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Source: *Journal of Music Theory*, Vol. 22, No. 1 (Spring, 1978), pp. 65-103
Published by: Duke University Press on behalf of the Yale University Department of Music
Stable URL: http://www.jstor.org/stable/843628

THE RECOGNITION OF MAJOR AND MINOR KEYS IN GERMAN THEORY: 1680–1730

Joel Lester

German theory on modes and keys during the 17th and early 18th centuries is rife with paradox. It was a German theorist who first presented a comprehensive theory of major-minor polarity and who differentiated two types of mode almost exclusively according to the quality of "tonic" triad (Johann Lippius, in works from 1610 to 12). Yet his German contemporaries and several generations of succeeding German theorists persisted in maintaining the traditional modal theories as the basis of contemporary music during their gradual but total demise in several other countries. Second, several theorists writing in German who did begin to recognize keys as opposed to modes around the turn of the 18th century related those keys to foreign practices (Antoni Berthali to French practice,[1] and Johann Mattheson to Italian[2]). Yet the earliest presentation of 24 keys as equally original (not with some keys considered transpositions of other more original ones) and the earliest recognition of the circle of fifths appeared in German theory. And finally, despite these "firsts" in German theory, it is only in Germany that a major

polemical battle erupted after 1715 debating the viability of major-minor keys as applied to contemporary music.

An earlier study has outlined the revolutionary breakthroughs in German theory around 1600, and the persistence of a conservative modal tradition in Germany throughout the 17th century.[3] The present article continues this historical survey, covering developments leading up to and immediately following the recognition of 24 keys in Germany.

German theorists at the end of the 17th century approached the major and minor keys from two distinctly different directions. Some discussed the traditional modes and their gradual evolution into major and minor keys, continuing a trend begun so tentatively by Zarlino in 1558. Others merely listed the keys in use by their tonic triads, sometimes without explicitly mentioning the major-minor differentiation, in a tradition deriving from many sources, both German and foreign.

Andreas Werckmeister (1645–1706) is without doubt the most important theorist in the first group. His theories on mode are presented in six treatises, published between 1687 and 1707. Since most of his views did not change substantially over this 20-year period, these six works will be discussed together:

Musicae mathematicae . . . (Frankfurt and Leipzig, 1687), on the derivation of rules of composition from calculations and the monochord.

Hypomnemata musica . . . (Quedlinburg, 1697), "musical notebook . . . in particular on composition and temperament."

Erweiterte und verbesserte Orgel-Probe . . . (Quedlinburg, 1698). Referred to hereafter as *Orgel-Probe.*

Die nothwendigsten Anmerckungen und Regeln wie der Bassus Continuus oder General-Bass wol könne tractiret werden . . . (Aschersleben, [1698][4]). Referred to hereafter as *General-Bass.*

Harmonologia musica . . . (Frankfurt and Leipzig, 1702), "or brief introduction to musical composition."

Musicalische Paradoxal-Discourse . . . (Quedlinburg, 1707),

"or uncommon presentation on how Music has a high and holy origin, and how to the contrary it is so misused."[5]

As a traditionalist and a church musician, Werckmeister saw much of value in modal theory. And even though he recognized that only two (or possibly four) modes were still in contemporary use, he argued that only a solid foundation in modal theory allowed one truly to understand the use of the new keys.

> We only want to discuss here something of the twelve modes, because our chorales, and, still from time to time, other musical pieces are based on them. Nowadays one could make do well with two modes; but because of the chorales we will discuss the twelve modes a little. For one so often hears some organists who do not know the least of this subject debase themselves: for example, when they prelude to the German *Hr. Gott dich loben wir* (which was considered and sung by the ancients as a humble prayer), they take the transposed Aeolian in the range of e f-sharp g a b c d e; yet it is regular Hypophrygian. Also, to *Erbarm dich mein O Herre Gott,* the same. When they would play *Ach Herr mich armen Sünder,* they make a prelude in C and take the Ionian mode for the Phrygian, yet these two modes are quite different . . . .[6]
>
> Thus only a few of today's musicians understand the above-mentioned modes, and many fewer know how to use them. What will we do? Will we discard them or the diatonic scale from which they have their origin? Not at all, for the foundation must remain . . . . For if a fully experienced composer hits upon a foreign cadence by degrees now and then, an inexperienced one does not know that it is done by degrees, and cites this as a precedent that the modes are no longer in use, claiming that the most eminent composers have seen the modes decline, and therefore proceed from one cadence to another, now major, now minor, now diatonic, now chromatic, and so forth . . . .[7]

Although similar sentiments are expressed in all his works, he is less insistent on knowledge of the modes in later trea-

tises. As a practical musician, in fact, Werckmeister recognized the existence of only two principal modes:

> Today's music is entirely different (as noted above), and only some four modes are in use: Ionian mixed with Mixolydian and Dorian mixed with Aeolian, mostly in the range of the fourth.[8] Thus no more than two modes can now be established. And that is not so unnatural if we use them with the proper order. If we take Lydian, on account of the tritone or *falsette* there is such an unnatural progression in it that even the ancients themselves never or hardly ever used it. Who uses Phrygian in today's music? Nobody. Who Mixolydian? Hardly any. Therefore on behalf of a better order according to today's style of composition, we want to maintain only two modes. But because these can take their names neither from the Dorians, the Ionians, nor from any other nations (because they did not have our present style of music), therefore we want to name them according to their nature and character, so that they can be differentiated. The first can be named the natural mode, because it always maintains the major third in the beginning over the fundamental note, according to the natural order of the proportional numbers 4, 5, 6, 8 as in the notes *c e g c* or *d f-sharp a d,* etc. The second can be named the less natural mode, because the root numbers in its natural progression are further from perfection, and therefore do not establish such a happy harmony as the preceding. The natural progression of this mode is 10, 12, 15, 20, which is further from unity than the first .... We can also name one mode perfect, and the other less perfect. Some performers name them *dur* and *moll;* e.g., CEG is C *dur,* CE-flatG is C *moll,* DF-sharpA is D *dur,* DFA is D *moll.* We are not happy with these names, because the word *dur* does not correspond with the harmony; for when something is sad, one says "that is entirely *dur,*" yet this triad is more joyful and perfect than anything else. Nevertheless, because these terms are now used so commonly, they will probably persist.[9]

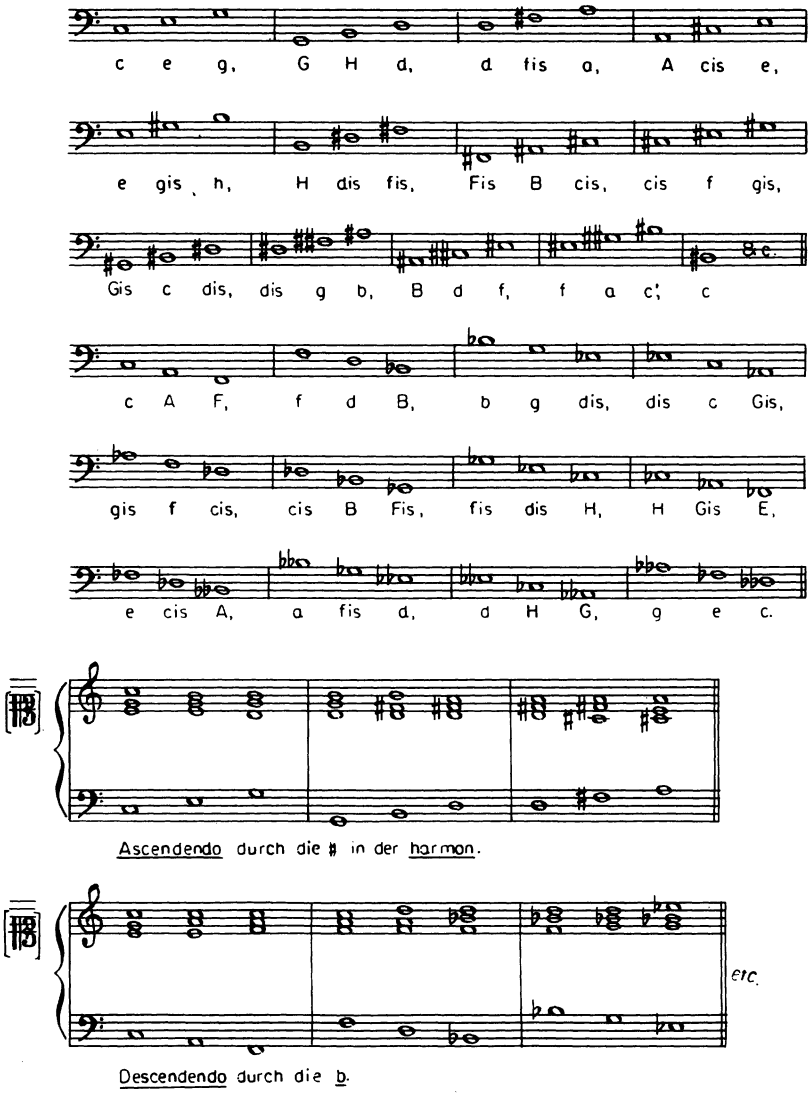
In his earlier works, he accepts Dorian as the model for the

minor mode. Only in his *Paradoxal-Discourse,* published posthumously in 1707, is Aeolian cited as the model.[10]

Werckmeister recognized all 12 possible transpositions, discussed harmonic progressions around the circle of fifths, and argued for an approximation of equal temperament to allow the use of these harmonies on the keyboard. But it is not clear whether he recognized 24 major and minor keys. The *Musicae mathematicae* discusses transposition only with the 12 modes. If each mode is transposed to all 12 pitches, and there are 12 modes, then theoretically 144 forms arise. But he rejects a fuller discussion of this point as unnecessary.[11] After the reduction of the number of modes to two, he does not again discuss transposition. Similar situations exist in his *Musicalische Temperatur* (Frankfurt and Leipzig, 1691) and *Harmonologia* (1702). In the introduction to the former, tempered intonation is considered necessary "because nowadays people want to play all songs on all the keys." In the latter, Werckmeister states that the organist who does not know how to transpose to any of the twelve notes does not know the keyboard well enough.[12] But in neither work does he specify whether he is talking about 24 keys or 144 modal transpositions.

Similarly, his discussion of the "musical circle" in other treatises refers to circular harmonic progressions, not directly to modes or keys. Thus, in both the *Hypomnemata musica* (1697) and the *Orgel-Probe* (1698), the musical circle is mentioned as one argument for equal temperament, but is not described.[13] In the *General-Bass* (1698) the sequence of triads is presented both ascending and descending. Major and minor triads alternate in each direction: C e G b D, etc.; and C a F d B-flat, etc.[14] The same example recurs in the *Paradoxal-Discourse* (1707) along with the harmonic progression of a major triad around the circle of fifths through both the sharp and flat keys (Example 1).[15]

Werckmeister also argues for modern key signatures, complaining about those who set incorrect signatures to transposed compositions. Thus, in Ionian on A, F-sharp, C-sharp, and G-sharp should all be in the signature. Those who write only C-sharp or G-sharp are writing in no mode ("nullius modi").[16]


c e g, G H d, d fis a, A cis e,
e gis h, H dis fis, Fis B cis, cis f gis,
Gis c dis, dis g b, B d f, f a c', c
c A F, f d B, b g dis, dis c Gis,
gis f cis, cis B Fis, fis dis H, H Gis E,
e cis A, a fis d, d H G, g e c.
Ascendendo durch die ♯ in der harmon.
etc.
Descendendo durch die ♭.

Example 1.

In summary, Werckmeister comes across in these treatises as a thoughtful, practical theorist, ready to accommodate himself to contemporary practice, and even to advocate new teachings, but also recognizing the problems in the newer theories and desiring to retain those aspects of the modes which are still valuable. This moderate stance is in sharp contrast to writers in the 1710's and later, when sharp polemic barbs flew between the defenders of antiquity and the proponents of the new keys, leaving little room for one who wished the best of both. Werckmeister received some harsh criticism from Heinichen, for example, who argued that all facets of composition could be adequately treated under the major and minor keys, and there was no cause to retain the modes. Perhaps what is most remarkable about Werckmeister's position is that he was a church organist. In the next decades, church musicians were to be among the most outspoken opponents of the 24 keys.

The second tradition leading towards the recognition of 24 keys involved a listing of the final triads to identify modes or keys. The origins of this tradition can be traced back to Zarlino, who had cited the final, fifth, and third of the modes as the principal cadence points. Johann Lippius, who recognized in these notes the fundamental nature of the "trias harmonica" both as a harmony and as the foundation of modal theory, listed modes by their "tonic" triads. This method of citing modes was used even by theorists of the 17th century who did not recognize the triad as a harmonic unit and who did not recognize any major-minor differentiation of modes.[17]

Joining this tradition at the end of the 17th century was another, whose roots go back to Italian theory and practice around the turn of the 17th century. The common usages of modal transposition of the psalm tones were codified for the first time in theory by Adriano Banchieri (1567–1634) as the "eight tones of ecclesiastical plain chant":[18]

Tone Number	Final Pitch	Signature
1	D	none
2	G	one flat
3	A	none
4	E	none

Tone Number	Final Pitch	Signature
5	C	none
6	F	one flat
7	D	one flat
8	G	none

This organization of tones will be referred to here as the "church keys."[19] The fourth register of the same work contains compositions on the Magnificat in these eight tones. But tones 3 and 8 are one step lower with a flat in the signature and contain the comment, "One note lower to accommodate the chorus."

Banchieri's *Cartella musicale* (third edition, Venice, 1613–14) lists the eight traditional modes on pp. 68–71, but then sets duos to the church keys. On page 73, introducing the duo of the second "ecclesiastical tone," he notes: "The second tone is plagal as we have said, contrary to the first authentic; it has as its limits the octave from the note g to g . . . . [!]" When he reaches the seventh mode, Banchieri describes the difference between it and the first:

> This seventh tone has the same overall structure ["corrispondenza"] as the first: it has cadences in the same positions, similar fugues; only in this is it different: that it is more languid, since the first possesses a B-natural, and this seventh has a B-flat . . . .

Although he presents no explanation of the origin of these modes, nor of their relation to the traditional modes, they are apparently derived from the common transpositions of the church modes. The transposition of Dorian to a one-flat signature explains tones 1 and 2. The same transposition of Phrygian results in tones 4 and 5, but the ordering is reversed, and there is no flat in the signature of the A mode. Lydian was often changed to Ionian; here tone 5 is Ionian, tone 6 its transposition. Tone 8 is Mixolydian; tone 7 the range of Hypomixolydian, but with D as final. Most puzzling is the identification of the terms authentic and plagal in both church modes and church keys.

Though Banchieri's presentation may be the earliest in a treatise, a number of earlier keyboard collections contain a similar presentation:

The anonymous *Intavolatura d'organo facilissima accomodata in versetti sopra gli otto tuoni ecclesiastici . . .* (Venice, 1598)[20] uses the eight church keys as presented by Banchieri.

Part I of *Il Transilvano . . .* (Venice, 1593)[21] by Girolamo Diruta (1557–1612) contains a number of toccatas and other keyboard compositions in various of the 12 modes. Not all the first eight are included, but those that are (numbers 1, 2, 3, 6, and 8) agree with Banchieri's presentation.

In the *Intonationi d'organo . . . composte sopra tutti li dodeci toni della musica . . .* (Venice, 1593),[22] which contains compositions by both Gabrielis, the first eight modes are similar to those of Banchieri (they differ in number 3, which is here on E, and number 7, which is here on G).

At some point later in the 17th century the seventh mode was changed to D with one sharp in the signature, probably either to differentiate it more clearly from the first mode, or to present a true transposition of Mixolydian. As a result of this change, the first four modes now contained a minor triad, and the last four a major triad. This listing of the church keys found its way into later treatises, among which the following are German:

Compendium oder Kurtzer Begriff und Einführung zur Musica sonderlich einem Organisten dienlich, a manuscript treatise by Allessandro Poglietti (d. 1683)[23] dating from before 1676, lists these as the "acht Choral-Töne."[24]

Instructio musicalis Domini Antonii Berthali (1676), a manuscript treatise, cites these as the "8 Toni" which are now ("aniezo") in use.[25]

Idea boni cantoris (Nürnberg, 1688), by Georg Falck (1630–1689), cites these as the regular tones or modes (see below).

Clavis ad thesaurum magnae artis musicae (Prague, 1701),

by Thomas Balthasar Janowka, which otherwise lists only the 24 major and minor keys, refers to these as the eight tones or modes of chant in the article "Cantus."

Das neu-eröffnete Orchestre (Hamburg, 1713), by Johann Mattheson, cites these as the first eight of the 24 keys, and refers to them as the Italian manner of differentiating the keys (see below, pp. 84–5).

Die Kunst des reinen Satzes (1771–79), by Johann Philip Kirnberger, notes that these keys were probably the first to be listed since they were the ones most easily performable on organs tuned in meantone temperament.[26]

Musikalisches Lexikon (Frankfurt, 1802),[27] by Heinrich Christoph Koch, treats the traditional church modes under the title "Tonart," but lists these church keys under "Kirchentöne," after noting the deterioration of the traditional modes since the time of Pope Gregory.[28]

A number of German keyboard works used these church keys well into the 18th century:

Blumen Strauss . . . in acht tonos ecclesiasticos oder Kirchen Thon eingetheilet (Augsburg, c. 1702),[29] by Johann Caspar Ferdinand Fischer (c. 1670–1746), includes one prelude and six fugues in each of the church keys. Tones numbers 7 and 8 differ from the above listings only in that they have the modern key signatures for D and G major.

72. Versetl sammt 12 Toccaten (Vienna, 1726),[30] by Gottlieb Muffat (1690–1770), contains settings in the "12 more usable tones." The first eight agree with the church keys, although all keys use the modern key signatures except Phrygian.

Certamen aonium . . . ab octo tonis . . . (Augsburg, 1733),[31] by Carlmann Kolb (1703–1765), contains settings in the eight church keys, with the following differences in signatures from older listings: tone 1 has one flat, tone 4 appears both with and without one sharp, and tones 7 and 8 have the modern signatures.

Toccate e fughe per l'organo . . . (Augsburg, 1747),[32] by Johann Ernst Eberlin (1702–1762), orders the toccatas and fugues according to the eight church keys.

The listing of the eight church keys (here called the "regular tones or modes"[33]) is expanded in Georg Falck's 1688 singing manual (*Idea boni cantoris* listed above) by the addition of another eight "transposed or *ficta* tones or modes":

According to A *dur* by the major third	a c-sharp e
According to B-flat by the major third	b-flat d f
According to B by the minor third	b d f-sharp
According to C *moll* by the same	c e-flat g
According to E-flat by the major third	e-flat g b-flat
According to E by the same	e g-sharp b
According to F by the minor third	f a-flat c
According to F-sharp by the minor third	f-sharp a c-sharp

No scale or signature is presented for these keys; nor is any major-minor differentiation cited for the first eight.

Note the use of the terms *dur* and *moll* in the listing of the "ficta" modes. Although *dur* is used for A major and *moll* for C minor, Falck does not intend the terms as "major" and "minor." Later, in the discussion of key signatures, he uses *dur* for signatures with no accidentals or with sharps, and *moll* for signatures with flats. Thus, G-flat major would theoretically be a *moll* triad for Falck.[34]

The *Unterricht der musicalischen Kunst* . . .[35] of Daniel Speer (1636–1707) also lists keys by the tonic triad, dividing them into three categories:

1. The natural keys, of which there are six: ace, ceg, dfa, egb, fac, and gbd.
2. The hard or sharp keys ("dur, hart, scharffen"), of which there are five: ac-sharpe, bd-sharpf-sharp, df-sharpa, eg-sharpb, gbd.
3. The soft ("mol, weich"), of which there are five: fa-flatc, gb-flatd, b-flatdf, ce-flatg, e-flatgb-flat.[36]

Discounting the repetition of G major in the natural and sharp categories, 15 keys are listed here. B minor and f-sharp minor, which were listed by Falck, are not here, but B major is added.

In Part II, on thorough-bass, Speer presents the intonations,

preludes and *toccatinas* in 13 of these keys, beginning with two sharps and ending with two flats:

> D with 2 sharps, B with 2 sharps, G with one sharp, E with one sharp, C with no accidentals, A with no accidentals, A with two sharps, F with one flat, D with one flat, B-flat with one flat, G with one flat, E-flat with two flats, and C with two flats.

Those keys with 2 sharps, one sharp, no accidentals, and one flat are given modern major and minor key signatures (i.e., Ionian and Aeolian signatures). A major is notated with a Mixolydian signature, G and C minor have Dorian signatures, and B-flat and E-flat major have Lydian signatures. Once again, as in Falck, there is no differentiation into major and minor, and, except for the examples in Part II, no scale or signature is presented.

Friderich Erhard Niedt (1674–1708) listed 16 keys in his *Musicalische Handleitung* (Hamburg, 1710),[37] so that an organist playing in any of these keys would know the correct pitches even if the signature were lacking. He lists the major and minor forms on all the white keys and on B-flat. For a number of these an incomplete signature is noted: C minor with two flats (although a note points out that A-flat is usually added), G minor with either one or two flats, and A major with two or three sharps. Because of the rationale of his selection, Niedt includes two keys with five accidentals (B major and B-flat minor), while omitting several with only three or four accidentals (F-sharp and C-sharp minor, and E-flat and A-flat major).

In 1704 Johann Phillip Treiber (1675–1727) published a manual with a novel approach to thorough-bass instruction. Instead of rules and examples, *Der accurate Organist* (Jena, 1704) uses two chorales, one in major and one in minor, which are presented in 20 out of the 24 keys. Only the major keys of F-sharp/G-flat and C-sharp/D-flat and their relative minors are absent. The key signatures are divided into those with flats and those with sharps, but apparently no explicit differentiation is made between major and minor keys.[38]

If the presentations of Werckmeister are compared to those of Falck, Speer, Niedt, and Treiber, it is clear that Werckmeister shows a much more profound understanding of the

keys and their use. By basing the use of keys on aspects of traditional modal theory (cadence structure, modulatory possibilities, melodic structure, etc.), he fills a void found in the works of those theorists who only recognize the new keys. In addition, he explicitly discusses the major-minor dichotomy, which is not even mentioned in some of these other works. Hence Werckmeister's above-mentioned arguments for maintaining the old modal theory even if only two modes are in use. Not until Heinichen's treatise of 1711 is there a full discussion in German of the usage of the major and minor keys.[39]

There are two separate traditions, then, which lead towards the recognition of 24 major and minor keys in German theory. Of the several theorists discussed, only Werckmeister mentioned the possibility of 24 keys, omitting, however, a complete listing. Between 1701 and 1713 three writers in German areas published presentations of the 24 keys: Thomas Balthasar Janowka, Johann David Heinichen, and Johann Mattheson. These presentations differ from one another in terminology, in the manner of presentation, in the ordering of the keys in relation to one another, and in the applicability of the keys to contemporary music as well as to older music.

The *Clavis ad thesaurum magnae artis musicae* (Prague, 1701) by the organist Thomas Balthasar Janowka (1660?–1715?) is perhaps most remarkable for its complete acceptance of the 24 keys for all music, past as well as present. The work is organized as a lexicon with several articles dealing with modes and keys. Janowka appears to be in total ignorance of the traditional church modes and terms associated with them. In his article on "Cantus" he asserts that the eight church keys, divided into *cantus durus* and *mollis* (in the meaning of major and minor), and listed with the traditional Greek names and affects, are the church modes founded by Pope Gregory and St. Ambrose and used in the Catholic Church continually since then. Similarly, in the article, "Tonus," Janowka notes that earlier authors have established 8, 12, or 14 keys (*toni*). These figures are indeed the common numbers of modes claimed by various sources going back to the Middle Ages, but they do not refer to the number of keys of the 24 major and minor, as Janowka intends them. *Ambitus* is defined as the range of the human voice or an

instrument, not of a mode or key. And finally, the article on *modus* only defines the term to mean interval.[40]

In his discussion of major and minor keys, Janowka presents a major and natural minor scale as a model, notes 12 pitches to the octave, and notates all 24 keys in ascending chromatic order, each with its proper key signature. In contrast to most earlier works, the complete scale is given for each key, not merely the tonic or tonic triad. He complains about incomplete key signatures in current use, particularly the Dorian signature for minor. Janowka also argues for another aspect of modern notation—correct spelling of all pitches, including even B-sharp instead of C in appropriate circumstances.[41] The only important aspect of keys not discussed concerns modulatory possibilities. Neither in the section on cadences (where previous theorists discussed this issue) nor elsewhere does the subject arise.

In its complete acceptance of the 24 keys, and its absolute silence concerning the old modes, Janowka's work surpasses even the works of Heinichen and Mattheson. But the *Clavis* went virtually unnoticed by his contemporaries. Mattheson, for example, who often shows a remarkable knowledge of contemporary literature, did not know of the work in 1713. The use of Latin, quite unusual at this late date, and the apparently limited circulation of the work, were probably factors.

The *Neu erfundene und gründliche Anweisung . . . des General-Basses* (Hamburg, 1711) by Johann David Heinichen (1683–1729) is a much more practical work. It represents the culmination of the trend found in the practical works of Falck (1688), Speer (1687 and 1697), and Niedt (1700). There is virtually no mention of the modes, and major-minor keys are merely listed. But Heinichen progressed several steps beyond his predecessors and arrived close to the modern conception of the 24 keys. He did not present triads, but complete scales with their modern key signatures (like Janowka). He presented not just some keys, but all. The keys are not ordered arbitrarily, but divided into major and minor, paired according to relative majors and minors, listed according to their position on the circle of keys, and presented with a wide range of tonal modulatory possibilities. Perhaps what is most remark-

able is that Heinichen presented this new development without fanfare. Unlike Werckmeister, who laboriously pondered each new point and continually questioned its value, and unlike Mattheson, for whom each new development, no matter how trivial, became the springboard for lengthy, self-righteous polemic, Heinichen presented the sum of his accomplishments as a *fait accompli.*[42] Major and minor are assumed, not argued. The Dorian form of minor is not accepted: Heinichen instructs the performer to use the minor sixth step of the scale in all minor keys, even when it is not notated.

> A minor has the same *ambitus* as C major; D minor the same as F major; E minor the same as G major, and so forth for all keys.... In all minor keys one must ordinarily use the minor sixth of the key in which the piece is written, where it is not already indicated in the signature.[43]

The performer must be aware of modulations:

> When, in this manner, the signatures and the natural *ambitus* of each key have been firmly imprinted on paper as well as in hearing, nothing more is required than to keep attention fixed on where the beginning key, which often changes in a piece, modulates; and then one begins the signatures once again in this new key, just as they ordinarily appear according to the model.[44]

Finally, the musical circle (Plate 1), for which Heinichen is perhaps most famous, is presented not as a revolutionary method of establishing a new tonal system, but as a practical convenience to aid in modulation from one key to another.

Heinichen does not even take credit for the invention of the musical circle, only for its improvement. He relates that while he was studying with Johann Kuhnau (1660–1722),[45]

> my teacher told me something of the above-mentioned circle of [Athanasius] Kircher [1601–80], but this gave me no satisfaction if I set out to go from a major key to a distantly related minor key and vice versa.... The well-known method of Kircher, to circulate through all the keys by fourths and fifths, is one of the most imperfect. For if one begins, e.g., from a major key, and continues by fourths or

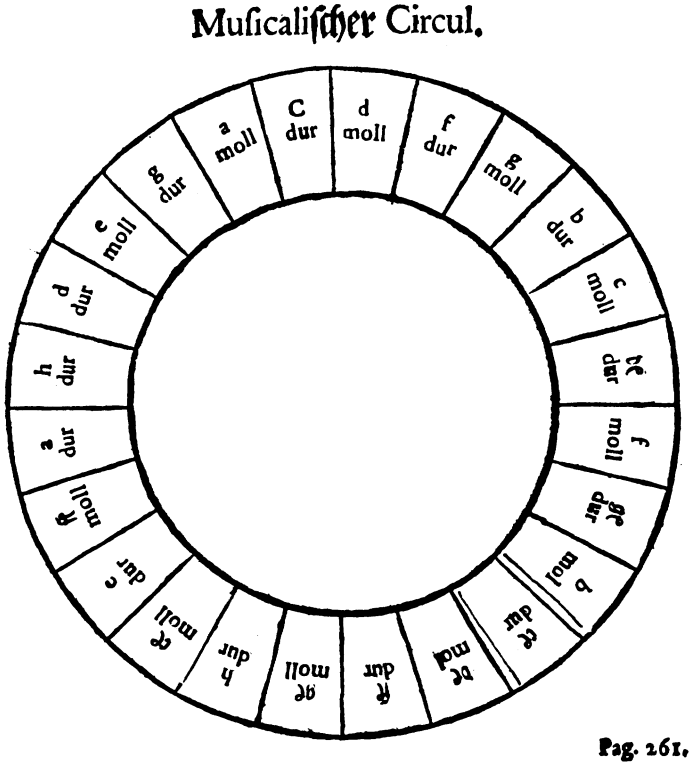


Plate 1. Heinichen's Musical Circle

(Courtesy of the Music Research Division, New York Public Library)

fifths until he returns to the first key, all twelve minor keys are left out.[46]

The reference to Kuhnau's teaching is puzzling. The only extant theoretical treatise of Kuhnau's, his manuscript *Fundamenta compositionis* (1703),[47] written after Heinichen studied with him, presents the traditional modes. Similarly, in a letter to Mattheson written in 1717, Kuhnau took exception to the major and minor keys, arguing for the retention of the Phrygian mode, and perhaps some others as well.[48] Possibly Kuhnau had also taught circular harmonic progressions in the manner of Werckmeister's "circle of the entire keyboard"[49] discussed above. The separation of modal theory and circular harmonic progressions found in the works of Werckmeister and implied in the teaching of Kuhnau apparently derives from Kircher. The treatment of mode in his encyclopedic *Musurgia universalis* (*Tomus I,* Rome, 1650; 650 pp. in 4°!) is completely traditional, the only unusual feature being an extensive discussion of transposition.[50] A harmonic circle ("χύχλωσιν harmonica") by fourths and fifths appears only as an abstract concept in the discussion of various types of keyboards. A particular keyboard with a 16-note octave is capable of such a "circulatio" but only after passing through three octaves.[51] Although Heinichen had assumed that Kircher's circle used major and minor keys, Heinichen himself was actually the first theorist to combine in print the concepts of circular harmonic progressions and key or mode theory.[52]

In the *Neuerfundene Anweisung,* Heinichen shows little respect for the old modes, although he notes in the preface that one does not necessarily have to do away with them. After presenting the musical circle, however, he suggests that the old modes can now pass away.[53] But in the considerably enlarged 1728 edition of his treatise,[54] Heinichen provides a fuller explanation of his positions, both in the body of the text and in extensive footnotes. In the chapter on the musical circle he gives four reasons for the usefulness of the circle.[55] He notes that even among musicians who accept the major and minor keys, there are many who assert that the old modes are necessary to learn the relationships between keys, and to learn which keys lie closer and which are more distant from

one another. He cites Werckmeister's warning that he who does not know the modes will enter a labyrinth in his compositions and not know how to proceed.[56] Heinichen ridicules this position, asserting that the method of modulation gained by understanding the modes is treated by him without reference to the modes. According to Werckmeister, one can modulate to those keys whose tonics are found in the tonic triad of the key or mode in which the modulation begins; for instance, if one begins in Ionian with the triad ceg, one can modulate to Phrygian with the triad egb. Heinichen notes that if this is true, it is the triad only which is necessary. Second, the modulation by thirds that arises is not the only possible one.

This is a crucial point. Earlier theorists, going back at least to Zarlino, had noted that the three principal cadences (whatever the terminology used) of a mode were to be made on the lower and upper notes of the species of fifth of the mode, and on the third which divides the fifth. This was maintained throughout the 17th century, with exceptions noted only where cadences on B would be necessary (Phrygian and Mixolydian). Heinichen is no longer willing to accept this. Not only does the circle pair each major key with its relative minor (hitherto considered a distant relation in theory) but it also separates the major keys rather widely from their mediants. The best ways to modulate through the circle are (1) proceeding through all keys in order to left or to right, or (2) proceeding through alternate keys in order to right or to left. Skipping two keys may work for a single modulation, but is hardly possible for continued use. Heinichen thus largely freed modulatory possibilities from the old modal bounds.

Other aspects of modal theory are also ridiculed. The assertion that the ambitus of a mode is an octave, give or take a few notes, is akin to saying that one should use only two or three fingers, or that only 24 letters of the alphabet should be used. He closes the discussion with the comment that such old stupidities ("Thorheiten") should pass, since they are no longer applicable to our times.

Heinichen's more open antagonism towards the modes in the 1728 edition may have been inspired by Mattheson's polemic in the latter's *Das beschützte Orchestre* of 1717.

Heinichen, one of the musicians to whom this work was dedicated, wrote to Mattheson on December 7, 1717:

> I am a special friend neither of the old imprisoning musical modes, nor of the superfluous and decayed *ut, re, mi, fa,* nor of other dusty musical fads. I admit readily that many times I have pondered deeply over the fact that, for whatever reason, there are still people in our time who seek to bring up and defend the long since decayed musical rubbish of antiquity . . . .[57]

Heinichen may have written the first work in the German language based on the 24 major and minor keys. But it was Johann Mattheson (1681–1764) who brought the battle between adherents of the major and minor keys and adherents of the church modes out into the open during the 1710's and 1720's. Mattheson waged a relentless campaign against the use of the church modes and related antiquities to explain contemporary music. His wit, satire, irony, and sacrilegious attitude towards the idols of the past, incited the upholders of the old order to respond with defenses of their opinions. On occasion this led to further rejoinders on both sides. As a result of his attacks, we have the comments of several musicians who might otherwise not have written at length on these subjects.

Mattheson was a prolific writer who published several thousand pages on music theory, criticism, aesthetics, performance practice, composition, and history. He read widely and exhibits familiarity with writings on music and other subjects by a variety of authors, both contemporary and ancient, in German, English, French, Italian, Latin, and Greek. In volume II of his *Criticae musicae* (Hamburg, 1725) he lists over 400 authors on music to be added to Brossard's list of 900 at the end of the latter's *Dictionaire* (Paris, 1703). That he kept abreast of contemporary developments is shown in his reference to Alexander Malcolm's *A Treatise of Musick* (Edinburgh, 1721) only a year after its publication.[58] In addition to writing on music, Mattheson composed both vocal and instrumental music. As a true man of the Enlightenment, his life extended outside the world of music: he was secretary to the

British Ambassador in Hamburg, and wrote and translated works on law, politics, diplomacy, and other subjects. Certainly he ranks as one of the most energetic persons associated with the history of music.[59]

It is ironic that Mattheson's first work, which began all the polemic, uses various aspects of traditional modal theory in the presentation of the major and minor keys, adopts as a whole a fairly tolerant attitude towards the church modes, and is not in general as radical as either Janowka's or Heinichen's treatise. *Das Neu-eröffnete Orchestre* of 1713 (referred to hereafter as *Orchestre I*) contains a full exposition of the church modes (which are called the "Greek manners of singing" ["Griechische Sing-Arten"]), with the note that "church and chorale music sometimes use these modes even today, although with great freedom and changes.[60] In all his works, Mattheson was willing to allow the modes a place in church music. It is for contemporary music that he considered these modes to be inadequate.

> The Italians and contemporary composers use another means to differentiate their "modulations"[61] and call
>
the first key	d f a	or	d minor
the second key	g b-flat d	or	g minor
the third key	a c e	or	a minor
the fourth key	e g b	or	e minor
the fifth key	c e g	or	c major
the sixth key	f a c	or	f major
the seventh key	d f-sharp a	or	d major
the eighth key	g b d	or	g major.

> ... Although the above-mentioned eight keys are easily the best known and most prominent,[62] yet the following are not less useful and acceptable:

9.	c d-sharp g	or	c minor
10.	f g-sharp c	or	f minor
11.	b-flat d f	or	b-flat major
12.	d-sharp g b-flat	or	d-sharp major
13.	a c-sharp e	or	a major
14.	e g-sharp b	or	e major
15.	b d f-sharp	or	b minor
16.	f-sharp a c-sharp	or	f-sharp minor

... Whoever is eager to know all the keys must add the following:

17.	b e-flat f-sharp	or	b major
18.	f-sharp b-flat c-sharp	or	f-sharp major
19.	g-sharp b e-flat	or	g-sharp minor
20.	b-flat c-sharp f	or	b-flat minor
21.	g-sharp c e-flat	or	g-sharp major
22.	c-sharp e g-sharp	or	c-sharp minor
23.	c-sharp f g-sharp	or	c-sharp major
24.	e-flat f-sharp b-flat	or	e-flat minor.

... According to the present division of the keyboard we have no more than 12 different tones, which are the 12 semitones of the chromatic octave, each of which can be changed once by the minor or major third; thus the 24 above-mentioned keys arise and remain just 24.[63]

Mattheson goes on to note that no other author, with the sole exception of Heinichen, ever presented all these keys.[64]

> Nevertheless, no musician will deny that all such keys are encountered on the keyboard; and that they can skillfully be made use of occasionally, provided that the tempering of the instrument is done properly (which the tuner must understand), and provided that he who would play thorough-bass is a solid virtuoso, and is well versed in it.[65]

Mattheson's order of presentation of the keys is in the tradition of Falck, Speer, and Niedt. Unlike Janowka, who paired parallel major and minor keys, or Heinichen, who paired relative major and minors, Mattheson's ordering has no musical rationale. Not until 1717 did he pair parallel majors and minors, and not until 1735, in his *Kleine General-Bass-Schule,* did he present an "improved" musical circle, in which he claims that it is "more comfortable" to modulate than in Heinichen's.

When he comes to list the affects of each new key, Mattheson presents a confusing mixture of old and new theory. He rejects the opinion that the entire affect resides in the major or minor third, or in the key signature.[66] For him each key has its own affect, and is wholly independent of the others. He discusses first the affects that the ancients ascribed to the

modes, then those of the moderns. Finally, he gives a list of the affects for each of the keys. Those keys which correspond by final and third to one of the old modes or to their common transpositions are referred to by name: D minor (Dorian), G minor (Dorian transposed), A minor (Aeolian), E minor (Phrygian), C major (Ionian), F major (Ionian transposed), G major (Hypoionian), B-flat major (Lydian transposed). The inconsistencies are confusing. F major is not referred to as Lydian, but B-flat major is. G minor is transposed Dorian, and D minor is referred to as Dorian, but the scale implied is transposed Aeolian. Mattheson was always interested in the study of affect, and evidently used the old modal names in order to be able to refer to the opinions of older authors on the subject. Thus Lydian, which was not widely used, and therefore had few affects associated with it, is avoided except where necessary. How seriously Mattheson took the entire subject of affect is seen by the length of his discussion, which encompasses over 20 pages.[67]

Mattheson pokes fun at older authors for never referring to several keys in common use. He notes that D major is not listed by Kircher, nor is it found among the ancient modes: "From this, among other things, is seen the defect of ancient music."[68] About C minor, he remarks:

> It would be no idle curiosity to investigate whether it was by crass error or by a most profound ignorance that this most attractive key merited a place neither in the authentic, plagal or transposed modes, nor even in the ecclesiastic or Gregorian tones. The stupidity of the ancients is hardly to be believed, much less excused.[69]

Like Heinichen and Janowka, Mattheson seems to project the 24 keys on the past and then wonders why no previous author took the trouble to mention them.

Thus, two conflicting attitudes towards modes and keys are present in the *Orchestre I.* On the one hand, the 24 major and minor keys are presented as the basis of modern music, and although the old modes are mentioned, earlier authors are severely criticized wherever they failed to give the major and minor keys their due. Yet some aspects of the old modes are retained. Some of this ambivalent attitude towards the modes

is explained by Mattheson's encyclopedic approach in the *Orchestre I.* In his attempt to provide impressive data, Mattheson perhaps ultimately weakened his case. But by introducing all this material, seemingly extraneous to the modern knowledge of keys, Mattheson betrays the state of affairs in 1713 all the more clearly. Even a strong advocate of the new keys in Germany in 1713 felt it proper to try to relate the old modal names and affects to the new keys. It is significant that it was only in the 1728 edition, not that of 1711, that Heinichen protested so vigorously against using the names and attributes of the old modes. The two men's attitudes in 1711 and 1713 may have not been very different, if allowance is made for Mattheson's posturing.

Johann Heinrich Buttstett (1666–1727), an organist at Erfurt, took sufficient offense at the *Orchestre I,* however, to publish an answer. His *Ut, mi, sol, re, fa, la, tota musica et harmonia aeterna* (Erfurt, 1715?)[70] is perhaps best described by its title page:

> *Ut, mi, sol, re, fa, la, tota musica et harmonia aeterna,* or newly published, old, true, sole and eternal *Foundation of Music,* opposed to the *Neu-eröffnete Orchestre,* and divided into two parts, in which, and to be sure in the first part, the erroneous opinions of the author of the *Orchestre* with respect to tones or modes in music are refuted. In the second part, however, the true foundation of music is shown, Guidonian solmisation is not only defended, but also shown to be of special use in the introduction of a fugal answer; lastly, it will also be maintained that some day everyone will make music in heaven with the same syllables that are used here on earth.

Ut mi sol is the first of a number of extremely conservative German works of the first half of the 18th century (others, to be discussed below, are by Murschhauser and Spiess). In his definitions of the modes, Buttstett wanted to turn the clock back to the mid-16th century, before Zarlino's differentiation of the affects of the modes according to the quality of certain important consonances. He defends the church modes, asserting that the placement of the semitone is the only criterion for differentiating modes, so that all of Matthe-

son's keys are transpositions of only two modes. And, as he quotes Printz, transposition is "more a folly and a blunder which corrupts the harmony, than an art."[71] In the practice of solmisation, moreover, he wanted to return to the status quo of the 15th century, before Ramos de Pareja advocated a seven-syllable solmisation based on the octave.[72] His defense of the Guidonian system of solmisation with three hexachords and the technique of mutation is consistent with his acceptance of the church modes as the sole basis of music. In major-minor tonality, there are only two basic scale constructions above the tonic that a beginning student has to learn. In the church modes, however, there are six basic scale constructions. By learning a single hexachord construction, and using mutation where necessary, any modal melody can be easily learned.[73]

Yet despite his fervor, Buttstett, already in the title of his work, indicates the basic dichotomy between major and minor. The syllables are ordered, ut, mi, sol, re, fa, la—the major and minor triads.[74] Walther Blankenburg has pointed out representations of the major and minor triads in the frontispiece.[75] Johann Lippius's treatment of the triad, with its analogies to the Holy Trinity, so revolutionary a century earlier, had now become part of "ancient" tradition.[76]

Mattheson answered Buttstett with *Das beschützte Orchestre* (*The Orchestre Defended* [Hamburg, 1717]; referred to hereafter as *Orchestre II*). It is a merciless satire of Buttstett's opus, beginning in the subtitle: "Ut, Mi, Sol, Re, Fa, La—Todte (nicht Tota) Musica." The frontispiece mocks Buttstett's admiration of solmisation with a tombstone erected to Guido of Arezzo. Mattheson derides Buttstett's scholarly pretentions, and ridicules the differentiation of modes based on the placement of the semitones. Buttstett had asserted that there is only one natural semitone in music—mi, fa—and that it occurs twice in each diatonic octave, creating six primary modes. Mattheson's 24 keys are all transpositions of only two modes. Mattheson answers first by noting that Buttstett claims one semitone, two semitones per octave, and 12 semitones per octave. How can there be only one, yet also two and 12 of something? For Mattheson, all semitones are natural. If you ask a peasant to sing a song, he will start on any com-

fortable pitch, and will sing D-sharp-E or D-E-flat just as easily as he will sing B-C or E-F. The keys in use in contemporary music are differentiated by the register of the final tone, the proportions of the tempered scale, and the triad, but in no way by the placement of the semitone.[77]

Mattheson accuses Buttstett of hiding the context of Printz's comment on transposition. According to Mattheson, Printz was complaining about transpositions on untempered instruments, and had no intention of prohibiting the use of keys such as C, F, B, and F-sharp minor and B, E, and A major. For Mattheson each major and minor scale is original, and none is the exact transposition of any other. In the meantone temperament he advocated, the tuning of each is different from any other—hence, each key is unique.[78] That the C major scale is considered the diatonic genus is only an accident of notation, not a sign that it is more original than any other.[79] He quotes from Werckmeister's *Hypomnemata musica* (1697):

> Why do upright musicians love transpositions so much? If they did not introduce pleasant variations, one would probably not think of them. The varied charm consists not only in the high or low register of the notes; rather, the difference and beat of the consonances and the dissimilarity of the tones and semitones impart an entirely different nature to the harmony.[80]

In other aspects as well, Mattheson's concept of key is not entirely in agreement with later interpretations. He argues that semitone differences in a given scale are unimportant, so long as they do not alter the quality of the third:

> If I prelude for a peasant in the octave species d e f-sharp g a b c d (transposed Mixolydian), for instance, and then prelude in d e f-sharp g a b c-sharp d (transposed Ionian) and he notes the difference, I will reward him. But if I play C minor for him only a few times, and then play D minor, if he does not sense this difference, he has either no ears or no soul.[81]

A similar point arises in a letter from Johann Kuhnau to Mattheson, written in answer to the *Orchestre II*.[82] Kuhnau, although praising Mattheson for his side of the argument,

expresses doubts about dropping all the old modes, particularly the Phrygian mode. Neither the major nor minor keys have a semitone above the final. How, Kuhnau asks, are Phrygian chorales to be elaborated in these new keys? Mattheson's answer is in two parts. First he notes that although all the keys begin with an ascent of a whole tone, in some keys there is a major tone, while in others the whole tone is minor. Then he notes,

> If, accidentally (outside of chorales), Phrygian and Hypophrygian phrases appear in a *galant* work, so long as it is required by the integrity of the song, this is not only possible, but must be considered as beautiful and moving.[83]

But this is not the way to expand the number of modes or keys. Mattheson's insistence on the quality of the third as the sole criterion for differentiating the keys allows him virtually to ignore the remaining scale steps.

The same point is raised in the letter exchange with Fux, also written in reply to *Orchestre II.* Fux notes that all of Mattheson's 24 keys were merely two modes, since they had the semitones in the same positions. Mattheson responds by listing 24 scales, each with the semitones in a different position, and each with the notation *dur* or *moll* based on the quality of the third, showing "that such changes of the semitones can contribute to the properties of today's modes little or not at all."[84]

Mattheson is not adverse to arguing two sides of an issue. He states that there are only two types of modes or keys. When he is charged with limiting compositional resources through this reduction in the number of modes from 12 to 2, however, he retorts that each major and minor key is unique because of the differences in temperament—but there are still only two types of keys! If the mythical Thuringian peasant he uses as an empirical proof cannot differentiate Ionian from Mixolydian, will he hear differences of a fraction of a tone? Each major or minor key is a transposition of the scale structure of all others. Yet the scales can be changed without altering the key, so long as the major or minor third is maintained. In effect, each key is unique and "original." Yet he is

hard put to find the affects for the last eight keys because they have not been used.

Finally, Mattheson still recognizes the use of the old modes for chorales:

> For, although one could get along according to today's manner with two types of modes, yet the old modes, and much less the 24 contemporary species, should not therefore be wholly and completely discarded, because our dear church songs, which in part are ordered according to the former, merit much respect from everyone. On the other hand, today's use of the modes [i.e., the 24 keys] also has its correctness and indicated ways, as a result of which there is no disorder and the digressions from the mode, when they follow nature and reason, remain proper. I will present my opinion of their characteristics most briefly, in order to show that I am not one of those who despise the old modes or discard them entirely out of ignorance.[85]

Mattheson dedicated the *Orchestre II* to thirteen prominent contemporary musicians, to whom he appealed for an "entirely impartial, free and candid opinion" of his views. Of the musicians who wrote replies to Mattheson, a number commented specifically on modes and keys. All the letters, together with Mattheson's answers where questions were raised, were printed by Mattheson in *Criticae musicae II* (1725), under the heading: "The *Orchestre*-Chancellery, or testimonies, letters, declarations, investigations, etc., by the former judges in the *Orchestre* trial." Among the favorable comments specifically on the subject of the modes are those by Georg Friderich Hendel (sic; 1685–1759), with whom Mattheson had been close friends and had fought a duel in 1704, Johann David Heinchen (1683–1729),[86] and Johann Krieger (1651–1735).

Only Handel will allow the modes for those who practice old music:

> As concerns the Greek modes, I find that you have said everything that there is to say. Their knowledge is doubtless necessary to those who want to practice and perform ancient music, which formerly was composed according to such modes; however, since now we have been freed from

> the narrow bounds of the ancient music, I cannot perceive what use the Greek modes have in today's music.[87]

Krieger's letter, which comments on each chapter of the *Orchestre II,* observes:

> I say this: the doctrine of solmisation and modes belongs to ancient music.... Concerning their use in today's music, I consider them unnecessary, troublesome and inadequate things....[88]

Johann Kuhnau's doubts about giving up the Phrygian mode, included in his letter, have already been mentioned.

By far the most important letter of this group, at least for the present study, is the one from Johann Joseph Fux, Capellmeister in Vienna, and later the author of the most important counterpoint text since Zarlino: the *Gradus ad parnassum, sive manductio ad compositionem musicae regularem* (Vienna, 1725).[89] He wrote on December 4, 1717, criticizing Mattheson's positions on modes and solmisation. Mattheson replied on December 18th. Fux and Mattheson each wrote one more letter, dated, respectively, January 12, 1718 and February 12, 1718.[90] The complete letter exchange is one of the most important documents we possess concerning developments of modes and keys in the 1710's and 1720's.

Fux appears here as a staunch defender of the church modes. For him, these are the basis of all music, ancient and modern, sacred and secular. Differentiations between modes are based solely on the position of the semitone in the diatonic octave. The 24 keys are, for him, only transpositions of Ionian and Aeolian modes. Fux also defends Guidonian solmisation, with six syllables, complete with the system of mutation, noting that he still uses it in Vienna.

Fux's position as expressed in these letters pertains directly to the interpretation of his *Gradus,* particularly with respect to the use of the church modes. Mode is discussed in two passages in the *Gradus,* the first just before the study of fugue and the second which presents much the same material but in more detail, at the end of the treatise. Fux notes that the subject of mode is highly complex, and announces his intention to mention only the most important points. Mode is defined

by the placement of the semitones in a diatonic scale,[91] and further by the placement of the fourth and fifth within the octave. There are six modes, and two forms of each. Josephus asks at one point whether all contemporary teachers have the same opinion of the 12 modes. Aloysius answers that there are differing opinions, but mentions only different countings of the church modes.[92] There is no mention of major and minor keys eight years after the letter exchange with Mattheson.

Some modern commentators have argued that Fux used the church modes in the *Gradus* merely for pedagogical purposes. Alfred Mann, for instance, writes in the introduction to *Steps to Parnassus:* "As a basis Fux chose the series of 'natural' tonalities, the old church modes which despite many attacks have, with the help of his teaching, proved their value throughout centuries of use."[93] In *The Study of Fugue,* Mann writes that Fux chose Palestrina as a model in order to use a style which emphasized equal treatment of all voices. This circumstance

> explains his retention of the modes, the theoretical basis of Palestrina's music. Indeed, in this presentation, Glarean's six authentic scales[94] offered Fux's student both a melodic-linear wealth which his own time had lost and the harmonic organization which it had conquered; studying the structure of the six basic modes and the essential intervals and cadences, he learned to understand the harmonic aspects of fugue while perceiving its melodic and linear aspects far more consciously than the limitation to two modes—major and minor—would allow.[95]

But Fux did not "choose" to use the modes; they were the only tonalities he recognized, as shown in this correspondence written eight years before the publication of the *Gradus.*[96]

It should be emphasized here that Mattheson was not adverse to the use of the modes for teaching purposes (or for church music, as noted above). In 1731, in his *Grosse General-Bass-Schule,* he hailed an announced German translation of Fux's *Gradus.*[97] Indeed, Mattheson himself may have planned a translation.[98] Fux and Mattheson were not arguing in 1717 over the best way to teach music; they were arguing about

which tonal system was best for the understanding of contemporary music.

Closely related to the question of Fux's purposes in using the modes is that of whether his work is to be understood as a general composition text, as a manual only intended for *a capella* style, or as a textbook in a purposely artificial style intended to make it timeless. Arnold Feil has argued that it is a pedagogical work for beginners only, written in an artificial style, and that the modes are used to insure its isolation from contemporary practice.[99] Hugo Riemann asserted that the work was out of date before it was written.[100] Peter Benary expressed a similar sentiment, and summed up Fux's contribution to music theory in the *Gradus* as basically conservative.[101] Lorenz Mizler, in his 1742 German translation of the *Gradus,* notes after the second discussion of the modes that "what the capable Fux states here about the keys, that has all been set forth much more clearly in our time."[102] Certainly Mizler did not believe that a revolution in teaching had occurred in the 17 years since the first publication of the *Gradus.*

Helmut Federhofer argued that the work is a composition text. Counterpoint was a legitimate type of composition, and was a standard part of pedagogy, along with thorough-bass. The basic rules learned in the *Gradus* were applicable to all musical styles.[103] After teaching counterpoint and fugue, Fux concludes his treatise with a study of the more complex dissonance usages in other styles in a manner not dissimilar to that found in Christoph Bernhard's *Tractatus compositionis augmentatus.*[104]

The evidence of this letter exchange with Mattheson supports this interpretation of the *Gradus* as a composition text. Fux as a composer wrote in both the old *a capella* style (*prima prattica*) and in more modern idioms. But the church modes were an intimate part of his thinking in all musical styles.

Although Mattheson wrote a number of works on composition after 1725, his opinions on the keys did not change substantially. One important distinction not found in his earlier works appears at the beginning of chapter 9 of *Der vollkommene Capellmeister* (Hamburg, 1739). He notes that *Ton* or *Ton-Art* refers to the placement of the final pitch, while *Modus* gives the species within the octave. This differentiation

of terms is also found in Alexander Malcolm's (b. 1687) *A Treatise of Musick* (Edinburgh, 1721), a work known to Mattheson. Apparently, the Frenchman Michel de St.-Lambert (dates unknown) was the first to make this distinction in his *Nouveau traite de l'accompagnement* (Amsterdam, ca. 1710).[105]

Buttstett's *Ut mi sol* was not the only work written in answer to Mattheson's *Orchestre I* of 1713. Franz Xaver Anton Murschhauser (1663–1738) published in 1721 the first volume of a projected two-volume treatise, *Academia musico-poetica* . . . . The section on modes includes three separate parts: the eight psalm tones, the eight Gregorian modes, and the 12 church modes used for "figural" music.[106] The work was severely criticized by Mattheson in *Critica musica,* Volume I (1722) in a section entitled "The compositional light-snuffers" ("Die melopoetische Licht-Scheere"). This subtitle is in answer to the inscription found on some copies of Murschhauser's work: "in order to bring a little more light to the excellent Herr Mattheson." Possibly as a result of this criticism, or for other unknown reasons, the second volume never appeared.

In 1745, Meinrad Spiess (1683–1761) published a lavish treatise in which, once again, the 24 keys are rejected as transpositions of only two modes.[107] The *Tractatus musicus compositorio-practicus* was reprinted in a second edition the following year.[108] Among other comments, Spiess notes that modern composers have limited themselves to only two modes. The mode on E with F-natural is used in the church, but not in the opera house: God has blinded the opera composers to the beautiful melodies possible in this mode to prevent them from profaning the mode. Among the advantages of the old modes are that it is easier to compose a fugue, there are more compositional possibilities, and there are more affects. On a number of important details, however, Spiess accepts modern terms. The 64-year-old Mattheson did not lift his pen, and Spiess was spared a fresh onslaught of polemic.

With the exception of Spiess's anomalous work, the treatises of Buttstett, Murschhauser and Fux were the last works published in German-speaking areas to advocate the use of church modes as the basis of all modern music. But this did

not indicate the end of the modal tradition in Germany. The dual modal and tonal theories were kept alive by the vast majority of treatises published in German virtually through the end of the 18th century. And so the national region which gave rise to the first true theory of major-minor keys at the beginning of the 17th century, and presented the first theory of 24 *equal and original* keys at the beginning of the 18th century, continued the dual traditions of church modes and major-minor keys from 1610 through the Baroque and well into the Classic periods.

NOTES

1. See the discussion of his *Instructio musicalis Domini Antonii Berthali* (1676) in Helmut Federhofer's "Zur handschriftlichen Überlieferung der Musiktheorie in Österreich in der zweiten Hälfte des 17. Jahrhunderts," *Die Musikforschung,* XI (1958), pp. 264–79.
2. See the discussion below of his *Das neu-eröffnete Orchestre* (1713).
3. See Joel Lester, "Major-minor Concepts and Modal Theory in Germany: 1592–1680," in *Journal of the American Musicological Society,* xxx (1977), 208–57.
4. Published undated. The date is found in the introduction to the *Harmonologia musica* (1702).
5. The second, third, fifth, and sixth treatises on this list have been published in facsimile editions (Hildesheim, 1970).
6. *Harmonologia,* p. 56.
7. *Musicae mathematicae,* pp. 123 and 112.
8. That is, in the upper fourth of the modal octave.
9. *Musicae mathematicae,* pp. 124–125. A similar complaint against the terms *dur* and *moll* is found in Georg Andreas Sorge's *Vorgemach der musicalischen Composition* (Lobenstein, 1745), p. 27. In Karl Geiringer's *Bach* (New York, 1954, p. 278) and in *The Bach Reader,* edited by Hans David and Arthur Mendel (New York, 1966, p. 85), the authors assert that terms for major and minor were not yet in general use in 1722 when J. S. Bach worded his elaborate reference to them on the title page of the *Wohltemperiertes Clavier:* "preludes and fugues through all the tones and semitones both as regards the *tertia major* or Ut Re Mi and as concerns the *tertia minor* or Re Mi Fa." This in spite of Werckmeister's complaint of 1687 that *dur* and *moll* were in such common use that he would accept them, even though he did not approve of them. Indeed, Bach's own *Gründlicher Unterricht des General-Basses* (published in Philipp Spitta, *Bach,* 2nd ed., Leipzig, 1916, vol. II, pp. 915–950) uses *dur* and *moll* to

mean major and minor in at least two passages (pp. 917 and 920). Bach's title to the *Wohltemperiertes Clavier* was possibly so worded in order to surpass Johann Kuhnau's two collections of 7 partitas each on "UT, RE, MI or the major third of each tone" and "on RE, MI, FA or the minor third of each tone" (*Neuer Clavier-Übung,* 1689, 1692; reprinted with original title pages in *Denkmäler deutscher Tonkunst,* IV [Leipzig, 1901]). Bach's compositions are on all the tones *and semitones,* in contrast to Kuhnau's partitas written only on the tones (C, D, E, F, G, A, and B-flat or B). Bach wrote the title page the year that Kuhnau died after a long illness, vacating the prestigious post at the Leipzig Thomaskirche for which Bach applied.

10. Pp. 85–89.
11. P. 123.
12. P. 69.
13. *Orgel-Probe,* p. 79. On p. 37 of the *Hypomnemata,* Werckmeister refers to a *Canzona* by Froberger composed some 30 years ago, in which the theme is transposed "through the entire keyboard on all 12 keys... through the circle of fifths or fourths."
14. Pp. 20–22.
15. Pp. 50–51. See Joel Lester, "Major-minor Concepts," footnote 77, for a discussion of the origins of the enharmonic spellings used here.
16. *Harmonologia,* p. 58.
17. E.g., Conrad Matthaei in *Bericht von den Modis Musicis* (1652). See Joel Lester, "Major-minor Concepts," p. 249–50.
18. *L'Organo suonarino* (Venice, 1605), Part II, "sopra gli Otto Tuoni spettanti al Canto fermo Ecclesiastico."
19. Walter Atcherson discusses these in his "Key and Mode in 17th Century Music Theory Books" (Journal of Music Theory, XVII [1973], 204-232), calling them "pitch-key modes." I have used the term church keys as a close translation of the name given to them in several languages by 17th century theorists: Banchieri's "tones of ecclesiastical plain chant," "Choral-Töne" in a German treatise by Poglietti (see below), and "acht tonos ecclesiasticos oder Kirchen Thon" in a keyboard collection by Fischer (see below), among others. "Pitch-key modes" also contains the problematic pairing of "key" and "mode" in a single term. Atcherson errs in calling them a "strictly seventeenth-century phenomenon" (p. 216); they are used from the late 16th until well into the 18th century, and are even cited in Koch's *Musikalisches Lexikon* of 1802 (article "Kirch-entöne," pp. 833–834). Furthermore, Atcherson's discussion contains confusing language on the differentiation of *mode* and *key.* Contrary to Atcherson's assertions, all major keys (like all minor keys) are transpositions of one another, just as modes can be transposed (cf. observation 2., p. 208); *ambitus,* if understood not merely as the range of the mode, but as the scalar content of that range, is as relevant to key as to mode (cf. observations 1. and 5., p. 208); and it is the modes, not keys, at least since Glarean, that have been

thought of as octave species (i.e., different organizations of whole and half steps) as much as species of 4ths and 5ths (cf. observation 4., p. 208; and see Joel Lester, "Major-minor Concepts," pp. 209 ff). Indeed, this last point is perhaps the most crucial. The difference between, e.g., Ionian and major is that Ionian is conceived *melodically* as an octave species, whereas major is a harmonic concept denoting major *harmonic* intervals over a few principal pitches. When differentiating major keys from one another, e.g., E-flat major from C major, the pitch name gives the level of transposition, and the term major gives the harmonic mode.

20. Transcribed by Macario Santiago Kastner, and published as *Altitalienische Versetten für Orgel oder andere Tasteninstrumente* (Mainz, 1957).
21. Facsimile, Bologna, 1969.
22. Reprinted as *Composizioni per organo,* ed. Dalla Libera (1956).
23. According to Walther's *Lexicon* Poglietti was a German (article *Polietti,* p. 486).
24. See Helmut Federhofer, "Zur handschriftlichen Überlieferung," p. 275.
25. Ibid., p. 274.
26. Part II, p. 66; Kirnberger lists tones number 7 and 8 as G and A major.
27. Facsimile, Hildesheim, 1964.
28. Pp. 833–34. See Herbert Schneider, *Die Französische Kompositionslehre in der ersten Hälfte des 17. Jahrhunderts* (Tutzing, 1972), pp. 271–73 for a listing of French treatises of the early 17th century mentioning the church keys.
29. Published undated. Walther's *Lexicon* dates it about the same time as Fischer's *Ariadne* (1702). See also Lothar Hoffmann-Erbrecht in *Die Musikforschung,* V (1952), p. 349. The collection is reprinted, edited by Rudolf Walter (Altötting, 1956).
30. Facsimile edition New York, 1967. Reprinted, edited by Guido Adler (Vienna, 1922).
31. Reprinted, edited by Rudolf Walter (Altötting, 1957).
32. Reprinted, edited by Rudolf Walter (Altötting, 1958).
33. Tone 7 is listed with F-sharp (pp. 85–86).
34. P. 38. Note that similar or identical meanings of *dur* and *moll* are found in Daniel Speer's *Unterricht* and in Janowka's *Clavis.* See also Johann Philipp Eisel's *Musicus autodidaktos* (Erfurt, 1738), p. 15. Jacob Adlung comments on this usage in his bibliographical *Anleitung zu der musikalischen Gelahrtheit* (Erfurt, 1758; facsimile Kassel, 1953), p. 218. Carl Dahlhaus's study, "Die Termini Dur und Moll," lists nine distinct meanings of *dur* and *moll* from antiquity to the 17th century, but omits this usage (*Archiv für Musikwissenschaft,* XII (1955), pp. 280–96).
35. Ulm, 1687; 2nd edition 1697 (facsimile edition, Leipzig, 1974).
36. 2nd edition, p. 20.
37. The first edition was published in 1700. Although Niedt planned a three-part work, only the first two parts appeared during his life-

time. The remaining part and the second edition of the second part were published posthumously, edited by Johann Mattheson. Since it is unclear to what extent Mattheson may have altered Niedt's work, only the first part is treated here as Niedt's own. (The second part, on variation, contains no discussion of the modes.)

38. I have not seen a copy of *Der accurate Organist,* and have taken the information presented here from Frank Thomas Arnold's *The Art of Accompaniment from a Thorough-Bass* (London, 1931, reprinted New York, 1965), pp. 243–47. Arnold does not state categorically whether or not Treiber makes an explicit differentiation between major and minor. The two chorales are "Was Gott thut, das ist wohlgethan" (Hypoionian), and "Wer nun den lieben Gott läst walten" (Hypoaeolian). Note that Treiber and Niedt, both musical amateurs, presented several keys earlier than many of their professional colleagues.
39. Walter Atcherson, "Key and mode," p. 228, concludes that major and minor did not descend from Ionian and Aeolian because "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." The two numbered assertions are completely contradicted by Werckmeister, surely the most important and learned German theorist of the end of the century. Furthermore, the "pitch-key" mode theorists (e.g., Falck) did gradually increase the number of keys formally recognized. Indeed, Mattheson stands as the culmination of this process, using the church keys as the first eight in his complete listing of the 24 keys.
40. This usage dates back to Boethius ("Modus est soni acuti gravisque distantia"), and was common among medieval and Renaissance theorists. In the MGG article, "Modus," Heinrich Hüschen lists no works after the *Musices libri II* (Wittenberg, 1561) by Martin Agricola (1486–1556) which use this terminology. It appears, however, not only in Janowka but also Heinrich Buttstett's *Ut, mi, sol* (c. 1715; see below) and in Johann Walther's *Lexicon* of 1732 (p. 417).
41. Both Heinichen and Mattheson use the older letter notation in 1711 and 1713, respectively.
42. Only in the preface does polemic intrude, when Heinichen complains about those supposedly learned theorists who often do not have any practical knowledge of music. In the body of the work, there are few such comments.
43. Pp. 104 and 199.
44. P. 204.
45. Heinichen was a student at the Thomasschule in Leipzig from 1696 to 1702. Kuhnau was in Leipzig after 1682, and was Cantor at the

Thomasschule from 1701 until his death in 1722, when J. S. Bach assumed the post.

46. *Der General-Bass in der Composition* (Dresden, 1728), pp. 840 and 837.
47. See Kurt Hahn, "J. Kuhnau's *Fundamenta compositionis*" in the *Kongressbericht* Hamburg 1956 of the Gesellschaft für Musikforschung (Kassel, 1957), pp. 103–5. It is unclear from Hahn's account whether or not the section on modes is a copy of Christoph Bernhard's *Tractatus compositionis augmentatus.* Johann Walther's *Lexicon* lists two other manuscript treatises by Kuhnau, but both are lost.
48. See below, p. 89–90.
49. *Hypomnemata musica,* p. 26.
50. Mode is discussed in Book III, chapters 15–17, and Book IV, chapters 7–8.
51. Pp. 457 and 462–63.
52. Although he was certainly the first to combine these theories in print, the manner of presentation suggests an oral tradition going back to an earlier date. It is difficult to assess such oral or pedagogical traditions except where they appear in print or in manuscript treatises.
53. P. 267.
54. Heinichen apparently began work on this version, titled *Der General-Bass in der Composition* (Dresden, 1728), not long after the 1711 work. By 1722 the first part of the treatise was already set in type (see p. 938).
55. Part II, Chapter 5, pp. 837–916. The last of these is the same as that on p. 267 of the first edition.
56. See Werckmeister's *Harmonologia musica,* p. 73.
57. Published in Mattheson's *Criticae Musicae* II (Hamburg, 1725; facsimile Amsterdam, 1964), pp. 212–13.
58. *Critica musica,* I (Hamburg, 1722), p. 8.
59. See Beekman Cannon, *Johann Mattheson, Spectator in Music* (New Haven, 1947), for a complete biography.
60. P. 57.
61. The term "modulation" carried several meanings during this period. See Alfred Mann, *The Study of Fugue* (New York, 1958), pp. 53–54, and William Mitchell, "Modulation in C. P. E. Bach's *Versuch,*" in *Studies in 18th-Century Music, a Tribute to Karl Geiringer . . .* (New York, 1970), pp. 333–42. In this passage it appears to connote "types of compositions."
62. They are of course the church keys.
63. *Orchestre I,* pp. 60–63. The following errors have been corrected here: no. 21 is mistakenly printed as g-sharp *minor,* no. 22 is printed as c-sharp *major.* In the pitch notation, the letter *b* is used for B-flat; the letter *h* for B. Some E-flats are notated by the symbol "♭"; all other accidentals are written as sharps, notated "♯."

64. Mattheson did not know of Janowka's listing, nor of those by the French mathematician Ozanam (1640–1717) in his *Dictionaire Mathématique* (Amsterdam, 1691, p. 660) and by Alexandre Frère in his *Transpositions de musique* (Paris, 1706).
65. *Orchestre I,* p. 64.
66. "Those who are of the opinion that the entire secret resides in the minor or major third and would prove that all minor keys, speaking generically, are necessarily sad, and on the contrary, that all major keys commonly foster a lusty character—it is not so much that they are wrong, but they have not yet gone far enough in their investigations. Those who are of the opinion that if a piece has a signature with flats it must necessarily sound soft and tender; if, however, it is set with one or more sharps, then its nature must be hard, fresh and gay—they have even less going for them" (ibid., p. 232). In later works he even argues that the tuning of each key is different (see below, fn. 78).
67. Pp. 231–52.
68. Ibid., pp. 242–43.
69. Ibid., p. 245.
70. Published undated. Mattheson's *Orchestre I* appeared in 1713. Buttstett notes in the preface that he has promised the work already for a year (fol. 5r). Mattheson's *Das beschützte Orchestre,* written in answer to *Ut, mi, sol,* was presumably published by the middle of 1717 (letters to Mattheson in answer were dated as early as December, 1717). This second *Orchestre* probably took a fair time in preparation; *Ut, mi, sol,* therefore, was probably published in 1715 or early 1716. The date 1717, given by Blankenburg ("Der Titel und das Titelbild von Johann Heinrich Buttstedts Schrift 'Ut, mi, sol, re, fa, la, Tota Musica et Harmonia Aeterna oder Neu-eröffnetes, altes, wahres, einziges und ewiges Fundamentum Musices (1717)," *Die Musikforschung,* III (1950), pp. 64–66) and also used in *RISM,* is almost certainly too late.
71. *Ut, mi, sol,* p. 49. Taken from Printz's *Satyrischer Componist* (Dresden and Leipzig, 1696), Part I, Chapter II, par. 6.
72. *Musica practica* (Bologna, 1482).
73. This is the very reason given by Guido of Arezzo in his *Epistola de ignoto cantu* (ca. 1030) for his invention of the hexachord. See the English translation in Oliver Strunk, *Source Readings in Music History* (New York, 1950), pp. 121–25. Mattheson, in the *Orchestre I,* advocated using letters of the alphabet (with suffixes to indicate accidentals) rather than solmisation.
74. The title is incorrectly listed as *Ut, re, mi, fa, sol, la* in Walther's *Lexicon* (1732), an inaccuracy continued in many later works, including even Ernst Ziller's monograph, "Der Erfurter Organist Johann Heinrich Buttstädt" (Halle/Salle, 1935), p. 81.
75. "Der Titel und das Titelbild."
76. In the *Orchestre I,* Mattheson derides such theological references to the triad (pp. 109–10), apparently unaware that it was precisely

because of the analogy to the trinity that Lippius coined the term *trias harmonica.*

77. P. 73. In later works, Mattheson turned to older sources to argue that modes were not differentiated by octave species until the later 15th century. The ancient Greek modes differed in register, not octave species. Nowhere in the works of Boethius is the octave species mentioned. Mattheson argues that it was not until Gafurius and Glarean that the octave species were cited as the basis of the modes, and that the problems of modal theory can be traced to them. See Mattheson's *Der vollkommene Capellmeister* (Hamburg, 1739; facsimile Kassel, 1954), Chapter 9, pp. 60–68.
78. Mattheson discusses the various tunings of intervals in his *Exemplarische Organisten-Probe im Artikel vom General-Bass . . .* (Hamburg, 1719, pp. 52–112). He recommends a tuning of the chromatic octave in which the I, IV, and V chords in C, E, and G major are tuned to pure thirds and fifths. The sole remaining pitch in the chromatic octave is B-flat, tuned to a major third below D. This system gives rise to four sizes of semitones and four sizes of whole tones. Only two pairs of keys (C and E major, and F and A major) share identical tunings. Mattheson notes that the chromatic tones in these keys will differ in tuning. (See pp. 57–59 and p. 60 for the tables which best illustrate these tunings.)
79. The treatment of all keys as equally original differentiates the theories of Janowka, Heinichen, and Mattheson from many more or less contemporary French presentations of 24 keys. See Joel Lester, "Major-minor Concepts," fn. 85.
80. P. 33.
81. P. 82.
82. Printed in Mattheson's *Criticae musicae,* II (1725), pp. 229–39.
83. *Criticae musicae,* II, p. 242.
84. Some of these scales are rather bizarre, including, e.g., F G-sharp A B-flat C D E-flat F, and D E-flat F G-sharp A B-flat C-sharp D. (See ibid., p. 195.)
85. *Orchestre II,* p. 382.
86. Heinichen's name was spelled this way in the 1711 edition of his thorough-bass treatise. See above, p. 83, for an excerpt from this letter.
87. Handel's letter, written in French, is printed along with Mattheson's German translation on pp. 210–11. The letter is dated London, February 24, 1719.
88. Pp. 216–19.
89. See Alfred Mann, *Steps to Parnassus* (New York, 1943) and *The Study of Fugue,* pp. 78–138, for English translations of books I and II. The introduction and notes to *Steps to Parnassus* give complete bibliographical details and include a history of all translations. The 1725 edition appears in facsimile (New York, 1966).
90. *Criticae musicae* II, pp. 185–205. Translated by this author. "The Fux-Mattheson Correspondence: An Annotated Translation," *Current Musicology,* no. 24 (1977), pp. 37–62.

91. *The Study of Fugue,* p. 80.
92. Latin edition of 1725, pp. 221–22 ff.; German translation by Lorenz Mizler (Leipzig, 1742), pp. 160–61 ff.
93. P. 12.
94. Because of his peculiar nomenclature for the modes, Fux's usage can be traced to Zarlino, not to Glarean. See Joel Lester, "Major-minor Concepts," fn. 18.
95. Pp. 53–54.
96. Friedrich Wilhelm Riedel's rather hypothetical reconstruction of Fux's library includes not a single treatise which contains the major-minor keys. See "Johann Joseph Fux und die römische Palestrina-Tradition," in *Die Musikforschung,* XIV (1961), pp. 14–22.
97. "Ode on seeing a translation of Fux's *Gradus ad Parnassum* announced in the catalog of the musical works of M. Telemann" (p. 181).
98. Alfred Mann, *Steps to Parnassus,* p. 10.
99. "Zum Gradus ad Parnassum von J. J. Fux," *Archiv für Musikwissenschaft,* XIV (1957), pp. 184–192.
100. *Geschichte der Musiktheorie* (Leipzig, 1898), p. 415.
101. *Die deutsche Kompositionslehre des 18. Jahrhunderts* (Leipzig, 1961), p. 80.
102. P. 165 in Mizler's translation.
103. "Johann Joseph Fux als Musiktheoretiker," *Hans Albrecht in Memoriam,* ed. Wilfried Brennecke und Hans Haase (Marpurg, 1962), pp. 109–15.
104. The separate translations of the sections on species counterpoint and on fugue (by Alfred Mann in *Steps to Parnassus* and *The Study of Fugue*) can give a misleading impression of the total scope of Fux's treatise.
105. "The tone of an air ("le ton d'un Air") is the note on which it ends; and this note is also called the final .... This final is always the fundamental note of the air, and, so to speak, the tonic note ("la note Tonique"). Mode ("le mode") is the determination of the course which the melody of an air should have .... It is that which constitutes the species of each interval; it is the particular system on which a piece of music is built" (p. 51).
106. "Von denen Tonis Choralibus, und Figuratis," pp. 106–86.
107. *Tractatus musicus compositorio-practicus* (Augsburg, 1745), pp. 34–36.
108. Spiess was a member of Mizler's "Korrespondierenden Sozietät der musikalischen Wissenschaft," and was highly regarded in many circles as a theorist and teacher. The *Tractatus* was listed along with Mattheson's *Der vollkommener Capellmeister,* Marpurg's treatise on fugue, Heinichen's thorough-bass treatise, and other works on composition, for a mid-18th-century music library by J. A. Hiller. See Vincent Duckles, "Johann Adam Hiller's 'Critical Prospectus for a Music Library,'" *Studies in 18th-Century Music, a Tribute to Karl Geiringer* (New York, 1970), pp. 177–85.