



## Yale University Department of Music

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Key and Mode in Seventeenth- Century Music Theory Books

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## KEY AND MODE

### IN SEVENTEENTH-

One of the more remarkable cultural phenomena of modern times is the emergence of a generally accepted musico-syntactical system (a musical "language") known, among other ways, as the "common practice of the eighteenth and nineteenth centuries," or as the "major/minor system of harmony," or as "tonal [as opposed to modal] harmony." While twentieth-century composers have sought new ways to structure music, interest in the major/minor system continues undiminished owing to a variety of reasons, among them the facts that the bulk of present day concert repertoire stems from the common practice period, and that theories relevant originally to music of the eighteenth and nineteenth centuries have been profitably extended to more recent music.

# **CENTURY**

## **MUSIC THEORY**

### **BOOKS**

WALTER ATCHERSON

Much has been written concerning the major/minor system. By far the most words have been expended in attempts to codify the syntax of major/minor and make it into a workable method of teaching composition. Numerous music theory text books of the eighteenth and nineteenth centuries fall into this category. Another category of writing concerning the major/minor system consists of those efforts to set forth philosophical, mathematical, or acoustical explanations of major/minor harmony; this category often overlaps the first, as it does already in Jean-Philippe Rameau's *TRAITÉ DE L'HARMONIE* (1722).

In the twentieth century the major/minor system has ceased to serve as a basis for composition instruction, and the search

for philosophical, mathematical, and acoustical explanations has proved unrewarding. Yet interest in the system continues in both its practical and theoretical manifestations. Indeed many recent studies have been concerned with that period of the late sixteenth century through the early eighteenth century when the major/minor system was evolving in practice and finding recognition in theoretical treatises. However, these studies are concerned principally with the evolution of major/minor harmonic syntax in musical practice; one could mention Dahlhaus's monograph on the origins of harmonic tonality or Apfel's many studies of the emergence of harmonic syntax.\*1 Evolution of major/minor key theory, on the other hand, has been largely overlooked by recent scholars. It is the purpose of this study to document the decline of modal theory in the seventeenth century and the concurrent emergence of major/minor key theory.\*2

Emergence of major/minor key theory in the seventeenth century put an end to a virtually unbroken tradition of modal theory which had endured for at least two millennia. The origins of modal theory are to be found in cosmological and calendaric speculation in Mesopotamia toward the beginning of the first millennium B.C.\*3 Modal theory then passed over, *mutatis mutandis*, into music of the synagogue and of various early Christian churches; modal theory of medieval Europe, in turn, appears to be an importation from Byzantium.\*4 Ancient Greek elements were superimposed on medieval European modal theory, but only because medieval theorists jumped to the conclusion that medieval modes were descendants of ancient *tonoi*. Amalgamation of medieval modal theory with the ancient Greek tetrachord theory was completed in the eleventh century, largely through the efforts of Hermannus Contractus.\*5 When the church modes are given systematic presentation in a twentieth-century dictionary or history book, the presentation is essentially that of Hermannus.

#### Recent Misconceptions

Since few scholars have been specialists in seventeenth-century music theory, one should not be surprised to encounter misconceptions of the relationship between modal and key theory. Some scholars suggest – or at least imply – that major/minor key theory is a direct lineal descendant of the modal system; Glarean is said to have introduced, in his *DODECACHORDON* (1547), two new mode pairs which quickly dominated the other four pairs, finally to their exclusion from the tonal system. Frere, writing in *GROVE'S DICTIONARY*, says, "The ancient

modes gradually disappeared until only the major and minor modes remained.\*6 Lowinsky calls Aeolian and Ionian the forerunners of major and minor.\*7 Other scholars overlook the essential differences between modes and major/minor keys, differences I intend to clarify in this study. Bukofzer, for example, credits Lippius, Crüger, and Carissimi with reducing "the multiplicity of modes to only two (major and minor). . . . \*8 It should be pointed out, however, that "reducing to two" and "establishing two categories" are not the same. Lippius, for example (to cite one of the three whom Bukofzer names), still maintains twelve modes, but acknowledges that they are of two basic types according to the quality of third above the final; Zarlino had already done this before him. The relevant passage from Lippius reads as follows:

A legitimate [authentic] mode [as opposed to a "spurious" mode, i.e., one divided at the tritone] is either natural, when it has the major triad, or minor, when it possesses the minor triad. There are three of each kind, according to the species of triads — the one group comprises Ionian, Lydian, and Mixolydian, the other Dorian, Phrygian, and Aeolian.\*9

The remainder of Lippius's discussion of the modes adheres faithfully to the tenets and procedures of Glarean's twelve-mode theory: that there are seven octave species, six of them capable of harmonic division and six of arithmetic division, and so on.\*10

Equation of major with Ionian and minor with Aeolian is accurate in one way — they share, respectively, the same intervallic arrangements — but quite misleading in other ways. Dahlhaus asserts that

In an attempt, finally, to describe the change in mode concept in the 16th and 17th centuries, no terminological differentiation is possible other than the designation of C-Ionian as "modus" and C-major as "Tonart."\*11

And according to Grout, with the addition of a B $\flat$  to Modes I, II, V, and VI, ". . . these modes became exact facsimiles of the modern 'natural' minor and major scales respectively."\*12 The remarks of Dahlhaus and Grout are by no means "wrong," but blur the essential distinction between mode and key (as represented by major and minor scales), and suggest direct lineal descent of major and minor scales from the modal system — a serious oversimplification at best.

Though it is misleading to regard key theory as a direct lineal descendant of modal theory, yet there are some historical ties between the two systems. One should keep in mind that the concepts of "mode" and "key" each consist of a cluster of ideas. The shift from modal theory to key theory might be described as a gradual change in constituency of the cluster of ideas making up the theory. However, the crucial idea in key theory — that focal pitch and intervallic structure (i.e., the tone system) be viewed as independent of one another — evolved apart from modal theory, as will be demonstrated in this study.

### Modes vs. Keys

How do modes differ from keys? This question is of central importance to the present inquiry, and can be answered by comparing the constituent concepts of modal theory with those of key theory.

1. Mode has a "natural" locus; Dorian, for example, connotes the series of pitches from D to d. Key, on the other hand, connotes no specific set of pitches, but rather one or another set of intervallic relationships (major or minor).

2. Modes can be transposed. To speak of a flat situated immediately to the right of a clef in music written before roughly 1670 as a "key signature" is an anachronism; it is merely a signal that transposition has occurred. Keys cannot be transposed in any theoretical sense, however. Beethoven's "Eroica" is in E $\flat$  major, not transposed C major.

3. Modes are generally paired, each authentic with its plagal. Keys are also paired, of course, but in one or another of several ways, all quite different from authentic/plagal pairing. During the last several decades of the seventeenth century, C major, for example, was frequently paired with a minor mode on D (with B natural). Parallel major/minor pairing is in evidence somewhat earlier; relative major/minor pairing somewhat later.

4. Modes are usually conceived of as consisting of species of fourth and fifth, keys as an ordering of whole tones and half tones. Keys and modes (at least for some theorists) are alike in one respect, though: they both admit optional pitches, e.g., a B $\flat$  in Lydian or an F $\sharp$  in C major.

5. Ambitus is an important aspect of mode definition and identification, but irrelevant to the concept of key.

6. In the church modes only one note besides the final has any structural significance, namely the "tenor" (dominant). Keys gradually acquired a whole set of hierarchical associations as harmonic theory evolved during the eighteenth and nineteenth centuries. The first note other than the key note itself to take on structural significance was, of course, the dominant; this occurred already in the seventeenth century. But the dominant of pitch keys is uniformly a fifth above the key note, whereas the dominant of church modes varies its position with respect to the final.

7. The structural importance of the tenor relates specifically to rendition of psalms and canticles, while the structural importance of the dominant and other notes in the key system concerns harmonic progression and pitch level of internal cadences.

8. Modes are generally taken up in connection with monophonic music; even when modes are dealt with in the context of polyphonic music, it is polyphonic music conceived of as a sum of monophonic musics. Key is usually associated only with polyphonic music in theory books of the last three centuries.

During the period of transition from modal theory to major/minor key theory, roughly coextensive with the seventeenth century, elements and characteristics of modes are often found intermingled with key traits; the transition was hardly instantaneous. But to say, in effect, that four of the six mode pairs fell into disuse leaving only Aeolian and Ionian, and that these two pairs were identical to minor and major, respectively, is to ignore the historical evidence of seventeenth-century music treatises.

#### Glarean's Modes

In 1547 Heinrich Loriti Glareanus published his famous *DODECACHORDON*. This book attempts to put modal theory back on firm conceptual foundation and thus make it a suitable and useful tool for dealing with sixteenth-century music. Glarean insisted on the inviolability of his octave species; a B $\flat$  would change Lydian into transposed Ionian. With the introduction of his two new mode pairs he also made the medieval doctrine of confinalis superfluous; a cadence on A need no longer necessarily be thought of as a cadence on the Dorian confinalis.\*13 Yet his modal system, as revolutionary as it was in some respects, was still a "modal" system.

In the latter half of the sixteenth century Glarean's system was adopted — and adapted — by most principal theorists. The most usual and significant adaptation was a reordering of the modes; Zarlino was apparently the first to do this (in 1571, in his *DIMOSTRATIONI HARMONICHE*). Zarlino's motive for re-ordering the modes was not to give prominence to Ionian and Aeolian as recognition of the growing importance of major and minor in musical practice as is commonly asserted,\*14 but in order to make the finales of the mode conform to the notes of the naturalis hexachord.\*15

Though Glarean's renovated modal theory found wide acceptance among theorists and wide recognition among composers of the seventeenth century, it had to contend with a number of rival theories, not to mention a great deal of confusion concerning the modes. In the first place, the older eight-mode system persisted; some theorists advocated the eight-mode system while rejecting Glarean's twelve modes, and others advocated the eight-mode system in addition to Glarean's twelve. Most theorists, whether they espoused eight or twelve modes, or both systems, admitted increasingly freer transpositions — an attempt to accommodate keys then coming into general use in musical practice. Other theorists, particularly from Catholic areas, set forth a system of eight church modes which were in effect keys (Mode II=G minor, Mode VII=D major, etc.). Still other theorists reduced the modes to two, pairing them either (in chronological order) as a given major with its parallel minor, or as C major with D "Dorian," or, finally, as a given major with its relative minor. Once the relative major/minor pair was established in theory the old "modal" key signatures were replaced by modern key signatures and the concept of transposed mode was rendered superfluous. Meanwhile various "irregular" systems were proposed (i.e., systems with few, or no, precursors or successors), much confusion was generated, and an attitude of either impatience or indifference toward the modes was often in evidence.

### "Irregular" Systems

Since the last named category of modal theory, the "irregular" systems, seems to be of least historical significance, other than as a symptom of decline, it may be well to discuss it first. Sometimes a unique approach to modal theory is born of (what appears, at least) ignorance. In a book entitled *L'ART DE LA POÉSIE FRANÇOISE ET LATINE, AVEC UNE IDÉE DE LA MUSIQUE SOUS UNE NOUVELLE MÉTHODE* (Lyons, 1694), Phérotée de la Croix (?-1715) says, "La musique figurée a



quatre Chants, le Doresin, le Phrigien, l'Indien, & l'Ionique." The nomenclature itself suggests that de la Croix was merely ill informed. Other "irregular" systems tend either toward proliferation of modes or — in conformity with the general seventeenth-century trend — toward reduction of their numbers.

Pier Francesco Valentini (ca. 1586-1653 or 1654), for example, set forth a system of 24 modes. Using the twelve modes of Glarean as a point of departure Valentini postulates twelve more: an alternate Dorian with finalis D and ambitus D to d but divided arithmetically on G; an alternate Hypodorian on D, but divided harmonically so that its ambitus is G' to G, and so on.\*16

The tendency toward reduction of the number of modes can be seen in such works as the early eighteenth-century manuscript *PRINCIPES DU COMPOSITION* of Nicholas Bernier (1665-1734). \*17 Bernier's seven modes are situated on each of the "white keys" and are identified as either major or minor according to the size of third above the final. Since some of these modes are furnished with chromatic alterations — e.g., the second mode on ré has a C# ascending and a Bb descending, while the mode on si has F#, C#, and A# — they approach the modern notion of keys. This is all the more true of Bernier's alternate seven modes, in which major has become minor and vice versa; the alternate seven are furnished with key signatures to establish in effect such keys as C minor (two flats), D major (two sharps), and so on up to B major and Bb major, both of which possess "modern" key signatures. Had Bernier's manuscript been prepared 50 or 100 years earlier it might be regarded as an important step toward a concept of key; since it postdates the actual emergence of the major/minor key system, it must be regarded as a vestigial, and anomalous, remnant of modal theory.

Another way to reduce the number of modes is to abandon the distinction between authentic and plagal. De la Voyer Mignot (fl. mid-17th century), in his *TRAITE DE MUSIQUE* (1656), having paid his respects to "Zerlain," insists that there can be only six modes. No real difference exists between a given authentic mode and its plagal since they share the same "cadenances medianes, dominantes et finales." By eradicating the authentic/plagal distinction, De la Voyer Mignot has moved closer to the notion of key.

Marin Mersenne (1588-1648) observes that there could be as many as 72 modes, were all the options for placement of the

9:8 and 10:9 whole tones realized, but his preferences lie in the direction of reducing the number of modes. He says of the twelve modes:

[They] have not been established for very good reasons, inasmuch as the same species of fifth and fourth which form the first seven modes are found again in the same order in the last five; . . . it is unnecessary, therefore, to augment their number. . . for fear of an imaginary distinction which depends only on the name of the clefs and the letters of the scale.\*18

On the other hand, however, Mersenne says, "One must not think that I wish to do away with the twelve modes, or to reproach those who have established them."

The suggestion for reducing the number of modes most frequently encountered in seventeenth-century theory books – to reduce them to two – will be taken up later.

Four, six, seven, twelve, twenty-four, or seventy-two modes – this all suggests a certain uneasiness with the eight church modes of medieval times. Yet amidst all the confusion the eight church modes persisted into the seventeenth century (and, indeed, into the twentieth century). This should hardly be surprising since the eight church modes lost none of their significance in the context of Roman liturgy, and though liturgy then (as now) was undergoing changes, many theorists sought to transmit eight-mode theory intact.

### The Eight Modes

Some theorists deal with eight modes only – often arguing that there can be no more than eight – while other theorists deal with both eight and twelve, clearly associating the former with chant and the latter with polyphonic music. Scipione Cerreto (ca. 1551-1633), for example, transmits the eight church modes of Hermannus Contractus in his *DELLA PRATTICA MUSICA VOCALE, ET STRUMENTALE* (Naples, 1601), arguing that there can be no more than eight. As the title of his book suggests, eight-mode theory is not limited to chant. In what appears to be an attempt to accommodate the increasing use of key signatures in practical music, Cerreto permits transpositions of the modes not generally found in earlier treatises.\*18a His "1. modo fitto con tre h quadri" is nothing but Dorian removed upward by a major second; he says "three sharps" for the reason that he places an F# both above and below the C#

in his signature. The eight modes of Cerreto, then, are susceptible of transposition either a major second down or a major second up, as well as a perfect fourth up (as had been recognized in treatises for over a century). The eight modes continued to be perpetuated, to the exclusion of the twelve, in such other seventeenth- and eighteenth-century treatises as the *ARTE DE MUSICA DE CANTO DORGAM, E CANTO CHAM* (Lisbon, 1626) of Antonio Fernandez, the *BREVE METODO PER FONDATAMENTE, E CON FACILITÀ APPRENDERE IL CANTO FERMO* (Milan, 1686) of Fabricio Tettamanzi, the *RESUMO DAS REGRAS GERAES MAIS IMPORTANTES, E NECESSARIAS PARA A BOA INTELLIGENCIA DO CANTO-CHÃO* (Coimbra, 1741) of Carlos de Jesus Maria, and the *MÉTHODE NOUVELLE POUR APPRENDRE. . . LES RÈGLES DU PLAINCHANT ET DE LA PSALMODIE* (Paris, 1748) of François de la Feillée. All of these are concerned with chant. What distinguishes the *RESUMO* of Carlos de Jesus Maria from sixteenth-century plainsong manuals such as Georg Rhau's *ENCHIRIDION* of 1518 is not so much the subject matter, but the use of Portuguese rather than Latin.

#### Eight Modes, Twelve Modes

Of those theorists who permit both the eight- and twelve-mode systems, Pierre Maillart (fl. early 17th century) made perhaps the strongest case for keeping the systems distinct from one another. In his *LES TONS OU DISCOURS, SUR LES MODES DE MUSIQUE, ET LES TONS DE L'ÉGLISE, ET LA DISTINCTION ENTRE ICEUX* (Tournay, 1610), after chiding Glarean, Gregor Faber, Froschius et al., for countenancing terminological confusion, he proceeds to differentiate "ton" (church mode) from "mode" (mode in polyphonic music). One must look to the dominant rather than the species of octave to determine a ton:

. . . in the case of ton it is not necessary to take into account the species of octave (by which one recognizes the mode) but rather the dominant note. . . . Thus when it is a question of perfection of the ton, one pays no attention to the perfection of the mode, nor to the [species of] octave, but only to whether the dominant note stands in relation to the final of the antiphon in accordance with the rule of the tons.\*19

The rule of the tons referred to is the often invoked memory verse

Pri re la, se re fa, ter mi fa, quart quoque mi la,  
 Quint fa sol, sex fa la, sept tenet ut sol, oct tenet ut fa. \*20

By keeping this verse in mind one can determine the ton of an antiphon; he need only observe the intervallic relationship between dominant and final. An antiphon whose dominant is la, and whose final is re, belongs to tonus PRIMUS. Since a "mode" is determined by species of fourth, fifth, and octave, it is not at all unlikely that ton and mode might be at variance in a given chant. Maillart adduces examples of such chants. \*21

Antoine Parran (1582-1650) likewise distinguishes the eight church modes from the twelve modes "of the Ancients" in his *TRAITÉ DE LA MUSIQUE THÉORIQUE ET PRATIQUE* (Paris, 1636). While Parran's treatment of church modes is conventional, his treatment of the twelve modes reflects the quandary confronting many theorists of his time: how to coordinate the twelve modes of Glarean with the modes of antiquity. Parran is thus equivocal about naming and numbering the twelve modes; the C mode might be either "le premier mode Dorique" or it might be the eleventh, Ionian, mode. In his examples of cadences he uses both sets of numbers and names.

Pierre-Benôit de Jumilhac (1611-1682) deals with both systems, the eight church modes and the twelve modes of polyphonic music, in his *LA SCIENCE ET PRATIQUE DU PLAIN-CHANT* (Paris, 1673). His discussion of modal theory is one of the more exhaustive among seventeenth-century theory books and served as the principal source on this subject for Sébastien de Brossard's (1655-1730) *DICTIONNAIRE DE MUSIQUE* (Paris, 1703). Jumilhac thoroughly investigates various mode categories — pairs, impairs; naturels, transposez; simples, mixtes, excédans, superflus; etc. \*22 — and various points of view concerning the number of modes: the several possibilities mentioned above together with a system of 210 modes (15 different octaves each set forth in 14 ways). Jumilhac also takes up the eight "pitch-key" modes, as well as the trend toward reduction to two modes. (A discussion of "pitch-key" modes is given below.)

#### "Key" Signatures and Transposition

While seventeenth-century theorists continued to perpetuate eight and/or twelve modes, seventeenth-century composers continued to move toward strict major/minor polarity. One very superficial manifestation of changes in seventeenth-century musical style can be found in the use of key signatures of

more and more sharps and flats. Theorists generally regarded these signatures, as they had the one- and two-flat signatures of the fifteenth and sixteenth centuries, as symptoms of transposition. Although these new key signatures betray a tendency toward recognition of keys, modal rather than key theory is the subject of discussion as long as there is talk of transposition. Key signatures, in fact, offer a clue to genuine "key" (as opposed to "mode") thinking. So long as C minor, for example, is given a signature of two flats, we can be sure that it was thought of as transposed Dorian. When given a signature of three flats, the relative major/minor system is likely to be assumed.

Theorists of the seventeenth century typically advocated transposition by intervals other than the traditional perfect fourth and minor seventh up (with signatures of one and two flats, respectively). Cerreto (1601), as has already been noted, permits transposition, in addition to a perfect fourth up, a major second up or down – the latter equivalent to transposition up a minor seventh. While Cerreto's transpositions required no more than two sharps or flats, later theorists adduced transpositions involving, ultimately, seven flats and seven sharps. This ultimate step was taken by Alexander Frère (fl. early 18th century) in his *LES TRANPOSITIONS DE MUSIQUE RÉDUITES AU NATUREL, PAR LE SECOURS DE LA MODULATION* (Paris, 1706). That Frère is indeed dealing with transposition of modes is borne out by the fact that his signatures for minor have either one flat too few or one sharp too many – and, of course, by the fact that his book is entitled *LES TRANPOSITIONS*. . . . For him Dorian is the prototype of minor (hence his signatures):

We likewise regard the minor modulation on re as the most natural of all the other minor modulations, which in turn we call "transposed," and it is to the minor modulation on re that we relate all the rest.\*23

(Just a year later the connection between transposition and key signature was to be severed by Saint-Lambert; see below.)

Theorists on into the eighteenth century continued to perpetuate the notion of mode transposition and thus forestall, at least for their own readers, the emergence of key theory. In spite of Frère, these transpositions are often limited by signatures of no more than four sharps or flats: witness Johann Joseph Fux (1660-1741), *GRADUS AD PARNASSUM* (Vienna, 1725), or Geronimo Romero de Avila (fl. late 18th century), *ARTE DE*

CANTOLLANO Y ORGANO O PROMPTUARIO MUSICO (Madrid, 1785). \*24

### "Pitch-key" Modes

I have coined the expression "pitch-key" modes to refer to those systems in which the eight church modes are presented from the start as transpositions from their "natural" loci, several with their own key signatures. Mode II, for example, is usually set forth in this system with a G final and a signature of one flat; it can then be transposed — even back to its natural locus. Though universal agreement concerning pitch-key modes is lacking, a system such as that of Johann Jacob Prinner (1624-1694) can be considered typical. In a manuscript treatise entitled *MUSICALISCHER SCHLISSL* (1677) Prinner sets forth the modes given in Example 1. \*25

These "modes" depart from one basic aspect of modality. A genuine mode associates a certain fixed intervallic structure — and only that one — with a specific focal pitch (final); if the focal pitch is removed by transposition, accidentals must be supplied to make the new pitch series conform to the intervallic structure. Thus it can be said that Prinner's modes approach the concept of key.

The pitch-key modes appear to be a strictly seventeenth-century phenomenon; there is no mention of them in the works of Glarean, Zarlino, or Salinas, for example. *L'ORGANO SUONARINO* (1605) of Adriano Banchieri (1567-1637) may be the first treatise to present eight modes in the guise of pitch-keys. Prinner followed Banchieri in several important respects (e.g., his finals are the same as Banchieri's), but yet there exist some important differences between the two systems. Compare Example 1 with Example 2.

Banchieri's cadences do not in every case outline what we would call a tonic triad. The reason for the "indifferent" cadence on A for Mode IV will become apparent when the liturgical role of these modes is discussed. (See below)

Treatment of pitch-key modes similar to that of Prinner can be found in such other treatises as *LA REGOLA DEL CONTRAPUNTO* (Milan, 1622) of Camillo Angleria, *TRAITÉ DE L'ACCORD DE L'ESPINETTE* (Paris, 1650) of Jean Denis, *TRAITÉ DE LA COMPOSITION DE MUSIQUE* (Paris, 1667) and *DISERTATION SUR LE CHANT GRÉGORIEN* (Paris, 1683) of Guillaume-Gabriel Nivers, and Brossard's *DICTIONNAIRE* (article "Tuono").

## EXAMPLE

1

THE EIGHT MODES OF PRINER

The image displays eight musical modes, numbered 1 through 8, arranged in three rows. Each mode is represented by a bass staff with a key signature and a starting note indicated below the staff.

- Mode 1: Bass staff, key signature of one sharp (F#), starting note D.
- Mode 2: Bass staff, key signature of one flat (Bb), starting note Gb.
- Mode 3: Bass staff, key signature of one flat (Bb), starting note A.
- Mode 4: Bass staff, key signature of two sharps (F# and C#), starting note E#.
- Mode 5: Bass staff, key signature of one sharp (F#), starting note C.
- Mode 6: Bass staff, key signature of two flats (Bb and Eb), starting note Fb.
- Mode 7: Bass staff, key signature of two sharps (F# and C#), starting note D#.
- Mode 8: Bass staff, key signature of one sharp (F#), starting note G#.

The pitch-key modes are evident in practical as well as theoretical sources. They serve as the schema by which various compositions in a collection were to be organized, just as major and minor keys were to provide the schema for ordering preludes and fugues in such collections as J.K.F. Fischer's *ARIADNE MUSICA* and J.S. Bach's *DAS WOHLTEMPIERTE KLAVIER*. The order of compositions in Carlmann Kolb's (1703-1765) *CERTAMEN AONIUM* (1733) follows Prinner's modes exactly (with respect to finals and key signatures), while the *OCTI-TONUM NOVUM ORGANICUM* (1696) of Franz Xaver Anton Murschhauser (1663-1738) adheres somewhat more closely to Banchieri's modes — e.g., the seventh mode, on D, has a signature of one flat rather than two sharps. Murschhauser's modal system also differs from that of Kolb in that it contains two fifth modes, one ("regularis") starting on F but cadencing on an A major chord, and the other ("irregularis") beginning and ending on C. Neither version has a key signature.

Klaus Speer's study of tonus designations in seventeenth- and eighteenth-century organ music reveals that some composers adapted the idea of pitch-key modes so as to make a twelve-mode system. Georg Muffat (1653-1740), for example, arranges the versets of his *APPARATUS MUSICO-ORGANISTICUS* (1670) as follows (lower case indicates a minor triad, capital a major triad):

Figure 1. Modes as manifested in Georg Muffat's *APPARATUS MUSICO-ORGANISTICUS*. \*27

<u>Mode</u>	<u>Initial key</u>	<u>Key signature</u>	<u>Final triad</u>
1	d	none	D
2	g	one flat	G
3	a	none	A
4	e	none	E
5	C	none	C
6	F	one flat	F
7	C	one flat	C
8	G	none	G
9	e	one sharp	E
10	D	one sharp	D
11	c	two flats	C
12	Bb	one flat	Bb

Most compositions in Gottlieb Muffat's (1690-1770) *72 VERSETL SAMT 12 TOKKATEN* (1726) conform to the pattern employed by his father, though those compositions in Modes IX through



## EXAMPLE

2

## THE EIGHT MODES OF BANCHIERI:

Their Finals and Cadences\*26

The image displays eight musical staves, each representing a mode of Banchieri. Each staff begins with a number (1 through 8) and a treble clef. The notes are written in a specific key signature and rhythm, with a final cadence at the end of each staff. The modes are labeled as follows:

- 1. Principante Mezana Indifferente Finale
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

XII exhibit quite a different pattern. Figure 2 should demonstrate the points of difference between Georg's and Gottlieb's conceptions of a twelve- (pitch-key) mode system. The numbers in parentheses indicate how many compositions belong to each category.

Figure 2. Modes IX through XII in Gottlieb Muffat's 72 VERSETL SAMT 12 TOKKATEN.\*28

<u>Mode</u>	<u>Initial Key</u>	<u>Key signature</u>	<u>Final triad</u>
• • • 9	• • • c	• • • two flats	• • • C (4) No 3rd (3)
10	A	three sharps	A (5) No 3rd (2)
11	e	one sharp	E (4) No 3rd (3)
12	B♭	two flats	B♭ (7)

Klaus Speer's study of tonus designations concludes with these words:

The evidence provided by seventeenth-century keyboard composers shows that they employed a major-minor concept though using the traditional tonus designations. Unfortunately, no contemporary theorist took the trouble to analyze this phenomenon.\*29

As a matter of fact, some seventeenth-century theorists did take the trouble to analyze this phenomenon. Nivers offers a particularly thorough explanation in his DISSERTATION SUR LE CHANT GRÉGORIEN (1683), and others, such as Denis, in his TRAITÉ DE L'ACCORD DE L'ESPINETTE (1650), contribute much to our understanding of the practical reasons for the existence of pitch-key modes.\*30

It may be well to recall at this point that the organ made increasingly frequent and pervasive incursions into Roman liturgy during the sixteenth and seventeenth centuries. From the start this took the form of polyphonic interpolations, usually between even numbered verses — which were sung in plainsong — of psalms or of canticles such as the Magnificat. These interpolations came to be known as "versets" (or "versos," or "versillos"), and had to be composed or improvised in such a way as to get the singers off again on the right pitch for the next verse or for the enclosing antiphon. As Nivers says,

In churches where the organ is used in the divine service, it is a rule of absolute necessity that the organ give the tone of everything that is sung by the choir after the organ . . . . That is why the singers, without bothering about rules, should pay attention only to the finalis of the organ . . . and upon that organfinalis, which is always the finalis of the antiphon to be intoned, to regulate the first note of the antiphon.\*31

But what does this have to do with pitch-key modes? If chants were all to be sung in their "natural," theoretical range, any given group of singers would need to have a range of at least two octaves. In view of this, it seems quite likely that singers in monasteries and parish churches transposed to a comfortable tonal level from earliest times. Indeed, music treatises of the Middle Ages do occasionally offer testimony about the practice of transposing.\*32 It is likely, too, that the organist was expected to transpose. The earliest literary evidence concerning transposition for the organist comes from Arnold Schlick (fl. 1492-1527); though much of what Schlick says in his *SPIEGEL DER ORGELMACHER UND ORGANISTEN* (1511) is obscure and subject to varying interpretations, he leaves no doubt that transposition was a commonplace necessity for the parish organist. And, of course, various transpositions were commonly accepted, as a means of accommodating the keys of musical practice, in music theory of the sixteenth, seventeenth, and eighteenth centuries (see pages above).

The essential difference between conventional transposition theory of the sixteenth through eighteenth centuries and the eight pitch-key modes of Banchieri, Prinner et al., lies in the fact that the latter were not generally regarded as transpositions. For Prinner, Mode II simply possessed a G finalis and a signature of one flat. And for Banchieri Mode II could be transposed from G (with a signature of one flat) to D (no signature). Yet the pitch-key modes themselves originated as transpositions, as Nivers clearly points out.

Nivers explains that the pitch level of the finalis should be set in relation to a pitch which might serve as a comfortable "reciting tone" or dominant of the mode for a given choir; this implies transposition of chants into a comfortable range for that choir. Not every transposition is satisfactory, however. Nivers warns, for example, not to retain the same pitch for dominant throughout a succession of chants in differing modes. To do this might give rise to an awkward shift in tonal system, as Example 3 (Nivers's example) illustrates.\*33 Part a of

Example 3 shows the conclusion of the First Antiphon in Mode I, and part b shows the beginning of the Second Antiphon, Mode II, situated in its natural locus. If a choir were to sing both antiphons untransposed they would exceed comfortable voice range. A transposition is in order, but not the one using dominant as pivot; part c of Example 3 illustrates the awkward shift of tonal system which would result. Nivers prescribes the transposition illustrated by part d. A smooth transition from one antiphon to the other results; to make matters even easier in this particular case, the Second Antiphon begins on the final of the First.\*34 It should be observed that the resulting Mode II conforms to Prinner's Mode II (though there exist discrepancies between Nivers and Prinner in the case of some of the other modes). Nivers sets forth rules concerning intervallic relationships of dominants in successive chants, rules which give rise to the transpositions indicated in Example 4.\*35

Howell's study of French Baroque organ music reveals, incidentally, that composers' mode designations conform most often to the finals and cadences of the modes as set forth by Nivers himself in his *TRAITÉ DE LA COMPOSITION DE MUSIQUE* (1667). This book adduces a modal system identical with that of Prinner, except in the case of Mode IV, which conforms to Banchieri's system.

It now appears that Banchieri's "indifferente" cadence on A (mentioned above) was designed to accommodate the reciting tone (repercussio, dominant) of Mode IV. Since key theory has virtually no historical connection with chant, one can infer elements of key thinking from the absence of ideas traditionally associated with chant: when Banchieri's indifferente cadence vanishes in subsequent modal theories (such as Prinner's), music theory has moved a step closer to the concept of key. (Actually it was Zarlino who introduced modal cadences on notes of what we would call the tonic triad, but in the context of Glarean's twelve-mode theory rather than of pitch-key modal theory.)

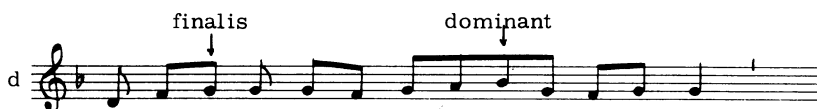
## Two Modes

While modes were on the way to becoming major and minor keys through the agency of transposition in liturgical contexts, they were also on the way by another route. As early as the mid-sixteenth century Zarlino recognized that the twelve modes were of two basic types, those with a major third over the final and those with a minor third, but he did not, of course, reduce

## EXAMPLE

3

FROM THE SECOND VESPERS OF CORPUS CHRISTI:  
 conclusion of the First Antiphon (natural locus), and  
 beginning of the Second Antiphon (natural locus and in  
 two transpositions)



## EXAMPLE

4

NIVERS'S TRANSPOSITIONS

Dominants:  
Finals:  
Tones:

Degrees of  
transposition:

The musical notation consists of two staves. The first staff contains notes corresponding to degrees I, II, III, IV, and V. Degree I is a whole note (C), II is a half note (Bb), III is a half note (Ab), IV is a half note (G), and V is a half note (F#). The second staff contains notes for degrees VI, VII, and VIII. Degree VI is a whole note (E), VII is a half note (D#) or a half note (Db), and VIII is a half note (Cb). The text '3# or 1#' is written above the first staff, and '2b' is written above the second staff.

their number to two. The credit for reduction to two apparently belongs to Giovanni Coperario and Thomas Campion (both are named since the question of priority cannot be conclusively settled), whose modal theories seem to have evolved independently of continental theorists. From the second decade of the seventeenth century on, then, English theorists almost without exception deal with two modes, usually to the exclusion of the church mode system. Meanwhile, on the continent, two-mode theory did gradually take hold, most likely as a logical consequence of Zarlino's two-fold classification rather than as a borrowing from Campion and Coperario.

If eight or twelve modes are to be reduced to two, the question arises: which two? During the seventeenth century there were three different answers to that question.

1. Two modes, equivalent to our major and minor, paired around a single final or key note.
2. Two modes: C major and D Dorian.
3. Two modes: C major and A minor, our modern "relatives."

The first option, parallel major and minor paired together, seems once again to be a peculiarly English phenomenon. Christopher Simpson, in *A COMPENDIUM OF PRACTICAL MUSIC* of 1667, says

I will show you this flat and sharp 3rd applied to the key in all the usual places of an octave, to which may be referred such as are less usual, for however the key is placed, it must always have its 5th divided according to one of these two ways, and consequently must be either a flat or a sharp key [i.e., either a minor or a major key].\*36

Simpson then proceeds to give examples of, in our terminology, the tonic triads of the major and minor keys of G, A, B $\flat$ , C, D, E, and F.

The second option, C major paired with D Dorian, seems to be a French phenomenon.\*37 One can encounter this pairing in such works as Jean Rousseau's *MÉTHODE CLAIRE, CERTAINE ET FACILE POUR APPRENDRE À CHANTER LA MUSIQUE* (1678), L'Affilard's *PRINCIPES TRÈS-FACILES POUR BIEN APPRENDRE LA MUSIQUE* (1694), and Loulié's *ÉLÉMENTS OU PRINCIPES DE MUSIQUE* (1696). Even Rameau adhered to this pairing in his *TRAITÉ DE L'HARMONIE*\*38 of 1722, though in the "Supplement" to the *TRAITÉ*\*39 and in his subsequent theoretical treatises he embraced the modern concept of relative major/minor.

As to that modern concept of relative major/minor, by which I mean in effect the method of pairing which won out in the end – it appears for the first time, as nearly as can be determined, in Thomas Salmon's (1648-1706) *A PROPOSAL TO PERFORM MUSICK IN PERFECT AND MATHEMATICAL PROPORTIONS* (London, 1688), thus once again an English affair.

Salmon's reason for pairing C major with A minor (for example) was to permit the viol player to play in those two keys without changing fingerboards. To play in C major and then in D minor would require an exchange of fingerboards. (Salmon's tuning advocated just intonation – hardly a revolutionary proposal.) The outcome of Salmon's proposal was a table of proportions for major and minor pairs through three sharps and three flats.

Later seventeenth- and early eighteenth-century English theorists – Lord North, for example – followed Salmon's lead. Though it cannot be proved at this time, it is likely that Salmon's concept of relatives has been passed down in English-speaking countries in unbroken tradition to the present.

### Key Theory

Before key theory could evolve it was necessary that the concepts of focal pitch and intervallic structure be viewed as independent of one another, and before this could come to pass it was necessary that there be a vocabulary available to make the distinction between the two. Words such as mode, tone, Dorian, and so on, connote focal pitch and intervallic structure. Even the word "finalis" cannot be understood apart from an associated intervallic structure.

The English appear to have introduced a concept of key – "key" understood as denoting focal pitch without necessarily connoting intervallic structure. This is implicit in Simpson's remarks (quoted above) as well as in Morley's admonition: when Philomathes asks if there is anything else wrong with his exercise, the master replies, "Yes, for you have in closing gone out of your key, which is one of the grossest faults which may be committed."\*40 For Campion, a key "guides and ends the whole song."\*41

Saint-Lambert (fl. early 18th century) was probably the first continental theorist to recognize the independence of focal pitch and intervallic structure and, at the same time, to set forth a system of relative major and minor keys. In his *NOUVEAU*



TRAITÉ DE L'ACCOMPAGNEMENT DU CLAVECIN, DE L'ORGUE, ET DES AUTRES INSTRUMENTS (Paris, 1707) Saint-Lambert makes a clear distinction between "ton" (key or key-note) and "mode" (as in major or minor). Our word "tonic" in its musical sense may very well go back to Saint-Lambert; the ton of a piece is indicated by the last note of the bass:

This final is always the fundamental note of the air, and is so to speak the note tonique.\*42

"Mode," on the other hand, is the disposition of the remaining pitches in relation to the tonic:

Mode is the determination of the path which the melody [chant] of an air, together with its [accompanying] parts (when there are any), must take, all in accord with the final. It is the particular system upon which a piece of music is built.\*43

Though there are 21 tons in name, there can actually be only 12 tons, according to Saint-Lambert, upon which there can exist either the major or the minor mode. Saint-Lambert then proceeds to set up a table of tons with their key signatures.\*44 Thus the minor mode on G (to cite one example) bears a key signature of two flats and is paired (as it had been with Salmon) with B $\flat$  major. Transposition, for Saint-Lambert, is a practical operation which changes the ton but not the mode.

Thus to transpose an air is nothing else but to remove it from its ton in order to place it on another, without, however, changing its mode.\*45

While it is possible that Saint-Lambert came upon the notion of relative major/minor pairs independently, there is some circumstantial evidence to suggest that he knew the work of Salmon. Salmon proposed, in his AN ESSAY TO THE ADVANCEMENT OF MUSICK (London, 1672), to reduce the number of clefs to one; the bottom line would always be G and the register indicated by the letters T (for treble), M (for meane), and B (for bass). Saint-Lambert proposed an identical notational reform in his LES PRINCIPES DU CLAVECIN (Paris, 1702) — hardly conclusive proof of Saint-Lambert's acquaintance with Salmon's work, but merely suggestive. The same kind of circumstantial evidence would suggest that John Francis de La Fond (fl. first third of the 18th century) followed Saint-Lambert in his A NEW SYSTEM OF MUSIC (London, 1725).

La Fond not only proposed a notational reform resembling that of Saint-Lambert, but also clearly set forth the latter's concepts of ton and mode, substituting the word "nota" for "ton."

### Conclusion

After Rameau took up the major/minor system of relatives in the "Supplement" to his *TRAITÉ*, modal theory became a purely academic matter (at least outside the context of liturgical music). There were vestigial holdouts to be sure, some of which have been noted in this study. Yet it was the concept of major/minor keys — that concept rather than the concept of modality — which served composers and performers for the next two centuries.

To say that major and minor descended from Ionian and Aeolian is misleading for two reasons:

- 1) Those who dealt with two modes and treated them as "modes," i.e., subjected them to transposition, generally chose Ionian and Dorian.
- 2) Those who dealt with two modes, one on C and one on A, treated them as keys from the start and ignored their fortuitous similarity to Ionian and Aeolian respectively.

Meanwhile there existed other groping attempts to arrive at the concept of key, notably on the part of theorists of the pitch-key modes, which, however, proved fruitless.

Key theory required as a prerequisite not just a theory of mode, but a theory of focal pitch, of key. The English appear to be responsible for introducing this concept. The word "key" pervades English theory books of the seventeenth century, and it remained for Saint-Lambert to link the idea with modality in such a way as to give rise to major and minor keys as we now know them.

## REFERENCES

## ABBREVIATIONS

AfMw	ARCHIV FÜR MUSIKWISSENSCHAFT
AMl	ACTA MUSICOLOGICA
JAMS	JOURNAL OF THE AMERICAN MUSICOLOGICAL SOCIETY
JMT	JOURNAL OF MUSIC THEORY
MD	MUSICA DISCIPLINA
Mf	DIE MUSIKFORSCHUNG
MGG	Blume, Friedrich, ed. DIE MUSIKIN GESCHICHTE UND GEGENWART. 14 vols. Kassel: Bärenreiter, 1949-1968.

- 1 Carl Dahlhaus, UNTERSUCHUNGEN ZUR ENTSTEHUNG DER HARMONISCHEN TONALITÄT, Vol. II of SAARBRÜCKER STUDIEN ZUR MUSIKWISSENSCHAFT, ed. Walter Wiora (Kassel: Bärenreiter, 1968.) Of Ernst Apfel's contributions to this area, these might be mentioned: "Wandlungen des Gerüstsatzes vom 16. zum 17. Jahrhundert," AfMw 26 (1969), 81-104, 209-235; and BEITRÄGE ZU EINER GESCHICHTE DER SATZTECHNIK VON DER FRÜHEN MOTETTE BIS BACH, Teil I (Munich: Eidos, 1964); Teil II (Munich: Wilhelm Fink, 1965).
- 2 The expression "major/minor key theory" and the word "key" itself will be used in this study to connote scale as well as focal pitch.
- 3 Eric Werner, "The Origin of the Eight Modes of Music (Octoechos)," HEBREW UNION COLLEGE ANNUAL 21 (1948), 211-255.
- 4 Otto Gombosi, "Studien zur Tonartenlehre des frühen Mittelalters," AMl 11 (1939), 128ff.
- 5 Gombosi, "Studien," AMl 10 (1938), 149-174; see also W. T. Atcherson, MODAL THEORY OF SIXTEENTH-CENTURY GERMAN THEORISTS (Ph.D. dissertation, Indiana University, 1960), pp. 6-14.
- 6 Walter H. Frere, "Modes. The Roman School," GROVE'S DICTIONARY OF MUSIC AND MUSICIANS, 5th ed., 10 vols., ed. Eric Blom (London: Macmillan, 1954-61), V, 802. When Frere speaks of "Gafori and his followers" he must have in mind Glarean and his followers.
- 7 Edward E. Lowinsky, TONALITY AND ATONALITY IN SIXTEENTH-CENTURY MUSIC (Berkeley and Los Angeles: Univ. of California Press, 1962), p. 34.
- 8 Manfred F. Bukofzer, MUSIC IN THE BAROQUE ERA (New York: W. W. Norton, 1947), p. 386.

- 9 Johann Lippius, *SYNOPSIS MUSICAE NOVAE* (Strassburg, 1612), "De modo musico." "Legitimus est alius Naturalior qui tenet Triadem Harmonicam Naturaliorem: alius Mollior, qui Triadem Molliorem obtinet. Uterque Trinus est juxta Species Triadum: ille Jonicus, Lydius, & Mixolydius: hic Dorius, Phrygius & Aeolius. . . ." See also Gioseffo Zarlino, *ISTITUTIONI HARMONICHE*, 2nd ed. (Venice, 1573), p.182.
- 10 In the *SYNOPSIS* and also in his *DISPUTATIO MUSICA TERTIA* (Wittenberg, 1610).
- 11 Carl Dahlhaus, "Tonalität. B. Systematik," in *MGG XIII*, col. 517.
- 12 Donald J. Grout, *A HISTORY OF WESTERN MUSIC* (New York: W.W. Norton, 1960), p.52.
- 13 W.T. Atcherson, "Theory Accommodates Practice: Confinalis Theory in Renaissance Music Treatises," *JAMS* 23 (1970), 326-330.
- 14 See, for example, Clement A. Miller, "THE DODECACHORDON: Its Origins and Influence on Renaissance Musical Thought," *MD* 15 (1961), 164: "By giving such prominence to the Ionian mode Zarlino recognizes the ever increasing importance of the major mode."
- 15 See Richard Crocker, "Perché Zarlino diede una nuova numerazione ai Modi?" *RIVISTA ITALIANA DI MUSICOLOGICA* 3 (1968), 48-58.
- 16 Lucas Kunz, *DIE TONARTENLEHRE DES RÖMISCHEN THEORETIKERS UND KOMPONISTEN PIER FRANCESCO VALENTINI* (Kassel: Bärenreiter, 1937), pp. 62-72. Valentini's *DUPLITONIO, MUSICA DIMOSTRATIONE E DILUTIONE* was probably written within a year or two of his death.
- 17 Nicholas Bernier, *PRINCIPLES OF COMPOSITION*, trans. and ed. by Philip Nelson. (Brooklyn: Institute of Medieval Music [1964]). The manuscript was most likely prepared after 1726. I am indebted to Dr. Nelson for clarifying for me certain terminological problems in Bernier's book.
- 18 Marin Mersenne, *HARMONIE UNIVERSELLE. TRAITEZ DES CONSONANCES*, p.183, quoted in and trans. by Albion Gruber, "Mersenne and Evolving Tonal Theory," *JMT* 14 (1970), 60-61.
- 18a Theorists had since the fifteenth century been accounting for accidentals by way of the concept of transposition, of course, but transposition of the entire tone system rather than of modes. See, for example, Claude Palisca's article on Bartolomé Ramos de Pareja in *MGG X*, col. 1911. Other means of accounting for accidentals consisted of adding tetrachords to the basic medieval gamut (Erasmus of Höritz) or starting Guidonian hexachords off on notes other than the traditional ones (Fernand Estevan). For Erasmus see Claude Palisca, "The Musica of Erasmus of Höritz," in *ASPECTS OF MEDIEVAL AND RENAISSANCE MUSIC: A Birthday Offering to Gustave Reese*, ed. Jan LaRue (New York: Norton, 1966), p. 645ff.; and for Estevan see Robert Stevenson, *SPANISH MUSIC IN THE AGE OF COLUMBUS* (The Hague: Nijhoff, 1960), pp. 51-52.

- 19 LES TONS OU DISCOURS. . . , p.272; "...pour le fait du ton, il ne faut point prendre esgard à l'espece de diapason (par laquelle se cognoist la mode) ains à la notte dominante. . . .Aussi quant il est question de la perfection du ton, l'on ne prend point esgard à la perfection de la mode, ny du diapason, ains seulement, si la notte dominante respond à la notte finale de l'Antienne, selon la reigle des tons."
- 20 Ibid., p.205.
- 21 Ibid., p.265ff.
- 22 LA SCIENCE ET PRATIQUE DU PLAIN-CHANT, p.133ff.
- 23 Frère, LES TRANSPOSITIONS. . . , p.13. "Nous regardons de même la modulation mineure du ré comme la plus naturelle de toutes les autres Modulations mineures, lesquelles nous appellons à son égard, transposées, & à laquelle nous les rapportons toutes. . . ."
- 24 Concerning the latter see Karl Gustav Fellerer, "Zur Chorallehre des Geronimo Romero de Avila," in GESAMMELTE AUFSÄTZE ZUR KULTURGESCHICHTE SPANIENS ("Spanische Forschungen der Görresgesellschaft, Erste Reihe" [Münster, Westfalen: Aschendorffsche Verlagsbuchhandlung, 1962]), Vol. 19, 265-268.
- 25 Hellmut Federhofer, "Eine Musiklehre von Johann Jacob Prinner," in FEST-SCHRIFT ALFRED OREL ZUM 70. GEBURTSTAG (Vienna: Rohrer, 1960), p. 49. Mode VI lacks a signature in Federhofer's example, but by analogy with Mode II it should doubtlessly have one.
- 26 Banchieri, L'ORGANO SUONARINO, p.41.
- 27 Adopted from Klaus Speer, "What is Tonus in Polyphonic Music?" in ESSAYS IN MUSICOLOGY: A BIRTHDAY OFFERING FOR WILLI APEL (Bloomington: Indiana University, 1968), p.142.
- 28 Ibid.
- 29 Ibid., p.139.
- 30 For a thorough discussion of Nivers's and Denis's books, see Almonte Howell, "French Baroque Organ Music and the Eight Church Tones," JAMS 11 (1958), 106-118. Some of Howell's findings will be summarized in the present study.
- 31 DISSERTATION SUR LE CHANT GRÉGORIEN, pp.111-112, trans. by Almonte Howell, *ibid.*, 108.
- 32 See, for example, Gilbert Reaney, "Modes in the Fourteenth Century, in Particular in the Music of Guillaume de Machaut," in ORGANICAE VOCES: FEST-SCHRIFT JOSEPH SMITS VAN WAESBERGHE (Amsterdam: Instituut voor Middeleeuwse Muziekwetenschap, 1963), p.138. Reaney's article should be read in the light of Dahlhaus's findings; see Carl Dahlhaus, "Der 'Modus duodecimae' des Nicolaus von Capua," *Mf* 16 (1963), 363-364.

- 33 Howell, "French Baroque Organ Music," 111.
- 34 Ibid.
- 35 Ibid., 110.
- 36 Christopher Simpson, *A COMPENDIUM OF PRACTICAL MUSIC*, ed. and with an introduction by Phillip J. Lord (Oxford: Blackwell, 1970), p.23.
- 37 Thomas Rive advances the thesis that minor descended from Dorian in musical practice; consult his "The Dorian Origin of the Minor Scale in the Ecclesiastical Polyphony of the Sixteenth Century," in *STUDIES IN MUSIC*, 2 (1968), 21-32.
- 38 Implicitly, at least. See Rameau's examples for the "Rule of the Octave," *TRAITÉ*, p.383ff.
- 39 "Supplement," p.11f. Rameau takes issue with Frère (*LES TRANSPOSITIONS DE MUSIQUE*), whose key signatures for the minor mode all entail either one sharp too many or one flat too few. Rameau's table (pp.12-13) sets forth major keys and their minor relatives, together with the "modern" key signatures.
- 40 Thomas Morley, *A PLAINE AND EASIE INTRODUCTION TO PRACTICALL MUSIQUE* (London, 1597), ed. by R. Alec Harman (London: Dent, 1952), p. 249.
- 41 Thomas Campion, "A New Way of Making Fowre Parts in Counterpoint" (c. 1613), in *THE WORKS OF THOMAS CAMPION*, ed. by Walter R. Davis (Garden City: Doubleday, 1967), p.324.
- 42 Saint-Lambert, *NOUVEAU TRAITÉ*, p.26. "Cette finale est toujours la note fondamentale de l'Air, & pour ainsi dire la note Tonique."
- 43 Ibid. "Le mode est la determination du chemin que doit tenir le chant d'un Air, & celui de ses parties, quand il en a, le tout par rapport à la note finale.... C'est le système particulier sur lequel une piece de Musique est bâtie."
- 44 Norman Phelps, writing in Willi Apel's *HARVARD DICTIONARY OF MUSIC*, 2nd ed. (Cambridge: Harvard, 1969), p.847, apparently overlooked Salmon's and Saint-Lambert's treatises when he credited Alexander Malcolm with introducing modern signatures for the first time in *A TREATISE OF MUSICK, SPECULATIVE, PRACTICAL, AND HISTORICAL* (Edinburgh, 1721).
- 45 Saint-Lambert, *NOUVEAU TRAITÉ*, p.32. ". . . Ainsi transposer un Air n'est autre chose que le tirer de son ton, pour le mettre sur un autre, sans neanmoins rien changer à son mode."