexachord to the $\overline{B}\flat$-hexachord). The first mutation shown above (from the $\bar{G}$-hexachord to the $\overline{G}$-hexachord) is a 'regular' recta-mutation (of the 'implicit' kind) on the fourth note. The second mutation is a 'regular' ficta-mutation (also of 'implicit' kind), in which a 'mutated' recta-syllable (represented above by the symbol $[ut=]$, according to the $\bar{G}$-hexachord) is replaced by a 'mutant' ficta-syllable (represented above by the symbol $=la$, according to the $\overline{B}\flat$-hexachord). This latter hexachord is deduced in face of the $fa$-sign placed on the line of $e$ (between the words "son" and "doulx"), generating the ficta-step $e-fa$ (equivalent to modern $e\flat$), which can only pertain to a hexachord whose $ut$ is placed on the ficta-step $\flat$-$ut$ (equivalent to modern $b\flat$, and unison with the recta-step $g-fa$). Thus, the situation involving a change from a recta-hexachord to a ficta-hexachord will occur when a melodic gesture has moved away from the realm of those three basic recta-hexachords, due to the presence of a ficta-sign enforcing the ficta-hexachord (which will often, but not always, denote modern accidental inflections), or due to a modal transposition (momentary or not).

In relation to most of

123 Guillaume du Fay's rondeau Navré je sui d'un dart pénétratif has been discussed by Karol Berger (1987, 177–188), detailing his readings of musica ficta. He also has included a full transcription of that polyphonic song, together with facsimiles of the three extant copies contained in the following manuscripts: GB-Ob, MS. Canon. Misc. 213, f. 78v; F-Pn, nouv. acq. fr., 6771, f. 98v; D-Mbs, Clm. 14274 (olim Mus. 3232a), f. 96v.

124 This second mutation in FIG. 4.1 is exactly the kind of ficta-mutation (i.e., falsa mutatio) described by Leodiensis as a subtype of 'irregular' mutation: a change between two unison steps of different species (a recta-step $g$-$ut$, and a ficta-step $g$-$la$).

125 Remember that the presence of a ficta-sign may or may not signify, in modern terms, the corresponding presence of an accidental inflection. For example, in the case of a $mi$-sign, if it is positioned in the place of $b$, the effect created will only produce the solmization of $\flat$-$mi$ (equivalent to the modern
the medieval repertoire and to some of the Renaissance repertoire, however, mutations between two *ficta*-hexachords are likely to occur less frequently than mutations between a *recta*-hexachord and a *ficta*-hexachord, since chromaticism and modal transposition are more easily observed in the repertoire from the mid-Renaissance onward. The next illustration (FIG. 4.2) shows two *ficta*-mutations: the first one between a *recta*-hexachord and a *ficta*-hexachord, and the second between two *ficta*-hexachords. In the first phrase, the solmization of the $\mathbb{F}$-hexachord is given by the intervallic span of the melodic gesture, together with the presence of a fa-sign indicating the *recta*-step $\mathbb{b}$-fa. Between the first and the second phrases, another sign enforces the solmization fa on the step-letter E, which (just as in FIG. 4.1) calls for the solmization according to the $\mathbb{B}$-hexachord. In the third

non-inflected $\mathbb{b}$; but the positioning of a mi-sign in the place of virtually any other step-letter might be seen as a sign that generates an accidental inflection in the modern sense. Also, in the case of a fa-sign, a modern accidental inflection will happen often, even when it is applied to a b, generating the step $\mathbb{b}$-fa (equivalent to modern inflected $\mathbb{b}$); however, the same does not happen, for example, when the sign is used to indicate the *ficta*-step ff-fa (for which a fa-sign is considered necessary)—the exception to this need being found only in the evidence of a few theorists that eventually included that step in their *recta*-gamut, mainly from the fifteenth century onward, although in general there is no clear individual or group of scribes that followed their precepts. In any situation, whether there is a chromatic inflection or not, *ficta*-signs do not ensue the solmization of *ficta*-steps, for at least $\mathbb{b}$-mi and $\mathbb{b}$-fa (as well as $\mathbb{b}$-mi and $\mathbb{b}$-fa) are considered as *recta*-steps by most theorists.

126 Of course, no historiographic division, nor stylistic definition can be made as watertight, or as obdurate, which would be to say that chromaticism and modal transposition did not occur before that time.

127 Notice that it is not necessary to notate the $\mathbb{f}_{molle}$ sign at the beginning the gesture, since the configuration of the intervallic span already indicates the $\mathbb{F}$-hexachord. However, in its signature-like position, that sign serves the additional purpose of indicating that the solmization for the entire passage should be based mainly on hexachords pertaining to the molle family (i.e., to the molle proprietas). The function of signs in signature positions will be briefly addressed in chapter 8.
phrase (second staff), the *ficta*-sign denotes the presence of the *ficta*-step a–fa, and the corresponding use of the *ficta* $\overline{B}_3$-hexachord.

**FIGURE 4.2 - Ficta-mutations (from a *recta* $\overline{F}$-hexachord to a *ficta* $\overline{B}_3$-hexachord, and from a *ficta* $\overline{B}_3$-hexachord to a *ficta* $\overline{F}$-hexachord).**

\[
\begin{align*}
  \overline{F}: & \quad ut \quad re \quad fa \quad fa \quad sol \quad fa \quad re \quad ut \quad ut \quad re = \\
  \overline{B}_3: & \quad =la \quad sol \quad mi \quad sol
\end{align*}
\]

\[
\begin{align*}
  \overline{B}_3: & \quad =re \quad mi \quad ut \quad fa \quad la \quad sol \quad fa \quad mi \quad ut \quad re \\
  \overline{F}: & \quad ut \quad re \quad fa \quad fa \quad sol \quad fa \quad re \quad ut \quad ut \quad re
\end{align*}
\]

In both situations, the *ficta*-signs mark the place of mutation (that is, the point from which a new hexachordal solmization should be understood), but they do not indicate the exact step in which the mutation must occur, since that will be decided by parameters that allow the change to be made as smoothly as possible, such as: (a) clear aural perception of the step of mutation; (b) occasional note-repetition that might be used for the step of mutation; (c) importance of step of mutation in the modal structure of the piece and/or of the melodic phrase; (d) the possibility of realizing a ‘regular’ mutation instead of an ‘irregular’ mutation (with regard to the use of syllable subsets, and the melodic-motion that follows the mutant syllable); or even (e) the possibility of using the syllable *re* for the
mutant syllable followed by an ascending motion, or the syllable la for the mutant syllable followed by an descending motion (at least considering, in this latter item, the restrictive instructions given by Guillaud, Finck, and mainly other sixteenth-century theorists). In the case of both mutations in FIG. 4.2, the note-repetition is one of the most important factors for deciding on the proper place of mutation, although all the others have been duly considered and satisfied, for both ficta-mutations are 'explicit' and 'regular.' The determination of the species of mutation (recta or ficta) is completely dependent on the presence of a ficta-sign, for in its absence the solmization is most likely to stay only within the realm of the three basic recta-hexachords. The remainder of this section will investigate the functions of ficta-signs with regard to solmization, to mutation in general, and to ficta-mutation in particular.

First, as it has been repeatedly stressed above, the presence of a ficta-sign does not necessarily ensure a solmization of ficta-hexachords, since under certain circumstances it might serve only as an enforcer for mis or fas of recta-hexachords.128 It is also conceivable that ficta-signs might be used to indicate other recta-steps than just ½-fa and ½-mi (or their upper octave), usually for the sake of clarifying the proper solmization of a melodic gesture, or to alter a ficta-context back to the recta-context. For instance, this is the case for mi-signs applied to a-la-mi-re or e-la-mi (or their recta-octaves), or fa-signs applied to c-sol-fa-ut or f-fa-ut (or their recta-octaves)—since they are steps that already include those syllables in the recta-gamut (a-mi, aa-mi, E-mi, e-mi, C-fa, c-fa, cc-fa, F-fa,

128 Cf. FIGS. 2.5, 2.7–2.8, 3.3–3.6, 4.2. For other explanations, see also note 125.
f-fa) and therefore cannot be modified into ficta-steps by the solmization of the syllables mi and fa prescribed by the apposition of the correspondent ficta-signs. Andreas Ornithoparchus presents one musical example in which ficta-signs are being used not only in order to indicate recta-steps (with mi- and fa-signs), but also ficta-steps (with fa-signs). His example illustrates the third "Of the general rules of counterpoint" ("De generalibus contrapuncti preceptis") in his treatise, whose text is quoted below with a translation by John Dowland and with facsimiles of the example in the original notation (FIG. 4.3 and FIG. 4.4). Ornithoparchus suggests that conspicuous intervallic conflicts between tenor and the bass must be resolved into valid consonances (those are labeled "Basis valens"). Otherwise the bass itself will be considered incorrect, or invalid ("Basis non valens").


(Ornithoparchus 1517, bk. 4, ch. 4, f. L iv)

129 The text is referring to the so-called mi-contra-fa conflict.

FIGURE 4.3 - Example in Ornithoparchus's original text.
The solutions are given in terms of inadequate or adequate pairing of \textit{ficta}-signs between the voices, which indicate, in fact, inadequate or adequate pairing of solmization syllables (not accidentals, and with no concern to whether the necessary steps pertain to the \textit{recta} or to the \textit{ficta} species). Therefore, it is noticeable that, although this is a problem assigned to a chapter on counterpoint (a subject characteristic of \textit{musica speculativa} discussions), the text demonstrates a practical method of presentation (not a speculative one). This may be seen as evidence of a concern with the prosaic activity of the performer, rather than the specialized, highly learned activity of the composer or the theorist.

In order to facilitate this assessment, a transcription of the Ornithoparchus's musical example is given below as \textbf{FIG. 4.5}. The tenor presents bs solmized only to the syllable \textit{fa}; i.e., true \textit{recta}-steps indicated by the \textit{ficta}-sign placed on the signature-like position. The invalid bass-solutions clearly present \textit{mi}-signs (*) in the original notation, # in the modern) indicating the \textit{recta}-steps E-\textit{mi} and B-\textit{mi}, while the valid bass-solutions present \textit{fa}-signs (♭ in the original notation, ∪ in the modern) on the same step-places, generating their \textit{ficta} counterparts E-\textit{fa} and B-\textit{fa}.\footnote{Although most musical examples from Ornithoparchus's original are reproduced in Dowland's translation, there are occasional corrections and variants. With regard to this particular example, the second \textit{mi}-sign is clearly placed on the line of B (in the translation), while it is placed on the line of D (in the}
FIGURE 4.5 - Functions of ficta-signs (indications of recta- and ficta-steps and correspondent mutations).

Notice also that, in the invalid bass-solution, there is no possible mutation between the third note (F-fa) and the fourth note (B-mi), whereas in the valid bass-solution, there is an easily made ficta-mutation (of the 'implicit' and 'regular' kinds), involving the mutated syllable ut and the mutant syllable fa (on the ficta-step B-fa-ut). With regard to the quoted text, in a close comparison between Dowland's translation and Ornithoparchus's original, it seems that "sharpe" is given for "vox mollis," and "flat" is given for "vox dura." However, this is not the case, since Dowland's translation in other parts of the treatise give the opposite equivalence between English and Latin. It would appear that Dowland's original source). Clearly, Dowland's edition has corrected the original, for such a placement in Ornithoparchus's edition would find no reference in the text of that third rule. It seems also strange that the mi-signs were intended for E and D in the part "Basis non valens," while its correction (in the part "Basis valens") places the fa-signs on E and B. A minor discrepancy also occurs with reference to the signa congruentiae, which are given in the original (though only in the tenor and the part labeled "Basis valens"), but none are given in the translation.
terminology ("sharpe" and "flat") might also be applied and understood in the same way as
the modern concept of accidentals. Dowland's terms need to be understood only as an
anglicized references for the terms "durum" (or rather "vox dura," in this specific passage),
and "molle" (or "vox mollis," in this passage), and not as terms that share any relation with
the modern concept. Thus, despite the placement of Dowland's terms in the humanistic
environment of late-Renaissance England, the meaning of the medieval \textit{ficta}-terminology is
still preserved, with no forecasting of the meaning (only of the name) each sign would
acquire in a much later future.

The indication of \textit{recta-} and \textit{ficta}-steps by \textit{ficta}-signs may also be dependent on the
notational tendencies of the repertoire in each period, which may or may not be influenced
by specific theorists who proposed expansions of the \textit{recta}-gamut (some including not only
seven hexachords, but nine or more hexachords—e.g., by including an $\bar{F}$-hexachord starting
on FF below $\Gamma$, or a $\bar{C}$-hexachord starting on $cc$, or even other hexachords both above and
below). For those theorists, steps such as B-$fa$, or FF-$ut$, or ff-$fa$ would be considered
\textit{recta}-steps. Otherwise, a \textit{ficta}-sign can only imply a \textit{ficta}-hexachord (and a \textit{ficta}-mutation
where necessary) when it is placed on a step-station that has no correspondent \textit{mi} or \textit{fa} in
the \textit{recta}-gamut—i.e., when the \textit{ficta}-sign is clearly indicating a \textit{ficta}-step.\footnote{In FIG. 4.5, this is the reason why the \textit{mi}-signs placed on E and B (of the invalid
bass-solution) are indications of \textit{recta}-steps, for E-$mi$ and B-$mi$ are step-designations duly found within the
\textit{recta}-gamut. The opposite happens with the \textit{fa}-signs on E and B (of the valid bass-solution), which must
be taken as indications of \textit{ficta}-steps, for there is neither E-$fa$ nor B-$fa$ designations in the \textit{recta}-gamut.}

\textbf{FIGS. 4.6–4.8} show illustrations of all these functions of \textit{ficta}-signs, and the effects on

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solmization created by changes in their position and their placement as indicators for ficta- and/or recta-steps (and the hexachords within which they are found), as well as markers for mutation.\textsuperscript{132}

\textbf{FIGURE 4.6} - Functions of ficta-signs (ficta-mutation).

In \textbf{FIG. 4.6}, the \textit{fa}-sign indicates both a \textit{ficta}-step on E (where \textit{mi} would be a \textit{recta}-syllable, but not \textit{fa}), and the imminence of a place of mutation where the \textbf{\(G\)-hexachord} must replace the \textbf{\(G\)-hexachord}. It may be reminded that all steps in a \textit{ficta}-hexachord are truly \textit{ficta}-steps, whether or not they are unison to \textit{recta}-steps. In the situation just described, the designations C-\textit{re}, D-\textit{mi}, F-\textit{sol}, and G-\textit{la} are not found in the \textit{recta-gamut}, although they are virtually unisons to C-\textit{fa-ut}, D-\textit{sol-re}, F-\textit{fa-ut}, and G-\textit{sol-re-ut}. Since the

\textsuperscript{132} The words 'position' and 'placement' are used here as references to different aspects. The latter refers to the \textit{ficta}-sign in relation to specific step-letters (e.g., a sign may be placed on different \textit{loca}: on E, B, A, or any other step-letter); thus, it is called 'placement' with regard to the vertical alignment of signs on the staff. The former refers to the \textit{ficta}-sign in relation to notes (or note-shapes, where they can be identified), independently from their \textit{loca}; thus, it is called a 'position' with regard to the horizontal alignment of signs on the staff.
ficta-sign is placed between the B and the D, it is fairly clear that the B should still be solmized according to the $\text{G}$-hexachord, while the D should pertain to the ficta $\text{B}_3$-hexachord. However, that D is a repeated note, and an 'explicit' ficta-mutation can be easily implemented with the first D being solmized sol, and the second being solmized mi (although it is an 'irregular' type of mutation, since there is a descending interval after that D-mi). In Fig. 4.7, the fa-sign has been moved back to a position within the second melodic gesture, between A and C (on the first staff).

**FIGURE 4.7** - Functions of ficta-signs (ficta-mutation).

![Diagram showing the functions of ficta-signs (ficta-mutation).](attachment:figure4.7.png)

That pre-positioning of the ficta-sign would appear to impose an early mutation from a $\text{G}$-hexachord (as shown in Fig. 4.6) to a $\text{B}_3$-hexachord, which could certainly be made on the repeated C step (from a C-fa to C-re) that comes immediately after that sign. Nevertheless, if that solmization is carried through, the $\text{G}$-hexachord will become highly uncharacteristic, not only because its solmization is limited to six notes that do not involve its typical b-durum quality (by means of a B-mi), but mainly because after the pretended
mutation on C the step would be precisely a $\text{B-fa}$. This situation seems to suggest that the second melodic gesture should in fact start with an $\text{F}$-hexachord (not a $\text{G}$-hexachord). At the same time, if one takes into consideration statements that "we ought to avoid mutation, and beware of them," or that "a mutation must not be made except for the sake of necessity," then the solmization of $\text{F}$-hexachord must be carried through, up to a point where it can no longer be maintained—that is, where one is about to find steps that will exceed the limits of that hexachord. The location in question is found near the same place of mutation given in the second of staff of FIG. 4.6 (on the repeated D of the third phrase), accounting for an 'explicit' and 'irregular' ficta-mutation between D-la (of the $\text{F}$-hexachord) and D-mi (of the $\text{B}_3$-hexachord). Thus, the function of a ficta-sign as a marker for the place of mutation (or of its proximity) must be weighed against the effective necessity for enforcing that mutation, against the aural perception of the eligible mutation-steps, as well as how the new configuration of steps (the new hexachord) thereafter may affect the proper hexachordal deduction of the previous melodic gesture (i.e., how it may affect the characterization and solmization of the hexachord that precedes the sign). In order to make more conspicuous the necessity for solmizing the $\text{F}$-hexachord at the outset of (and throughout) the second melodic gesture, the next musical illustration (FIG. 4.8) will consider a different placement for the ficta-sign: on B (but at the same position within the gesture as the sign placed for E in FIG. 4.7). Before starting the second phrase, the musician (who is already trained to read

133 ‘The first statement is excerpted from Garlandia’s Introductio musice (p. 1240; CS 1: 160): “debemus mutationes evitare et eas percavere.” The second statement is excerpted from Capuanus’s Compendium musicale (1415; La Fage 1864, 315): “non debet fieri mutatio nisi causa necessitatis.”
ahead and anticipate changes) will clearly see the necessity for solmizing the $\text{F}_1$-hexachord, and later to mutate back to the $\text{C}_1$-hexachord—thus assuring the solmization of the *recta*-step $E\text{-mi}$ (equivalent to modern $e_\#$) in the third phrase, since no other *ficta*-sign has been notated.

**FIGURE 4.8** - Functions of *ficta*-signs (*ficta*-mutation).

Notice however, that the $\text{F}_1$-hexachord in question is a *ficta*-hexachord, for there is no $B\text{-fa}$ in the *recta*-gamut, nor is there a FF step-letter (whose solmization in this case would be FF-$u_t$). Both mutations in **FIG. 4.8** may then be classified as 'explicit' *ficta*-mutations, though the first is 'regular' and the second 'irregular.'

Apart from enforcing hexachords in specific locations, the position of *ficta*-signs may be naturally affected by the presence of ligatures. If a *ficta*-sign is applied to a step within a ligature, the sign cannot be positioned immediately before that step, for it would interfere with the ligature and prevent its appropriate reading—only in special conditions may the *ficta*-sign be positioned close to a note within a ligature (e.g., close to the second
note of a podatus). There are at least two additional reasons for the deliberate positioning of the ficta-sign away from the note it affects directly: the intention to enforce (or confirm) a hexachordal reading different from than the one suggested by the melodic gesture; or because a ficta-sign may be performing the function of a punctus divisionis (or divisio modi). In fact, it is quite natural to suppose that if a ficta-sign is near to that of a punctus divisionis (dot of division), the ficta-sign could be intentionally moved to the position of the punctus, and visually perform that function of separation, while keeping its own function as enforcer of a specific hexachordal reading. As in the case of the ligature, the proximity with a ficta-sign could interfere with the appropriate reading of a punctus divisionis. In that situation, it is possible that a scribe would choose to make the ficta-sign perform the function of a punctus divisionis by momentarily occupying its position. Therefore, it must not be overlooked that a ficta-sign could assume a mensural significance (even if momentarily and in very special conditions), in addition to the functions previously mentioned.134

134 Andrew Hughes seems to be the first who has clearly stated that a ficta-sign may function as a punctus divisionis.

In mensural notation the grouping of notes and of notes and rests is often of primary importance. The accidental [or rather, the ficta-sign] is placed early so that, for example, two minim rests and a minim note will form a single group immediately obvious to the eye. There can be little doubt that the necessities of mensural grouping cause some preplacements: many occur in prolatio major or tempus perfectum where the grouping of perfections is specially important so that [mensural] alteration and imperfection may be clear. In other words, the accidental sometimes functions as a punctus divisionis.
(Hughes 1972, 61)

It must be noted that although a ficta-sign may serve as punctus divisionis, it may never serve the
Another matter to be addressed is the placement of a \textit{ficta}-sign not on the line or in the space, but either under or above the step to which it refers. This kind of occurrence is likely to be attributed either to a later hand, or to occasional corrections the original scribe may have made (due to some initial carelessness). In most cases, the melodic gesture will be sufficient to solve any doubts about the step to which the \textit{ficta}-sign is applied, or about the additional functions the sign may perform, even if its position has been compromised by a misplacement.\textsuperscript{135}

The ability of medieval and Renaissance performers (or scholars) to read long phrases ahead of time, generally used as a tool to solve problems regarding mensural matters (alterations, perfections, etc.), was probably one of the most important factors in solving problems regarding solmization and \textit{musica ficta}. These might include: the possibility of \textit{ficta}-signs serving as \textit{punctus divisionis}; the occasional misplacement of sole function of a \textit{punctus perfectionis} (dot of perfection)—the only possible exception is when the \textit{punctus} itself (if it were there) would be performing both functions at once.

\textsuperscript{135} Related to apparent mistakes, there is still another matter that may also be addressed: the so-called post-positioning of \textit{ficta}-signs, in which a given sign would be applied not only to the step that may follow in that space or line, but also to steps that may precede. Andrew Hughes, for instance, has explained what he calls a "retrospective effect," by relating this post-positioning of signs to the post-positioning of tuplets and tuplet-numbers in romantic and modern music—e.g., the number is frequently placed fractions of an inch (or even a few inches) after the actual beginning of the tuplet, usually in the middle of the tuplet (whether or not it is marked by a bracket). Hughes also relates the post-positioning of signs to the positioning of whole-measure rests, or whole-measure notes in the middle of the measure, and argues that "[m]edieval performers were able to assimilate at a glance much longer phrases than is possible with modern notation"—see (Hughes 1972, 69ff.). Anyone who has dedicated some time transcribing medieval and Renaissance music will certainly agree with Hughes's statement, but will not necessarily agree that it is the appropriate argument or proof of an intentional post-positioning of signs. It seems more likely that a sign would not be deliberately post-positioned, unless by error and unwanted omissions on the part of the scribe.
ficta-signs (although this possibility may not serve as justification for occasional errors or
omissions); problems regarding the deduction of hexachords by means of melodic gestures
and the presence of ficta-signs; or even decisions about the most appropriate place of
mutation in each given situation. These latter decisions, informed by the position of
ficta-signs (when they are present), are still a matter that deserves further consideration,
bearing in mind that although a mutation can be made either before or after the actual
ficta-sign, most of the time it is preferable to mutate before the sign, and certainly before the
step that is actually affected by the ficta-sign. Among Hermann Finck's set of nine "rules of
mutation," his seventh rule may serve to inform about this preference.

VII. Omnis mutatio fit tertia ante fa, si
adsit notula: si non, in secunda uel quarta
poterit mutatio inchoari.
(Finck 1556, bk. 1, f. F i)

(7) Every mutation is made on the third
before fa, if the note may be present [in the
melody]; if not, the mutation may begin on
the second or fourth [before fa].
(my translation)

His statement allows for at least two different interpretations: one taking Finck's text
as a reference to 'syllables' before fa; another taking it as a reference to 'notes' (or,
'note-shapes') before fa. In the first interpretation, the words "tertia ante fa" appear to
denote the syllable re (i.e., "the third [syllable] before fa"), and "secunda uel quarta" the
syllables mi or ut (i.e., "the second or fourth [syllable before fa]"). In this interpretation,
Finck would appear to present an abridged version of the rule that 'mutation should be made
on places where the mutant-syllable can be solmized re, when it is followed by an ascending
motion, and la, when it is followed by a descending motion.136 However, Finck already

136 This is the understanding given by Gaston Allaire—cf. (Allaire 1972, 52).
gives the unabridged version as his third rule, and there seems to be no reason (nor intention) to provide an abridged version as a new rule that, in fact, creates an additional confusion by taking the syllables *mi* and *ut* as possible mutant-syllables in lieu of *re*.\textsuperscript{137}

Even if the seventh rule is interpreted as a further elaboration of the third rule, by incorporating *mi* and *ut* as true alternatives for *re*, one would expect to find a similar elaboration regarding alternatives for the mutant-syllable *la*. Finck provides no additional elaboration, however. In the second interpretation, the solmization syllable "*fa*" is taken as a reference to a "*fa*-sign," rendering the translation "the third [note] before the fa-sign" for words "*tertia ante fa,*" and the translation "the second or fourth [note before the fa-sign]" for the words "*secunda uel quarta.*" In this case, Finck's seventh rule is not understood as a command about the most likely syllables to be used as mutant-syllables (as in his third rule), but as a command about the position in which the mutation should occur (i.e., how to determine what should be the place of mutation itself, or else, the step that should be taken as a bearer for both the mutated and the mutant syllables)—regardless of the species, type or case in which the mutation may be classified.\textsuperscript{138} In Finck's text, the absence of 'rule' that

\textsuperscript{137} The third rule has been quoted above, see p. 164.

\textsuperscript{138} In Finck's assertion, there is also the possibility of understanding "*fa*" as a reference to "a step solmized with the syllable *fa,*" which would render the translation "the third [note] before [the one solmized with the syllable] *fa*" for the words "*tertia ante fa,*" and the translation "the second or fourth [note before the one solmized *fa*]" for the words "*secunda uel quarta.*" This possibility would be same as the one that takes "*fa*" as a reference to "fa-sign," but only if the sign is placed immediately close to the step that is supposed to be solmized fa, in the case of pre-positioned signs (i.e., signs positioned two or more notes before the one it may actually affect), this would be a different case. In any case, however, the seventh rule would also be a statement regarding the 'position in which the mutation should occur;' and not with the 'syllables (mutated and mutant) involved in mutation' (as it was the case with Finck's third rule).
makes reference to a *mi*-sign (i.e., a rule on how to choose the place of mutation in relation to the position of a *mi*-sign) is not surprising, because *fa*-signs are used much more often than *mi*-signs (either in polyphonic or monophonic contexts, and even in Finck's own time). More to the point, the first book of Finck's treatise is dedicated to a presentation of the elements of music in a plainchant context (which would hardly use any *mi*-signs).

In summarizing some of the main points discussed in this and in the previous section, it may be stated that the place of mutation is the result of an equation that can be solved only by observing three essential variables: the melodic gesture; the presence or absence of a *ficta*-sign; and the position of the *ficta*-sign. The melodic gesture shows the possible hexachordal spans, the *ficta*-sign enforces or confirms a specific hexachord over that gesture, and the position hints to how soon or how late the actual enforcement (or confirmation) of a hexachord is supposed to be effected. As mentioned above (fifth guideline in section [iii], p. 148), although a *ficta*-step may serve as a marker for a place of mutation (*ficta-* or *recta*), which can be made either before or after the *ficta*-sign (as demonstrated by means of the latter three musical illustrations), a mutation can never occur on the step to which that sign is being applied. A change between hexachords, on the precise step to which the *ficta*-sign is being applied, can occur only by means of 'permutation.'
In order to introduce the concept of 'permutation' there is probably no better
definition than the one given by Marchettus da Padova in his *Lucidarium in arte musice*

*Permutatio est variatio nominis vocis seu
note in eodem spacio seu linea in diverso
sono.*

(Marchettus 1317/18, tr. 8, ch. 1; Herlinger 1985, 270; GS 3: 89)

Permutation is a change in the name of a
syllable or note lying in the same space or
on the same line but with a different pitch.

(Herlinger 1985, 271)

Marchettus is considered the first theorist to have clearly enunciated the procedure, and also
the first one to have used (or chosen to use) the term “*permutatio*” in this particular context.
There is, however, debatable evidence as to whether or not 'permutation' (as defined above)
was systematically used in the repertoire that precedes the thirteenth or the fourteenth
centuries, or whether or not it was a vital (or even necessary) procedure. As a concept,
'permutation' can be apparently traced back to the mid- or late-ninth century, through a close
reading of some statements provided in the anonymous treatise *Scolica enchiriadis*
(abbreviated SE)—cf. (Anon. SE a.900, pt. 1; Schmid 1981, 61–62; cf. also Gerbert 1784,
this discussion, Marchettus must be taken not only as the first theorist to have enunciated
'permutation,' but also the first one to have clearly conceptualized, defined and illustrated such a procedure. The terms *permutatio* and *mutatio* are, in fact, virtually synonymous, which perhaps makes Marchettus's choice seem somewhat misleading. However, it seems to be exactly the close correspondence between those two terms that made his choice more appealing, for both procedures can be understood in terms of their likeness, both etymologically and with regard to the results associated with them, although they are different with regard to process and necessity.  

Marchettus's treatises were transmitted into the Renaissance, and found in Franchinus Gaffurius one of his most influential supporters, who also incorporated some Marchettian ideas in his own writings. Nevertheless, Gaffurius seems to have displayed some kind of resistance or criticism toward Marchettus, particularly with regard to 'permutation,' for whose practice and concept Gaffurius conceived some restrictions.

Marchettus's choice also appears to be related to 'permutation' as a logical concept. Although permutation, in this sense, is today understood under the mathematical processes that involve 'combinatorial analysis' (which derives from nineteenth-century studies), it did already exist as a logical concept in the late-medieval/Renaissance universe. At that time it meant simply the act of changing the order (or arrangement) of elements within a given set of things (e.g., numbers, or even steps). Another meaning of 'permutation,' which is also likely to have driven Marchettus toward his choice, is the one regarding rhetoric, for 'permutation' is the Latin equivalent for 'allegory' in Greek.

With respect to 'permutation,' Marchettus's most extensive explanations are provided in his *Lucidarium*. One of the extant copies of that treatise is included in a manuscript entirely written in the hand of Gaffurius—the manuscript in question (I-TRE) also includes Franco de Colonia's *Ars cantus mensurabilis*, Marchettus's *Pomerium*, and the one-page anonymous *Novem sunt species contrapuncti*.

In his edition of Marchettus's *Lucidarium*, Jan Herlinger has stated that "Georgio Anselmi (1434), Gaffurio (1492), and Lanfranco (1533) distinguished between mutation and permutation just as Marchetto had, though Gaffurio warned against use of the latter" (Herlinger 1985, 13). Other theorists who shared Marchettus's concept of permutation were: Bonaventura da Brescia, in his *Brevis collectio artis*  

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In $\text{fa}\,\text{mi}$: quod ambae syllabae non sint eiusdem soni: nullam posse fieri mutationem plerique consentiunt: maiore enim semitonio ab inuicem sunt disiunctae: [...] Qua re: quum necessitate coacti ipsam deductum in $\text{fa}\,\text{mi}$ mutationem et qualitatis et quantitatis conueniet mutatio: qualitatis inquam idest proprietatis $\text{fa}$ mollis in $\text{mi}$ duram: mutando $\text{fa}$ in $\text{mi}$: ascensus gratia: vel e converso descendendi causa. quantitatis idest transeundo per $\text{fa}$ ad $\text{mi}$ ex grauiore ad acutiorem sonum: ipsius apotomes interuallae: aut e converso: per $\text{mi}$ in $\text{fa}$ descendendo ex acuto in grauiorem quem quidem transitum quoniam difficilis et admodum dissonus est; omni solertia devitandum musicorum scola precepit: hunc Marchetus et Anselmus permutationem vocant. Est enim ad inuenta Irregularis et Indirecta mutatio ad evitandum dissonum huiusmodi permutationis transitum. quem vrgente notularum dispositione fieri necesse est. (Gaffurius 1496, bk. 1, ch. 4, f. aviijv)

The two syllables on $\text{fa}\,\text{mi}$ do not sound the same, and many think that no mutation can take place, for the syllables are mutually separated by a large semitone. [...]. Therefore, when necessity forces us to make a mutation of both quality and quantity on $\text{fa}\,\text{mi}$, a mutation of quality only, that is, of soft $\text{fa}$ proprietas into hard $\text{mi}$, will be made by changing $\text{fa}$ into $\text{mi}$ because of an ascending melody, or conversely, [of $\text{mi}$ into $\text{fa}$] because of a descending melody. A mutation of quantity is made in going from a lower to a higher sound by changing $\text{fa}$...

Most authorities agree that on $b\,\text{fa}$ and $b\,\text{mi}$ no mutation is possible since the syllables do not both have the same pitch and since they are a major semitone apart from one another. [...] When, therefore, we produce that $b\,\text{fa-b\,mi}$ mutation out of necessity, a mutation both of quality and of quantity will result. I speak (1) of quality, that is, of the propriety of $B$-mollie into $B$-durum by changing $\text{fa}$ into $\text{mi}$ in order to ascend, or conversely, in order to descend, and (2) of quantity, that is, passing from a lower to a higher sound by means of $\text{fa}$ into $\text{mi}$ at the...
into *mi* on the *apotome*, or conversely, in descending from a high to lower sound by changing *mi* into *fa*; this is a difficult and very dissonant movement, and according to musical scholars, it should be avoided with all possible ingenuity. Marchettus and Anselmus call it permutation. Irregular and indirect mutation has been devised to avoid the dissonant movement of such a permutation, which must only be used when it is absolutely necessary because of the arrangement of the notes.  

(Young 1969, 33–34)

Although the above quotation seems to start out with an assertive opposition to 'permutation,' it becomes clear (in the course of the statements) that Gaffurius was only exercising the common humanistic mode of establishing theoretical and academic limits to the concept (in the speculative sense), in order to impart some control over 'permutation' as a solmization procedure (in the practical sense). In other words, Gaffurius was not against its practice or concept, but sought a way to explain Marchettus's idea: (a) by narrowing its dimensions (elaborating on instructions and parameters to its usage); and (b) by expanding its scope (defining other possible situations not clearly described by Marchettus). Thus, Marchettus and Gaffurius described a specific procedure by means of which one can change (or rather, permutate) from *mi* into *fa*, or vice versa. No mutation (in whatever species: *recta* or *ficta*) between those syllables was possible, and for some authors no change (of any kind) could be conceivably made between them (whatever its name: mutation or permutation). In terms of medieval and Renaissance descriptions, the main reason was because both syllables (*fa* and *mi*) could not be found under one single step (defined as the conjunction of letter-plus-syllables), at least with regard to the traditional *recta*-gamut. The
designation b-fa / #-mi, supposedly the only recta-place (together with its upper octave) where those two syllables would be found, is actually the designation for a recta double-step (a double-place) that represented two different hexachords (or different qualities, following Gaffurius's explanation) and two different sounds (or different quantities, according to Gaffurius). Even with regard to the ficta-gamut, although those two syllables (fa and mi) could be found under the same step-letter, in most cases they would produce a double-step yielding to two different sounds. Nevertheless, if the recta-gamut and the imaginary ficta-gamut were merged, only a couple of steps would include all possible syllables and still produce a unison under one and the same step-letter: D and G (and their octaves). Naturally, a hexachordal change between the syllables mi and fa could be called 'mutation' only when D or G (or their octaves) were eligible as places of mutation, which seems sporadic at best, considering that in order to promote such an eligibility the melodic transition between gestures would have to be greatly restricted.

<table>
<thead>
<tr>
<th>hexachords</th>
<th>t w e l v e - s t e p m e r g e d g a m u t</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ut</td>
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<tr>
<td>B</td>
<td>sol</td>
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<tr>
<td>C</td>
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<td>E</td>
<td>mi</td>
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<td>F</td>
<td>ut</td>
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<tr>
<td>G</td>
<td>sol</td>
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</tbody>
</table>

TABLE II – Expanded gamut
The expanded gamut given in TABLE II (merging recta- and ficta-steps), shows all the available syllables for each step-letter (only one octave is displayed with pitch-class-like letters). The alleged rareness of a change happening exactly on D or G is due not only to the frequency in which those steps might occur, and their unpredictable capacity to serve as places of mutation, but is also due to the great distance (in terms of the circle of fifths) between the hexachords involved in those specific changes. On a D, the mi-fa mutation would have to occur only between an $\overline{A}$-hexachord and a $\overline{B}_5$-hexachords, and on a G, between a $\overline{D}$-hexachord and an $\overline{E}_3$-hexachord. Otherwise, when other step-letters were involved, a change between $mi$ and $fa$ would be necessarily called 'permutation'—a procedure that was conceived precisely to allow and explain those changes that involved two consecutive steps whose sounds were different (i.e., that did not meet in a unison).

In fact, permutation could be done in two distinctive cases: stepwise, and by leap. The former case corresponds to the basic situation described and exemplified by Marchettus (quotation above and FIG. 5.1 below), and the latter case is deduced from Gaffurius's statements and examples (quotation above and FIG. 5.3 below)—numbers referring to each note have been added to the modern transcriptions, for the sake of clarifying the analyses of these musical illustrations. Stepwise permutation is very similar

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142 It may be observed that when merging both gamuts, step-letters that are already $fa$ cannot have their sound modified (altered) when that syllable is solmized, even if a notated $fa$-sign ($b$) is applied. Those steps can have their sound modified only if a syllable $mi$ is applied to them. Conversely, a step that already includes the a recta-syllable $mi$ can be appended with a syllable $fa$ and perhaps have its sound modified, but cannot have its sound modified by a $mi$-sign and the consequent solmization of the syllable $mi$. In other words, syllables may not be duplicated under the same step-letter.
to 'explicit' mutation in that it involves two consecutive notes sharing the same step-letter, although their individual sound is different. In modern terms this situation would correspond to the chromatic inflection of a pitch—naturally, this procedure was not possible in terms of mutation (which required two syllables on a unison). In this context, a permutation would be indubitably marked by the presence of a ficta-sign applied to the second note—e.g., from b-fa to b-mi (b♭ to b♭) or vice versa; or from c-fa to c-mi (c♯ to c♯) or vice versa; or any other similar inflection, as shown in FIG. 5.1. Although permutation by leap may be more common, stepwise permutation can be taken to represent its most significant case, since it was the first to which the term 'permutation' was applied, and the first to receive a clear definition, explanation and illustration (imparting authority to Marchettus's presentation).

FIGURE 5.1 - Stepwise permutation. From Marchetto da Padova's Lucidarium (1317/18, tr. 8, ch. 1)—cf. (Herlinger 1985, 272; GS 3: 89).
Before proceeding with the analysis of **FIG. 5.1**, some indications of mutation must be revised, while others—devised to differentiate mutations from permutations—must be explained. An 'explicit' mutation is indicated by means of an 'equals'-sign (=) placed after the 'mutated' syllable, and another placed before the 'mutant' syllable. An 'implicit' mutation is also indicated with both signs, except that the 'mutated' syllable is enclosed in square brackets, in order to denote that such a syllable is only mentally intended (not uttered) by of the performer. Paraphrasing the 'mutated/mutant' nomenclature, this dissertation will make use of the term 'permutated' as a reference to the last syllable of the hexachord that is being discontinued, and 'permutant' to the first syllable of the hexachord that is coming into effect. In a permutation, the 'permutated' syllable is followed by slash, and the 'permutant' syllable is preceded by a slash, in order to indicate that the permutation process involves a passage from one syllable to the other in a place where the hexachords are disjunct. Notice that the 'permutated' and 'permutant' syllables must not be vertically aligned, since they are applied to two different consecutive steps, and that an 'implicit' permutation cannot exist in any circumstance.

In the transcription of Marchettus example for stepwise permutation (**FIG. 5.1**), double-barlines have been used to mark two distinct parts: one that starts with a permutation from *fa* to *mi*, and is done within the limits of *musica recta*; and the other that starts with a permutation from *mi* to *fa*, and involves the use of *musica ficta*. (In order to provide a clear example, Marchettus carefully restricts any hexachordal changes to the upper voice, for the solmization of the entire lower voice requires only syllables from the C-hexachord.) In the
first part, the upper voice is marked by a fa-sign placed on b (seemingly in a signature-like position), indicating that the first two steps must be solmized according to a recta \( \overline{E} \)-hexachord, while step 3 is preceded by a mi-sign, indicating that the solmization should proceed with syllables from a recta \( \overline{G} \)-hexachord—thus a recta-permutation is made from \( \flat-fa \) to \( \flat-mi \). The \( \overline{G} \)-hexachord solmization is interrupted by another fa-sign (on b) positioned between steps 6 and 7—implementing another recta-permutation back from \( \flat-mi \) to \( \flat-fa \), and producing a return to the \( \overline{E} \)-hexachord solmization for remainder of the first part (steps 7 and 8). In the second part of FIG. 5.1, although the mi-sign appears only near step 10 (indicating its solmization as c-mi, equivalent to modern c\( \sharp \)), it is clear that steps 9 and 10 must be both solmized according to the ficta \( \overline{A} \)-hexachord.\(^{143}\) At the same time, the fa-sign that appears on c, between steps 10 and 11, enforces the solmization c-fa for that latter step (a recta step, pertaining to the \( \overline{G} \)-hexachord, equivalent to modern c\( \sharp \))—a ficta-permutation is then implemented from the ficta c-mi to the recta c-fa. Finally, the solmization of the \( \overline{G} \)-hexachord is interrupted by the mi-sign on c, positioned between steps 12 and 13—implementing another ficta-permutation from the recta c-fa to the ficta c-mi, and producing a return to the \( \overline{A} \)-hexachord for the remainder of steps in the upper voice (steps 13 and 14).

In the stepwise case, however, 'permutation' may not always be restricted to a hexachordal change between the syllables \( mi \) and \( fa \), but may happen between any pair of

\(^{143}\) In case the entire example needed to be solmized without a break between its two parts, then one would have to implement an 'implicit' mutation from the \( \overline{E} \)- to the \( \overline{A} \)-hexachord on step 9—thus mutating from d-la to d-fa.
syllables that, applied to the same step-letter, do not yield a unison—e.g., between C-ut and C-mi, or C-sol and C-mi, or a-re and a-fa, or a-la and a-fa, etc.\textsuperscript{144}

FIGURE 5.2 - Stepwise permutation. "Garrit gallus—In nova fert—[Neuma]" (mm. 54–60), from F-Pn fr. 146, f. 44v (Roman de Fauvel).

In all situations, there is a syllabic interval of third between the two consecutive notes on the same step-letter, for which one of the steps must be solmized either as mi or as fa—therefore must always be preceded by the correspondent ficta-sign indicating its

\textsuperscript{144} A few exceptions to this kind of change as 'permutation' are to be found in situations that can be classified as simple 'mutations': from E-sol to E-mi (or their octaves), or from F-re to F-fa (or their octaves), or else those changes between any syllable on the step-letters D or G (or their octaves); these instances would all produce unison steps—cf. TABLE II.
A stepwise permutation from c-ut to c-mi (thus, from a △-hexachord to an □-hexachord) is illustrated above (FIG. 5.2), in the triplum (mm. 57–59) of Philippe de Vitry’s motet. In face of the intervening rest (m. 58) between the two permutation-steps, the performer can, while pausing (though briefly), undertake a calmer aural conception of this rather abrupt change of sound. Hence, it is an event that clearly represents one of the smoothest ways in which this procedure can be performed, even though it is one of the most difficult kinds of hexachordal change.\(^{146}\)

A permutation by leap, on its turn, is defined as a procedure that involves two consecutive notes represented by different step-letters—so that the difference with regard to ‘quantitas’ (following the nomenclature used by Gaffurius) applies to larger distinctions of sound, and not only that of a semitone as in the stepwise case of permutation. The permutation by leap commonly occurs when there is an intentional use of melodic tritones, although other intervals may also happen.\(^{147}\) In general, a permutation by leap is solmized

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\(^{145}\) Jacobus Leodiensis, in his *Speculum musicae* (p. 1330, bk. 6, ch. 66), classified the hexachordal change that involves *syllabic intervals* of third among the first cases of what he called *irregularis mutatio*—cf. (CS 2: 293; Bragard 1955–73, 6: 184–185).

\(^{146}\) The ‘indirect’ mutation that occurs in the *motetus* (m. 57)—already explained on p. —can also be identified as a feature of solmization that parallels this kind of permutation, for they represent the easiest forms of change of their kind.

\(^{147}\) Other leaps that necessarily call for a solmization by permutation would be augmented and diminished intervals of octaves, sevenths, sixths, and fifths. However, not only these intervals are unlikely to occur in the medieval repertoire or in most common exemplars from the Renaissance repertoire, but some of them (such as augmented and diminished sevenths and sixths, or augmented fifths) were not explained in historical treatises nor really conceivable in those epochs. There are still other leaps whose solmization might be implemented either through ‘permutation,’ or according to the octave-equivalence concept (depending on the hexachords involved), these are: sevenths (major and minor), sixths (major and
with the syllable *mi* for one step and the syllable *fa* for the other, although (as with stepwise permutation) some cases may happen in which only one of those syllables is used for any of the two consecutive notes involved in the procedure. Since that kind of permutation takes either the syllable *mi* or the syllable *fa* for the solmization of any one of the notes, the indication of a correspondent *ficta*-sign is customarily assumed, although they may not always be explicitly present. When there are no *ficta*-signs, solmization of a tritone is usually justified by harmonic needs, that is, in situations where harmonic consonances might have priority over melodic consonances. However, permutations by leap may also happen in pure melodic contexts, with no *ficta*-signs prescribing their solmization, so that syllables must conform to the deductions made from observing the melodic gestures—a musical example that followed Gaffurius's explanations on permutation (transcribed in FIG. 5.3, below) illustrates these specific instances of permutation by leap, including some circumstances in which mutations seem more appropriate.\(^\text{148}\)

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\(^\text{148}\) With regard to 'permutation' and 'mutation' (as well as other general references to solmization and *musica ficta*), most medieval and Renaissance treatises seem to present a larger amount of melodic illustrations and discussions, rather than harmonic ones. The exception of Marchettus's basic example (FIG. 5.1) seems striking, for it shows a two-voice structure, even though his *Lucidarium* was dedicated to

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\(^\text{148}\)
plainchant, not polyphony. Moreover, there are also other two-voice examples in the *Lucidarium*, all of them dealing with 'permutation' in some form or another—some of them including also the procedure called 'transmutation,' which will be later discussed in this dissertation. Marchettus’s concept of 'permutation' was deliberately linked with polyphony, probably because it was within polyphonic situations that he saw its origin and necessity. In this respect, the status of Gaffurius’s example (FIG. 5.3) seems as controversial as that with Marchettus’s. Even in a chapter "On musica ficta in counterpoint" ("De Fictae musicae contrapuncto") where Gaffurius provides an illustration in a harmonic format and uses the term 'permutation' and related verbs, the presentation takes a rather melodic approach—cf. his *Practica musice* (1496, bk. 3, ch. 13, esp. f. ee iiijr) for the original text, and (Miller 1968, 146; Young 1969, 156–157) for translations of the relevant passages. Also in bk. 3, ch. 2, esp. ff. cc viijr–v ("On the nature and denomination [i.e., nomenclature] of contrapuntal species"—"De Natura et denominatione specierum contrapuncti"), even though the main subject is not *musica ficta*, Gaffurius uses a similar melodic approach (including conspicuous references to the of ficta and 'permutation') in order to discuss and define intervals within a contrapuntal context—cf. (Miller 1968, 120–121; Young 1969, 126–127) for translations of the relevant passages. It is evident, however, that links between *musica ficta* and polyphony are both undeniable and inevitable, if not regarding the origin of *musica ficta*, at least because some specific situations for the use of ficta can only be explained (or seem to arise) from a polyphonic standpoint.
Some of the statements in Gaffurius's treatise may shed some light on where the permutations should be implemented, and where they should not.\textsuperscript{149} In the relevant passage (repeated below, in order to provide a quick reference) Gaffurius clearly attests that permutation is designed to be used only as a 'last resort,' and that, if necessary, 'irregular and indirect' mutation should be used in its place.

\[\text{Quem} quidem transitum quoniam difficilis et admodum dissonus est; omni solertia devitandum musicorum scola preceptit: hunc Marchetus et Anselmus permutationem vocant. Est enim ad inuenta Irregularis et Indirecta mutatio ad evitandum dissonum huiusmodi permutationis transitum. quem vrgente notularum dispositione fieri necesse est.\]
(Gaffurius 1496, bk. 1, ch. 4, f. aviij\textsuperscript{v})

\[\text{T}his \text{ is a difficult and very dissonant movement, and according to musical scholars, it should be avoided with all possible ingenuity. Marchettus and Anselmus call it permutation. Irregular and indirect mutation has been devised to avoid the dissonant movement of such a permutation, which must only be used when it is absolutely necessary because of the arrangement of the notes.}\]
(Miller 1968, 40)

Since this progression is difficult and highly dissonant, the schools of music have advised that it be avoided with every ingenuity. Marchettus and Anselm call this permutation. Irregular and indirect mutation was conceived in order to avoid the dissonant passage of such permutation, a passage which must be made by an oppressive arrangement of notes.
(Young 1969, 34)

Following those precepts, together with an appropriate reading of the melodic gestures, solmization should start with a $\overline{C}$-hexachord applied to first four steps, followed by the solmization of an $\overline{F}$-hexachord at least up to step 9.\textsuperscript{150} In this case, an 'implicit' mutation...

\textsuperscript{149} The entire presentation concerning permutation has been quoted earlier on p. 189.

\textsuperscript{150} In fact, the entire gesture from step 1 to step 9 could have been read according to the $\overline{F}$-hexachord if its compass was not exceeded by step 2 on e.
(c-sol) from the C- to the F-hexachord should take place on step 4, avoiding any need for 'permutation' between steps 5 and 6, whose leap must be interpreted not as a tritonus, but as a diatessaron (equivalent to modern b₃ and f¹, respectively). In face of these deductions and the fairly consistent solmization of the F-hexachord for most of the first ten notes, there is virtually no way of avoiding a return to the C-hexachord on step 10, and a consequent solmization of a tritonus between steps 9 and 10. Thus a permutation must be implemented in order to handle that tritonus, resulting in the 'permutated' F-b₃ (on step 9), and in the 'permutant' e-mi (on step 10). The next two hexachordal changes may only be implemented as mutations: one needed near the place where the C-hexachord is exceeded, toward a gesture that denotes an F-hexachord, thus imposing a mutation on step 14 (from c-sol to c-sol); and the other needed as a return from that F-hexachord to the former C-hexachord, thus imposing a mutation on step 19 (from c-re to c-sol). The return to that initial C-hexachord establishes itself as an ephemeral one, for the e (on step 20) is immediately followed by a descending leap to b (on step 21), constituting an inevitable need for a 'permutation' involving those two steps through the solmization of e-mi and b₃-fa, respectively. Further, step 21 establishes the beginning of a melodic gesture denoting a new

151 The only way of avoiding that tritonus would be by reading step 10 as e-fa (i.e., an e₃⁴). This seems unlikely, not only because Gaffurius's intention is exactly that of illustrating the possible alternations between avoidance of and compliance with permutation, but also because (in accordance with that context) step 10 would have to be preceded by a fa-sign, in order to escape the C-hexachord solmization.

152 The latter mutation on step 19 may be identified as an 'indirect' mutation (to which Gaffurius referred as a possible alternative to permutation), since it involves an 'implicit' (non-uttered) mutant-syllable—cf. the explanations on that sub-case of 'implicit' mutation at the end of section (iii), on pp. 157–159.
(and last) return to the $\text{F}$-hexachord (at least up to the $c$ on step 27). The last gesture (involving steps 27 and 28 to the end) is a matter for debate, probably even more than the earlier ones. On the one hand, both $b\text{-}fa$ and $e\text{-}mi$ constitute, by the end of the melody, sounds well- ingrained in the mind of any performer that has complied with the proposed solmization. In this case, the $\text{F}$-hexachord could be retained up to step 29 (then solmized as $b\text{-}fa$), and a permutation would be implemented toward step 30 (then solmized as $e\text{-}mi$, according to a $\text{G}$-hexachord that would be valid for the remainder of the example)—this latter possibility (shown in FIG. 5.3) must be considered carefully, since it allows for an almost symmetrical hexachordal solmization of the entire example.\textsuperscript{153} On the other hand, Gaffurius has defended the avoidance of ‘permutation’ whenever possible, calling for an interpretation of a leap of diatessaron from $b$ (on step 29) to $e$ (on step 30). In that case, the $\text{F}$-hexachord must be surely interrupted either on step 27 (c) or on step 28 (d), allowing for a mutation to a $\text{G}$-hexachord for the remainder of the melody, and establishing that $b$ (on step 29) as a $\text{b\text{-}mi}$—this possibility is the one shown in FIG. 5.4, with the change that takes on step 27 being classifiable as an ‘irregular’ mutation (from the ‘mutated’ sol to the ‘mutant’ $fa$). However, a different hexachordal symmetry could be generated with the substitutive solmization of the $\text{G}$-hexachord on steps 19 to 21 (generating the sequence $g\text{-}ut$, $e\text{-}la$, $b\text{-}mi$),

\textsuperscript{153} The hexachordal sequence would be $\text{G} = \text{F} / \text{G} = \text{F} / \text{F} / \text{G}$—where ‘equals’ represents mutation, and ‘slash’ represents permutation. This sequence establishes three groups separated by the two permutations: the first (with the initial two hexachords) involving the first nine steps; the second (with middle three hexachords) involving the next eleven steps; and the third (with the remainder two hexachords) involving the last twelve steps—only in the latter group the hexachords are internally separated by a permutation, while in the other groups the hexachords are conjoined by mutations.
where an 'irregular' mutation would be performed on step 19 (with re as its 'mutated'-syllable, and ut as its 'mutant'-syllable), and a permutation (formerly involving steps 20 and 21) would be delayed to steps 21 and 22—this possibility is also shown in Fig. 5.4. Notice that this latter possibility of permutation is not effected through the syllables mi and fa, but uses a 'permutated'-syllable mi (on 3, step 21) and of a 'permutant'-syllable ut (on f, step 22).

**FIGURE 5.4** - Permutation by leap (alternative solution). From Franchinus Gaffurius's *Practica musice* (1496, bk 1, ch. 4, f. a viijv).

154 In this case, the hexachordal sequence would be \( \overline{C} = \overline{F} / \overline{C} = \overline{F} = \overline{G} / \overline{F} = \overline{G} \), showing a symmetry in which the hexachords of each group are internally conjoined by mutations, and the permutations reserved for separating the three groups: the first (\( \overline{C} \) and \( \overline{F} \)) involve nine steps; the second (\( \overline{C}, \overline{F}, \) and \( \overline{G} \)) involve twelve steps; and the third (\( \overline{F} \) and \( \overline{G} \)) involve eleven steps.
In both solmization-solutions given for Gaffurius's example (FIG. 5.3 and FIG. 5.4),
the recta-permutations are alternated with 'implicit' recta-mutations, but only FIG. 5.3
presented the use of an 'indirect' mutation (on steps 19) as suggested by Gaffurius, while
the solutions in FIG. 5.4 presented 'irregular' mutations (on steps 19 and 28)—the other
mutations were 'regular' (on steps 4 and 14), in both solutions. 155

Whether permutations are made on stepwise motion or by leap, it is an extremely
difficult procedure to implement, since the performer must pass from one hexachord to
another without the support of a common unison, and there seems to be a scarcity of
theorists that would defend it as a justifiable procedure, at least if one looks for the use of
the term 'permutation' in association with that concept. Some authors have indeed used the
terms 'mutatio' and 'permutatio' as synonyms—e.g., Ramos de Pareja in his Musica
practica (1482, pt. 1, tr. 2, ch. 4, 31–34; [trans.] Miller 1993, 78–81); and Georg Rhau in
who used these terms as synonyms was Heinrich Glarean, who is supposed to have known
very well the permutation-procedure associated with the Marchettian legacy. Nevertheless,
he withheld the knowledge of the procedure in his treatises, and even implied he was against
its practice, as it becomes clear in his Isagoge in musicen (1516, ch. 3; [trans.] Turrell

155 The solmization-solutions proposed by Irwin Young (relatively to Gaffurius's example) do not
seem appropriately interpreted from Gaffurius's statements, nor conform to the deductions of hexachords,
and other concepts presented in this dissertation—cf. (Young 1969, 34) for his transcription of Gaffurius's
example. In the specific case of the permutations, Young interprets that there should be a change between
b-fa and b-mi on every single b in the example. Permutations of this kind, as exposed above, can only be
made in a stepwise motion that requires two consecutive notes of the same step-letter (creating a chromatic
inflection)—an instance not found in any of the b instances given in Gaffurius's example.
1959, 119–122)—the quotation below (only the translation) is excerpted from that chapter, entitled "Concerning the Permutation of the syllables," dedicated in fact to explain how hexachordal 'mutation' worked.

[T]he distinction they [teachers of music] draw between "mutation" and "permutation" impresses me very little, much less all the types of quality and quantity of mutation, and I know not what portentous forms of proprieties and deductions.

(Turrell 1959, 121)

In fact, there seem to have been very few statements against 'permutation' in the terms proposed by Marchettus, Gaffurius and others—Glarean's seems to be one of the few, if not the only one to state such a conspicuous opposition. Most theorists did not even discuss the existence of such a procedure, and some may have even avoided references to it—either because they lacked a more appropriate or complete knowledge, or perhaps because they did not find ways to oppose it in face of repertorial evidences. Even Prosdocimus de Beldemandis (one of the foremost opposers of Marchettus's ideas) does not seem to have spoken against the use of the term 'permutation' (or even mentioned it), nor seems to have even implied any kind opposition to its practice. Prosdocimus's position in this respect appears to be particularly curious, since he overtly stated his opposition to Marchettus's divisions of the tone, and to the very signs Marchettus employed both as indications of those divisions, and as indications for hexachordal changes. In a later revision of his Parvus tractatulus de modo monacordum dividendi (A Little Treatise on the
Method of Dividing the Monochord), Prosdocimus writes about his intentions toward Marchettian propositions.156

Omnia tamen ista diffusius et clarius habent demonstrative in tractatu quem de hoc compilavi contra istos Marchetinos, qui has erroneitates per Ytalian saltim seminaverunt.  
(Prosdocimus 1413-25/28, ch. 4; Herlinger 1987, 88)

(All these things [about the divisions of the tone] are presented more amply and more clearly by demonstration in the treatise on this matter that I compiled against the disciples of Marchetus, who have disseminated these errors throughout Italy.  
(Herlinger 1987, 89)

(Interpolation mine)

Despite the synonymical relation between the word 'mutatio' and 'permutatio,' the concept and process that defines the latter term was also discussed by others, like the anonymous author of the Berkeley Manuscript, although the term itself was not employed.  

Quia ab una deduccione sepe sit transitus ad aliam in cantu, quod absque mutacione vocum bono modo fieri non potest, licet aliquando fiat per disiunctas. Est enim disiuncta vehemens transitus ab una deduccione in aliam, absque quacumque vocum mutacione ibi fieri possibile [...].  
(Anon. Berkeley 1375, tr. 1, ch. 2; Ellsworth 1984, 48, 50)

(Although there may often be a transition from one hexachord to another in song (which cannot be accomplished in a good manner without the mutation of syllables), it may take place sometimes by disjunctions.  A disjunction is a violent transition from one hexachord to another, without whatever mutation of syllables might be possible [...].  
(Ellsworth 1984, 49)

(Underlines mine)

In the above description, 'permutation' is implied by a reference to a process effected "through disjunct" ("per disiunctas") syllables, performing a "violent transition"

156 According to Herlinger's commentary (1987, 11), Prosdocimus "seems to have undertaken the revision of the Monacordum primarily to repudiate Marchettus's theories." The other treatise, to which Prosdocimus refers in the quotation from the Parvus tractatulus ... monacordum, is his Tractatus musicae speculative, written in 1425.
("vehemens transitus"). Similar statements that appear to descend from this Berkeley lineage, are presented in Guerson's *Utilissime musicales regule*.157

Sequitur quartum capitulum quod est de disiunctis

ET primo ponitur diffinitio secundum Picttagoram

Disiuncta est vehemens transitus soni de vna proprietate: aut deductione in aliam absque mutationis facultate vel sic

Disiunctio est progressio vnius vocis vel deductionis ad aliam vbi esses neccessaria mutatio tamen non fit [...]  

Et dicitur disiuncta de disiungo disiungis: quia vna proprietates vel deductio disiungitur ab alia.

Et fit disiuncta vbi non debet nec potest penitus causari mutatio.

Est tamen differentia inter disiunctam et coniunctam: quia disiuncta disiungit:  

Coniuncta vero coniungit duo extrema id est duas voces diuersarum deductionum ad vnum sonum vel tonum.

Disiuncta ergo dicitur et vocatur quando disiungit vnam proprietatem ad alia ascending vel descending pro vt inferius sequitur et denotatur in practica.

(Guerson [ca. 1495], bk. 1, ch. 4, f. b iii\textsuperscript{v})

It follows the fourth chapter, which is about the *disiunctae*

First, the definition is established according to Pythaghoras.

A *disiuncta* is the drastic transition of sound from one *proprietas*, or *deductio* [i.e., hexachord] into another without the feasibility of mutation, or the like.

*Disiunctio* [i.e., disjunction] is the progress of one syllable (vox) or deduction toward another, where it might be necessary, yet a mutation is not made [...].

And it is said *disiuncta* from [the verb] 'to separate' (disiungo, disiungis): because one *proprietas* or *deductio* is separated from another.

And the *disiuncta* is made where a mutation ought not or cannot be advocated.

Still, there is a difference between *disiuncta* and *coniuncta*: because the *disiuncta* separates; [and] to be sure, the *coniuncta* unites two extremes, that is, two syllables of different *deductiones* toward one sound or tone.

*Disiuncta*, therefore, is said and is named when it separates one *proprietas* in consequence of another, by ascending or by descending, inasmuch as it follows or is specified in practice.

(ellipsis mine)

157 Other authors have made similar statements: Dionysius Lewis de Ryckel in *De arti musicali* (15th cent., pt. 2, f. 116\textsuperscript{r}); and Nicolaus Wollick in his *Enchiridion musices* (1512, bk. 2, f. c iii\textsuperscript{r}).

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Apparently, Guerson elaborated briefly on the statement from the Berkeley treatise in order to provide a clearer understanding of the concept, even if no real expansion of meaning was made. One or two generations after the Berkeley anonymous (and approximately a century before Guerson), Petrus Tallanderius was still another author who used the term ‘disiuncta’ in lieu of ‘permutatio’—cf. his *Lectura ordinata tam per cantu mensurabili quam immensurabili.* (ca. 1390, f. 162r–162v). In the quotation below, although Tallanderius made no direct reference to ‘vehemens transitus,’ it appears that his treatise would also pertain to the same Berkeley lineage, or perhaps to a branch derived from that treatise.

Sequitur de disiunctione.

Nota quod disiuncta est ascensus vel descensus sine mutatione et proprietate, et habet fieri quando per mutationem non possimus ad cantum attingere, et etiam quo quomodo transcendat quintam.

(Tallanderius ca. 1390, f. 162v)

It follows [the chapter] on *disiuncta.*

Notice that *disiuncta* is an ascent or descent without mutation and *proprietas,* and it has to be done when through mutation we cannot manage (administer) the chant, and likewise when one may exceed (*transcendat*) the fifth.

(my translation)

158 Although Guerson’s statement seems to equate ‘mutation’ with ‘coniuncta,’ it becomes clear, later in his treatise, that *coniuncta* may signify either *musica ficta* (or to *ficta*-hexachords) in the generic sense, or *ficta-mutation* in the specific sense—cf. (Guerson [ca. 1495], bk. 1, ch. 4, f. b iii iv; bk. 2, f. b viii–viii). These meanings for *coniuncta* were also used by a myriad of other authors, as well as by the anonymous author the Berkeley treatise—cf. (Anon. Berkeley 1375, tr. 1, ch. 1, 2–4, 8; Ellsworth 1984, 44, 48–66, 86–88, 94–96 [even only]; [trans.] Ellsworth 1984, 45, 49–67, 87–88, 95–97 [odd only]). A rather long list of other authors, who have used the term *coniuncta* (and also related words such as *coniunctio, coniungo,* etc.), can be checked in the *Lexicon musicum latinum,* p. 628–643—all including the meanings mentioned above, together with various others.
Ramos de Pareja also used *disiuncta* in the same context, although he judgmentally qualified it as an 'improper' term—thus it seems that he would have preferred another term, of which he apparently may have had no knowledge. Following previous authors, Ramos de Pareja states that the term *'disiuncta'* applied to changes from one *proprietas* to another, without a mutation per se (i.e., without the use of a common-step). Thus, in his definition of *disiuncta* (and through the case-descriptions he used), Ramos de Pareja clearly equates that term with the basic concept of 'permutation': a procedure of hexachordal change without the use of a common-step. At the same time, Ramos de Pareja gives no description of a stepwise (chromatic) case similar to the one defined by Marchettus da Padova, but expands on explanations about other features and applications of that basic concept of

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159 It has been mentioned above that Ramos de Pareja did use the term *'permutatio'*, although as a synonym to *'mutatio'*, in a chapter entitled "On the permutation of syllables" (*De vocum permutatione*), cf. (Ramos de Pareja 1482, pt. 1, tr. 2, ch. 5, 25–27; Wolf 1901, 31–34; [trans.] Miller, 78–81). In a detailed reading of that chapter, he seems to have applied *'mutatio'* as the proper noun for the procedure, and *'permutatio'* as a tentative description-noun of the procedure (in the sense of 'through mutation').

160 At the specific point from chapter 5 (*pars 1, tractatus 2*), quoted below, Ramos de Pareja's text takes only the *recta*-gamut as basis for discussion; for this reason, he mentions only changes from one *proprietas* to another (e.g., from a *durum* hexachord to a *molle* or a *naturalis* hexachord). In keeping up with the context of Ramos de Pareja's chapter, however, the term *disiuncta* can also be applied to hexachordal transitions without any change in *proprietas*—e.g., between two hexachords pertaining to the *durum proprietas* (such as from a $\bar{G}$-hexachord to an $\bar{A}$-hexachord). Notice that Miller (1993, 86) translates "property" for "proprietas," instead of the rendition "propriety" (preferred in this dissertation).
In the translation given below, the cases described by Ramos de Pareja have been numbered individually, in order to facilitate the interpretations that will follow.

[I]sti contemporanei nostri [...] disiunctas improprie vocant, quando sine mutatione ab una proprietate in aliam se transferunt, ut puta: si reperiantur in c sol-fa-ut dicentes fa et ad f fa-ut descendere immediate cogantur et deinde ad graviore, tunc ille descensus dicitur disiuncta, quia fa in altiori voce et fa in inferiori pronuntiant. Dixi in diapason necessario, quoniam in diapente non semper fit de necessitate, sed solum, quando diapente est mi mi ut e ½ aut fa fa ut f k. Sed si [cantus] fiat ab a la-mi-re existente cum re et descendat per saltum diapente, immediate illud re mutatur in la et dicitur re la re, quoniam tunc bene sequitur illud re ab illo la. Sic et in g existens cum ut saltu facto per diapente immediata non fit disiuncta, sed mutatur in sol et dicitur ut sol ut, quia bene sequitur illud ut ab illo sol. Tritonus immediatus semper causat disiunctas, ut si ab f fiat saltus usque c sol-fa-ut transiens ½ unica notula, tunc dicitur in f fa et in ½ fa ½ mi mi et sequitur c fa et tunc disiuncta dicitur, quoniam illud mi non sequitur nec

[O]ur own contemporaries [...] improperly call them disjunctions when they transfer them without mutation from one property to another; for example, [1] if they may be found saying fa on c sol fa ut and must descend immediately to f fa ut and thereupon to lower tones, then this descent is called a disjunction, because they may sing fa on the higher tone and fa on the lower tone. And so [2] when an octave leap occurs, wherever it happens a disjunction necessarily will always be formed. I said “necessarily in an octave” because in a fifth it does not always occur through necessity, but only [3] when the fifth is mi mi, as e ½, or fa fa, as f k [i.e., F to c]. But [4a] if it may be formed from a la mi re by proceeding on re, and it descends by a leap of a fifth, the re is immediately changed into la and re la re is said, for then that re is followed well by that la. And similarly [4b] on g proceeding with ut formed by a leap of a fifth, a direct disjunction is not made, but ut is changed into sol and ut sol ut is said, for that ut is followed by that sol.

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161 This lack of description and definition for the chromatic, stepwise permutation may also be verified in the works of the authors pertaining to the Berkeley lineage, cited above.

162 According to Ramos de Pareja’s nomenclature, the lowercase step-letters (a, b, c, d, e, f, g) should be equated with the medieval uppercase step-letters (A, B, C, D, E, F, G), and the other step-letters (h, i, j, k, l, m, n, o, p) equated with the medieval lowercase step-letters (a, b, c, d, e, f, g, aa). Notice, however, that when the author gives the full designation, the steps do follow the medieval recta-nomenclature—e.g., c-sol-fa-ut, and a-la-mi-re. In the interpretive readings after the quotation, his nomenclature will be converted to the appropriate medieval nomenclature adopted in this dissertation.
dependet ab illo fa graviori. Alii saltus, qui
maiores sunt diapente, semper faciunt
diisectas tam in intendendo quam
remittendo, præterquam ubi la possit accipi
in hexachordo, ut, si in a la-mi-re re aut mi
tenemus, cantus per saltum ad c fa-ut
remittatur; tunc la est accipiendo et dicitur
mi la ut aut re la ut. Aliter autem supra
diapente semper diisecta fiet.
(Ramos de Pareja 1482, pt. 1, tr. 2, ch. 5,
29; Wolf 1901, 37–38)

A direct tritone always causes
disjunctions, as [5] when a leap is made
from f up to c sol fa ut by moving through
the single note 4; then fa is said on f fa and
mi on 5 mi [sic] and c fa follows, and so it
is called a disjunction because the mi does
not follow nor depend upon the lower fa.
[6] Other leaps greater than a fifth always
make disjunctions either in ascending or
descending, except [7] where la can be
applied in a hexachord, so that, if we use re
or mi on a la mi re a song may drop by leap
to c fa ut; then la must be applied and
mi la ut or re la ut is said. But otherwise a
disjunction will always be formed beyond a
fifth leap.
(Miller 1993, 86–87)

(ellipsis, enumerations, and interjection mine)

Some of the musical descriptions used by Ramos de Pareja, however, represent
cases that do not constitute 'permutation,' but 'mutation' (which he uses as a logical converse,
in order to state what 'permutation' is not, and where it is not necessary). Below, the
interpretation of each case will present subtypes of 'permutation,' as well as those specific
possibilities in which it should not be applied, or even alternatives for avoiding that
procedure. Musical examples (not found in treatise) have also been prepared as illustrations
to the interpretive readings of each case, in compliance with Ramos de Pareja's
descriptions—in those examples, Ramos de Pareja's prescriptive solmization-syllables are
set in boldface.

The first description of disiuncta [1] involves a change between two melodic
gestures (separated by a leap of fifth): one ending on c-fa (thus solmized according to a
G-hexachord), and the other starting on F-fa and descending to lower steps (thus

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characterizing a solmization according to a $\overline{C}$-hexachord). Although that kind of change will certainly configure a permutation (if Ramos de Pareja's prescriptive solmization is the only one implemented), there are two other alternatives that do not create any permutation (if one considers the existence of the other syllables in each step). The first alternative takes the octave equivalence as an expediency to avoid permutation, by solmizing $ut$ (based on the $\overline{C}$-hexachord) as a mutant syllable for the step $c$-sol-fa-ut—this solmization would then serve as an 'indirect' mutation (producing on that step the equation $fa = [ut]$, then descending to $F$-fa-ut with the solmization $fa$ (also based on the $\overline{C}$-hexachord). The second alternative may use the $\overline{F}$-hexachord as a transient mediator between the $\overline{G}$- and $\overline{C}$-hexachords wanted by Ramos de Pareja, implementing 'implicit' mutations on both steps ($c$-sol-fa-ut and F-fa-ut). The step $c$-sol-fa-ut would take $fa$ as a 'mutated'-syllable, and $sol$ as a 'mutant'-syllable (thus an 'irregular' mutation from the $\overline{G}$-hexachord to the $\overline{F}$-hexachord); then the step $F$-fa-ut would take $ut$ as a 'mutated'-syllable, and $fa$ as a 'mutant'-syllable (thus a 'regular' mutation between the $\overline{F}$-hexachord and the $\overline{C}$-hexachord).

In FIG. 5.5, item (a) refers to Ramos de Pareja's original 'permutation,' item (b) refers to the mutation obtained by means of the octave-equivalence expediency, and item (c) to the mutations obtained by the mediation of the $\overline{F}$-hexachord.

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163 In this first alternative, the 'indirect' mutation seems to be the better option, not only in keeping with the prescriptive solmization given by Ramos de Pareja, but also because the solmization of the $\overline{C}$-hexachord on $c$-sol-fa-ut would be obtained by means of an octave equivalence. However, it would be also possible to implement a simpler 'implicit' mutation, in which the 'mutant'-syllable $ut$ (according to the $\overline{C}$-hexachord) would be the one uttered, and not the 'mutated'-syllable $fa$ (according to the $\overline{G}$-hexachord)—thus producing the equation $[fa] = ut$.  

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FIGURE 5.5 -  *Disiuncta* ('permutation') by leap of fifth (*fa* / *fa*), and alternative options of mutation—case [1].

(a)

\[ \text{G: } ut \text{ re } fa \text{ mi } fa/ \]

(b)

\[ \text{G: } ut \text{ re } fa \text{ mi } fa= \]

(c)

\[ \text{G: } ut \text{ re } fa \text{ mi } fa= \]

The second case [2] described by Ramos de Pareja, takes an octave leap as a sign for 'permutation.' Although this is certainly one situation in which a hexachordal change can only be implemented by means of permutation (since no hexachord reaches the octave compass, and therefore there are no common steps in an octave leap), the octave-equivalent solmization may be applied, if only to provide a momentary (mediator) 'mutant'-syllable for the first step of the octave leap, or a momentary (mediator) 'mutated'-syllable for the second step. In any case, a change involving an octave leap is certainly problematic (whether or not it makes use of octave equivalence)—this is likely the reason why most theorists seem to
prefer 'irregular' mutation as a proper classification for this case (probably a much more reasonable classification, for an octave correspondence between the two hexachords involved can always be established). Since Ramos de Pareja provides no examples or descriptions of steps involved in such a case, this could imply that an octave leap is easily understandable by any reader, and that perhaps it is a common event.

The third case [3] asserts that in particular leaps of fifth one cannot possibly find recta-hexachords that will share in any of the steps (thus, a 'permutation')—the author here describes two cases. The first case is clear with respect to 'permutation,' for it refers to the step-letters E and ♭, since there exists no single recta-hexachord incorporating both in a direct leap. At the same time, ficta-hexachords of the durum proprietas (e.g., D-hexachord, or A-hexachord) do incorporate those two step-letters, and therefore may be used as transient mediators for the solmization of the two distinct melodic recta gestures that contain E and ♭—see FIG. 5.6 (a) for a representation of that description as 'permutation,' and FIG. 5.6 (b) for the mediated solution with a D-hexachord (producing 'implicit' ficta-mutations on both steps). The second case refers to the step-letters F and c, both solmized fa (therefore F-fa within a C-hexachord gesture, and c-fa within a G-hexachord gesture). This case does allow for a justifiable alternative through an F-hexachord mediator, since at least c-fa is already a step of that hexachord, and so is F when solmized with the

164 An 'indirect' mutation, like the one illustrated in FIG. 5.5 (b), could also be presented as solmization-solution for case [3]. This alternative would take E as a place of mutation, first solmized with a 'mutated' uttered syllable mi, then aurally changed to a 'mutant' non-uttered syllable la (obtained by means of octave equivalence)—generating the equation mi= [♭B].
syllable *ut*. It also allows for another alternative through 'indirect' mutation, if the second step of that leap is taken as place of mutation and solmized by means of octave equivalence (thus generating a c-*ut*), and immediately proceeding to the $\text{G}$-hexachord (whose solmization, according to Ramos de Pareja's description, would still start on that place of mutation with c-*fa*, since it forms a unison with c-*ut*). This latter case involving an ascending leap from F-*fa* to c-*fa* (and its two alternative solmizations by mutation) is, in fact, a restatement of case [1], described with a descending leap of fifth, and illustrated in FIG. 5.5 (together with two corresponding alternatives).

**FIGURE 5.6** - *Disiuncta* ('permutation') by leap of fifth (*mi / mi*), and an alternative option with two ficta-mutations—case [3].

(a)

\[
\begin{align*}
\text{G}: & \quad \text{mi} \quad \text{re} \\
\text{C}: & \quad \text{ut} \quad \text{mi} \quad \text{fa} \\
\end{align*}
\]

(b)

\[
\begin{align*}
\text{G}: & \quad =\text{mi} \quad \text{re} \\
\text{D}: & \quad =\text{re} \quad [\text{la=}] \\
\text{C}: & \quad \text{ut} \quad \text{mi} \quad \text{fa} \\
\end{align*}
\]

The fourth case [4] is an attempt to narrow down particular leaps of fifth that do not call for 'permutation' (i.e., *disiuncta*), but for 'regular' types of *recta*-mutation. This alternative is justifiable when the step-letters of that fifth are found within the compass of a
single recta-hexachord. Ramos de Pareja presents two situations ([4a] and [4b]) in which this alternative may happen. In situation [4a], he states that when a descending interval of fifth is made from a-re (of the G-hexachord) directly to d-re (of the C-hexachord), then one does not need to make a disiuncta, but could implement a 'regular' mutation on the step-letter a (which is found both in the G- and C-hexachords)—thus producing a change from a 'mutated' a-re to a 'mutant' a-la, and then proceeding with the leap to d-re. Similarly, in situation [4b], when a leap is made from g-ut (of the G-hexachord) directly to c-ut (of the C-hexachord), the hexachordal transition could be anticipated through a mutation on the step-letter g (also found both in the G- and C-hexachords)—thus producing a change from a 'mutated' g-ut to a 'mutant' g-sol, and only then proceeding to c-ut. In accordance with those interpretations, situation [4a] is represented by the solmization sequence re la re, and situation [4b] by the sequence ut sol ut. The two situations are illustrated in FIG. 5.7, respectively, in items (a) and (b). Although Ramos de Pareja described only descending leaps of fifth in case [4], the solmization of ascending fifths could also use the same kind of alternative mutations, provided the step-letters fall within the compass of a single hexachord—in any event (ascending of descending) the first step of the leap would be taken as a place of mutation. The same consideration of equivalence between descending and ascending leaps of the same species (and quantitas) must be applied to the other case-descriptions of the above quotation.

165 Notice also that Ramos de Pareja's justifications for case [4] may be used in favor of the first alternative mutation proposed for case [1], as illustrated in FIG. 5.5 (b).
FIGURE 5.7 - Alternative mutations on a leap of fifth (re la re and ut sol ut)—case [4].

(a)

\[\overline{G}: \text{=} \text{la re mi ut re fa la sol} \]
\[\overline{G}: \text{ut re fa ut mi [re=]} \]

(b)

\[\overline{G}: \text{=} \text{sol ut resol fa mi fa la sol} \]
\[\overline{G}: \text{ut re fa ut mire [ut=} \]

The description for the fifth case [5] starts with a gesture that involves a fifth, from F-fa to c-fa, that interval is not reached directly, but mediated by a \( \frac{1}{2} \)-mi, which therefore establishes a leap of tritone with the lower step F-fa—see FIG. 5.8.\(^{166}\) Thus, it is truly configured as a 'permutation,' for there exists no possibility of mutation (by mediation or otherwise) in leaps of tritone, since that interval cannot be found in any conceivable hexachord following the Guidonian paradigm. This case is even more characteristic of 'permutation' in that it involves the consecutive use of the syllables fa (for the 'permutated'-syllable) and mi (for the 'permutant'-syllable)—two syllables that cannot usually yield to unisons.

\(^{166}\) In Miller's edition, the phrase "tunc dicitur in f fa et in \( \frac{1}{2} \) fa \( \frac{1}{2} \) mi mi" is translated with a slight omission, a corrected version should read as follows: "then fa is said on \( f \) and \( mi \) on \( \frac{1}{2}fa / \frac{1}{2}mi."  

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The sixth case [6] is only a generic acknowledgment that leaps beyond the interval of fifth are bound to be solmized by means of hexachords that do not find common-steps, although the seventh case [7] discusses the exception of particular leaps of sixth.\textsuperscript{167}

In case [7], Ramos de Pareja described two specific melodic situations of a descending leap of sixth involving a-la-mi-re as the higher step, and C-fa-ut as the lower step—which together outline the outer limits of a $\text{C}$-hexachord, and may be solmized respectively as a-la and C-ut. However, in the first situation (a), the higher step is also prescribed with the solmization $mi$, implicitly determining an $\text{F}$-hexachord solmization for the gesture ending on that a-mi, whose solmization would then be changed to a-la, serving as place of mutation between the preceding $\text{F}$-hexachord and the subsequent $\text{C}$-hexachord—this situation is illustrated in FIG. 5.9 (a). In the second situation (b), the higher step is prescribed with the solmization $re$ (thus, a-re), implicitly determining an $\text{G}$-hexachord solmization for the melodic gesture preceding that step, which would then

\textsuperscript{167} With regard to 'permutation,' the interval of sixth has been also discussed above in note 147, and with regard to the exceptions of case [7], it has been discussed in chapter 2 (iii).
serve as place of mutation between that $\overline{A}$-hexachord and the subsequent $\overline{C}$-hexachord—this situation is illustrated in FIG. 5.9 (b).\footnote{Notice that case [7] may serve as argument in favor of the mediated mutations proposed for cases [1] and [3], as illustrated in FIG. 5.5 (c) and FIG. 5.6 (b), respectively.}

**FIGURE 5.9** - Mutations on a leap of Guidonian sixth (\textit{mi la ut} and \textit{re la ut})—case [7].

(a)

\[ \text{\overline{C}: } =\text{la ut re fa mi fa sol mi re} \]
\[ \text{\overline{F}: ut misol fa re [mi=]} \]

(b)

\[ \text{\overline{C}: } =\text{la ut re fa mi fa sol mi re} \]
\[ \text{\overline{G}: ut re fa mi [re=} \]

As the descriptions for case [7] exemplify, if the leap of sixth denotes the same intervallic configuration of a Guidonian hexachord (T-T-S-T-T), then that leap may be solmized according to a single hexachord and, therefore, will denote no hexachordal change or any sort—neither a \textit{disiuncta} (i.e., will need no 'permutation' to be solmized), nor any 'mutation.' A change will only be needed when the compass of that particular Guidonian sixth is exceeded (above or below), and even then a 'mutation' will be the most likely
procedure implemented. The reason for this latter interpretation is because a leap of this magnitude would be normally followed by another smaller interval (either by leap or stepwise) in the opposite direction—i.e., if it is an ascending leap of sixth, the next interval would be descending; or if the sixth is descending, the next interval would be ascending.

Even on rare situations in which a melodic gesture proceeds above or below the extremes of that leap of sixth, a simple 'mutation' will be usually possible, either taking one of the steps that frame the sixth as a place of mutation, or taking the hexachord represented by that Guidonian sixth as mediator.

In light of the above presentation, 'permutation' may be summarized as a procedure of hexachordal transition implemented on two consecutive steps that do not meet on a unison, whether it is done on chromatic, stepwise motions (following the concept exposed by Marchettus da Padova), or on some particular leaps (following Ramos de Pareja, Gaffurius, and others). Among these leaps, some intervals (however rare) may be taken as definite signs for 'permutation,' such as: tritones, fifths (diminished), and octaves (augmented and diminished). Some other leaps, like sevenths (major and minor), sixths (major and minor), and thirds (minor), may denote the necessity for 'permutation' (depending on the actual hexachords involved), but in other circumstances do not always call for that rough procedure. Even if these latter intervals are mentioned as signs for 'permutation' ('disiuncta') in selected historical treatises, they must be judged first according

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169 Cf. note 147, with regard to other leaps that could serve as signs for 'permutation,' but which are not likely to be found in the medieval and Renaissance repertoires, as well as leaps that may or may not call for 'permutation,' depending on the hexachords involved.

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to their specific configuration (whether or not they fit within a Guidonian hexachordal paradigm), and according to possibilities of applying other hexachords or alternative concepts of solmization (e.g., use of ficta-hexachords as mediators, or use of octave equivalence).\textsuperscript{170} In the specific case of fifths (perfect), there is usually an alternative that enables a solmization according to one sole hexachord (even if only for that interval, with mutations needed on its framing steps), provided one considers the use of a hybrid gamut (recta plus ficta)—the mention of fifths as signs for 'permutation' ('disiuncta'), as in the case of authors like Ramos de Pareja, is only applicable if solmization is restricted to the \textit{recta}-gamut.

\textsuperscript{170} Notice that the octave-equivalence concept has been formulated only for ephemeral situations, when there are only a few steps outside that fall beyond the limits of only one hexachord, but which could fall on a related octave-transposed hexachord. In situations when those steps create an individualized melodic gesture, either a mutation, or a permutation is needed.
The term 'transmutation' refers to the momentary and punctual use of syllables from an extraneous hexachord, while maintaining the solmization of a prevalent hexachord for the surrounding notes (all within the same melodic gesture). In general, 'transmutation' involves three consecutive steps: (i) a departure, 'transmutated'-step; (ii) a transient, 'transmutant'-step; and (iii) a return, 'retransmutated'-step—although generally all three steps (or at least two) may be aurally conceived according to the extraneous hexachord, its solmization (utterance) is usually not applied to all. One of the characteristic examples of 'transmutation' happens in the situation commonly know as fa-super-la—that is, when the sentence 'una nota super la semper est canendum fa' can be applied. In this situation, the 'transmutated' and the 'retransmutated' steps are generally solmized according to the prevalent hexachord, and the 'transmutant'-step is the only one solmized with the extraneous syllable. Thus, the 'transmutant'-step constitutes a brief (transient) intervention that represents 'transmutation' per se. Illustrated below (FIG. 6.1), the fa-super-la situation is represented by a 'transmutant'-step b-fa (on "cae-lorum"), preceded by a 'transmutated'-step a-la (on "Regi-na"), and followed by a 'retransmutated'-step a-la (on the first note of "cae-lo-rum"). The illustration is an excerpt from one of the examples in Gallicus's Ritus canendi (1458/64,
pt. 2, bk. 2; Seay 1981b, 14: 59; CS 4: 380), which includes solmization-syllables for each step (indicated in boldface in the transcription below)—the entire example (FIG. 6.7) will be discussed later in closer detail.

**FIGURE 6.1** - Transmutation in *fa-super-la* situation.

\[
\overline{\text{C}}: \text{ re fa mi re ut fa sol la (fa) la sol fa mi re ut re} \]

(a) the 'transmutant'-syllable is individually enclosed in parentheses, but no hexachord is indicated—emphasizing its function as a transient intervention in the solmization of the prevalent hexachord; (b) the 'transmutated' and the 'retransmutated' syllables are not graphically differentiated from the other syllables of the prevalent hexachord (to which they also pertain). Although Gallicus's original example gives only a single solmization-syllable for each step, the syllables denote the hexachord applied to each note, and therefore, any procedures of hexachordal change (transmutations or otherwise) are also made clear—even though the places of those changes are not made explicit by means of the indicators devised for this dissertation (equals, slashes, parentheses, brackets, etc.). The extensive melodic gesture on the incipit of the antiphon "*Ave Regina caelorum*" ("Hail, Queen of the Heavens") are clearly meant to be solmized according to a \( \overline{\text{C}} \)-hexachord, except for that
extraneous fa on the highest b-step, which would pertain to an F̆-hexachord. However, it may be noted that both the 'transmutated' and the 'retransmutated' steps may constitute common-steps between the prevalent and the extraneous hexachord, and therefore may be understood as potential places of mutation. If the mutation alternative is considered in FIG. 6.1 (even preserving Gallicus's prescriptive syllables), the first step a-la (preceding the 'transmutant'-step b-fa) could be solmized according to the equation la = [mi] (thus producing an 'indirect' mutation); whereas the second a-la (following b-fa) could be solmized according to the equation [mi]= la (thus producing a simple 'implicit' mutation). What prevents this mutation approach is precisely the transient, momentary character of the syllabic escape to an extraneous location beyond the upper limits of the prevalent C̃-hexachord—i.e., the escape to one sole note above la.

Another example of 'transmutation' happens when the solmization of a step must be altered, for the sake of providing an appropriate interval in a cadential situation—that is, the alteration of an interval that precedes a cadential arrival, for which one must observe the prevailing tendencies of counterpoint in each time period (or even region, or composer, etc.). This type of 'transmutation,' which implements subsemitone inflections, is usually based on the contrapuntal precept of 'propinquity' (or 'closest approach'), whose basis Marchettus da

171 The notion of 'Heavens' is transmitted by means of a twofold word-painting on the first syllable of "caelorum": (a) the highest step of the musical phrase is reserved for that place, representing the highest place of the Heavens; and (b) the solmization syllable fa for that highest step pertains to the extraneous F̆-hexachordal realm (when observed from the prevalent C̃-hexachordal realm), representing the remote, almost unattainable Heavens (when observed from the earthly place of humankind).
Padova discussed in his *Lucidarium*, when talking about the "dissonances" of third, sixth, and tenth.

9. Hee autem dissonantie et hiis similes ideo compatiuntur ab auditu, quia sunt magis propinque consonantiis, cum moventur sursum et deorsum.

10. Oportet enim quod quando due voces sunt in dissonantia que compatitur ab auditu quod ipsarum quelibet requirens consonantiam moveatur ita videlicet, ut si una in sursum tendit, reliqua in deorsum, semper distando per minorem distantiam a consonantia ad quam tendunt.

(Marchettus 1317/18, tr. 5, ch. 2; Herlinger 1985, 202; GS 3: 80–81)

9. These dissonances, and those similar to them, are compatible to the ear because they lie closer to consonances as [their notes] are taken upward and downward.

10. When two notes lie in a dissonance compatible to the ear, each, seeking consonance, must be moved so that if one tends upward the other tends downward; and they always must lie at the smallest distance from the consonance toward which they tend.

(Herlinger 1985, 203)

A musical example illustrating this presentation, and clarifying what "the smallest distance" is, comes only in a later chapter of that same part (treatise 5) of Marchettus's work—chapter 6 entitled "*Questio de dissonantiis*" ("An Investigation Concerning Dissonance").

**FIGURE 6.2** - 'Propinquity.' (Marchettus da Padova 1317/1318, tr. 5, ch. 6; Herlinger 1985, 214; cf. also GS 3: 82).
Marchettus's example shows alterations from minor to major on: (a) a sixth that proceeds to an octave, (b) a tenth that proceeds to a twelfth, and (c) a third that proceeds to a fifth. Although the basis of 'propinquity' is justified as a result of harmonic contexts, it is the way of producing its inflections, in the melodic context of solmization, that needs to be addressed. In the example, each segment of three harmonic intervals is clearly individualized, bearing no relation with the others. Therefore, any solmization-solutions that may arise for each voice of each segment must be taken as mere suggestions, since hexachords and eventual transitions can only be determined by more complete melodic gestures. It is in this sense that solmization syllables have been presented for each note in FIG. 6.3 (a transcription of Marchettus's example).

FIGURE 6.3 - Transmutation in cadential situations ('propinquity'). From (Marchettus 1317/18, tr. 5, ch. 6; Herlinger 1985, 215; GS 3: 82).

\[
\begin{align*}
\text{(a)} & \quad \text{ut} \ (\text{mi}) \ ut & \text{(b)} & \quad \text{D}: \ (\text{re} \ \text{mi} \ \text{fa}) & \text{(c)} & \quad \text{B}: \ (/\text{mi} \ \text{fa}) \\
\text{G}: & \quad \text{sol} \ \text{la} \ \text{sol} & \text{G}: & \quad \text{la} \ \text{sol} \ \text{la} & \text{G}: & \quad \text{sol} \ \text{mi} \ \text{re}
\end{align*}
\]
In the case of the lower voice, a \( \hat{A} \)-hexachordal solmization can be coherently applied to any of the three segments, but in the case of the upper voice, in which hexachordal changes must be implemented, the solutions must be carefully considered. In the upper voice, item (a) shows the only clear case that can be possibly solmized by means of 'transmutation,' while item (b) shows no apparent need for a hexachordal change, and item (c) shows a solmization by means of 'permutation,' since there is no possible hexachord that could include both d-mi and a preceding d with a solmization that is clearly other than mi. Item (a) illustrates the most characteristic case of a subsemitone inflection, in which only the middle-step ('transmutant') is solmized according an extraneous hexachord (c-mi of an \( \hat{A} \)-hexachord), while the surrounding steps are solmized according to the prevalent hexachord (d-uts of the \( \hat{D} \)-hexachord). However, in subsemitone cases (as it happens with the upper-semitone inflections of the fa-super-la situations) both the 'transmutated' and the 'retransmutated' steps could be solmized according to the extraneous hexachord—in item (a) they could be solmized as d-fas of that \( \hat{A} \)-hexachord. If the transient aspect that characterizes 'transmutation' is verified for all three steps, then they may be all solmized according to that extraneous hexachord, without disfiguring the procedure of 'transmutation'; if only the middle-step is characteristically transient, then it will be the only one solmized to the extraneous hexachord—but any of these decisions would definitely need a more complete melodic gesture. In item (b), either all three steps may be solmized according to the extraneous hexachord, or only the middle, 'transmutant'-step—the final decision, as before, depends on a larger melodic context, within which the transient aspect
may or not be identified. However, the stepwise one-direction motion of that diatonic contour suggests that no interruption should be implemented by that middle-step, and all three notes should be solmized as a group. This latter consideration may paradoxically allow that the first and third steps be taken as potential places of mutation (perhaps without detriment to the transient aspect of the three-note gesture)—in this case, in order to indicate the transitional character of the hexachord, it would still be advisable to keep all three steps enclosed in parentheses, but as a group (as notated in FIG. 6.3) and not individually as it would happen in a more distinctive case of 'transmutation.' In a chromatic situation such as the one shown in item (c), the proper identification of 'transmutation' (and of its transient aspect) would also depend on a larger melodic context. In any case, a 'permutation' from the first d to the second (prescribed by Marchettus as d-mi) is inescapable, and it remains to decide whether the second step will be the only one taken as characteristically transient (in which case it should be individually enclosed in parentheses), or whether both the second and third steps will be taken as transients (in which case they may be enclosed in parentheses as a group, as notated in FIG. 6.3, and not individually).

In FIG. 6.4, a more complete melodic context is shown, denoting a solmization according to the Ė-hexachord, within which three momentary departures occur: two as fa-super-la situations (clearly upper-neighbor semitone inflections), and one as a cadential situation (a subsemitone inflection). On the one hand, if a 'transmutation' is done in a situation that finds an upper- or a subsemitone inflection, it will be generally adequate to enclose in parentheses only the middle-step ('transmutant'), explicitly denoting its function
as a transient intervention (for the melodic gesture immediately returns to the prevalent hexachord being solmized). If, on the other hand, there is a stepwise motion (either diatonic or chromatic, as in Marchettus's example), it will seem more convenient to apply the solmization of the extraneous hexachord either to all three steps, or to the two latter steps, enclosing them in parentheses as a group (according to what seems fit for each case).

**FIGURE 6.4** - Transmutation in *fa-super-la* situation (upper-semitone inflection) and in cadential situation (subsemitone inflection)—melodic context.

\[ \text{C: re fa mi fa la sol fa sol la (fa) la sol la re (b)} \]

\[ \text{(C: fa sol la (fa) la sol fa mi re (mi) re re (b)} \]

An illustration of the diatonic and chromatic cases can be seen in **FIG. 6.5**, although there the transmutations are implemented in transitional (not cadential) situations, and the context that supports the inflection is a melodic (not harmonic, nor contrapuntal). In an exclusive melodic context such as the one illustrated below, the notation of the two *mi*-signs will be mandatory if the inflections are intentional, for otherwise the performer would have no idea where to implement these inflections.

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In face of the transitional situation (both in the diatonic and in the chromatic cases), another solution for the 'transmutation' would be to solmize as extraneous steps only F-mi and C-mi in the second staff—for that alternative solution, parentheses should enclose the mi syllables individually, and the surrounding steps should maintain the C-hexachordal solmization. Thus the equation for those and for the surrounding steps would read as follows: mi (mi) sol (on the diatonic E, F, G motion); and ut (mi) re (on the chromatic C, C, D motion). At the same time, as it happened with Marchettus's example, alternative procedures of hexachordal change may still be used in the solmization of Fig. 6.5. But even assuming that these alternatives solmization are possible (with 'mutation' and 'permutation' in lieu of 'transmutation'), the extraneous hexachords (on D and A) are characteristically momentary occurrences with regard to the prevalent C-hexachord—Fig. 6.6 will illustrate this situation below.
FIGURE 6.6 - Transmutation in *fa-super-la* situation (upper-semitone inflection) with alternative Mutation and Permutation in the transitional situations (diatonic and chromatic inflections)—melodic context.

In fact, in all situations (*fa-super-la*, cadential, or transitional), 'transmutation' may be understood as a procedure akin to 'permutation,' as well as to 'mutation'—that is, a kind of hybrid of the two former procedures. 'Transmutation' and 'permutation' are both implemented in face of a brusque transition to a step that falls outside the realm of the previous hexachord. The similarity with 'mutation' may be established with regard to the 'transmutated'- and 'retransmutated'-steps, which may sometimes serve as virtual places of mutation. The major typification of 'transmutation,' and its consequent difference with regard to those two former procedures, lies in that it is a momentary occurrence, or transient intervention which may be due to sheer 'necessity' of avoiding unwanted dissonances (*causa necessitatis*), or due to 'taste' of obtaining more 'pleasant' sonorities in particular situations (*causa pulchritudinis*).
In order to understand the various instances of 'transmutation,' the sentence "una nota super la semper est canendum fa" must be investigated first (both in its significance and origin), for it is one of the most emblematic situations in which 'transmutation' may happen. Nevertheless, no theorist (composer, scribe, or even performer) has yet been identified as author of this sentence. One of the most conspicuous references to that sentence is presented in Praetorius's *Syntagma musicum* (1619), though with a slightly different wording.\(^{172}\)

Es wisse doch ein jeder Cantor vnnnd Musicus vor sich selbsten wol/ daß/ wenn ein Tritonus oder Semidiapente vorfellt/ er eine rechte Diatessaron, und Diapente, und bey der Clausula [f]ormali das Semitonium singen und gebrauchen müsse: Item unica notulâ ascendente super la, semper canendum esse fa, &c.

(Praetorius 1619, 3: pt. 2, ch. 3, 31)

It is known, indeed, that when a tritone or a semidiapente happens, every one singer and musician [who] wants [to obtain] a proper diatessaron or diapente before himself, must begin and use the semitone at the formal clause [i.e., the cadence]: thus, one only note ascending above la must always be sung fa, etc.

(my translation; cf. Lampl 1957, 80)

In Praetorius's treatise (and particularly in his *Tomus tertius, zweite Theil*—the part to which the quotation above pertains), explanations for each topic usually employed assertions in two languages: Latin and German. Following humanistic ideals, this method of presentation was done in order to make use of a learned ambience and at the same time

\(^{172}\) In the original printed version of Praetorius's work, clauses in German were given in Fraktur and clauses in Latin were given Roman typeface—in the quoted text, alternative typefaces have been applied in order to represent those differences. The spellings have been maintained, with the exception of the regular lowercase 's' that substitutes for its cursive lowercase version 'ʃ' (without the lower curl); and the use of an 'ʃ' enclosed in brackets that substitutes for one instance of that same cursive 'ʃ,' which had been applied to the word "ʃormali" in the original version. The correspondent translation for the Latin words is set in italics, whereas that for the German words is set in plain text. According to Andrew Hughes (1972, note 18), Praetorius's presentation should be "the earliest version" of that well-known sentence.
provide an easy path of understanding to the reader— the use of Latin phrases would then impart authority to the text and serve as basis for discussion, while the German explications (expanding and commenting on the Latin material) would provide the needed access to most of Praetorius's audience. Thus, at a rhetorical level, those Latin assertions would be functioning as 'commonplaces.' In the case of the quoted passage, there is only one small-scale 'commonplace': the sentence "unicâ notulâ ascendente super la ...," whose position at the end ascertains an implicit status both as basis for discussion, and as a place of arrival for the previously made elaboration of the German commentaries. Taken together, these factors characterize that sentence as a 'proverb': a short saying "popularly known and repeated, usually expressing simply and concretely, though often metaphorically, a truth based on common sense or practical human experience."173 In terms of rhetoric, a proverb ('proverbium') is considered neither prescriptive nor the only solution, but (fulfilling the role of a small-scale 'commonplace') is regarded as a basis for further elaboration of the subject under discussion, and an incentive to potential solutions, while providing at least one. The notion of a 'proverb' is further corroborated by the presence of the elliptical adverb "etc." (at the end of the commentary), suggesting that the reader should be able to fill in any additional meanings, implied reasons or consequences that may come from implementing that saying, and that no further explanation is explicitly required. In other words, Praetorius was not providing any new statement, but a common, well-known one (although he does not mention its origin). But in order to properly implement the

173 Cf. (Random House Webster's 1995, s.v. 'proverb').
solution presented by the proverb, one must observe if the restrictions of the situation to which the proverb applies are satisfied. In fact, that Latin assertion is designed to present a closing argument and a possible solution to one particular situation: the necessity to avoid a tritone or a semidiapente—it is only with regard to this situation (and its restrictive intervals) that the adverb "semper" ("always") may be applied. In this context, the sentence "una nota super la ..." must not be taken as a prescriptive 'rule,' whether in the rhetorical or in the musical level of understanding. Also, the proverb makes use of an 'epitheton' (in fact, a customary resource used in 'commonplaces' and 'proverbs'), generally defined as a figure of rhetoric that employs qualifiers (generally adjectives) to enhance the perception of either the subject or the predicate of a sentence. In the case at hand, the qualifier is also the solution itself: the determination of 'fa,' for it immediately suggests a mollis (soft, suave) approach to a note that exceeds the upper limit of a hexachord, and even serves as a further qualification for the restrictive factor of 'one sole note' (una notalunica notula)—that is, that 'one sole note' can only be 'fa.'

174 The excessive implementation of the proverb fa-super-la, without the observing whether or not there is need to avoid a tritone or diminished fifth, is the reason why Andrew Hughes declared that the apocryphal sentence is an "unfortunate ditty" that "perpetuates the perversion of incorrect solmizing" (Hughes 1972, note 18). Hughes, as well as Gaston Allaire (1972), discussed this 'proverb' by showing that it was created rather as a way of avoiding the melodic tritone (if any was present), than as a postulate that would be effected every time a melody reached a second above the hexachordal la. In his Musica Ficta, Karol Berger (1987, 77–79) also discusses the 'proverb' and warns about its careless application and perpetuation. Berger calls attention for the fact that it represents "merely one of the ways in which the [melodic] prohibition of the tritone was formulated" (Berger 1987, 77).

175 Metaphorically speaking, the 'one sole note' (in face of the dissonant threat of the tritone or of the semidiapente) can only be implemented in a 'soft' manner, just as 'one sole person' who (in certain specific situations of discord) can only interact with others by making use of a 'smooth' attitudes imposing
the rhetorical sense), that 'fa' will also serve as an ornament and emphasis to 'la' (as it is proper of an adjective), thus generating an upper neighbor-note (an upper-semitone inflection to 'la') that emphasizes the prevalent hexachord by a swift departure from and return to its realm (as something/someone that leaves and longs for immediate, but smooth, return).

Besides Praetorius's assertion, there is another, earlier and also conspicuous statement of this proverb, provided by Hermann Finck in his *Practica musica*—the quotation is drawn from his chapter dedicated to mutation, where it appears as the eighth rule of mutation.

VIII. Propter unam notam ascendentem supra la, non fit mutatio, sed semper fa in ea est cantandum, nisi hoc ½, uel hoc # assignatum sit.
(Finck 1556, bk. 1, f. Fir)

8. A mutation is not made by reason of one note ascending above la, but always fa in it must be sung, unless this ½ or this # is assigned.

(my translation)

Finck not only makes it clear (as did Praetorius) that the use fa must be implemented only when there is one sole note that exceeds the limit of the prevalent hexachord above la, but also presents two additional pieces of information: (a) such a situation may not be called a 'mutation'; and (b) the situation will not happen if a mi-sign is notated for the note above la. It may not be called a 'mutation' because that procedure denotes a definite hexachordal change, something that does not happen with the transient character of 'one sole, soft note above la.' The situation given in item (b) denotes that even in dissonant situations (i.e., in the presence of a triton or semidiapente) the fa-super-la is a 'polite' ambience, 'someone' who is willing to work out compromises 'diplomatically.'
'proverb' cannot be followed if the dissonance is intentional. In this case, the intentionality should be made clear by means of an explicitly notated mi-sign (in whatever shape)—an occurrence which would probably impose a 'mutation,' or even a 'permutation.'

A near-contemporary of Hermann Finck, Maximillian Guillaud (in his *Rudiments de musique pratique*) provides a similar (slightly earlier) statement with regard to the *fa-super-la* situation, again with a different wording. Guillaud is perhaps even more conspicuous in his instructions than Finck, for while he states that *fa* may not be implemented in the presence of a *mi*-sign, he also assures that the syllable *fa* may be implemented "even in the absence of" a *fa*-sign—at the same time, he clearly does not rule out the possibility that the *fa*-sign may be duly notated.

Toustefois & quantes que par dessus ces six voix s'en trouuera vne seule n'excedante que d'une seconde, elle s'appellera fa, sans faire muance, laquelle faudra profferer mollement mesmement sans aucun signe de b mol, pourueu que celuy de ½ dur n'y soit mis.

(Guillaud 1554, tr. 1, ch. 5, f. A 1iiir)

Whenever a note exceeds the six degree-syllables by a second, this seventh note must be called *fa* without making mutation into the next hexachord. This note must be sung flat (*mollement*) even in the absence of any flat sign (♭) before or above it, unless the natural sign (♮), were to affect it.

(Allaire 1972, 45)

Guillaud also brings in the 'soft' ('gentle,' almost 'languid') character to which the *epitheton* expediency of the 'proverb' alludes.176

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176 The mention of a sixth degree may seem to serve as a dismissal (in Guillaud's mid sixteenth-century treatise) of any possibility of creating an additional solmization syllable for a seventh degree. However, Allaire's personal translation should not be deceiving, for his "six degree-syllable" is originally only and simply the "six syllable" (*six voix*), and the mention of a "seventh note" (which does not appear in the original text) is only his attempt of provide a clearer (though misleading) translation.
It is clear, in light of these statements and of the explications given in the beginning of this section, that 'fa' must not always be sung above 'la,' but only when a direct or indirect tritone is unwanted. This reference to *fa-super-la* may be present even where the proverb is not mentioned explicitly, but it would suffice to have the situation itself described: the presence of unwanted tritone (direct or indirect). The earliest explicit description seems to be found in the mid fifteenth-century treatise by Johannes Gallicus, although his assertions appear to imply that this was not a new situation or procedure. In fact, by explaining its occurrence in plainchant, and being himself a rather conservative theorist, he implies that *fa-super-la* had been in effect for as long as plainchant tradition could be remembered.

[Discipulus:] Da mihi, quaeso, post haec de plano cantu vel parvulum exemplum, ubi fa prorsus de 3 rotundo propter tritonum habeam, et quem non solum per litteras, sed per illas syllabas et notas quadras modulari queam.

Cantor: Exemplum quidem hic de plano cantu tibi docebo clarissimum, quod modulari te docebo per voces mixtas, hoc est, per contrapunctum.

(Seay 1981b, 14: 59; CS 4: 380)

[Disciple:] Tell me, please, by means of a plainchant or a brief example, where I may in fact have *fa* out of the round b (b3) because of the tritone, and how I may be able to sing it not only through letters, but also through those syllables and square notes.

*Cantor:* Certainly, I shall give you this most clarifying example out of plainchant, for I shall teach you [how] it is to be sung (modulari) through mixed voices, that is, through counterpoint.

(my translation)

Despite the above reference to counterpoint, Gallicus illustrates this passage with a monophonic example—the antiphon "Ave Regina caelorum" (transcribed below in [FIG. 6.7]), for which he presents a full solmization. A polyphonic example (a two-voice version based on the same antiphon) was reserved by Gallicus for a presentation at the end of the treatise (pt. 2, bk. 3; Seay 1981b, 14: 88; CS 4: 395)—the new, upper voice created
above the plainchant tenor is designated in this dissertation as ‘contratenor.’ In that polyphonic example (transcribed below in FIG. 6.8), the solmization for the tenor is assumed from the previous, monophonic example, for only the contratenor is provided with full solmization.177 In the two examples (monophonic and polyphonic), the presentation of

177 An excerpt of the monophonic example has been used earlier in this chapter (FIG. 6.1), in order to illustrate the fa-super-la situation. An excerpt of the ‘contratenor’ from the polyphonic example has been used in chapter 2 (FIGS. 2.9 and 2.10), in order to illustrate the use of octave equivalence. Gallicus’s version of the plainchant does not correspond to two of the most common versions given in the Liber usualis (LU, 274, 278), neither with respect to the words nor with respect to the music. However, the version used as a chant at benediction in honor of the Blessed Virgin Mary (LU, 1864) does show partial concordances to Gallicus’s version—given below is a comparison between Gallicus’s version—hereafter (Ga), and the latter LU version—hereafter (LU).

Words: “Ave Regina caelorum, Mater Regis Angelorum, O Maria flos, virginum” — these words are the same in (Ga) and (LU)
Music: on “A-ve” — (Ga) shows E-D-C; (LU) shows D-C
on “caelo-rum” — (Ga) shows a-G-F-E-D-C; (LU) shows a-G-F-G-F
on “caelo-rum” — (Ga) shows D; (LU) shows E-D
N.B.: There are no concordances (musical or textual) for the remainder of the chant: (Ga) has the words “Ora pro nobis Dominum”; (LU) has the words “velut rosa lilium: funde preces ad Dominum pro salute fidelium.” Except that in (LU) there is melodic gesture (D-E-F-D-C-D, mostly syllabic) on the “salute fidelium,” which matches with the gesture (mostly melismatic) on “Dominum,” in one of the manuscripts of (Ga)—see commentaries below.

There are also differences in the plainchant, between the two available editions of Gallicus’s treatise: Seay’s edition (Seay), and Coussemaker’s edition (CS). Seay used two manuscripts: as a primary source he took GB-Lbm Harl. 6525 (apparently written on Gallicus’s own hand or at least under his supervision)—hereafter MS (H); and as a secondary source he took GB-Lbm Add. 22315 (apparently copied by Nicolaus Burtius)—hereafter MS (A). Coussemaker, however, used only MS (H) for his edition. Below, the differences between two manuscripts are listed as reported in (Seay); otherwise, if the manuscript is not identified, differences are referred to the editions.

Words: (Seay) gives the spelling “caelorum,” and “angelorum”; (CS) gives ”coelorum,” and “ange-lerum” —otherwise they are the same
Music: on “an-ge-lo-rum” —(Seay) gives F-E (on “-ge-”) and D-C (on “-lo-”); (CS) gives F-E-D (on “-ge-”) and C (”-lo-“) (cont. ...)

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solmization-syllables for each single step is significant in itself, for no earlier illustration of full solmization appears to be extant. Since those solmization-syllables indicate the hexachord that is being enforced at a given step (locus), the examples show not only which hexachord is solmized for each melodic gesture, but also what procedures of hexachordial change Gallicus's meant (as well as their cases, types, etc.), together with where the exact place of change (locus) is in each situation—in Gallicus's examples only 'mutations,' and 'transmutations' are needed.

In FIG. 6.7, besides the fa-super-la 'transmutation,' whose 'transmutant'-step falls on "cae-lorum" (already discussed above on pp. 222–224), there are two 'regular' mutations (both involving the syllables re and la for the step-letter a): one on "Ma-ri-a" (an 'indirect' mutation), and the other on "virgi-num Q-ra" (an 'explicit' mutation). With respect to the 'transmutation,' it should be noted that (according to the quotation from Gallicus's treatise) fa-super-la has been specifically used in the illustration for the sake of avoiding a tritone.

Notation:

- on "Q-ra," set with the step-letters a-G — MS (A) gives the solmization la, ut; MS (H) gives la, sol
- on "Do-mi-num" — MS (A) gives E-F-E-D-C; MS (H) gives E-F-E-D; (CS) gives the same as MS (H), except that the melisma D-E-F-E is applied to "Do-mi-num," and two Ds are individually applied to the syllables "Do-mi-num"
- (Seay), following mainly MS (A) in this example, gives solmization-syllables placed at the left side of note-shapes (virgae and ligature based on the clivis pattern);
- (CS), following MS (H), gives step-designations (letter-plus-syllable) placed on the staff (in heightened-notation fashion) in lieu of note-shapes

Within the treatise itself, one minor melodic difference occurs between the monophonic example, and the tenor used in the polyphonic example—on "Do-mi-num," the latter example gives the E-F-E-E (the variants for the monophonic version are listed above). With regard to the polyphonic example, see also note 64 (for a description of the notation), and note 180 (for other concordances and differences between the two editions).
Gallicus was, in fact, referring to the indirect tritone that could have been created between the b (on "caelorum") and two Fs, one on each side (the first on "Re-gina," and the other on "caelorum")—both Fs being separated from the b by two notes (G and a). Thus, the b must be solmized as b-fa (even if there is no fa-sign prescribing its solmization), and the two Fs must be solmized with the syllable fa (in compliance with the C-hexachord denoted by the melodic gesture). It must be noted that this is the only occurrence of a b-fa, since there
are no other tritones to be avoided, and all of the other melodic gestures denote either the continuation of the C-hexachord or a sectional change to a G-hexachord, on the verse "O Maria flos virginum" (where the melody ascends to its highest steps, up to d-sol on "flos," and including the only ñ-mi as the second step on "vir-ginum").

With regard to the first 'mutation' on "Ma-ri-a," la (in boldface) is the only syllable given for that step-letter a (re is not, and therefore is also not in boldface), but it is clear that according to Gallicus's solmization this would be the only place to implement a mutation, since it is clearly not done on the G-sol of "Ma-ria," and no 'mutation' would be possible on the c-fa of "Mari-a." Thus, the only way to preserve Gallicus's prescriptive solmization is to implement an 'indirect' mutation on that a-la-re, although it does not appear to have been the best solution. It seems that a 'direct,' 'implicit' mutation would have been a more easily implemented solution, with a non-uttered syllable la, and an uttered syllable re (consequently represented by the equation [la=] =re). This solution would avoid an aurally confusing situation that may arise from solmizing, immediately after that la, the syllable fa with an ascending leap of minor third (semiditonus), since a previous ascending motion from la to fa (for the 'transmutation' on "Regi-na cae-lorum") had already implemented a semitone. The 'direct,' 'implicit' solution would then provide a clear leap of ditonus, whose solmization within the restrictions of the Guidonian paradigm are only possible by means of

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178 It is again significant to have a higher melody in this verse, since it is the first time that the chant mentions the name "Maria," which is done by means of a vocative (thus calling directly onto Her assistance), followed by the qualification of "flos virginum." Significantly, in the polyphonic example, this is the section in which the 'contratenor' lowers itself below the plainchant melody—cf. FIG. 6.8.
the pair re-fa, or the pair mi-sol.179 As for the 'explicit' mutation on a-la-re ("virgi-num O-ra"), Gallicus's choice seems easily understandable, since it is indeed one of the most easily implemented cases of mutation, requiring on the part of the performer no aural, non-uttered conception of a sound or of syllable.

The polyphonic example will now be inspected with regard to the melodic gestures and hexachordal changes in the 'contratenor.' In that example, the solmization-syllables provided by Gallicus (only for the 'contratenor') are set in boldface in the transcription given below (FIG. 6.8). Other syllables are not set in boldface in the transcription, and include: non-uttered syllables in 'implicit' mutations (according to the solmization prescribed by Gallicus); syllables (either uttered or non-uttered) denoting alternative places of mutation;

179 Some additional considerations, with regard to the hexachordal passage that must happen within the words "O Maria," may be made here, in order to speculate (and perhaps clarify) how the processes of choice for a procedure and a place of change may have worked. It is highly unlikely in practice (though theoretically conceivable) that Gallicus could have intended a 'permutation' from a-la do c-fa, since the aural roughness for its implementation is generally the least preferred, and one of the cases (or subcases) of 'mutation' would be possible—a 'transmutation' is not an option here. Notwithstanding the above mentioned solutions ('indirect' and 'direct' 'implicit' mutations), others (easier than 'permutation') would also be conceivable, like performing mutations on the previous G-sol (on "Ma-ria"), or even on the previous a-la (on "O Maria"). The latter possibility does not seem a good choice, since it comes right after a leap, and there would be certainly a tendency to implement hexachordal changes after a stepwise motion (a much easier situation to deal with aurally). The other solution on G-sol ("O Ma-ria"), even if facilitated by the stepwise motion both before and after, would still be superseded by any solution on the second a-la-re ("O Ma-ri-a"), which is aurally clearer, exactly because of the presence of that first a-la ("O Maria"), whose aural conception is emphasized by the leap of fifth (provided it is solmized as la after re). Still another possibility would be a mutation using a G-hexachordal octave-equivalence on the c-fa ("Mari-q"), thus imposing the solmization [ut] =fa—which, however, would not be aurally preferable to Gallicus's 'indirect' mutation, because of an aural difficulty to implement an octave equivalence on the leap of ditonus, especially given the expected solmization for that leap (as explained above).
FIGURE 6.8 - "Ave Regina caelorum"—polyphonic. From (Gallicus 1458/64, pt. 2, bk. 3; Seay 1981b, 14: 88; CS 4: 395).
and also the entire solmization for the plainchant 'tenor' (which is based on the solmization for the monophonic example, and is given in FIG. 6.8 for the sake of illustrating some cases of mi-contra-fa conflicts and 'propinquity').

The melodic outline of the 'contratenor' covers virtually the entire recta-gamut (from A-re to ee-la). In the first verse ("Ave Regina cælorum") it covers exactly the compass of the high region of the gamut (superacuta: aa-la-mi-re to ee-la), in second verse ("Mater Regis angelorum") it moves to its middle region (acuta: a-la-mi-re to g-sol-re-ut), in the third verse ("O Maria, flos virginum") it descends further to its lower region (gravis: A-re to G-sol-re-ut), and finally in the last verse ("Ora pro nobis Dominum") it goes back up, covering all three regions from A-re to dd-sol. At least within each verse, the solmization clearly follows the precepts and guidelines discussed in this dissertation. The transitions between those regions of the gamut also follow the same precepts and guidelines, but due to the intervallic leaps that must happen in order to make those transitions, the solmization poses several aural difficulties to the performer. Thus, the performance of this 'contratenor'

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180 (For the abbreviations used here, see note 177.) The 'barlines' that appear in FIG. 6.8 were given only for the 'tenor' in (Seay)—the edition used for the transcription, and for both voices in (CS)—since in that presentation they shared the same 9-line staff. The mi-signs in brackets ([ ]) placed above the upper staff), were given in the same way in Seay's edition (Seay), and without brackets in Coussemaker's edition (CS). Those there are concordant signs in both editions were marked with an asterisk in the transcription, the only discrepancy is marked with the abbreviation for the edition. With regard to the fa-sign notated on "cælorum" (in the 'tenor' voice), it is given only in (Seay), and although it is include in FIG. 6.8, it is unnecessary for the solmization, as attested in the transcription of the monophonic example in FIGS. 6.1 and 6.7, and in the discussions related to them. (For additional variants regarding the notation given in the two editions, see note 64.)
seems vocally problematic, and an instrumental performance could be more suitable.\footnote{As mentioned in note 65, the instrumental approach for the 'contratenor' seems probable, mainly because of those two factors: the compass of the entire melody, and the transitional leaps. Although there are also leaps within each verse, those are kept within the restriction of each region, and do not exceed beyond the diatessaron—except, of course, on the last verse, which includes leaps of diapason, diapente, and diatessaron, in order to cover all three regions of the gamut. In fact, this 'contratenor' appears to be an exercise (or a demonstration) on how to compose melodies that are restricted to each region of the gamut (in each of the first three verses), while producing transitions between those regions (by means of the leaps), and resulting in an unfolding of the entire gamut (through the entire melody, and through the last verse, which functions as a synthesis of the whole).}

The first melodic gesture (on "Ave Regina caelorum") clearly denotes a $\overline{\text{G}}$-hexachord, which includes a series of $\flat$-mis (on "A-ve," on "Re-gi-na," and on "cae-lo-rum") imposing false-relations with the $\flat$-fa of the 'tenor' (on "cae-lorum"). Here Gallicus is clearly unconcerned about those false-relations (which are observed in the harmonic level), since it is far more important for him to avoid the tritone (observed in the melodic level).

The second melodic gesture (on "Mater Regis angelorum") also denotes a $\overline{\text{G}}$-hexachord (with its ut falling on G-sol-re-ut, whereas the ut of first $\overline{\text{G}}$-hexachord would fall on g-sol-re-ut). In order to reach that middle region of the gamut, two consecutive leaps are performed: a fifth from dd-sol to g-sol, followed by fourth from that g-sol to d-sol. Thus the transition between the two $\overline{\text{G}}$-hexachords (represented in the steps dd-sol and d-sol) is mediated by a $\overline{\text{C}}$-hexachord (represented in the step g-sol). For that solmization, one must implement two consecutive 'implicit' mutations, by thinking (not uttering) the 'mutated'-syllable ut on g, and another 'mutated'-syllable re on d. There is no doubt that it is a very difficult situation to perform and conceive aurally within the restrictions of the
Guidonian paradigm. It seems conceivable, however, that this transition may be treated as a 'transmutation,' since the change to the C-hexachord is momentary. In this way, dd-sol would function as a 'transmutated'-step, g-sol as a 'transmutant'-step, and d-sol as the 'retransmutated'-step. But what prevents this solmization by 'transmutation' is that there is no return to the same C-hexachord; therefore, one would have to think of a 'transmutation' with an additional, subsequent application of octave equivalence between the two C-hexachords. At the same time, if octave equivalence was used here (and if Gallicus wanted such a resource to be applied), the g-step would have been better solmized as g-ut (with no mutation), and the d-step would be constituted as the sole place of mutation through the equation \[ \text{sol}=\text{sol}. \]

Although this latter octave equivalence (without 'transmutation' and with one sole 'implicit' mutation) would appear to be the better solution, Gallicus's solmization is trying to emphasize that the entire second verse must be thought of on a different level, a different register, by changing the strata of the discourse, which imposes a different hexachord (yet reminiscent of the first), that I will argue may find its basis in a rhetorical procedure. Before the second verse and this second melodic gesture come to an end, Gallicus prescribes one occurrence of 'transmutation' on "an-ge-lo-rum," precisely placed on the central note of the entire 'contratenor' melody. Although this occurrence should be supported by the fa-super-la situation, there is no tritone to be avoided, the only justification is the maintenance of the C-hexachordal solmization with which Gallicus wants to characterize the second verse, and thus must not be interrupted, except if it is done momentarily. Also, there would be no sense in solmizing a larger
portion of melodic gesture with a different hexachord. Therefore, this transmutation may be more clearly understood as an upper-semitone, or upper neighbor-note inflection, which are also proper of 'transmutation' and may be understood as a 'generic' situation that encompasses the more restrictive fa-super-la.

The third melodic gesture (on "O Maria, flos virginum") is also reached by means of an 'implicit' mutation, in which both the last step of the second verse (d-sol, in the \(\text{G}\)-hexachord) and the first of third verse (D-re, in the \(\text{C}\)-hexachord) can be used as places of mutation. While uttering a 'mutated' sol on the d-step, one would be only thinking of a 'mutant' re (according to the upcoming \(\text{C}\)-hexachord, but an octave higher), thus imposing an 'indirect,' 'implicit' mutation for that step. Conversely, on the D-step, one would be thinking of a 'mutated' sol (according to the \(\text{G}\)-hexachord, but one octave lower), while uttering the 'mutant' sol (of the new \(\text{C}\)-hexachord), thus imposing a 'direct,' 'implicit' mutation. Thus, the consecutive occurrence of those two mutations establish a symmetry (as can be seen in their graphical representation in FIG. 6.8), which significantly corresponds to a division of that antiphon in two halves (one for the first two verses, and the other for the last two verses). The possibility of both mutations occurring consecutively, creating those symmetries and the two inverted equations (\(\text{sol}=\text{re}\) and \(\text{sol}=\text{re}\)), resembles a rhetorical figure called 'antimetabole,' whose definition is here given in the words of Quintilian.

Fit etiam adsumpta illa figura qua verba declinata repetuntur, quod antimetabole dicitur: 'non ut edam vivo, sed ut vivam

Antithesis may also be produced by the Figure called antimetabole in which words are repeated with different inflections: "I do
edo.' [et] Quod apud Ciceronem conversum ita est ut, cum mutationem casus habeat, etiam similiter desinat: 'ut et sine invidia culpa plectatur et sine culpa invidia ponatur.' (Quintilian ca. 93/95, 9.3.85; Russel 2001, 152)

not live to eat, but eat to live"; this is adapted in Cicero in such a way that, though it involves a change of case, the similarity of terminations remains: "so that without ill-feeling an offence is punished (plectatur), and without an offence ill-feeling is laid aside (ponatur)." (Russel 2001, 153; cf. Lanham 1996, 96, s.v. 'Antimetabole')

In the same way, d-sol of the G-hexachord is changed into D-sol, which may be thought as a different inflection, since the difference in octave (as seen in chapter 2) is done by changing a childlike voice into a adultlike one—the converse being done with d-re and D-re according to the G-hexachord. In fact, one may say that each of these occurrences (for each hexachord), constitute individual 'antimetaboles,' and that the simultaneous occurrence of both, together with the consecutive occurrence of the two 'implicit' mutations ('indirect' and 'direct'), constitute a different, perhaps more complex example that creates a symmetrical statement with the coupling of the two equations.182 Also significantly, the Latin word used for the Greek 'antimetabole' is 'commutatio'—meaning 'interchange,' or 'changing together'—which could be clearly related to the musical 'mutation' and understood as a two 'mutations' implemented together (close, consecutively to each other).

182 Some authors understand that a more complex, balanced, symmetrical figure of this kind should be defined as 'chiasmus.' However, a 'chiasmus' is an inversion of ideas equated with 'antimetabole' only when the inversion uses the same words, and differentiated when the inversion uses structures that are equated but the words are different ('It is boring to sleep, to wake up is stimulating'), or else ('It is boring to sleep, to eat is fulfilling'). In the latter example, though individually the ideas do not seem related, as in the former, they are forced into such a relation by means of the grammatical structure: verbal-adjective plus infinitive-verb, followed by infinitive-verb plus verbal-adjective—cf. (G. Burton 1999–2004, s.vv. 'Antimetabole' and 'Chiasmus') and (Lanham 1996, 96, s.v. 'Antimetabole'; 201–202, s.v. 'Chiasmus').
The second mutation in the third verse (also 'implicit') is implemented on "vir-ginum," changing from the Ė-hexachord (that occurred only for five steps) to another Ė-hexachord (the lowest). In fact, the presence of the F-step in the beginning of that third melodic gesture is reason enough to impose the Ė-hexachordal solmization on those first five steps; otherwise, the Ė-hexachord could have been solmized throughout the third verse. One could consider that, as it happened in the previous verse, the F-step that falls outside the Ė-hexachord could have been solmized by means of 'transmutation.' However, that step is preceded by a leap of fourth, and if it were to be solmized in that fashion (with a solmization-syllable fa), it would have been preceded by a C also solmized with the syllable fa (according to the Ė-hexachord), which is not a usual solmization for such an intervallic leap—the possibility of such a solmization (fa-fa) would traditionally be applied to leaps of fifth.\footnote{183}

On the fourth verse (on "Ora pro nobis Dominum") the solmization and mutations are graphically explained in the representations given in FIG. 6.8, which should be understood in light of the presentation on octave equivalence, in which this passage was used as illustration—see pp. 80–82.

With regard to the mi-signs enclosed in brackets [♯] above the solmization, as Seay remarked (1981b, 14: 89n), they were distinctly included by "a later hand" in both

\footnote{183 Cf. Ramos de Pareja's presentation on this subject, for which alternative solmizations of 'implicit' mutations were also conceived, as discussed above (pp. 214–215).}
manuscripts he used for the edition of Gallicus's treatise. The table below will show how they appear in Seay's and in Coussemaker's edition.\(^ {184}\)

**TABLE III**  – Added *mi*-signs in Gallicus's two-voice Ave Regina caelorum (variants)

<table>
<thead>
<tr>
<th>OCCURRENCE IN FIG. 6.8</th>
<th>STEP IN 'CONTRATENOR'</th>
<th>STEP IN 'TENOR'</th>
</tr>
</thead>
<tbody>
<tr>
<td>first—only in (Seay)</td>
<td>cc-fa</td>
<td>E-mi</td>
</tr>
<tr>
<td>second—only in (CS)</td>
<td>cc-fa</td>
<td>C-ut</td>
</tr>
<tr>
<td>third</td>
<td>cc-fa</td>
<td>a-la</td>
</tr>
<tr>
<td>fourth</td>
<td>cc-fa</td>
<td>E-mi</td>
</tr>
<tr>
<td>fifth</td>
<td>f-fa</td>
<td>D-re</td>
</tr>
<tr>
<td>sixth</td>
<td>cc-fa</td>
<td>E-mi</td>
</tr>
</tbody>
</table>

Apparently, if one observes only the first occurrence (given only by Seay), together with the fourth and the sixth, it would appear that those *mi*-signs were provided in order to avoid *mi-contra-fa* conflicts with the lower voice. However, *mi-contra-fa* is applied only when the interval between the two voices is an octave, a fifth, or a fourth (or their compounds). The only case with one of those intervals is the second occurrence (a double-octave), but the 'tenor' is solmized C-ut, and therefore *mi-contra-fa* does not apply. Moreover, if the solmization of the 'contratenor' is altered from cc-fa to cc-mi, it would create an augmented double-octave, since that cc-mi would pertain to a *ficta* \(\overline{A}\)-hexachord (thus making it equivalent to the modern \(c^\#\)), while the 'tenor' would be performing a simple \(c\). The other possibility for having those *mi*-signs is 'propinquity,' but which would happen only when a third or sixth (or their compounds) moves toward a consonance of

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\(^ {184}\) Seay also presents the signs enclosed in brackets, whereas Coussemaker does not. Seay does not mention variants between manuscripts, thus the table is given with references to the editions, which may imply an editorial of publishing error.
octave or fifth (or their compounds). There are only two occurrences that fall on this situation: the fourth and the sixth. In the fourth, however, the 'contratenor' is preceded by another cc-fa which should also be altered in such a context, or a 'permutation' would have to be imposed between those two steps—not only this would seem to contradict the melodic gesture of the 'contratenor,' but also Gallicus (on account of this treatise) does not appear to have ever defended, discussed, or acknowledged the possibility of 'permutation.' Therefore, the only occurrence that seems to make any sense is the sixth, with the interval E-cc (actually the penultimate interval of the that polyphonic setting) closing by contrary motion on the double-octave D-dd. In any case, it must be noted that all those cases contradict the original solmization prescribed by Gallicus, and are virtually unjustifiable—even if the last one can be supported by harmonic precepts of 'propinquity.'
The close relation that existed between rhetoric and music of the Middle Ages (as well as Renaissance) has already been noted by several modern scholars, some dealing directly with musica ficta, others with music in general. The links that exist between solmization, counterpoint, and musica ficta are no less frequent, and must be addressed in order to reveal (or at least attempt to unveil) one of the pieces of the hermeneutical puzzle that can illuminate the understanding of historical practice and speculation, of notation and theory.

As was mentioned above (note 139) in the presentation on 'permutation,' Marchettus's choice for that term may have been influenced by its meaning in rhetoric—'permutatio' being the Latin name for the Greek 'allegorid' (or 'allegory,' meaning 'to speak otherwise than it seems'). In its primary meaning, 'allegory' is frequently explained as an extended (expanded) form of 'metaphor'—or, according to the definition provided by Richard A. Lanham in his Handlist of Rhetorical Terms, an 'allegory' means:

185 For an example of authors who dealt with the relationship between rhetoric and musica ficta, see (Atkinson 1990) and (Reckow 1992); for an example of authors who dealt rhetorica and music in general see (Gallo 1963, 1975, 1981, 1985) and (Derksen 1982).
Extending a metaphor through an entire speech or passage; the rhetorical meaning is narrower than the literary one, though congruent with it. The allegory is sometimes called “pure” when every main term in the passage has a double significance, “mixed” when one or more terms do not. (Lanham 1996, 41, s.v. 'Allegory')

Following the first phrase, it may be said that 'allegory' is a 'metaphor' (or series of 'metaphors') maintained throughout an entire phrase (or paragraph, or even an entire discourse), instead of being restricted to only a few words. In order to understand better what an 'allegory' is, and how it is differentiated from 'metaphor,' an example is given below, excerpted from the first few verses of the triplum in the motet "Garrit Gallus—In nova fert—[Neuma]."

Garrit Gallus flendo dolorose
Luget quippe Gallorum concio,
Que satrape traditur dolose,
Ex cubino sedens officio.
Atque vulpes, tamquam vispilio
in Belial vigens astucia
De leonis consensu proprio
Monarchisat, atat angaria.

The cock babbles, lamenting sorrowfully, for the whole assembly of cocks mourns because, while serving vigilantly, it is trickily betrayed by the satrap. And the fox, like a grave robber, thriving with the astuteness of Belial, rules as monarch with the consent of the lion himself.

(Hoppin 1978b, 125)

This text can be stripped of its 'metaphors' or other figures, eliminating the 'allegory' and producing a more direct, literal criticism against the desperate state of a society, the corruption of its representatives, and the weakness of a monarch. In fact, even if some isolated metaphors or other figures are maintained, 'allegory' will be decharacterized, for it depends on the occurrence of various metaphors occurring (almost consecutively) throughout the text, and not only in isolation. In the interpretive modifications produced below, three figures will remain for further reference: one 'simile' ("... like a grave robber") and two evident 'metaphors' ("the satrap," and "the lion himself").

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The French barely speak and grieve painfully,  
For the people of the entire French society suffer  
Because while carefully observing their duties  
They were betrayed by the satrape.  
And Enquerran de Marigny [the King's chief councillor], like a grave robber,  
Getting wealthier through corruption, wit, and evil-doing,  
Rules as monarch, with the consent  
Of the lion himself.  

In the case of the last 'metaphor,' the identification of the King with a Lion has at least two meanings: one that is drawn from the word itself (the King is a Lion since he must be a strong, all-powerful figure for all and everything under his kingdom); and another that is drawn from the context (this is a weak, petty King, a ruler that is not true to its nature of being strong and all-powerful, since he allows for corruption amongst his councillors, for the suffering of his people, and finally grants excessive power to his chief councillor). The second, contextual meaning applied to this metaphor, is also informed by the 'simile' (in which the King's counsellor is explicitly and directly likened to 'a grave robber'), and by another 'metaphor' of the King himself, through the word 'satrap' (a despotic, petty ruler). In a certain sense, despite the attempt of decharacterizing 'allegory,' the fact that the context implies new meanings is a sign that it has not been completely eliminated, especially because the coherence of such a text depends on it (even if partially). Naturally, the same is true of the procedure of hexachordal change called 'permutation,' for when the musical text must be solmized using that procedure, its complete elimination may impair the coherence of the whole (or at least of a particular passage). (In the ensuing discussion, the term 'permutation,' in its anglicized form, will be reserved as a reference to the musical procedure of hexachordal change, and the term 'allegory' as a reference to the figure of rhetoric.) Note
that this idea of 'eliminating permutation from a musical text' does not refer to 'eliminating a particular dissonant leap that must be solmized' (like a tritone), nor 'a chromatic gesture,' but would mean 'trying to read, or go through, those situations without the aid of permutation.' In some cases this 'elimination' can be done, and in other there is no way of avoiding 'permutation,' but even when it can be done, its elimination will certainly impose a change in the understanding and coherence of a musical gesture.

Let me now return to Lanham's definition of 'allegory.' By saying that "the rhetorical meaning is narrower than the literary," Lanham is in fact stating that although every sentence is an allusion to something else (and therefore, has a double meaning), there is only one, well-determined subject, that remains the same for the entire discourse (the one that is being commented upon). Thus, the double meaning may be easily understood, for it is limited (narrowed) to only two basic references: one consisting of the literal meaning of the words used, and another of its meaning by analogy (relative to the subject about which the commentary is being made). It is frequently possible to perceive that more than one single commented-subject may exist for the same 'allegory,' but the interpretation will be narrowed to one main subject, since it depends on the contextualization of all elements (even when dealing with each possibility individually, and despite the wealth of imagery used in the 'allegory'). Thus, in Lanham's assertion, the 'literary meanings' ('significants') are broader and unbiased because of the wealth of imagery (wealth of 'signs'), and because there may exist several possibilities of interpretation for individual (decontextualized) elements—this is akin to the 'literal' interpretation in exegesis. At the same time, the
'rhetorical meanings' (or 'signifieds') are narrower because they exist only in a contextualized situation, one that unavoidably keeps (in interpretation and audition) its coherence to the commented-subject—this is akin to the 'allegorical' interpretation in exegesis.186

In the same way, a musical 'permutation' has a broader (literal) and a narrower (allegorical) meaning. The broader meaning is available through the individualities of both the 'permutated'-step and the 'permutant'-step, which may have many meanings, since they may pertain to several different hexachords at once. The narrower meaning is available through the contextualization of those steps not only as part of a given melodic gesture, and as part of particular hexachords, but also as parts of a process of change (whose meaning differentiates them from the surrounding steps and from the steps used to implement other kinds of hexachordal transition). As it happens with 'allegory,' in which the 'imagery' has no apparent or immediate connection with the 'commented-subject,' so in music the two consecutive steps that are going to be the subject of 'permutation' have no apparent connection with each other. The connection is established not only by means of the context, but mainly by means of interpreting that context. In the musical case, this connection is established by means of the need to solmize (read) the melodic gesture, and forge (interpret) a relation between the two disjunct steps, by contextualizing their hexachords: 'permutation' is thus the connection per se, turning individual 'imagery' into the 'permutant'-step, and the 'commented-subject' into the 'permutated'-step.

Similarly, Lanham identifies two cases of 'allegory': "pure" (in which every element in the discourse has a double meaning), and "mixed" (in which some elements do have double meanings, while others do not). In a certain sense, these two cases may be made analogous to (or may account for) the two main cases of 'permutation': the "pure" case similar to 'stepwise permutation' (in which the double meaning of the step-letter is evident, since it is a chromatic motion); the "mixed" case similar to 'permutation by leap' (in which the double meaning is not readily evident, for it depends on the proper identification of the situation, and whether or not there are alternative procedures of hexachordal change that can be applied in lieu of 'permutation,' even though it might not be summarily ruled out).

In the case of 'mutation,' it may be related to the figure of rhetoric called 'metaphor.' A basic definition of 'metaphor' (lit. 'transference,' or 'carrying beyond,' from the Greek 'metaphora') may be thus phrased: it is a procedure in which of a word (generally unrelated to the subject at hand) is used in lieu of another word (related to that subject), the substitute word being used to comment (either to enlighten, or to characterize, or even criticize) upon the subject or one of its elements.\textsuperscript{187} Similarly, 'mutation' substitutes a syllable (from an unrelated hexachord) for another (from the hexachord at hand in a given moment), no only in order to allow solmization to proceed, but also stating that the new hexachord must be acknowledged as part of the whole, and broadening the available context for interpretation (just as a 'metaphor' informs about new possibilities of interpretation of a subject, and

\textsuperscript{187} In this definition, 'word' (in italics) is not a limited reference to one sole word (e.g., a noun, verb, adjective, etc.), but may refer to more than one word (e.g., as in a noun- or verbal-locution), or even to a phrase, or an idea—all of those, however, consisting of only one thing, or subject, or imagery.
broadens its perspectives). The speculations of Aristotle and of Quintilian (Marcus Fabius Quintilianus) with regard to 'metaphor' may serve to enlighten these considerations.

We all naturally find it agreeable to get hold of new ideas easily: words express ideas, and therefore those words are the most agreeable that enable us to get hold of new ideas. Now strange words simply puzzle us; ordinary words convey only what we know already; it is from metaphor that we can best get hold of something fresh.

(Aristotle Rhet., 3.10.1410b; Roberts 1924, 186)

Let us begin then with the commonest and far the most beautiful of Tropes, namely translatio, which is called metaphor in Greek. This is both a gift which Nature herself confers on us, and which is therefore used even by uneducated persons and unconsciously, and at the same time so attractive and elegant that it shines by its own light however splendid its context. So long as it is correctly employed, it cannot be vulgar or mean or unpleasing. It also adds to the resources of language, by exchanges or borrowings to supply its deficiencies, and (hardest task of all) it ensures that nothing goes without a name. A noun or a verb, then, is "transferred" from a place in which it is "proper" to a place in which either there is no "proper" word or the "transferred" term is better than the "proper" one. We do this either because it is necessary or because it expresses the meaning better or (as I said) because it is more decorative.

(Russel 2001, 427–429)

188 The comparison between 'mutation' and 'metaphor' is especially significant within the context of musica ficta (i.e., especially when ficta-mutations are involved), for the new element it brings into the interpretation of the whole is metaphorical in itself, since 'musica ficta' may be interpreted as a parallel reality to the realm of 'musica recta.'
Thus, 'metaphor' is used in order to provide an appropriate meaning (and understanding) to something that is not found among the regularly (commonly) known or available array of things (ideas or words). 'Metaphor' is produced by analogy, i.e., by changing an extraneous idea or word into something closer to common understanding, and yet essentially different from that extraneous idea or word. Moreover, in 'metaphor,' this analogy is not explicitly provided, i.e., the identification with that extraneous idea or word, through something more regularly known, is simply implied, never directly addressed—as if there was apparently no connection between the two. The connection is only established within the context, and only after the analogy has been understood and ended. Thus is irregular mutation, for it makes use of an already known position (within the hexachord already being solmized), which is transformed into something that was originally extraneous (the hexachord that will be solmized, ergo becoming known and common).

There exists, in fact, a close relation between 'metaphor' and 'simile,' which also allows for some speculation whether 'mutation' is more akin to 'metaphor' or to 'simile.' In this sense, the influential work by Quintilian (Institutio oratoria) may again provide an insight; it explains more clearly the difference between the two.

In totum autem metaphora brevior est similitudo, eoque distat quod illa comparatur rei quam volumus exprimere, haec pro ipsa re dicitur. Comparatio est cum dico fecisse quid hominem 'ut leonem,' tralatio cum dico de homine 'leo est'.
(Quintilian ca. 93/95, 8.6.8; Russel 2001, 428)

In general terms, Metaphor is a shortened form of Simile; the difference is that in Simile something is compared with the thing we wish to describe, while in Metaphor one thing is substituted for the other. It is comparison when I say that a man acted "like a lion," a Metaphor when I say of a man "he is a lion."
(Russel 2001, 429)
As seen above, in the sections dedicated to explaining 'mutation,' for pedagogical reasons 'mutation' was described in historical treatises as a procedure that commonly happened when two different syllables were applied to a single step, thus promoting the change from one hexachord to another. In the graphical representation of 'mutation' proposed in this dissertation, the 'mutated'-syllable is generally enclosed in brackets, and followed by an 'equals'-sign, while the 'mutant'-syllable is simply preceded by an 'equals'-sign. By way of example, when the step-letter C serves as a 'place of mutation' between a $\text{C}$-hexachord moving to a $\text{G}$-hexachord, the performer will arrive at that C as if it was going to be solmized as ut (whose suggested representation would be $[ut=]$), but since the change of hexachord is needed, a $\text{fa}$ (whose representation would be $=\text{fa}$) will substitute for that ut. If one assumes that 'simile' could apply in this case, that assumption may come from the idea that a syllable is likened to the other via the 'equals'-sign ($=$). This is, however, only a pedagogical representation, devised in order to provide an easy-to-understand reduction. What really happens is that one syllable truly substitutes for the other, since the hexachords have changed. In the situation described above, there is no way one could say that 'c is like sol' at the 'place of mutation,' but that 'c is sol,' carrying with it and establishing the context of a new, different environment: a different hexachord (as if another 'being,' or another 'word'). There is, nevertheless, another possible interpretation that places both 'metaphor' and 'simile' under the umbrella of 'mutation'—or rather, as particular cases of 'mutation,' as it may become more evident, below, through an excerpt of the definitions given by Lanham for each of these rhetorical figures.
Metaphor (G. "transference") — Translatio; Transport — Changing a word from its literal meaning to one not properly applicable but analogous to it; assertion of identity rather than, as with Simile, likeness.

Simile (L. "like") — Homoeosis; Similitude — One thing is likened to another, dissimilar thing by the use of like, as, etc.; distinguished from Metaphor in that the comparison is made explicit: “My love is like a red, red, rose.”

(Lanham 1991, 100, 140; 1996, 663, 949)

'Simile' is thus 'explicit,' while 'metaphor' is 'implicit.' Through these definitions, 'metaphor' can be simply related to 'implicit' mutation, in which one step suffers a change of meaning by altering its individual solmization (the syllable, as the word) in a given moment, imposing an analogy between its initial context and the context in which it will be inserted—the whole process serving as a bridging between the two contexts: the two hexachords. Elaborating further on the example that takes the step C-fa-ut as a place of mutation (from the C- to the G-hexachord), if C-ut is assumed, the meaning of the c-step will be drawn from the C-hexachordal context, and if C-fa is used, then the meaning will be established by the G-hexachordal context. In this situation, neither C-fa is applicable within the C-hexachord, nor C-ut is applicable within the G-hexachord, for individually they have no meaning in those contexts. Their meaning, however, may change if the fact that they share the same sound is used as analogy between them. It is this analogy that, in the case of an 'implicit' mutation, asserts a new identity for that step: as place of mutation. An identity revealed not only by the designation formed by the step-letter plus those two particular solmization-syllables (C-fa-ut), but also by the equation [ut=] =fa, implemented when it serves that particular role of place of mutation—which could be read: 'c is now fa in lieu of ut.'
At the same time, 'simile' can be related to 'explicit' mutation, in which the place of mutation is formed by two consecutive steps bearing the same step-letter, but which are uttered with two different syllables (therefore two *words* that generate two different individuals, two dissimilar identities). While their identity is distinguished from one another by means of their distinct solmization utterance (as a practical and theoretical necessity), their similitude is established by means of the common sound they produce (as an aural manifestation), and also by means of the equation (as a graphical representation of 'explicit mutation'). Still exemplifying by means of the same change between a C- and a C3-hexachord through C-fa-ut, there will be two distinct identities (C-ut and C-fa), where one is likened to the other through the equation *ut* = *fa*—which could be read: 'c-ut is now read as c-fa.'

Notice that although the result may appear to be the same, the conceptual process, perception, and procedures for those two figures of rhetoric are different; just as the conceptual process, perception, and procedures for the two cases of mutation are also different, even if eventually their solmizational result is the same.

In fact, rhetoricians (both ancient and modern) consider 'metaphor' as one of the most basic rhetorical figures; one that together with 'metonymy' serve as foundation for almost all of the other figures (or at least for those called figures of substitution, and even
those that may be more precisely classified as figures of metaphorical substitution).  

Roman Jakobson has singled out metaphor and metonymy as the two main engines of rhetorical language, passing down to modern critical thinking a basic distinction between metaphor as indicating similarity and metonymy as revealing contiguity. [...]. Christine Brooke-Rose (in A Grammar of Metaphor, [1958], pp. 23–24), after surveying all the definitions, settles on this plain definition: "metaphor ... is any replacement of one word by another, or any identification of one thing, concept or person with any other."

Perhaps it is metaphor's intrinsic instability which has attracted so much recent attention: to appreciate the metaphoricality of a metaphor we must posit a nonmetaphorical, normative "reality"

189 It may be noticed that 'color' is another term used to mean 'figures of rhetoric' in a 'generic' sense—thus including both 'metaphor,' and 'metonymy,' as well as 'allegory' and 'simile.' However, 'color' may also be considered in a more 'specific' sense as 'ornament,' frequently divided by rhetoricians into two groups: the 'easy ornaments' ('ornatus facilis'), and the 'difficult ornaments' ('ornatus difficilis'). The figures that may be listed within one or the other group usually vary between different auctoritates, although generally speaking the both 'metaphor' and 'metonymy,' together with at least 'allegory' are listed within the few basic ones under 'difficult ornaments.' For the sake of illustration, a list of figures within those 'difficult ornaments' is given below, based on the classification provided in the anonymous Rhetorica ad Herennium (which includes only ten figures)—all figures are given alphabetically and with brief definitions, except for 'allegory,' 'metaphor,' and 'metonymy,' discussed more thoroughly in the body of the text.

'Allegory' -- See discussion above about 'allegory' and 'permutation.'

'Antonomasia' -- This figure consists of a substitution of a proper name for an attribute that it represents, or substitution of a periphrasis for a name, proper or common—e.g. "He proved a Judas to the cause"; "You must pray to heaven's guardian for relief" (Burton 1999-2003, s.v. 'antonomasia,' access 11/18/03).

'Catachresis' -- The use of a word in a context different from the original, due to the lack of a more specific word to the current context—this figure is usually seen as a vice of rhetoric.

'Hyperbaton' -- Any inversion in the word order, i.e. in the normal syntax, or an insertion of a word, usually for the sake of emphasis.

'Hyperbole' -- The use of a word for the purpose of exaggerating some attribute or situation.

'Metaphor' -- See discussion above about 'metaphor' and 'mutation.'

'Metonymy' -- See discussion below about 'metaphor,' 'metonymy,' and 'transmutation.'

'Onomatopoeia' -- The use of a word, invented or not, whose sound imitates its meaning.

'Periphrasis' -- This figure consists of a substitution of a descriptive word for a proper name, or use of a proper name as a shorthand for attributes associated with it—usually it is seen as a kind or specific case of 'antonomasia,' and may even be taken as synonymous to 'circumlocution' or to Puttenham's 'ambage.'

'Synecdoche' -- This figure performs a substitution of a part for the whole, or vice-versa.

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against which to project the metaphorical transformation. The oscillation of the two reality states, normative and transformative, provides the essential bounded instability of a bistable illusion. (Lanham 1996, 664–665, s.v. 'Metaphor')

(interpolations and ellipsis in brackets mine)

As discussed above, 'mutation' (being akin to 'metaphor') also implements a replacement of one syllable by another, changing the context and the identification of a basic element—i.e., changing the hexachordal context and the individual designation of a step and in a given moment (and sometimes changing also the conceptual proprietas). This change of contextualized individuality is due, in fact, to the immutable, normative 'reality' of the hexachordal paradigm—for it prescribes limits that must be exceeded for the sake of providing broader contexts to the musical discourse, and therefore imposes changes performed at selected passage-places (boundaries) between one hexachord and the other. Also, the 'instability' (of which Lanham speaks) is intrinsically present in 'mutation' through the ambiguity of its representative equation in the 'place of mutation.' It transforms and at the same time imposes on one chosen step-letter a seemingly paradoxical duality: one side of the syllabic equation indicating that the originating context is being discontinued, while the other side indicates a new context that is yet barely established (sometimes even hesitatingly, as when some 'indirect' mutation is being implemented). In 'mutation,' in fact, the transformation of those individual contexts is established not only by the dual hexachordal 'reality,' but also (as with any other procedure of hexachordal change) upon the artificial 'reality' (which perhaps could be called 'fictional reality') of the paradigm itself. What differentiates one procedure from another is established by the degree in which the
comparison of context is understood and implemented. In 'mutation,' the comparison is unequivocal (whether 'explicit' or 'implicit'), making its implementation immediately feasible. In 'permutation,' as one step is not actually 'equated' with the other, the comparison between the two contexts (hexachords) is not immediately perceived, and it takes a great deal of effort to realize (i.e., both implement and understand) the connection between the two contexts—just as in 'allegory' the 'imagery' or 'commentary' is perceived only after the a complex connection is made with the 'commented-subject.' In 'transmutation,' however, the comparison between contexts is marginal, that is, an auxiliary or subaltern context (whose individuality is not even clearly stated) is eclipsed by a prevalent or dominant context, and any change (as any actual comparison) is but ephemeral.

Having discussed the correlation between 'mutation' and 'metaphor,' and between 'permutation' and 'allegory,' the correlation between 'transmutation' and rhetorical figures must also be investigated. Given that the Latin term transmutatio was used by some rhetoricians as the equivalent to the Greek 'metonymy,' it seems conceivable to inspect if the definitions and discussions about that figure of rhetoric will also apply the musical 'transmutation.' As used before in other sections of this dissertation, it seems appropriate here to apply the rhetorical resource of substitution to the first few phrases of the above quotation (from Lanham's work), using 'solmization' for 'rhetorical language,' and the musical terms 'mutation' and 'transmutation' respectively for the rhetorical terms 'metaphor' and 'metonymy.'
'Mutation' and 'transmutation' may be singled out as the two main engines of 'solmization,' passing down to modern critical thinking a basic distinction between 'mutation' as indicating similarity and 'transmutation' as revealing contiguity.

The 'similarity' that 'mutation' indicates (as does 'metaphor') is perceived when two different syllables, each pertaining to a different hexachord, are applied (or applicable) to the same step, constituting two elements on each side of the same equation. As mentioned before, each of these elements (letter-plus-syllable) has an individual meaning within their own contextual hexachord, but which are made equivalent (or similar) to each other by means of their common sound (thus establishing their 'similarity' in the practical level). The 'contiguity' that 'transmutation' (as does 'metonymy') reveals is the one permitted by the temporary, ephemeral enunciation of a syllable that does not pertain to the current hexachord, and which does not implement a definite change to a new hexachord (conversely to what happens in the cases of 'mutation' and 'permutation'), nor diverge from the context of the current hexachord. Ergo, when 'transmutation' occurs, the 'transient' aspect of the extraneous hexachord creates a sensation of a contiguity of the prevalent hexachord. This hexachord is not being really interrupted, but ornamented, for its boundaries (la and ut) are only momentarily crossed, without affecting the sense that the hexachord is still in force. In 'mutation,' however, the similarity (obtained through sound, step-letter, and graphical representation of the solmization) is made readily available and understandable, whereas in 'permutation' the dissimilarity is the first characteristic aspect, for the connection is obscured by disjunct elements (steps) of individual hexachords that appear to share no commonalities.
A more precise definition of 'metonymy' may help here in tracing its correspondence with 'transmutation'—the quotation below is excerpted from the anonymous Rhetorica ad Herennium, in which the anonymous author employed the Latin term 'denominatio' in lieu of the Greek 'metonimia' (the definition itself is given in bolface, and examples are given in plain text).

Denominatio est quae ab rebus propinquis et finitimis trahit orationem qua possit intellegi res quae non suo vocabulo sit appellata. Id aut a superiore re conficitur, ut si quis de Tarpeio loquens eum Capitolinum nominet; ...; aut inventio, ut si quis pro Libero vinum, pro Cerere frugem appellet; ...; aut instrumento dominum, ut si quis Macedones appellart hoc modo: "Non tam cito sarisae Graeciae potitae sunt," aut idem Gallos significans: "nec tam facile ex Italia materis Transalpina depulsa est"; aut id quod fit ab eo qui facit, ut si quis, cum bello velit ostendere aliquid quemiam fecisse, dicat: "Mars istuc te facere necessario coëgit"; aut si quod facit ab eo quod fit, ut cum desidiosam artem dicimus quia desidiosos facit, et frigus pigrum quia pigrum efficiat. Ab eo quod continet id quod continetur hoc modo denominabitur: "Armis Italia non potest vincir nec Graecia disciplinlis"—nam hic, pro Graecis et Italis, quae continent notata sunt; ab eo quod continetur id quod continet, ut si quis aurum aut argentum aut ebur nominet cum divitas velit nominare. 

Metonymy is the figure which draws from an object closely akin or associated an expression suggesting the object meant, but not called by its own name. This is accomplished by substituting the name of the greater thing for that of the lesser, as if one speaking of the Tarpeian Rock should term it "the Capitoline"; ...; or by substituting the name of the thing invented for that of the inventor, as if one should say "wine" for "Liber," "wheat" for "Ceres"; "...;" or the instrument for the possessor, as if one should refer to the Macedonians as follows: "Not so quickly did the Lances get possession of Greece," and likewise, meaning the Gauls: "nor was the Transalpine Pike so easily driven from Italy"; the cause for the effect, as if a speaker, wishing to show that some one has done something in war, should say: "Mars forced you to do that"; or effect for cause, as when we call an art idle because it produces idleness in people, or speak of numb cold because cold produces numbness. Content will be designated by means of container as follows: "Italy cannot be vanquished in warfare nor

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190 The ellipses, given by the editor/translator, indicate corruptions of the text, where there should be explanations and examples, respectively: of inferior res for superior res; and of inventor for inventum.
magis in praecipiendo divisio quam in quaerendo difficilis inventio est, ideo quod plena consuetudo est non modo poëtarum et oratorum sed etiam cotidiani sermonis huiusmodi denominationum.

(Anon. ad Herennium 4.32.43; Caplan 1954, 334, 336)

Thus, according to a particular ('generic') facet of the definition of 'metonymy,' 'transmutation' is that which uses a name of a smaller thing in lieu of another larger structure, and although it may represent that larger structure, it also has an identity of its own. This understanding of 'transmutation' also seems related to both 'synecdoche' and 'hypallage.' 'Synecdoche' is defined as a figure that substitutes the whole for its part, or conversely the part for the whole—i.e., it implies the part by naming the whole, or it implies the whole by naming its part. 'Hypallage,' as defined by Smyth is:

A change in the relation of words by which a word, instead of agreeing with the case it logically qualifies, is made to agree grammatically with another case.

(Smyth 1956, 678; cf. Lanham 1996, 550, s.v. 'Hypallage')

The grammatical nature of this definition makes its relation to musical 'transmutation' especially significant. In 'transmutation' (as in 'hypallage') the syllable (or word) of another hexachord (or case) is made to agree (grammatically) with the current hexachord being solmized, even though it is clear that the syllable (either the fa in a
fa-super-la situation, or the mi in a subsemitone inflection) is but a borrowing from another hexachord with which it agrees by default.

Still another figure of rhetoric that may be inspected here is the one called 'metaplasm,' not only for being potentially equivalent to 'transmutation' as a procedure of hexachordal transition, but also because it draws some relation to the other procedures and to the historical definition of 'musica ficta' itself. The quotation below, presenting a definition attributed to Henry Peacham seems here most appropriate for this inspection.

Metaplasm is a transformation of letters or syllables in single words, contrary to the common fashion of writing or speaking, either for cause of necessity, or else to make the verse more fine. (Peacham 1593)191

This explication closely resembles those about musica ficta, in that 'metaplasm' (as musica ficta) is defined as a change of the syllables of a single word (as the solmization syllables of a single step), and further justified by cause of necessity ('causa necessitatis'), or else by cause of obtaining a finer, more pleasant verse ('causa pulchritudinis'—i.e., by cause of beauty). The "transformation" (mentioned in the quotation) may be exemplified by the word 'theatre,' which suffers an alteration into 'theater'—an example that is actually a specific type of 'metaplasm,' more properly called a 'metathesis.' 'Metaplasm' is more properly a phonetical transformation (or alteration) done by means of augmentation, suppression, substitution, or only transposition—in the case just exemplified above, it is a

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191 Lanham's work (1996, p. 666, s.v. 'Metaplasm') is the source of the attribution to Peacham, and from which the quotation was drawn. However, the quotation could not be located in Peacham's The Garden of Eloquence (either in the 1577-edition or in the 1593-edition)—this title, in its 1593-edition, is the only work by Peacham listed in the Lanham's bibliography.
'transposition' of a phoneme within a syllable of a single word. These transformations are due to ways of complying with the phonetical occurrences established in the spoken language, usually contrary to the common origin of the word, or for adapting to the vernacular what originally came from a foreign language—as it is also the case with the word 'theater,' which is an adaptation from the Latin word 'theatrum.' The same occurs, of course, with *musica ficta* and any of the three procedures of hexachordal change: they exist in order to comply with needs of musical performance, which imposes inflections on steps of the gamut (changing the designation of steps and creating new hexachords), and which reach beyond the limits of hexachords (in order to virtually allow limitless possibilities of elaboration)—all this is implemented even if it poses contradictions with the established sets of theoretical explanations (the musical grammar) available during the Middle Ages and Renaissance. Whatever the transformations are, 'metaplasm' never changes the signification (or signified) of the word itself. That is the most significant difference, in fact, between 'metaplasm' and any of the three procedures of hexachordal change—for 'mutation,' 'permutation,' and 'transmutation' (as well the occurrence of *musica ficta*) all impose changes in the signified of the word (for the hexachordal context of the step is forcibly changed). In this sense, 'transmutation' is perhaps the only procedure that could produce a transformation equivalent to that of 'metaplasm,' since there is an immediate return to the context of the prevalent hexachord—nevertheless, the main step in 'transmutation' (the 'transmutant'-step) is truly identified as an extraneous step (thus with a different signified).
In fact, the distinctions between these figures are sometimes hard to define. Both 'metonymy' and 'synecdoche' are usually related, and classified within the same subtype of substitutive figures as it happens with 'metaphor' and 'allegory.' 'Hypallage,' however, is classified (together with 'metaplasm') as an ungrammatical use of language—which could also be construed as some kind of vice of rhetoric. It seems therefore that, since in early medieval theory *musica ficta* was equated with vices of rhetoric (by means of the word 'vitium'), 'hypallage' would be a better term to define the procedure named in the present work as 'transmutation,' but the choice of 'metonymy' was manifold: because of its obvious connections (morphologically and semantically) with the other procedures that signify 'change in the generic sense' (i.e., they all spring from the generic word *mutatio*), and because it is paired with 'mutation' (as 'metonymy' is paired with 'metaphor') as one of most important and frequent procedures of hexachordal change. Finally, 'transmutation' (as one of the possible Latin names used for 'metonymy') may be understood as a denomination of a 'generic' figure that contains (i.e., embraces, or may be divided in) other more specific figures such as 'synecdoche,' 'hypallage,' as well as 'metaplasm.'

In the light of what has been exposed above, it seems reasonable that those three procedures of hexachordal change be named 'figures of solmization,' thus establishing a clearer connection with 'figures of rhetoric.' When implemented, these 'figures of solmization' perform not only a musical task, but a rhetorical one: the task of

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192 ‘Permutation,’ given its rough nature of execution, does not happen nearly as frequent as the other two procedures.
persuading the audience of the subject and argumentations at hand, by means of references to extraneous, new, or even unexpected ideas and imagery, even if only at the level of minute detail, also serving to illuminate and broaden the audience's understanding of the figures used by both disciplines.
ISSUES OF TERMINOLOGY:
FORGING TERMS, DEFINITIONS, AND CONCEPTS IN MODERN SCHOLARSHIP

(i) Generic Terminology: The Audience Considered

The previous chapters were dedicated to explanations of solmization and musica ficta through its theoretical and practical contents, and involved the presentation of related terms and concepts. However, some terms and concepts were subjected to little or no discussion about origin or comparison between modern and early understandings (i.e., Middle Ages/Renaissance). In order to clarify the nomenclature of these previous chapters, I will undertake the discussion of basic definitions of musica ficta, as well as of the term 'ficta-signs,' which were assumed earlier as a generic reference to the signs $\frac{1}{4}$-quadratum (or durum) and $\frac{1}{4}$-rotundum (or molle), introducing some interpretive and speculative positions along the way.

In a paper delivered at the American Musicological Society Meeting in Boston (1998), Peter Urquhart argued against one trend in modern musicological practice that produces rather artificial and decontextualized sets of rules. One of his main arguments relies on the observation that the assembly of those sets of rules is often made without
attention to the kind of public for which each individual rule was intended.

It must also be borne in mind that the rules that we have come to associate with the term *musica ficta* were never stated as a set of principles in sources of the period. While these ideas stem from the theory of the time, their assembly as a set of rules for performance or transcription is a purely modern invention. It is useful, therefore, to reconsider the intended audience for each of these various "rules," which is the primary intent of this paper. Briefly, the rules may be boiled down to the following three categories.

1. the inflection of cadences: subsemitones; closest approach; "propinquity"
2. adjustment of melodic contour: avoidance of linear tritones; "una nota super la"
3. correction of harmonic problems; perfection of 5ths and 8ves; "mi contra fa"

I'd like to consider each of these rules in order, with the following firmly in mind: who was the intended audience for these rules--the composer, or the performer reading his own part from notation.

(Urquhart 1998, 2)

This assessment, however crucial, seems to have inadvertently dismissed another possible audience for a treatise (and the guidelines or rules it establishes): the collective of theorists, or even the theorist/composer. This audience should not be overlooked, especially with regard to the Renaissance—from and for which Urquhart draws most of his conclusions—and its Humanistic environment, when a large number of theorists (or more generally, writers on music) were concerned with formulating new and original (personal and independent) propositions, rather than merely repeating or expanding (through quotation, paraphrase or gloss) on propositions by previous authors. An audience of theorists (or even theory-educated and theory-concerned readers) can be viewed as a metalinguistic audience, in the sense that, potentially consisting of readers/writers, it exercises some degree of self-examination and self-criticism both when reading and when writing. Since any given author is a member of this audience by default, one can assume the
existence of a natural concern with structuring the text in such a way as to appease the minute criticism of schooled peers—even when such an audience was not meant as the primary public of the text. Thus, an audience of theorists exerts an indirect, interpretive control over any given text, which may influence not only its reception, but (because of an author's concern with that reception) may also influence the inception, production, and completion of that text, or even its two most basic components: content and form (whether or not these can be dissociated for analytical purposes). An author—who is writer, reader, and self-critic at once—will choose between a number of conventions (both musical and rhetorical), knowing that this choice may affect the acceptance (or even the survival) of the propositions being made, and that this acceptance may be determined also by the form of presentation (the content and assembly of those propositions). Of course, even if an author chooses to avoid, disobey, or else contradict any number of conventions, many will have to be followed, if not for the sole purpose of acceptance, at least to allow a minimum understanding between author and audience through the text. Speculative, philosophically informed writers of the Middle Ages and Renaissance (not unlike many modern music scholars) may have been driven by particular interests in following certain conventions or in establishing rules (aesthetic, and even ethical ones), which do not necessarily coalesce with the practical concerns of either composers or performers.\textsuperscript{193} The learned and often obscure language of medieval and Renaissance music theory suggests that the concerns and

\textsuperscript{193} For an appreciation of the role of musical theory, its speculative and ethical significances, cf. (Lippman 1966).
motivations of musical performers on the one hand, and those of musical theorists on the other, were no less divergent then as now. That these differences should somehow have concurred to produce a single cohesive and integrated strain of regulatory language governing all musical situations—practical or theoretical—seems hardly likely. And yet, modern ficta-scholarship has been grounded for the most part in precisely such an historiographical construction. If there is a common substratum for communication between theorists and performers (or other musicians, scribes, etc.), or even between different theorists (whether they are speaking from the same or from different disciplinary stances), that seems to lie within an understanding of rhetorical components, particularly allegorical ones. The effectiveness of the rhetorical discourse (or more specifically, the effective use of allegories or other rhetorical figures—generically speaking, deviations of speech) is measured by its capacity to impress the mind of the audience, as homogeneously and as subliminally as possible—no matter how learned or specialized are the various segments of the audience. The noncoalescent differences between theoretical and practical concerns—and perhaps even the impression of an obscure language—are apparently due to interpretations of theoretical texts realized mainly at a literal level, or with little attention to their various significances. Even though different audiences could (and certainly did) produce different interpretations for a given text or situation, these differences seem to lessen when the other three senses of exegesis (allegorical, moral or tropological, anagogical or spiritual) are considered. Although this process of interpretation may paradoxically allow individuals to impose readings and forge meanings of a personal nature.
(thus expanding the differences from one reader to the other), it also requires the use and understanding of several commonplaces (necessarily embedded in the text), to which the readers can (and must) collectively relate, and through which they can comprehend the propositions made within the text.

Returning to the quotation above, Urquhart must be praised for having detected one of the most significant problems with regard to interpretations of early texts: the modern "assembly" of rules for *musica ficta*. This raises the notion of a forged "set of rules" that has no correspondent in early music theory, but creates an inferential hierarchy that does not seem to have existed between these so-called "rules," and that is made haphazardly available to all kinds of modern audiences (such as modern scholars, modern performers, and editors), usually without respect to the origin or intention of each "rule." In other words, inspired by Urquhart's suggestions, one may state that both the assembly and the application of rules are being implemented by modern scholarship irrespective of differing audiences for each particular rule, or even irrespective of the context (musical, rhetorical, or social) in and for which each rule was enunciated. But Urquhart's claim is only partially true, for while one can hardly identify in a historical treatise one specific "set of rules" exclusive to *musica ficta*, there are many sets that include *ficta*-related issues together with general issues on solmization—at least from systematizations found as early as in Jacobus Leodiensis's *Speculum musicae* (p. 1330, bk. 6, chs. 65–67; CS 2: 289–295; Bragard 1955–73, 6: 179–188) to Rhau's *Enchiridion* (1517, esp. chs. 3–4, ff. Cii–Dij), and Finck's *Practica musica* (1556, tr. 1, ff. Biij–Ci, Eiiij–Fi, Fij). It does not follow, however, that
theorists were not engaged in producing a "set of rules," only that there were rather few conspicuous attempts involving *ficta*-dedicated chapters.\textsuperscript{194} In any single treatise, these 'rules' are frequently scattered through different chapters dedicated to various topics—e.g., solmization, mutation, clefs, consonances and dissonances, or even counterpoint and other composition-related topics, etc. Now, even if modern scholarship creates one such artificial "set of rules," it does not invalidate the actual attempt of assembly, provided that intended audiences are acknowledged, and that individual 'rules' do not take on the appearance or intention of unexceptionable 'laws'; however more appealing and cogent the latter might be for Western pedagogical approach. To be sure, Urquhart's starting point was an identification of two different concepts (or definitions) of *musica ficta*: one (which he calls the "old sense") representing direct formulations from medieval and Renaissance music theory, and including only those steps that cannot be found in the *recta*-gamut; and the other (which he calls the "modern sense of performer's accidentals") representing most of modern musicological interpretation, and including any accidental inflections—even $b_\flat$ (equivalent to the *recta*-step $\flat-fa$).\textsuperscript{195}

\textsuperscript{194} One early attempt (of what modern scholars might identify as a "set of rules") is found in Prosdocimus de Beldemandis's *Contrapunctus*, (1412–1425/28, ch. 5; Herlinger 1984, 70–94 [even only])—also edited by Coussemaker as tr. 3, ch. 1 (CS 3:198–199).

\textsuperscript{195} Cf. the entry 'Musica ficta' in MGG 2 (6: 673–680) published in 1997, where Urquhart also exposes some of the same concepts on which he lectured at the AMS meeting in Boston/98. The entry in MGG 2 (6: 662–682) is co-authored by Jehoash Hirshberg ('Bis zum 14. Jahrhundert') and Peter Urquhart ('15. und 16. Jahrhundert').
The two meanings of the term *musica ficta*, that of the 20th c. and of the earlier period, overlap to a large extent, but each covers an area that the other does not [...]:

1) In the old sense [...] *musica ficta* includes notated accidentals. The connotation of fictive as invented by the performer, imagined and therefore not real or on the page, does not occur. Treatises that discuss *musica ficta* invariably provide explicit accidentals, and most do not mention accidentals that are not signed.

2) When used in the modern sense of performer's accidentals [...] "ficta" includes *musica recta* pitches, specifically B♭. When one includes questions about flat signatures, it is clear that modern discussions of "musica ficta" are more often concerned with *musica recta* pitches than with *musica ficta* in the old sense.

(Urquhart 1998, 1)

Urquhart is, in fact, elaborating upon similar concerns of earlier scholars, perhaps voiced more conspicuously by Daniel Zager, in an article dedicated to discussing solmization in fifteenth-century music.

The term *musica ficta* has frequently been used incorrectly to embrace all of the editorial accidentals added to modern scores of Renaissance music. In fact, many of these editorial accidentals, specifically many B♭s, may be explained and should be understood in terms of the standard system of *musica recta* as delineated in the gamut, the theoretical framework by which the fifteenth-century composer and singer defined musical space. *Musica ficta*, on the other hand, refers only to pitches outside the gamut. The distinction is crucial, for while the fifteenth-century singer, and, by implication, his modern counterpart, would normally avoid entering ficta hexachords unless necessary, there was simply no reason to avoid the B♭s of *musica recta*. Thus, all editorial accidentals are not equal, and it is critical that the modern editor make a conceptual distinction between editorial accidentals representing *musica ficta* pitches and those representing *musica recta* pitches.

(Zager 1989, 7)

Even if some modern scholars do not provide distinctions/definitions as explicitly as others, a great many scholarly works have been careful in respecting and using the term *'musica ficta'*—though unfortunately not all—as it was conceptualized by medieval and Renaissance
writers. With respect to works that do observe the early concepts of *musica ficta*, it must be noted that most of them are found in the specialized literature of works devoted to the topic of *musica ficta*, or in other related works by *ficta*-scholars.\(^{196}\) The situation, however, is certainly not the same with regard to the bulk of music editions, to which Zager's and Urquhart's criticism is rightfully aimed.\(^{197}\)

In trying to formulate a merged concept, and considering the claims of the above authors about medieval/Renaissance senses, *musica ficta* could be defined as a collection of steps not pertaining to the *recta*-gamut, being used in order to obtain semitones or whole tones where they could not be originally found, while wanting notated *ficta*-signs for the proper identification of *ficta*-steps. However concordant with several assessments presented earlier in the present work, if this definition is taken literally, and interpreted only via the arsenal of modern terms and concepts, 'steps' (i.e., in the old sense) could be simply equated

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196 One must include the invaluable production of Lowinsky, Allaire, Hughes, Bent, Karol Berger, Christian Berger, Toft, and countless others, even if they fail to distinguish among the intended audiences for each rule—something that Zager also fails to do. Urquhart's production should also be included, with the exception that he duly proposes (as seen above) distinctions between 'rules' according to intended audiences.

197 These editions of early music repertoire, not only tend to disregard the appropriate solmization of a piece, in order to determine *ficta*-occurrences (whether or not these are effected by a *ficta*-sign), but frequently take *ficta*-signs as accidentals applied only (or exclusively) to specific notes. Thus, the function of *ficta*-signs as hexachord enforcers is concealed from the reader of those editions, and any inflections are ultimately perceived as *ficta*-steps, even if they duly pertain to the *recta*-realm. This situation inadequately contributes and furthers the understanding of *musica ficta* (and particularly of *ficta*-signs) as mere accidentals in the modern sense.

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to 'pitches' (i.e., in the modern sense). In such a situation, \( b \) would always be considered a pitch that has a correspondent in the *recta-*realm, and not in the *ficta-*realm—i.e., equivalent only to a *recta*-step. Of course, this is not accurate, for while the modern \( b \) can certainly correspond to the single *recta*-step designated as \( b{-fa} \), it could also correspond to plural *ficta*-steps—e.g., \( b{-fa-ut} \) and \( b{-fa-sol} \).

In fact, the early concept (or Urquhart's "old sense") of *musica ficta*, as exposed above, needs to be further analyzed and rephrased, for it is composed of two different and seemingly independent—however complementary—components (or definitions): one 'specific,' the other 'general.' As a 'specific' definition, *musica ficta* is a procedure through which one (composer, scribe, theorist, or performer) makes a tone out of a semitone, or vice versa. This definition, which implies an alteration within a given context (whether melodic or harmonic), may apply to the necessity of substituting a consonance for a dissonance, as well as to an aesthetic determination of obtaining some particular consonance, even where there was no dissonance—in which case, it may be seen as a

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198 In accordance with the terminological distinctions adopted at the outset of the present work: 'step' is here being used as a term that implies interval, as well as locations in the gamut, and is represented by letter-plus-syllable designations—e.g, A-*la*, B-*mi*, C-*fa-ut*, etc.; 'pitch,' however, is the term elected in this work only for modern, absolute, frequency-defined sounds, and is represented by letter-only designations—e.g., A, B, C, etc.

199 A similar commentary was made by Margaret Bent, as the official respondent to the AMS session in which Urquhart read his paper mentioned above. Moreover, it must be stressed that alone the modern nomenclature does not allow one to determine whether a given pitch (e.g., \( b \)) is equivalent to a *recta*-step (\( b{-fa} \)) or a *ficta*-step (e.g., \( b{-ut} \)). This applies to any pitch, not only those that bear accidentals, but also those that do not in modern nomenclature (e.g., \( c' \) can be equivalent to \( c{-fa} \) within a \( C \)-hexachord, or equivalent to \( c{-re} \) within a \( B_b \)-hexachord).
definition that hinges on the concepts of *causa necessitatis* and *causa pulchritudinis*. However, if an underlying default structure is not perceived (as it might within the narrow scope of such a definition), a transformation from b-mi into b-fa (for whatever reason, *necessitas* or *pulchritudo*) could be interpreted, for example, as belonging to the practice of *musica ficta*, though these particular steps are commonly defined as *recta*-steps. As a 'general' definition, *musica ficta* is said to represent all those steps that are not found in the standard array of steps (i.e., not found in *musica recta*)—this kind of definition does not hinge nor depend on notions of *necessitas* or *pulchritudo*. While the 'specific' definition emphasizes the transformational aspect over that of a default structure, the 'general' definition does the opposite. The problem of comprehension then arises when any of those definitions is individually generalized and assumed as some kind of 'rule' hierarchically prevalent over the other; in fact, it is a problem of considering the audience in order to achieve a more subtle comprehension of the texts.

Among those historical treatises that included discussions about *musica ficta*, not all have included both of these definitions ('general' and 'specific'). An author's choice for one or the other was apparently determined by necessity, in order to avoid ambiguities or verbose clarifications; for example in sections of a treatise requiring one of the definitions, but not the other. Where both definitions are discussed and enunciated in one and the same treatise, they could be presented as complementary parts of a single concept, but much more often complementarity was only implied. The latter case is observed when the two definitions are presented in completely different sections of the treatise, with no explicit
connection, or with any aspect of complementarity left exclusively to the reader's interpretation. From the perspective of an author, whether such a reader's interpretation was presumed necessary or unwarranted may have been a matter of which was the intended audience of a particular assertion, or even of the whole treatise.\textsuperscript{200}

Coniuncta est dum fit de tono regulari semitonium irregulare aut de semitonio regulari tonus irregularis, vel sic: Coniuncta est appositio b rotundi aut \(\frac{1}{2}\) quadri in loco irregulari.

Coniuncta is when an irregular semitone is made out of a regular tone, or an irregular tone out of a regular semitone, or else: Coniuncta is the apposition of b-\textit{rotundum} or \(\frac{1}{2}\)-\textit{quadrum} in an irregular place.

Ficta musica est cantus propter regularem manus traditionem aeditus.

Musica ficta is song that has been produced as a result of [i.e., outside of] the regular tradition of the hand.

\(\text{[...]}\)

Through these brief statements, Tinctoris provides both kinds of definitions (also adding another about the use of \textit{ficta}-signs), but keeps them completely unconnected; although the additional component on the application of \textit{ficta}-steps (the second entry on 'coniuncta') could even serve as a mediator. Two levels of interpretation must be noted: a 'micro' level, in which the two definitions are understood independently; and a 'macro' level, in which there is only a single concept. The macro level, in which the two definitions would be enunciated, possibly in one and the same merged sentence, is in fact a conceptualization of modern scholarship; it is not generally found in historical treatises, and depends on a

\textsuperscript{200} The unconnected presentation of these definitions in two independent sections, or even the choice of enunciating just one of the definitions instead of the other, may have served an author's intention in producing treatises with either a speculative or a practical concern. The quotation from Tinctoris's \textit{Terminorum musicae diffinitionum}, given here for immediate reinspection, has also been included in chapter I (ii), along with others providing those basic definitions of \textit{musica ficta}. 283
connection that only interpretation can provide.\textsuperscript{201} Properly merged, however, the two definitions can convey a suitable and more complete definition (at least for the modern understanding), not only of what \textit{musica ficta} is, but also what it does, and/or how it may be implemented.\textsuperscript{202} Even if the two definitions can be naturally made into components of one

\textsuperscript{201} In his \textit{Exégèse médiévale} (1959–63), Henri de Lubac presented the four exegetical senses (literal or historical, allegorical, tropological or moral, and analogical or spiritual) mainly as means for interpreting the Scriptures, although even within his work those exegetical approaches can be applied to any kind of text (theoretical, musical, literary, etc.) whether belonging to sacred or to secular contexts. The interpretation of which I speak with regard to the macro level is one that might benefit from each and all of these exegetical approaches, and thus contribute to the identification of the intended audience of a treatise, or just of a brief assertion.

\textsuperscript{202} As an evidence against the understanding being forwarded here, there is but one treatise that has enunciated both definitions in a merged manner, in one sentence: Prosdocimus de Beldemandis's \textit{Contrapunctus}. Quoted below is the first paragraph of the last section (dedicated exclusively to \textit{musica ficta}) in Prosdocimus's treatise—in Herlinger's edition that entire section is given as chapter 5, and in Coussemaker's edition as treatise 3 in one chapter. The quotation adopted the text from Prosdocimus's own revision (between 1425 and 1428) of the original 1412-text, and the rephrasings or added words from that revision are marked in boldface.

\begin{quote}
Hiis visis, aliquid de ficta musica, que huic arti neccessaria est, est pertractandum, unde ficta musica est vocum fictio sive vocum positio in \textit{aliquo loco manus musicalis ubi nullo modo reperiuntur}, sicut ponere \textit{mi} ubi non est \textit{mi}, et \textit{fa} ubi non est \textit{fa}, et sic \textit{de aliis vocibus}. De ista ergo \textit{ficta musica notande sunt hee regule}, quarum prima est \textit{hec}, quod ficta musica nunquam ponenda est nisi loco neccessitatis, eo quod in arte nichil est ponendum, \textit{et maxime fictio}, sine neccessitate.
\end{quote}

(Prosdocimus 1412–1425/28, bk. 5; Herlinger 1984, 70, 72; cf. CS 3: 198)

Now that these things have been examined, we must study something of musica ficta, which is necessary to this art. Musica ficta is the feigning of syllables or the placement of syllables in any location \textbf{on the musical hand} where \textbf{they are in no way to be found}--to apply \textit{mi} where there is no \textit{mi} and \textit{fa} where there is no \textit{fa}, and \textbf{thus for the other syllables}. \textbf{Concerning musica ficta, these rules must be noted, the first of which is this}: that \textbf{musica ficta is never to be applied except where necessary, because in art nothing--least of all a feigning--is to be applied without necessity.}

(Herlinger 1984, 71, 73)
single concept, they are neither mutually inclusive, nor mutually exclusive, i.e., although they can exist independently, the existence of one definition can be related to the other by extension. An analysis of the conceptualizations that may have generated each definition will shed some light on their differences and complementarity as well, and on how they contribute to each other's clarification.

In the micro level, the two definitions are conceptually different: one ('general') is static and speculative; the other ('specific') is dynamic and practical. The latter, 'specific' definition (implying an alteration of a given default) describes an action, a procedure, a practice: the actual modification from tone to semitone, or vice versa. Thus, it depends as

The entire section on musica ficta functions as a kind of addendum to the treatise, and the character of the initial assertion suggests that the previous chapters are a consummate presentation. In light of that, it appears that Prosdocimus regarded musica ficta as a practice of its own, differentiated from counterpoint (perhaps even extraneous to it), although composers should know how to apply it in counterpoint. The two basic definitions of musica ficta ('general' and 'specific') are followed by a warning against the overuse of musica ficta. The assertion that "musica ficta is never to be applied except where necessary" has also been used to develop the modern statement that the composer should not "write to many accidentals but leave them to the performer" (Bent 1972, 77; 2002, 65). The origins of Bent's work ("Musica Recta and Musica Ficta") can be traced back to the prominent works of Apel (1938, 1939, and 1950), Lowinsky (1945 and 1954), Hoppin (1953 and 1956), and also Parrish (1957) who first addressed the problems of the so-called "partial" or "conflicting" signatures, "cautionary" signs, and non-notated signs. Its basically through her convincing work, that the idea that 'in general ficta-signs would be better left unnotated' has been developed, as if Bent was an outspoken defender of such an idea. In the same article, she stated that "[Prosdocimus's] advice is not relevant to singers, schooled orally in a performing art, nor to the modern editor who acts on the performer's behalf. Prosdocimus does not claim to help singers to solve problems; he tries to eliminate problems before the singer has to tackle them" (Bent 1972, 77; 2002, 65). In fact, in that particular paragraph, Prosdocimus is not addressing the notation or application of 'signs,' but rather it is a much more generic statement that musica ficta (as a deviation from the gamut of musica recta) is to be used sparingly, only where there is no other alternative. It may also be said that this assertion is aimed to the audience of a treatise on counterpoint, not of a treatise concerned with musica practica.

For all the modernity of Prosdocimus's presentation in its approach and tentative comprehensiveness (although clearly separating musica ficta from counterpoint), it is not surprising that his text has been used as a support to modern concepts and presentations.
much on motion, as on active intention of change, and conveys a concept that is both
dynamic and practical in essence. The 'general' definition, however, denotes an abstraction:
the delimitation of steps within two different but correlated systems (*recta*-gamut and
*ficta*-gamut), hence establishing the conceptual existence of crystallized and hermetically
conceived frames.\textsuperscript{203} Obviously, the delimitation and establishment of frames per se does
not depend on motion, and is intrinsically passive, for it is founded on applying
preestablished designations for each step. Thus, it conveys a speculative concept, by force
of being founded in an abstraction, as well as it denotes a static condition, by force of its
motionless, passive character.\textsuperscript{204}

\textsuperscript{203} The notion of 'static,' 'crystallized and hermetically conceived' frames can be related to the
*recta*-gamut in its clear limitations and stillness, since theoretically it cannot be expanded and at the same
time keep its function and denomination as 'recta.' At the same time, the *ficta*-gamut, offers an speculative
conceptualization that allows for expansion, but whose limitations are given by the preexisting
*recta*-gamut. The two gamuts, in fact, cannot be seen as subsets of one another, but as parallel and
interdependent sets—much like the 'general' and 'specific' definitions.

\textsuperscript{204} The association of those particular qualifiers ('general' and 'specific') with the two micro-level
definitions ('speculative' and 'practical,' respectively) may, at the same time, be understood as a paradox.
The qualifiers are here being applied because of the results each of the definitions impose on the merged
macro-level concept of *musica ficta*. If the practical concept, primarily dependent on the idea of change, is
divested of principles of regularity versus irregularity (i.e., default versus its alteration), then it can be
applied indistinctively to *recta* - and *ficta*-steps, and thus may be considered 'more general.' If the
'speculative' concept is more dependent on the pre-definition of (and comparison with) a structure such as
the *recta*-gamut, which is a restriction in itself, than on the breadth of expansion of the *ficta*-gamut (which
does not exist independently), then its qualification can also be understood differently, and thus it may be
considered 'more specific,' because 'restrictive.'
Johannes de Garlandia (fl. ca. 1240), in his Introductio musice, was once identified as the first author to have explicitly used the term 'falsa musica' (i.e., musica ficta), defining an intentional and justified change in the quality of a step (thus, a 'practical' definition).  

Falsa musica est, quando de tono facimus semitonium, et e converso.  
( Garlandia med. 13th cent.; CS 1, 166)  
( my translation )

However, Christopher Page (1991, 96n) denies Garlandia's position as the first author to have used the term 'falsa.' Page's view is based on the appearance of the term 'falsa' in two treatises: Summa musice, attributed to the double authorship of Perseus and Petrus, according his own edition of 1991; and Carmen de musica cum glossis (?13th cent.) attributed to Alexander de Villa Dei, according to Seay's edition of 1977—Page dates both treatises to ca. 1200. In the latter treatise, the appearance of the term 'musica falsa' implies the existence of a prior, well-known definition, although one cannot tell whether this definition would have been formulated in a written form, or just divulged orally—cf. (Villa Dei ?13th cent.; Seay 1977, 19). In the case of the Summa musice, the authors named by Page do not go beyond the use of 'falsa' as a mere adjective (i.e., as a qualifier with no clear terminological intention), and suggest that although 'false' procedures and 'false' intervals may exist, 'musica falsa' "should be scrupulously avoided" (Perseus and Petrus ca. 1200,  

205 The attribution of primacy of such an use of the term 'falsa musica' had been given in Margaret Bent's entry in the first The New Grove Dictionary—cf. (NG 1, 12: 803, s.v. 'Musica ficta'). The quotation from Garlandia's treatise has also been included in chapter I (ii).
Thus, Perseus and Petrus imply that *musica ficta* would be unacceptable both as a regular practice and as an institutional concept. Even if Johannes de Garlandia was not the first to use the term 'falsa,' and his definition was a restatement of 'practical' definitions that existed before, he may still be responsible for providing a formal definition of *musica ficta* by conspicuously utilizing 'falsa musica' as a designating term. In fact, Garlandia employed the term 'falsa' beyond its use as a mere adjective, as previous theorists did, and conferred to the term 'falsa musica' a musico-lexicographical status. However, attempts to account for, and above all validate the practice of *musica ficta* appear as early as the second half of the ninth century.  

Cf. also (Perseus and Petrus ca. 1200, chs. 15, 21, 23, 25; GS 3: 221 [formae for falsam], 235, 238–239, 243; Page 1991, 177, 195, 199–200, 206). Formerly, this treatise was attributed to Johannes de Muris, based on the inscription given in Gerbert's edition (GS 3: 190–248). Later this inscription was challenged and an anonymous author was claimed (sometimes referred as Pseudo-Johannes de Muris). As mentioned earlier in chapter 1 (note 34), Page's date (ca. 1200) may also be challenged on the basis of a number of untimely references to Aristotle's (through citation, gloss or paraphrase), which Page himself identifies, but which may be unusual for such an early date in the acceptance of Aristotle's auctoritas on the part of the Church, which would enable his works to be so openly used. Although the *Lexicon musicum Latinum mediæ aevi* has kept a different date for the treatise (i. 1274–1312), Page's contention has been accepted by Margaret Bent in the new edition of *The New Grove Dictionary*, together with another early use of that term, stating that "[t]he earliest known use of the term *musica falsa* is in a late 12th-century didactic poem, describing variable hexachord steps (I-Rvat lat. 1346; [from] an unpublished edition by Smits van Waesberghe […]" (NG 2e, s.v. 'Musica ficta,' §2 [ii]).

In fact, although Page's dates for those two treatises (Perseus and Petrus's and Villa Dei's) may be debatable, that may be less relevant in tracing the origins of 'falsa,' for many earlier theorists employed the term 'falsa' as an adjectival reference to those step alterations that fall within explanations of 'musica ficta' and its practice—e.g., (Anon. SE a. 900, pt. 1; GS 1: 173, 175, 177; PL 132: 983, 985, 988; Schmid 1981, 61, 65, 72); (Anon. Comment. Microl. 1070/1100; Vivell 1917, 34, 35); (Guido d'Arezzo 1026–28, ch. 10; B-Br II 784, f. 8v; GS 2: 10; PL 141: 389–390; Waesberghe 1955, 133–134); (Aribo ca. 1070's; Smits van Waesberghe 1951b, 13–14; GS 2: 203; PL 150: 1313–1314); (Affligemensis ca. 1100, ch. 2, 7, 21, 22; GS 2: 233, 237, 257, 259, 260; PL 150: 1394, 1398, 1422, 1424, 1425; Waesberghe 1950, 52, 65, 133, 139, 143)—some of the evidences from earlier authors were presented in chapter I (ii).
frequently introduced under the classification of 'error' or 'corruption' (or literally, a 'vice,' from the Latin noun 'vitium'). In fact, the term 'vice' is one of the earliest and most significant terms employed in the presentation and process of defining musica ficta, usually in terms of the 'practical' perspective explained above. These early definitions and validations of musica ficta (i.e., vitium) embraced not only issues that were purely musical, but philosophical and rhetorical as well, for the same word serves as an opposite to 'virtue' ('virtus'), and as a reference to 'vices of language.' This can be conspicuously observed in the quotation below, from Scolica enchiriadis. (Note, however, that in Erickson's translation, the word "vitia" has been translated as "errors," thus concealing the connection with the rhetorical concept of 'vices of language,' although it is openly stated by the anonymous author.)

M: Limmata ergo haec non plena spacia vocari solent et per ea interdum vel modus a modo transfertur vel per eadem restituitur, sicut in cantibus satis observari poterit.

Δ: Num pro vitiis ea reputabimus?

M: Vitia nimirum sunt, sed sicut barbarismi et soloecismi metris plerumque figuraliter intermiscentur, ita limmata interdum de industria cantibus inseruntur.

M[aster]. It is customary to call these less-than-whole intervals limmas. Sometimes through them one mode is changed into another, or the original mode is restored. This can often be observed in chants.

D[isciple]. We do not regard these things as errors, do we?

M[aster]. To be sure, they are errors, but just as barbarisms and solemcisms are frequently intermixed in verses for poetic reasons (figuraliter), so limmas are sometimes deliberately introduced into chants.


Besides the marked statement by the Master, relating those musical 'vices' to
rhetorical counterparts (specifically "barbarisms and solecisms"), the question by the Disciple implies moral and philosophical contexts which are not denied by the Master, only expanded to include the context of rhetoric. With respect to the definition of ficta, the text asserts that 'vitium' is a procedure through which one can obtain a semitone where only a tone would be originally found (i.e., according to the standard established through the Daseian notation), or else a procedure that can restore the original structure either by means of imposing a semitone or a whole tone. Since Scolica enchiriadis is a treatise that shows musica practica concerns (at least in the section from which the quotation was excerpted), it is appropriate to have a definition of a 'practical' nature such as the one above, although with hints of 'musica speculativa' both in its subliminal mention of a standard from which the 'vice' is deviating, and in the open references to rhetoric.

Significantly, in defense of the notion that practical procedures precede theoretical explanations, the 'practical' (specific, dynamic) concept seems to have appeared and have been emphasized already in the oldest sources, while the 'speculative' (general, static) seems to be a later construction, designed to adapt an already existing concept of change to the change in standards of solmization. Now, despite the dependence of something 'ficta' on a pre-definition of something 'recta,' it is the need for something 'ficta' (i.e., for alterations of a standard) that precedes the qualification of something through the term 'recta' (the standard). In other words, if there was no need for ficta-occurrences, the standard structure in use would be the only one available in reality, and thus it would need no definition, distinction, justification, comparison, or even validation; it would be 'general' and 'specific' at
These considerations allow us to formulate perhaps one last (macro-level) definition of *musica ficta*, combining both facets ('practical' and 'speculative'): *musica ficta* is a practical means through which one can obtain semitones and whole tones within a different theoretical array of steps than the ones available solely via a default standard for a given musical (or theoretical) text.

These assessments—in which the 'practical' perspective has been interpreted as a prior element—would seem to imply some kind of hierarchy between the two micro-level definitions. Although this may be true, both chronologically and in a literal sense (from the standpoint of their enunciation in early treatises), the division proposed above is also interpretively pedagogical, for the two micro-level definitions are virtually inseparable by force of their complementarity—as mentioned above.

As for the merged definition, one of its corollaries is the understanding that *musica ficta* deals primarily with the aural identification of intervals within a hexachordal structure, and not of unrelated steps or specific pitches—and certainly not with the identification of the absolute (frequency-defined) pitches of the modern era. As has already been noted, this identification of intervals was not only informed by the Guidonian hexachordal paradigm (T-T-S-T-T) that served as means for solmization, but was also embraced by way of the letter-plus-syllable(s) designations through which theorists defined places within the gamut. These designations are, in fact, conjunctions that both preserve and merge the notion of

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208 It is not surprising that *musica recta* may be discussed both as a symbol and as the only means for the musical expression of godly things.
intervallic variable (via hexachordal step-syllables), and the specificity and regularity of sounds (via step-letters)—again the 'dynamic' versus the 'static.' Thus, *musica ficta*, in all its aspects (procedures, use, existence, and speculative validation), is virtually inseparable from solmization, even when this solmization does not follow the Guidonian tradition, or even if it does not involve hexachords. In this light, it is first toward solmization that the scholar must look in order to ultimately interpret the modern pitch-equivalent content of a composition of 'early' music. As Margaret Bent has reminded us, modern scholars should note that early notation was not as intentionally prescriptive as the modern notation employed to transcribe medieval and Renaissance music.

It is the modern transcription that has traditionally been treated as our default, as when we refer to "the notation as it stands," or at "face value," despite changing standards in editorial practice. After considerable editorial experience, it is now my conviction that so to treat it is a greater disfigurement and source of misprision than to start from the other end, as I now advocate. It is obvious that *their* starting point for these determinations, *their* access to the music, was not from a modern transcription but rather through singing from their manuscripts and prints. Early notation provided a weak intervallic default organization by clef and signature, but because it was incompletely prescriptive of pitch (hence "weak default"), the performer expected to arrive at actual sounds by some means besides prescriptive notation. (Bent 1996, § 5)

Some scholars have, in fact, misunderstood (or even ignored) the importance of this "incompletely prescriptive" character of early notation, and jumped too soon to the

209 For example, in the case of the above quotation from *Scolica enchiriadis*, one cannot speak of a gamut in Guidonian terms, but of an array of steps derived from the so-called 'daseian' arrangement, which was as standardized as its *recta* counterpart—at least, within the cohesiveness of those 'daseian' propositions.

210 Also in other essays, Margaret Bent discusses the equivalence (or its absence) between early and modern notation, and the latter's inadequacy to provide all the elements necessary for an understanding of the original musical text—cf. (Bent 1994b, esp. 373–385; 1998, esp. 15–26).

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conclusion that it would be enough to provide added accidental-inflections (in highly
prescriptive, modern-notation scores) through a simple application of rules of counterpoint.

With regard to counterpoint as a solution to ficta uncertainties, Bent's statements, always
carefully worded, may have even contributed to this misunderstanding by other modern
scholars and editors. Virtually in all of her writings dealing with musica ficta, she has
struggled to mark her position and to indicate (in a much more clear discourse than previous
scholars) that musica ficta must always be understood and solved in the context of
counterpoint—the following quotation, from a fairly recent essay, may serve as illustration.

It is in respecting and reconciling melodic principles and the rules of counterpoint that ficta is
necessitated; I have tried to show that ficta needs to be viewed in the context of counterpoint as a
whole, and not informed just by precepts specifically labelled as ficta.
(Bent 1996, § 3)

Furthermore, although she does not dismiss the importance and attention to

solmization, she explicitly (and to me paradoxically) dismisses its role as a determinant of

musica ficta.\footnote{Similar claims, as the one quoted here about the role of solmization, were stated by Margaret Bent in her response to Peter Urquhart's paper (1998) mentioned above.}

I never meant to claim (as Zager implies but does not state) that solmization can resolve
counterpoint/ficta problems. I do not share his dependence on solmization to determine
counterpoint. Rather the converse: contrapuntal decisions, once made, can be expressed in terms of
solmization, the nearest they had to a precise language in which to conceptualise and name sounds.
But since they stretched the system to cope with all eventualities, so that anything could be
solmized by extensions and disjunctions, the criterion of easy solmization is not a valid arbiter of
which sounds are or are not possible. To argue a particular solution from solmization is to let the
tail wag the dog. I wrote: "Hexachords provide a functional context for semitone locations which
have been predetermined by musical considerations, but they do not in themselves determine what
the sounds will be. The hexachordal voces are the means by which those sounds become

\footnote{Similar claims, as the one quoted here about the role of solmization, were stated by Margaret Bent in her response to Peter Urquhart's paper (1998) mentioned above.}
practically accessible in vocal polyphony, just as, by analogy, fingering is the means by which small groups of notes are physically negotiated on instruments." Hexachordal thinking permeates their terminology. It guides us away from the notion of "inflections" of individual notes and into that of small scalar segments (sometimes projected as tangents from the scala of musica recta) that accommodate and articulate semitones, the need for which is pre-determined on contrapuntal principles. It cannot in itself solve individual ficta problems just as, conversely, no ficta solution can be rejected on grounds that it can't be solmized. (Bent 1996, § 18)

Of course, solmization cannot "determine counterpoint," but it does determine the reading of a composition, and therefore may be used to inform and even actively contribute to creating (composing) the intended musical structure.212 There is also no doubt that counterpoint (and its own precepts) should weigh in the final evaluations of ficta, as much for the modern musicologist, editor or performer, as it may have weighed in decisions made by composers and perhaps also by scribes. However, as far as the original performers are concerned, there should be no doubt that a heavier weight was placed on solmization, for the sake of identifying steps (thus including ficta-steps)—at least at the basic level of identification that performers were supposedly capable of executing. Also, both the composer and the scribe seem to have had no alternative but to abide to these basic procedures, language, and reading-patterns of their peer performers. Thus, in the present work I have argued that solmization must have precedence over any other decision when the modern scholar, editor, or performer is faced with a piece that utilizes ficta-signs

212 Thus, solmization and hexachordal syllables are neither limited to being instruments of description (designation) of steps, nor restricted to passively serving as means of accessing the tone-content of the composition, but also serve to further the understanding of musical structures. Canons and other imitative structures have already been noted and accepted as classic examples in which solmization and hexachordal syllables are used in this sense, thus interfering in compositional processes, to their benefit—cf. (Leech-Wilkinson 1984).
At the same time, as stated in previous chapters, one must bear in mind that extant medieval and Renaissance manuscripts (as well as printed editions) are not exempt from errors of all sorts. For most of those errors, of course, whenever polyphonic music is concerned, probably the best yardstick would be one that is marked with the paradigms of counterpoint, more than those of solmization. This is the only exception; in all other cases solmization ought to have precedence. In any case, it is not the performer, reading from his individual part (whether or not able to see the separate notation for the other voices), who has the responsibility for compositional corrections, deviations, or enforcing any contrapuntal rule the composer may have decided not to observe, or the scribe may have notated in some ambiguous manner. Naturally, modern scholars do not necessarily have to agree with this interpretation, even if they have defended that *musica ficta* may be defined as "part of the performer's art."  

In order to further assess what role counterpoint versus simple solmization may have had in the process of identifying as well as determining steps (in performance), one must bear in mind some issues concerning the different levels of erudition and musical education of early theorists, composers, scribes, and performers in general—including, but not limited to interpretations of historical, rhetorical, as well as societal perspectives. Thus, the understanding of historical concepts and their application can only be solved by means

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213 In this respect, the explanations contained in this dissertation have considered primarily the Guidonian model, because it allows for clearer presentations of concepts and procedures, which can be generalized further to other kinds of solmization paradigms.

214 Cf. Margaret Bent's statement in (NG 1, 12: 803, s.v. 'Musica ficta').
of interpretive approaches, informed by the use of an appropriate terminologies that do not conceal the historical meanings and subtleties from the modern scholar, nor impose untimely meanings to interpretations. In accordance with this analysis, it is imperative to discuss the adoption and application, in the present work, of one particular item: the term 'ficta-sign' instead of 'accidental,' or of other possible terms.

(ii) Particular Terminology: Accidentals Versus Ficta-signs

This section will discuss conceptual impediments to employing the term 'accidentals,' first considering purely musical issues and misapprehensions generated by the meaning of the term in modern usage, then inquiring into the philosophical significance of the term, illustrated by a speculation with regard to its understanding and use in Marchettus da Padova's two main treatises (Lucidarium and Pomerium). The term 'ficta-signs' shall be discussed and defended later in section (iii), where other alternative terms—'hexachord-signs,' 'syllable-signs,' 'interval-signs,' and 'solmization-signs'—will also be discussed. First, however, some considerations about the existence of a 'generic term' must be observed. More specifically, the proposition of a 'generic term' referring both to fa-signs (♭) and mi-signs (whether ♭, ♭, or other variants) is controversial and arbitrary in essence. To be sure, there seems to have existed no conspicuous intention of creating a generic term, either in medieval or in Renaissance theoretical writings. Thus, one could argue that an attempt in modern scholarship to forge a generic term may be unsubstantiated (because there is no
historical evidence of any such term or of any intention of speculatively defining one), or fallacious (because it may lead to a crystallization of concepts that was not intended either in early theory or practice), or minimally deceiving (because its creation would only be serving a rationale proper of modern scholarship and of reductionistic trends). At the same time, demands for a generic term seem justifiable especially in the case of the present work, where definitions and terms are necessary to carry out the discussion, provided these definitions and terms are not taken as fixed and inalienable entities, but as signs or abbreviations of a larger concept. The need for meticulously defined generic terms, that can be used ubiquitously, is truly a modern one. The modern compulsion toward lexical terms represents (and is driven by) a paradoxical ideal, whose intention is to ally the comprehensiveness of the 'universal' to the minutia of the 'individual.' In philosophical terms, this trend purports the creation of terms that can be 'universalized' and granted an 'extensional' significance, even though they can only act 'individually' and 'intensionally.' It is in this light that a modern coinage of a generic term for the signs of fa and mi needs to be understood.

The term 'accidental,' according to its modern concept and usage in music, refers to signs applied to individual pitches, and will necessarily alter the sound of the pitch in

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215 Musical lexicalization seems to have become a major concern among scholars only after Classical Encyclopedism, even though lexicons containing musical terms were being produced at least since the times of Varro’s Disciplinarum (1st cent. B.C.), and even though Tinctoris’s Terminorum musicae diffinitorium (1495) is commonly regarded as a watershed in this matter.
relation to a given default without the sign.\textsuperscript{216} At least in terms of the standards set by modern notation, an 'accidental' does not alter significantly the overall tonal structure of a piece, unless its sign is meant as a key-signature. As for those 'signs of early music,' even when they impose sound-inflections to specific steps (which is not always the case), they not only imply a change in the underlying hexachordal structure, but may also affect the understanding of the mode itself (whether or not they are found in signature positions). Thus, the modern use of the term 'accidentals' for these 'signs of early music' leads to a largely mistaken assessment: one assuming that their concepts (of 'accidentals' and of 'signs of early music') can be equated. One of the elements that may have contributed to this misconception appears to have been drawn from an equally mistaken interpretation that \emph{musica ficta} was primarily the expression of non-notated (or unwritten) signs. For instance, the hypothetical example illustrated in \textbf{FIG. 8.1} could be described as containing a leap from $b\text{-}fa$ to $e\text{-}la\text{-}mi$, where a sign (originally meaning a $fa$) has been provided only for the $b$, but none for the $e$. If the tritone is to be avoided, and it is also accepted that $b$ must be translated as $b\flat$ by force of its solmization as $b\text{-}fa$, then $e$ will have to be translated as $e\sharp$' (since to avoid the tritone it must be solmized with the syllable $fa$ as well).

\textsuperscript{216} Of course, modern 'cautionary accidentals' are usually not assessed under this category of mandatory alteration, since they may be interpreted as preventing an alteration from occurring. However, one may also understand that, if an alteration needs to be prevented, then a previous alteration is being understood (even if momentarily, and even if mistakenly) as a default. In the latter sense, the cautionary accidental would also be acting as a further alteration (or perhaps a 'de-alteration') of that altered, new default, even when the cautionary accidental serves only to warn about the still valid, initial default established by a key-signature or its absence.
In fact, when the *fa*-sign is used in a signature position like this, it is creating what may be called here a ficta-signature—its function is to establish a new setup of hexachords.\(^{217}\) If no ficta-signature was given, there would be only three possibilities for reading the melodic gestures: the three basic *recta*-hexachords (*F*, *C*, *G*). As a signature is given, it shifts the expected three-hexachord group to new setup, which in the case of one *fa*-sign on b will move that group down a fifth into the *molle*-family, thus establishing a new group of three hexachords: *Bb*-hexachord, *F*-hexachord, and *C*-hexachord.\(^{218}\) At the same time, two factors could be considered in the above example: (a) the first melodic gesture (six notes, from F to b) would denote the *F*-hexachord whether or not there was a *fa*-sign; (b) if that b is going to be solmized as \(\text{b-}fa\) even without the sign, and the tritone should be

\(^{217}\) Of course, the function of a ficta-signature derives from the function of a 'sign of early music,' which is primarily to impose a hexachord; or else, to impose a solmization-syllable on a specific step-letter, and therefore impose the hexachord to which that letter-plus-syllable pertains.

\(^{218}\) If the signature had presented one *fa*-sign on b, and another *fa*-sign on e, then the expected solmization would move down yet another fifth into the *molle*-family, thus the *Bb*-hexachord, *Bb*-hexachord, and *F*-hexachord would be the ones expected to serve for the solmization of the entire melody. The more *fa*-signs in a signature, the deeper into the *molle*-family the expected hexachords for solmization will get, but always maintaining the expectancy of three hexachords, unless another hexachord is imposed, by placing another sign within a melodic gesture.
avoided, then e (seventh note in FIG. 8.1) will necessarily have to be solmized as e-fa according to the $\text{B}_b$-hexachord. In this situation, the signature fa-sign seems to be even redundant, for the solmization would be the same whether or not it was given, provided the hexachordal indications promoted by the melodic gestures are observed. Thus, FIG. 8.2 below shows the same example as before, with the same solmization, but without the fa-sign.

FIGURE 8.2 - Absence of signs ('accidentals' versus 'ficta-signs').

Situations like these are part of the reason for the perpetration of the modern notion that *musica ficta* refers to accidental-inflections where no signs were originally notated. Such a notion implies that the early signs would indicate no more than an alteration of a specific pitch, and not that they could act as harbingers of a change in the solmization of a particular melodic gesture—notedly, according to hexachordal structures. This modern understanding is obviously dependent upon the assumption that the same conceptual value of modern 'accidentals' can be applied to those 'signs' for *musica ficta*, therefore concealing their hexachordal meaning. In fact, it is not only by equating their concepts that their action (or their value) is equated, but by equating their names; i.e., by referring to those 'signs of early music' simply as 'accidentals,' the latter term imposes on the former its concepts and
actions. In the examples above, notice that the pitch e♯ is being considered an equivalent to the ficta-step e-fa, solmized according to a ficta B♭-hexachord. Also, the pitch b♭ is equivalent both to the ficta-step b-ut (B♭-hexachord) and the recta-step b-fa (F- hexachord), whether the fa-sign was deliberately provided or not. It is clear that both ficta- and recta-steps (equivalent to accidental-inflected pitches) can be obtained with or without 'signs' attached to them, provided the hexachords are solmized according a proper reading of the melodic gestures. Thus, 'accidentals' cannot be equated either with 'ficta-signs,' or with 'ficta-steps' (whether they are obtained through the use of ficta-signs or not); or in the words of Peter Urquhart:

Musica ficta does not equal non-notated accidentals, and statements about musica ficta by theorists must not be taken as statements about non-notated accidentals.
(Urquhart 1998, 12)

The term 'accidental' refers only to isolated pitch occurrences and inflections, rather than step occurrences and changes within the larger scope of hexachords. The unwarranted use of the modern term 'accidental' in place of those 'signs for musica ficta' allows for an unfolding of misapprehensions about musica ficta (its concepts, definitions, functions, and procedures). The three quotations shown below shall serve as a sample of statements that may mislead modern scholars, especially those whose work does not place musica ficta and solmization under strong scrutiny. Statements like these are included in works whose objective toward musica ficta is only to provide an overview, thus influencing a number of readers into misconception.
There exists a crucial misconception about music of the century before 1550. It is often thought that it was performed, as it was notated, largely devoid of accidentals, that it confined itself almost exclusively to the modes, to scales mistakenly thought of as having uninflectable degrees. Nothing could be further from the truth. Music of the Renaissance can display quite remarkable chromatic colouring, and also far more of what might now be thought of as 'tonal' usage than this misconception would admit. However, the inflections involved were rarely notated, since it was expected that the music would be sung by performers intimately acquainted with a complicated series of conventions for introducing chromatic alterations.

(Routley 1985, 59)

The term *musica ficta* is now often used loosely to describe intended accidentals left unwritten in the original manuscripts or prints of music from before about 1600 but added in performance or editing. [...].

Although the theoretical definition of *musica ficta* remained constant in the years before 1600, the degree to which unwritten accidentals were admitted into practice and sanctioned by theorists changed greatly over time. This change is highly significant, because the addition of intended but originally unwritten accidentals is the principal matter of concern to modern scholars investigating *musica ficta*. No single formula for applying accidentals to all types of music has been found, nor is one likely to be.

(NHarvard 1986, 517, s.v. 'Musica ficta')

The term *musica ficta* has acquired two separate but related meanings. In today's casual parlance, it refers to the application by editors and performers of accidentals (sharps, flats, naturals) that are not notated in the sources themselves. For musicians of the fifteenth and sixteenth centuries, the term referred specifically to those notes that fell outside the Guidonian hand [...].

(Atlas 1998, 328)

Even if some of these statements are careful enough to apply the terms "loosely" or "casual parlance" as qualifiers, they do not explain adequately the terminological and conceptual equation they implicitly establish between 'accidentals' and 'signs for *musica ficta*, and thus they help to advance the mistaken generalization that 'ficta-signs' were left unwritten as a default practice. In this respect, Karol Berger’s paradigmatic work is again to
be praised, for he calls direct attention to the inaccuracy of such definitions at the outset of the section on "Written and Implied Accidental Inflections"—the last in his work.

In popular, and as should be clear by now not quite correct, musicological usage the term musica ficta refers to accidentals implied by the music of the Middle Ages and the Renaissance, but not written down in the sources. [...]. And yet, the fact that not all accidental inflections called for by the music of our period were expressly notated is the main reason why musicologists are interested in problems raised by musica ficta [...].
(K. Berger 1987, 162)

By using the term 'accidental,' as pointed out above, these statements ultimately shelter the assumption that the concept and understanding of ficta-signs is virtually equivalent to that of modern 'accidentals.' To be sure, even if a term such as 'accidens' was used in historical treatises, it was never exclusive to those signs for musica ficta. A conspicuous use of this philosophically charged term (together with other morphologically similar terms) can be seen in the Pomerium (1318/19) of Marchettus da Padova, where it was utilized to characterize a number of different musical signs. The presentation that will follow the quotation (discussing possible translations of his text) is designed to place Marchettus's use of 'accidens' and others terms (such as 'essence' and 'proprietas') within

219 In this respect, Karol Berger's work (entitled Musica ficta: Theories of Accidental Inflections in Vocal Polyphony from Marchetto da Padova to Gioseffo Zarlino) is no exception, despite his many insightful and enlightening assessments.

220 Cf. the illustrative survey of quotations for the term 'accidens' given in the Lexicon Musicum Latinum Medii Aevi (Bernhard 1995, 2: 24–27). In all those instances, one can conspicuously observe the philosophical meaning of term 'accidens' (and similar), which is contextualized toward several musical procedures and concepts, including issues concerning fa-signs as well as mi-signs, modes, mensural notation, etc. The term also appears in the treatise by Boethius (a. 510, bks. 1 and 2; GB-Ctc R.15.22 (944), ff. 13v, 14r, 28r; PL 63: 1176, 1196; Friedlein 1867, 195, 196, 227), whose citation, surprisingly, has not been included in the Lexicon for this particular entry.

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an Aristotelian philosophical context, which will then serve as basis for the subsequent
discussion concerning the application of 'accidental' in musica ficta.

Quoniam, dicente Philosopho in prooemio de Anima, accidentia multum conferunt ad cognoscendum quod quid est, id est, per cognitionem accidentium devenimus in cognitionem essentiae rei. Cum igitur in praesenti opere nostrae intentionis sit cognitionem tradere per rationes essentiae musicae mensuratae,igitur primo de accidentibus sive de accidentalibus concurrentibus in musica mensurata principaliter est tractandum, deinde de essentialibus musicae praelibatae.

Quantum ad primum, est sciendum quod omnia praeter notas, in quibus solum essentialis ratio consistit musicae, ut demonstrabitur Deo dante, sunt accidentia sive accidentalia concurrentia in ipsa musica mensurata rationibus infra dicendis. Cuius modi sunt caudae, proprietates, pausae, puncta et quoddam signum quod a vulgo falsa musica nuncupatur. (Marchettus 1318/19, bk. 1, pt. 1, tr. 1; Vecchi 1961, 39–40; GS 3: 123–124)

Since, [as] the philosopher [Aristotle] said in the preface to De anima, that 'accidents' confer much to the knowledge of what it is [of what a thing is], that is, through the 'accidents' of knowledge we arrive at the essential material [the 'essence'] of knowledge. Thus, since in the current work our intention may be [or, is] to bring knowledge through the understanding [or else, theory] of the essence of measured music, then first and more importantly one must examine the 'accidents' or the 'accidental occurrences' in measured music, and later the aforementioned 'essences' of the music.

Of the first, be it known that all, except notes, in which only the essential reason consists of music, as will be demonstrated later by [the will of] God, are 'accidents' or 'accidental occurrences' in measured music itself, by the reasons indicated below. Of such kind there are caudae [i.e., tails, or stems], proprietates, rests, dots [of division], and a certain sign called falsa musica by the populace. (my translation; cf. Renner 1980, 7–8)

The Latin word 'accidens, -tis' is originally the present participle active of the verb 'accido, -cidere, -cidi' (to happen, to occur, to turn out, to befall, etc.); but it could also be used as a verbal adjective or as noun, as in Marchettus's text. Derivatives of this word are found in the adjective 'accidentalis, -e,' and in the feminine noun 'accidentia, -ae'—generated from the nominative plural of accidens, which would normally take the form 'accidentes,' but if declined as a neuter i-stem noun could take the form 'accidentia.' It

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is in this sense that the word "accidentibus" (first paragraph) is read as dative plural of 'accidens' ('accident'), and "accidentia" (second paragraph) is read as its nominative plural. By the same token, "accidentalibus concurrentibus" (first paragraph) is read as dative plural of 'accidentale concurrens' ('accidental occurrence'), and "accidentalia concurrentia" (second paragraph) is read as its nominative plural.221

As for the term proprietas (nom. pl.: proprietates), it can stand for both 'property' (in its Aristotelian sense), and 'propriety' (in its use as a term that describes attributes of ligatures in early mensural notation). Renner translates the term as "stem" (1980, 8), and in his commentary argues against a direct reference to 'propriety' in terms of ligature interpretation (1980, 9). He particularly challenges Vecchi's identification of a passage in Franco de Colonia's Ars cantus mensurabilis (Marchettus mentioned Franco in his text without providing a specific citation or quotation—Pomerium, tr. 1, ch. 2; Vecchi 1961, 49, 213)—cf. (Renner 1980, 29). According to Vecchi, the passage should be identified as the section where Franco discusses ligatures 'cum proprietate' and 'sine proprietate' (CS 1: 125; Reaney and Gilles 1974, 50). Renner, however, interprets Marchettus's text as a reference to another passage (CS 1: 119; Reaney and Gilles 1974, 30) where the subject matter is the shape of notes, and more specifically the use of stems (i.e., caudae, tails). Renner's arguments, and his debatable translation, seem to arise from an attempt to narrow down the meaning of proprietas, producing a uni-intelligible translation, and resulting in a

221 In his work, Ralph C. Renner (1980, 7–8) translates these terms as "accessories" or "accessory elements," which unfortunately conceals the link with the Aristotelian concepts.
failure to acknowledge its multifaceted meanings—i.e., through a construction that could allow pluri-intelligibility. Especially in a treatise like the *Pomerium*, where the musical and philosophical backgrounds coexist so distinctively, these meanings include the understanding of *proprietas* not only as an attribute applied to *caudae* as well as to any other stem-like signs, or as a reference to the 'propriety' that defines the proper understanding of ligatures, but most importantly as a reference to the Aristotelian concept or 'property.'

The presence of philosophical terminology and concepts in Marchettus's work was not only a trend of his time, but a tradition that he followed from within his Paduan environment.

In her paper "The Influence of Aristotle's Philosophy of Nature on the *Pomerium* of Marchetto of Padua" (1998), Eleonora Beck has called attention to Marchettus's particular appropriation of Aristotelian concepts not only to help explaining many of the features of measured music (via concepts of 'nature,' 'art,' and 'accident'), but

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*The philosophical term 'property' (from 'proprietas') is also rendered under the Latin term 'proprium,' as a direct translation of the Greek '*φιλαξι*—cf. (Aristotle Top., 1.5.102a–b). In his translation, Renner consistently fails to render (or at least acknowledge) words according to their appropriate philosophical terminology, thus concealing the tradition upon which Marchettus wrote his *Pomerium*—cf. (Beck 1998).*

*In fact, the Aristotelian influence on medieval scholasticism was especially strong in the fourteenth century, but it had been brought into prominence already from the time and through the works of St. Thomas Aquinas (ca. 1224/5–1274), who expanded on interpretations of Aristotle's concepts passed down through a long line of works by several commentators, at least since the ninth century—al-Farabi (ca. 872–950), Avicenna (980–1037), Averroes (ca. 1126–1198), and Aquinas's own professor Albertus Magnus (ca. 1206–1280). In the case of Marchettus's *Pomerium*, a foundation based on medieval scholasticism was established through the influence of Syphants of Ferrara, who helped with the philosophical (predominantly Aristotelian) background and organization of the treatise, as Marchettus himself declared in his introductory *Epistola.*

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also to inform the shape and composition of the treatise itself (via analogy with the 'four
causes': material, formal, effective, and final)—cf. (Marchettus 1318/19, bk. 1, pt. 1;
GS 3: 121; Vecchi 1961, 31).²²⁴

In terms of this philosophical approach, the modern musico-technical concept of
'accidental' can account only to a partial meaning and understanding derived from its
medieval philosophical counterpart. An 'accident' is generically defined as something that
differs from 'essence,' or from the 'substance' of the object to which it refers.²²⁵ An
'accident' is also purely 'incidental,' and although it may help to define an 'individual,' if it is
omitted (taken away, or disregarded) it will not change the 'essence' of the thing, nor its
recognition. Thus, the musical, modern concept of 'accidental' does not correspond
completely to the philosophical meaning of 'accident,' and therefore 'accidental' cannot be
used indiscriminately for 'ficta-signs.' While an 'accidental' may sometimes occur

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²²⁴ According to Eleonora Beck's insightful analysis, the four causes are also used as means of
justifying (rather than impartially explaining) some of the divisions of measured music, at least with regard
to difference and/or sameness between *semibreves*. Unfortunately, probably due to the necessary limitations
inherent to a paper, Eleonora Beck did not find time to properly acknowledge Marchettus's explicit use of
the concept of 'accident.'

²²⁵ In English renditions of Aristotle's works, the words for 'essence' and 'substance' (derived from
the Latin readings *essentia* and *substantia*) are often used interchangeably, although in a more specific
discussion only a qualified term such as 'necessary essence' could be equated with 'substance' in Aristotelian
terms. In the Middle Ages, however, the differentiation between the two becomes even less evident in some
authors such as St. Augustine, who also uses both terms interchangeably. It is only with St. Thomas
Aquinas that a differentiation is provided, although the concepts are different than those used by Aristotle.
In adapting and re-interpreting Aristotelian premises according to Catholic doctrine, Aquinas defines that
'substance' is that 'essence' which has been endowed with 'existence,' so to differentiate the material world
from the spiritual one, and to come to the conclusion that it is only in God (as the supreme endower,
creator of things) that 'essence' and 'existence' are one and the same.
incidentally in the course of a modern piece, it does alter the 'essence' of the thing to which it refers (in this case, the pitch or absolute sound), and denotes an 'entity' completely differentiated from the original 'essence without the accidental.' That is, a pitch such as $c\#$ may be defined by having both $\overline{C}$-ness and sharpness, and if either of these attributes are omitted, it will cease to be a $c\#$. A $c-mi$, however, may not be understood under the same parameters of pitch (i.e., absoluteness of sound), but as a purveyor of relations with other steps. In this case, $c-mi$ may be identified (if viewed from the perspective of the ficta-gamut) as a step that is $mi$ relatively to a-$ut$, and (if viewed from a recta-only perspective) as a c-$sol$-$fa$-$ut$ whose solmization syllable has been 'accidentally' (or, incidentally) changed to $mi$, and thus pertains to a hexachord other than the three basic ones (in which c-$sol$-$fa$-$ut$ is a commonplace). There are at least two reasons why, in medieval terms, the 'absolute sound' is not relevant to the 'essence' of any 'step' (generically speaking), or of a 'c-step' (particularly speaking). First, because it does not help to establish the relation with the other steps, and it is this relation that is more relevant both to medieval practice and to medieval theory. Second, because the deviation (which the new syllable creates in terms of a new hexachord, and consequently new relations with the other steps) is thought of as something that lies outside the standard patterns (the recta-gamut), whether or

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226 In modern *acceptio*, the relation between 'pitches' is essential mostly for practical purposes of solfeging. In medieval *acceptio*, however, the relation between 'steps' lies at the core of step-denomination (*litterae*), as well as of step-recognition (*voces*). In this respect, *musica-speculativa* purposes may be represented by step-denomination (*litterae*) obtained through successive calculations of string-lengths (as in theoretical considerations based on the monochord), whereas *practica* purposes may be represented by step-recognition (or deduction) through solmization syllables (*voces*). Both processes depend on the relation (intervals) with preceding steps, or may serve in the determination of succeeding ones.
not the actual sound is changed. For example, the ficta g-fa in the D-hexachord sounds the same as the recta (standard) g-sol-re-ut, whereas the ficta g-mi of the E-hexachord will have a different sound, but both ficta-steps will be thought of as being 'essentially' (not only 'accidentally') different from any recta-step. In other words, the ficta-ness by which c-mi may be defined is not a 'property' of pitch or absolute sound, but a 'property' of its relations with the other steps, as much as its mi-ness. In practical terms, in the case of c-sol-fa-ut, that ficta-ness is in fact a different 'property,' defined by a different relation: it always finds a tone above itself, and below, it will find either a semitone (when it is a fa) or a tone (when it is a sol).

In order to illustrate this assessment, let us take a modern example such as a c# raised by a quarter-tone. While late 20th-century musicians may be used to working with this kind of micro-alteration, conceiving it as a standard event, the same may not be true for other musicians who either do not work with the micro-tonal universe, or else have not even been trained in it. These latter will not only consider that the indication 'c#-quarter-tone-higher' is an incidental occurrence that has no correspondence within the standardly accepted (i.e., classical) patterns, but will also find hindrances to visualize (notate), perceive (aurally), understand (conceptually), and perform. In certain cases, some of them may even consider that the exactness of intonation is irrelevant, and that the indication 'quarter-tone-higher' is meant as 'slightly sharpened out of tune.' These kinds of understanding, which pose all the aforementioned hindrances, arise from the fact that the c#-quarter-tone-higher is not included within the standard classical system of only twelve
pitches per octave, in which modern musicians are generally instructed. Likewise, the same hindrances may have arisen for early musicians with regard to a *ficta*-step such as c-\mi, since it does not pertain to the standard *recta*-gamut. Thus, only steps such as the *ficta* c-\mi, or the pitch c\sharp-quarter-tone-higher, can be properly called 'accidents' or 'accidental occurrences' in accordance with the prevailing Aristotelian concept followed during the Middle Ages and Renaissance.\(^{227}\) Once again, it becomes evident that the current musical usage and understanding of the term 'accidental,' denoting modern flats (\flat) and sharps (\sharp) and their exactness, cannot be equated to what has been thus far called 'ficta-signs,' which include the fa-signs (\flat) as well as mi-signs (\natural, or \natural).\(^{227}\)

\(^{227}\) In his article entitled "Is Mode Real?," Harold Powers has interpreted differently the Aristotelian notions of "essence" and "accidence," in their application to discussions about *musica ficta*.

The essential property of the system is the double nomenclature of Latin letter (littera) and hexachordal syllable (vox). The letters represent the total collection available to musica recta, and all the potential "real" musical relationships within it. (The "accidental" sharps and flats of musica ficta have no effect on the "substantive" relationships of musica recta: the distinction of "accidence" from "substance", originating in Aristotelian metaphysics, is fundamental.) (Powers 1992, 15)

From Powers’s perspective, in fact, it is the litterae that are "essential" or "substantive," while the voces (syllables) would be only "accidental" or "non-substantive" (perhaps he could even say 'adjectival'). But this seems to contradict his own assessment about the "essential property of the system." Again, it is to be noted that the voces are as essential to this system as the litterae, for each step of the system is at once composed, represented, and designated by the conjunction littera-voces (i.e., letter-syllables). In other words, they are undissociable at least where step-designation, understanding of the system, and even solmization are concerned. If one vox is changed, then the whole step will also change—not necessarily in terms of a modern frequency-bias, but conceptually.
Having discussed the problematic adoption of the term 'accidentals' for 'ficta-signs,'
there remain four alternatives that need to be considered: 'hexachord-signs,' 'syllable-signs,'
'interval-signs,' and 'solmization-signs.' In the Middle Ages and the Renaissance, adjectival
references to the signs were either based on their shape (i.e., b rotundum, and b quadratum
or quadrum), or, alternatively, based on their alleged aural quality (i.e., b molle, and b
durum). 228 The signs themselves served as referents and heralds both of those hexachords

228 When referring to music, the terms molle and durum were initially used to describe qualities of
sound and its production (thus aural qualities), clearly including social and moral connotations. These terms
are apparently related to several other terms used in Greek philosophical tradition, and can be said as derived
(among others) from the Greek words malakos [i.e., soft] and skleros [i.e., hard], as defined by
Aristotle—cf. TGL and TLL. In his Meteorologica, he uses these terms as 'qualities of bodies,' and states:

Those things are absolutely hard and soft which satisfy the definition absolutely, and those things
are relatively so which do so compared with another thing. Now relatively to one another hard or
soft are indefinable, because it is a matter of degree, but since all the objects of sense are
determined by reference to the faculty of sense it is clearly the relation to touch which determines
that which is hard and soft absolutely, and touch is that which we use as a standard or mean. So
we call that which exceeds it hard and that which falls short of it soft.
(Aristotle Meteor., 4.4.382a; [trans.] Webster 1923; cf. Lee 1952, 310–315)

Aristotle makes it clear that "touch" is just a term used to define some accepted "standard or mean."
In this sense, the term easily lends itself to further interpretation, and could be used as 'sound,' which entails
both 'audition' (as a practical standard) and 'calculation' (as a speculative mean). Moreover, given that
"relatively to one another hard or soft are indefinable," the use of these terms in a musical context seems
appropriate, for the two varieties of b (according to the Pseudo-Odonian alphabetical denomination for steps)
are clearly differentiated in their sound. Thus, b-molle and b-durum are defined not in relation to
themselves (i.e., to one another), but in relation to other surrounding steps. With respect to the terms
rotundum and quadratum (or quadrum), before they were applied to the two varieties of the letter b, their
application in a musical context had included philosophico-scientific descriptions. For example, they were
used to denote geometrical figures used for calculating or demonstrating proportions (notedly in the case of
quadram), or to explain models of physical occurrences as in waves of sound (notedly through rotundum),
that included them, and their hexachordal families.\textsuperscript{229} In accordance with this usage, since
the signs served mainly as markings for a hexachord, the generic term 'hexachord-signs'
would seem to be a likely alternative in lieu of 'ficta-signs.' However, this term poses a
problem for the understanding of solmization with regard to pieces that existed before the
advent of a theory of hexachords, or at least before its initial proposition (with Guido
d'Arezzo). This problem would happen, for instance, when trying to understand the scope
(conceptual and practical) of \textit{vitium} and \textit{absonia} (i.e., \textit{musica ficta}) as transmitted and
defined in the anonymous treatise \textit{Scolica enchiriadis}.

Another alternative, that would seem to circumvent the restrictions imposed by the
previous option, might be found in the term 'syllable-signs.' However, this would also be
too restrictive, for the term associates music-reading to a specific kind of solmization purely
based on syllables. It is true that the term 'syllable-signs' has the double advantage of

\begin{itemize}
\item or even to describe faster and variegated rhythmic motion-patterns (by attributing roundness to them, as
opposed to the fullness of slower ones), etc. For a small sample of early musical usage of all of these
terms (or derivatives and related terms)—calling forth, by means of their sensible attributes (tactile, aural,
and geometrical), connotations of social ethics and morality as well as rhetorical purposes—cf. (Capella a.
439, bk. 9; Meibom 1652, 2: 180, 187, 191; Dick 1925, 496, 511–512, 518–519; [trans.] Stahl et al.
1971–1977, 361, 369–370, 374); (Boethius a. 510, bk. 1, chs. 1, 14, and 21; \textit{GB-Ctc} ff. 5v–7r, 15v, 21v:
39–41); (Isidorus ca. 627–636, bk. 3, ch. 20; GS 1: 22; PL 82: 164–166; Lindsay 1911, 1: ff. K7–K8;
[trans.] SR 1950, 95–96; SR 1998, 151–152). Naturally, as references to hexachords, these
terms—descriptive of b-attributes—were employed only after Guido's propositions came into acceptance.
For some presentations on these terms, their Greek and philosophical background, and their use in later
musical theory, cf. the articles by Mountford (1920, esp. 17–28), Dahlhaus (1955), and more recently the
entry authored by Michael Beiche and published in 1995 in the \textit{Handwörterbuch der musikalischen
Terminologie} (HmT, s.v. 'Dur — moll,' esp. 1–6).
\end{itemize}

\textsuperscript{229} Hexachords such as $\text{\textup{\textit{Bl}}}$- and $\text{\textup{\textit{Bb}}}$-hexachord, which include either $\text{\textit{b}}$ or $\text{\textup{\textit{bb}}}$, were said to belong to the
\textit{molle} family, while those such as $\text{\textup{\textit{D}}}$- and $\text{\textup{\textit{A}}}$-hexachord, which include either $\text{\textit{d}}$ or $\text{\textup{\textit{dd}}}$, were said to belong
to the \textit{durum} family.
making it clear that one such sign as ₃ stands for fa, or that ₅ (or ₓ) stands for mi, and of denoting, by necessity an underlying intervallic relationship with other steps and their syllables. But, it preserves the disadvantage of limiting the understanding of signs to a paradigm that is not only based on syllabic solmization, but also one that suggests different syllables for different steps (according to the Guidonian paradigm), which was not entirely true of all syllabic-solmization propositions—e.g., noeanne/noeagis solmization. In other words, other kinds of solmization—especially those that were not based on syllables—would be suggestively discarded where the notion of a 'syllable-sign' was applied. For example, in the case of solmizing by means of pure and simple step-letters (whether or not of the Pseudo-Odonian kind), the absolute (frequency-defined) sound was not the aim of solmization, but the proper relation (intervals) between step-letters, as argued above. Even if the Guidonian paradigm is accepted as predominant during the Middle Ages and Renaissance, different solmization systems (tetrachordal, hexachordal, or others) may have been used (extensively or not), or alternatively devised or chosen (whether or not by an individual performer's will), and must not be discarded by any generic term being artificially established in this work.²³⁰

A third alternative could be the term 'interval-signs,' for the signs indicate not only attributes of the specific steps, but mainly specific kinds of interval to adjacent and nonadjacent steps—a semitone below and whole tone above for the fa-sign (₃), and a

²³⁰ Cf. chapters 1 and 2 for considerations about other systems, pre- and post-Guido's propositions on hexachordal solmization, its acceptance and later predominance, as well as evidences of other kinds of solmization, apparently resistant to the Guidonian paradigm.
semitone above and whole tone below for the mi-sign (♯ or ♭)—whether in the same hexachord, tetrachord, or other structures. Nevertheless, 'interval-signs' might lead to the mistaken understanding that signs were meant only as alterations of surrounding intervals, perhaps indicating a sound-stability (pitch) of the specific steps to which they are attached; or in other words, changing the sound (pitch) of the surrounding steps while preserving the sound (pitch) of the attached step, in order to obtain the required intervallic alteration. For instance, if a ♮ was notated at the place of g (making it a g-fa), it could be interpreted not as an inflection on the sound of the g, but as an alteration on the interval with its surrounding steps (f and a). By means of this interpretation, the g would maintain the same sound as a regular g-sol-re-ut, but f (now solmized as f-mi) would be the one step to suffer a sound alteration, making it equivalent to ♮.  

If it is true that a sign may have been used (paradoxically and ironically) to alter the interval between the step to which it was attached and others, without changing the sound of the step itself, then this kind of use may as well have been restricted, due to a particular composer's intention or taste, patron, city, region, or perhaps even to the context or design of a particular composition.  

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231 Such an understanding was offered by Andrew Hughes in analyzing relevant passages in Ugolino's *Declaratio musicae disciplinae* (ca. 1430–35), and later corroborated by Margaret Bent in "Musica Recta and Musica Ficta,” where her interpretations were based on evidence presented in the treatises by the anonymous Parisian author of the Berkeley manuscript (Anon. Berkeley 1375) and as well as those by Ugolino—cf. (Hughes 1969; 1972: 29–30, 37–38, 44–45, 51; Bent 1972, 85–89). The idea, was criticized by Karol Berger in his famous work on ficta.—cf. (K.Berger 1987, 17–18).

232 The latter interpretation has been speculatively suggested by Seay (1969) as a solution for reading the signs in Lorenzo Masini's *L'Antefana*, but that would be possible only if the 'permutation' instances in that work were ignored.
this interpretation of signs can be truly verified or not, it ought to be considered an
exception, rather than a widespread practice and understanding. So, the term 'interval-signs'
must be dismissed, together with the others.

Still another term, that could more easily comply with all that has been said and
defined so far, would be 'solmization-signs.' It has the apparent advantage of not being
dependent on specific solmization systems, but allowing diverse possibilities and/or choices.
Furthermore, it clearly states the most basic purpose of signs, that is, to serve solmization.
Notice that in order for this term to be effective, the term 'solmization' per se must be
generalized to mean 'reading early music' from any kind of early notation. However, this
generalization can generate some misapprehensions regarding origin and usage. For
instance, when describing J. Leodiensis's definition for 'false mutation,' Andrew Hughes has
suggested that the term 'solmization' may have been derived from the syllables sol and mi.

He [Jacobus Leodiensis] called mutation between the standard [recta] and the new [ficta] hexachords
false mutation, and that which it produced falsa musica (CS, ii, p.239a). Mutation of this kind
placed adjacent the syllables sol and mi, from which Renaissance theorists abstracted the term
'solmization': medieval writers used only the noun 'solfatio' and verb 'solfare.'
(NG 1, 17: 461, s.v. 'Solmization'; NG 2e, s.v. 'Solmization,' § I.4)

[Interpolations mine]

In fact, research indicates that not only the immediate Latin equivalents for the
anglicized 'solmization' (from 'solmizatio' and 'solmisatio'), but all its closest spellings
(whether as nouns, or verbs and adjectives) seem to have gained currency only in the
Renaissance. An inspection of a sample of Latin treatises revealed that only 33 (involving
30 authors) employed equivalents to 'solmization' in various Latin spellings and
derivations.\textsuperscript{233} Even so, 26 of those treatises (involving 24 authors) were written during the Renaissance. Among the several Latin spellings one may find the following: (nouns) \textit{solfatio}, \textit{sola}, \textit{solfatoria}, \textit{solfisatio}, \textit{solfizatio}, \textit{solmisatio}, \textit{solmizatio}, \textit{solmifatio}, \textit{solfatura}; (verb) \textit{solfare}, \textit{solfiare}, \textit{solfaciere}, \textit{solfisare}, \textit{solfizare}, \textit{solmisare}; (verbal adjectives) \textit{solfizans}, \textit{solmisans}, \textit{solmizans}; and also the noun \textit{solmisator} (a designation apparently given only by Martin Agricola [1539, ch. 2, f. Biij\textsuperscript{r}], and, with the spelling \textit{solmizator}, by Joachimus Wolterstorpius [1530's/1550's, ch. 2; Kast 1963, 25–26]—the latter probably based his brief treatise on Agricola's, for several passages are verbatim with his \textit{Rudimenta musices}). Naturally, many treatises (irrespective of their dates) used different spellings indiscriminately, but as stated by Hughes in the thirteenth and fourteenth centuries the most common forms were the noun \textit{solfatio}, and the verb \textit{solfare}—although \textit{solfiare} and \textit{solfaciere} also seem to have been used exclusively in that period. On the other hand, closely related spellings like \textit{solfisatio} or \textit{solfizatio}, and \textit{solfisare} or \textit{solfizare} seem to have been used for presentations in Renaissance treatises.\textsuperscript{234}

\textsuperscript{233} The present research on the term 'solmization' was realized via the search engine of TML, which included 673 treatises at the time this inspection on 'solmization' and derivatives—TML currently holds transcription of over 800 treatises.

\textsuperscript{234} In the chronological list of treatises given below, the ones preceded by an asterisk (*) indicate use of spellings with the morpheme 'solmi,' instead of 'solfi' or 'solfi'—there are only 11 treatises thus marked. Notice that nearly all of those treatises were written near the end of the fifteenth century, except for the one written by the anonymous Carthusian monk (here dated ca. 1400), which cannot be dated earlier than mid fourteenth century (since it makes reference to Tewkesbury's \textit{Quatuor principalia}), but also, according to Coussemaker, may have been produced early in the 15th century, based on the history of the manuscript \textit{B-Gu 70(71) (olim 421)}, ff. 124r–159v, Ghent, 1503–4, edited by Coussemaker (CS 2: 434–483)—cf. also (CS 2: xxii–xxvii; Grove 6, 1: 443; Aluas 1996, 1: 189–197). It is also possible, since that copy of the treatise was made in 1504, that the introduction of the term is due to a later scribal
If Hughes's interpretation is correct (that the term 'solmization' alludes to a ficta-mutation involving the syllables sol and mi), then the original terms 'solfatio' and 'solfare' (and all others based on the morpheme 'sola' or 'solfa') would stand for a mutation involving the syllables sol and fa. Such a mutation would be considered 'irregular,' not only because it would involve two syllables from the same hexachordal subset, but also because it would necessarily involve a mutation between two nonadjacent hexachords (i.e., choice—the term occurs only twice in the treatise, in the same paragraph, through the verb solmizare. The chronological list is as follows: (13th century [4 authors, 4 treatises]) — (Zamorensis, 1260/80, ch. 5; GS 2: 378; Robert-Tissot 1974, 62); (Elias Salomon 1272, chs. 2, 20; GS 3: 18, 42); (Amerus 1271; Ruini 1977, 32, 96); (Villa-Dei(?)) 713th cent.; Seay 1977a, 18); (14th century [2 authors, 3 treatises]) — (Engelbertus Admontensis a. 1320, tr. 3, ch. 4; GS 2: 322); (Leodiensis in. 13th cent., chs. 5, 8; Smits van Waesberghe, et al. 1988, 110, 114); (Leodiensis p. 1330, bk. 6, chs. 61, 63–64, 65, 67, 69, 101; CS 2: 280, 285–288, 291, 294, 301, 360; Bragard 1955–73, 6: 162, 173–178, 183, 188, 199, 286); (15th century [10 authors, 11 treatises]) — (Anon. Carthus. ca. 1400, pt. 1, ch. 8; CS 2: 449); (Olomons 1404/9, ch. [6]; Seay 1977c, 19); (Person 1417, ch. 3; Müller 1907, 184); (Anon. 11 med. 15th cent.; CS 3: 417, 419, 421–422, 445, 467; Wingell 1973 1: 4, 10, 16–17, 86, 152); (Tallanderius med. 15th cent., Seay 1977d, 4, 11); (Tinctorius 1495, f. b iiiⅴ, s.v. 'solfisatio'; CS 4: 188; Machabey 1951, 53; Parrish 1963, 60); (Zalka 1490; Bartha 1934, 68–69, 117–118); (16th century [15 authors, 16 treatises]) — *(Anon. Introd. mus. ca. 1500; Riemann 1897, 157, 158); (Cochlaeus 1511–14, tr. 2, ch. 3, 6, ff. Biiiⅴ, Biiiiⅴ); *(Felstin 1517, chs. [Preface], 2, 3, ff. Aijⅵ, Aiv–Biv, Bijd, Bijd–Cijd, Cijd, Cijⅴ, Diⅴ, Diijd–iiiⅴ); *(Rhuai 1517, chs. 3, 4, 7, 8, ff. Ciiijd–Dijⅴ, Dij–ijd, Dvirj, Ejⅵ); *(Rossetti 1529, ch. 4; Seay 1981, 14); *(Wolterstorpius 1530's/1550's, ch. 2; Kast 1633, 23–26); (Vanneo 1533, bk. 1, ch. 3, ch. 12ⅵ); *(Saess p. 1536, chs. [dedicatoria], 2, 5; Fedderhofer-Köngs 1964, 64, 71, 74, 76); *(Agricola 1539, chs. Preface, 2, 3, ff. Avi–vijⅴ, Biv, Bijd–vijd, Bvijⅵ); *(Heyden 1540, bk. 1, chs. Index, 1, 2, 4, 6, 8, ff. A6ⅵ, 2, 10, 13, 18–20, 24–25, 42, 54); *(Vogelsang 1542, chs. [Index], 1, 4; Fedderhofer-Köngs 1965, 78, 79, 84); *(Glarean 1547, bk. 3, ch. 11, 220); *(Coclico 1552, pt. 1, f. B ijⅵ); *(Finck 1556, ff. Aiijⅵ, Fijⅵ, Nijⅵ, Siiijⅴ); *(Stoquerus ca. 1570, chs. 1, 2, 3, 5, 18; Rotola 1988, 102, 104, 108, 112, 114, 120, 190); *(Stoquerus p. 1570, ff. 41ⅵ, 42 ⅴ). To this list, one could append the Summa musice, considering the differences between its two available editions (Gerbert's and Page's). Gerbert gives one occurrence of the word "solfamus" (2nd. person pl. pres. ind. act. of 'solfio, -are'), but Page reads it to "solvamus" (2nd. person pl. pres. subj. act. of 'solvio, -ere,' which has many meanings depending on the context, but can be loosely translated into 'to release; to solve; to set free'). Although Page does not mention Gerbert's reading, the context of the passage seems to warrant Page's reading—cf. (Perseus and Petrus ca. 1200, ch. 25; GS 3: 245; Page 1991, 208).
separated by two fifths relatively to a circle of fifths). In other words, if this was a \textit{recta}-mutation (however 'irregular'), then it would necessarily involve the nonadjacent hexachords based on $\overline{C}$ and $\overline{F}$. There are only two steps in the entire \textit{recta}-gamut that could support such a mutation: $c$-sol-fa-ut and its upper octave $cc$-sol-fa —or in modern pitch-notation, equivalent to $e'$ and $e''$. In the case of the term 'solmization' (as seen above), a hexachordal change between \textit{sol} and \textit{mi} on the same step-letter would necessarily denote a 'mutation' of the \textit{ficta}-species, or could alternatively denote a 'permutation.' The hexachords solmized in this hypothetical $sol=mi$ mutation would be separated by three consecutive fifths (relatively to a circle of fifths), and in a $sol/mi$ permutation, the hexachords would be separated by five fifths (and additionally, as in any permutation, the step-sounds would be necessarily different). In both situations, there would always be at least one \textit{ficta}-hexachord involved in the process of change, although such a distance between hexachords would impose solutions that are not commonly found in the repertoire—cf. \textbf{TABLE II}, p. 191, in order to visualize these hexachords and the distance between them relatively to a circle of fifths.

Although no treatise consulted has provided evidence of Hughes's interpretation, or any of the assessments above for the origin of the term 'solmization,' its possibility is

\begin{footnote}{Leodiensis's definitions for 'irregular mutation' (\textit{irregularis mutatio}) are provided in his \textit{Speculum musicum}, together with definitions of 'false mutation' (\textit{falsa mutatio}), whose meanings are briefly surveyed in chapter 4 together with other considerations (esp. p. 165–170). Although these kinds of mutation ultimately denote different concepts, in his explanations the latter can be interpreted as a particular case of the former, but certainly not the opposite—cf. (Leodiensis p. 1330, bk. 6, chs. 63, 66; CS 2: 285, 293–294; Bragard 1955–73, 6: 172–173, 185–187).}

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certainly admissible. The term ‘solmization-signs’ would then imply, through its own morpheme (‘solmi’), the use of musica ficta as a resource for ‘reading early notated music,’ and would, therefore, be fairly appropriate for the purposes of the present work. However, one might argue that due to its late adoption in historical treatises, the term ‘solmization’ should not be considered, since it may be misleading; that is, since it is rather a Renaissance term, purists could argue that it pertains neither to medieval musical practices, nor to non-Guidonian hexachord-based readings. As a counter-argument, it may be considered that also the term musica ficta is a late one, although modern scholarship has chosen to adopt it, based not only on late medieval discussions and suggestions toward an appropriate substitute for musica falsa and vitium, but also in its more definite adoption by some Renaissance auctoritates. In any case, if all these concepts behind the terms ‘solmization’ and ‘musica ficta’ are properly and consciously unveiled, then their modern usage cannot be seen as misleading. There is, however, one only and strong reason not to adopt ‘solmization-signs’ and, instead, favor ‘ficta-signs.’ Historical treatises do provide clear statements that although the signs of ♭ and ♭ served solmization, they were ultimately described and identified as ‘signs of musica ficta’ (i.e., signa falsae musicae, or signa fictae musicae, or signa coniunctae).236

236 In the quotation from Anonymous 11, below, there is no explanation why Wingell chose the translation "signified" for the word "signata" given explicitly in the first phrase, and "signed" for the same "signata" implied in the second phrase. It is clear in the text that the verb ‘signo, -are’ is meant as ‘to sign,’ and not as ‘to signify.’
False music is said to exist when \(\text{molle}\) or \(\text{quadrum}\) is placed at a point where it is not customary.

Indeed, two are the signs of false music, namely, \(\text{molle}\) and \(\text{quadrum}\). Where \(\text{rotundum}\) is placed, \(\text{fa}\) is said; however, where \(\text{quadrum}\) is placed, \(\text{mi}\) will be said. And thus one species [of interval] can be transmuted into another, as it was seen in the chapter on proportions [of intervals].

Therefore, you ought to know, as has been indicated, that musica falsa has two signs, namely the round \(\text{rotundum}\) and that other figure \(\text{quadrum}\). And they have such a property as, in the case of round \(\text{rotundum}\), to make of a descending semitone a tone, and of an ascending tone, a semitone. And that other figure \(\text{quadrum}\), effects the reverse: that is, of a descending tone it makes a semitone, and of an ascending semitone, a tone. Nevertheless, in those places where these signs are required, they are, as has been indicated above, not false, but true and necessary.

\[
\text{coniuncta} \text{ is the mental transposition of any property or hexachord from its own location to another location above or below. As evidence of this, it must be noted that every coniuncta is signed by b or #, placed in an unusual location.}
\]

(Plantinga 1961, 213)
Signa autem ut hic considerantur hanc fictam musicam demonstrativa sunt B molle sive rotundum, cui haec vox fa dicitur deservire, et † quadrum sive durum, cui haec vox mi penitus famulatur, [...].
(Ugolino ca. 1430–1435, bk. 2, ch. 34; Seay 1959–62, 2: 46; Hughes 1972, 22)

The signs designed to display musica ficta are †, to which we immediately utter the subservient syllable fa, and †, to which we pronounce mi, [...].
(Hughes 1972, 30)

Et sciendum quod omnis coniuncta signata per b molle dicitur fa; sed per b quadratum dicitur mi, loco cuius frequenter h. Qum ergo cognicio talium coniunctarum necessaria sit in cantu plano, et eciam organico, idcirco videndum diligenter est de eis et scrutandum.

One should know that every coniuncta signified by soft B is sung as fa, but if signed by square B, in place of which an h frequently appears, it is sung as mi. Since, then, the knowledge of these coniunctae is necessary in plain chant and also polyphony (organum), therefore, coniunctae must be diligently considered and studied.
(Wingell 1973, 203)

Duo sunt signa coniunctarum, scilicet † quadrum, quod coniunctam fieri demonstrat in locis b mollaribus. Et b molle, quod in locis † duralibus eam indicat. ‡ enim quadrum mi, orbiculare fa notat, quippe fa ευφονιαµ [euphonian], mi vero κακοφατοµ [kakophaton] sanat.
(Rhau 1517, ch. 7, f. [D viij])

Two are the signs of the coniunctae, namely † quadrum [i.e., square b], which shows the coniuncta to be made in the place of the † mollare [i.e., soft b, same as † molle], and the † molle, which indicates it [the coniuncta] in the place of the b durale [i.e., hard b, same as † durum]. Indeed, the † quadrum denotes mi, [and] the orbicularis [i.e., orbicular, same as rotundum] denotes fa, for in fact fa heals euphony, while mi heals the cacemphaton.
(my translation; cf. K.Berger 1987, 116)

I believe that enforcing the term ficta-signs as a terminological standard has enhanced the clarity and rigor of my own analyses of musical and theoretical texts.
Whether or not my commitment to this and other usages specific to this dissertation find their way into the discursive mainstream of *ficta* scholarship, I hope the particular perspectives laid out in this study serve to promote further investigation of this fundamental segment of the musical practices of pre-modern Europe.


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Jehan des Murs. (See Pseudo-Muris.)

John of Garland, [grammarian]. (See Garland, John of.)

Johannes Affligemensis. (See Affligemensis, Johannes.)

Johannes de Garlandia, [musician]. (See Garlandia, Johannes de.)

Johannes de Grocheo. (See Grocheo, Johannes de.)

Johannes de Muris. (See Pseudo-Muris.)
Johannes de Tewkesbury. (See Tewkesbury, Johannes de.)

Johannes Galicus. (See Galicus, Johannes.)


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Odo. (See Pseudo-Odo.)


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Philippe de Vitry. (See Pseudo-Vitry.)


Pseudo-Cicero. Rhetorica ad Herennium. (See Anonymus. Rhetorica ad Herennium.)


Pseudo-Johannes de Muris. (*See* Pseudo-Muris.)


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Pseudo-Philippe de Vitry. (*See* Pseudo-de Vitry.)

Pseudo-Tunstede. (*See* Tewkesbury, Johannes de.)


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