CARL DAHLHAUS
ROBERT O. GJERDINGEN

Studies on the Origin of Harmonic Tonality

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Carl Dahlhaus

Translated by
Robert O. Gjerdingen

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TRANSLATOR'S PREFACE

In his book on architecture, the Roman scholar Vitruvius included a section on what we might now call the subject of acoustics, though he called it harmony. Forced to use the prevailing Greek terminology, he lamented that "harmony is an obscure and difficult aspect of music theory, especially for those not versed in Greek. If we wish to explain it, then we must make use of Greek terms because some of them do not have Latin equivalents" [Harmonice autem est musica litteratura obscura et difficilis, maxime quidem quibus graecae litterae non sunt notae. Quam si volumus explicare, necesse est etiam graecis verbis uti, quod nonnulla eorum latinas non habent appellationes (De Arch., 5.4.1)].

The modern writer on harmony faces similar if not greater problems, with the intervening centuries having added Latin, Italian, French, German, and English to the list of languages with important music-theoretical vocabularies. Professor Dahlhaus, in preparing the original edition of this work, wisely chose to let each source speak in its own tongue. He trusted his intended readers, European scholars in the humanities, to translate the various passages as they saw fit. For them, Rameau speaks in French, Zarlino in Italian, Tinctoris in Latin, de Santa Maria in Spanish, Lowinsky in English (with a slight accent, to be sure), and Riemann in German.

In preparing the English edition, my intent has been to make its contents accessible to as broad a spectrum of readers as possible. And, reasoning that if translating 20th-century German is helpful, translating 14th-century Latin is surely more helpful still, I have forced everyone in the book to speak English. As in the quote above, however, I include the original language after each quotation. So the expert, who might favor translating Vitruvius's *harmonice* as "harmonics" rather than "harmony," has the source at hand for direct comparison.

Vitruvius and other Latin authors translating musical terminology from the Greek had to contend with the Latin tongue's comparatively meagre vocabulary for matters musical. Two Greek terms with slightly different meanings often emerged as the same Latin word (e.g., the Greek φθόνγος [tone] and ψόφος [noise] could both become the Latin *sonus* [sound]). In musical vocabulary, especially on technical points, German and English stand in a similar relationship. Two German words expressing subtle distinctions often have a single English equivalent.

For example, Professor Dahlhaus illustrates a discussion of different historical concepts of musical intervals by contrasting the terms *Grossterz* [lit. "large third"] and *Durterz* [lit. "major-mode third"]. Both are normally translated as "major third." But this hopelessly obscures Professor Dahlhaus's point: the distinction between an interval as a size (a large size) and an interval as a component in a harmonic system (a major system). Another and more central distinction for the topic at hand is that between *Zusammenklang* and *Akkord*. In English, both can mean "chord." But as used in this study, the first term refers to a "sounding together" of many independent entities, while the second implies something perceived as one unit in a larger relational system. For the first, either "simultaneity" or "sonority" is possible in English, though neither is quite right. My choice in this book is predominately "sonority" because though less accurate in some instances, it better fits the overall semantic field to which Professor Dahlhaus applies *Zusammenklang*. For the second term, the ordinary word "chord" suffices, with the understanding that here it takes on an additional connotation: "*Akkord*, not *Zusammenklang*."

Other terms may lack native equivalents not because of an insufficient vocabulary, but because the ideas they represent may not survive the journey from one conceptual world to another. *Leittonwechselklang*, for instance, is a German word so deeply embedded in the concepts of Riemann's theory of functions that it requires an extended footnote even for German readers. In cases like this I have chosen to leave the word in the original language, since an awkward but legitimate borrowing seems preferable to the introduction of a spurious English neologism.

When Professor Dahlhaus wrote his *Studies* in the 1960s, it was a common practice to modernize the orthography of sources from earlier periods. Scholars who had grown up reading Cicero found Medieval spellings like *que* for *quae* or *michi* for *mihi* quaint and, in the minds of some, uncouth. Today the fashion has shifted toward preserving a text's original appearance. In reproducing the hundreds of citations treated by Professor Dahlhaus, my policy has been, where possible, to give them in their *Urtext* form. The tremendous amount of textual scholarship that has occurred since these *Studies* were written has also made it possible to present texts of greater authenticity than those based solely on the early though invaluable collections of Gerbert and Coussemaker.

Readers should note that textual authenticity is occasionally a mixed blessing. An author like Rameau can spell "subdominant," a word of his own coinage, three different ways in three different sources. And yet this too is a trait that warrants preservation, at least in small doses.

It shows us, in orthographic microcosm, something of Rameau the man—the 18th-century savant whose thoughts were always in flux, always seeking a better way to reduce the complexity of harmony to its *principes naturels*.

While I translated all quotes and citations independently, I have nevertheless gained much from consulting the extant translations of many of the texts touched upon in this volume. I owe a great deal to the work of Warren Baab on Guido d'Arezzo, Peter Berquist on Pietro Aaron, Philip Gosset on Rameau's *Traité*, Lawrence Gushee on Aurelian of Réôme, Deborah Hayes on Rameau's *Generation harmonique*, Jan Herlinger on Prosdocimo de' Beldomandi, Earnest Harris on Mattheson, Walter Hilse on Christoph Bernhard, H. Wiley Hitchcock on Caccini, Edward Lowinsky on Tinctoris, Guy Marco, Claude Palisca, and Vered Cohen on Zarlino, Clement Miller on Glarean and Gaffurius, Benito Rivera on Johannes Lippius, and Irwin Young on Gaffurius.

Misprints and other minor errors found in the German edition have been corrected without comment.

I would like to thank the National Endowment for the Arts for their original support of this project, the Mellon foundation and Harvard University for providing me time to revise it, and the staff of Harvard's Eda Kuhn Loeb Music Library for assisting with my many queries. I would like to thank my wife Catherine for her editorial assistance, Elizabeth Powers of Princeton University Press for guiding the book's production, and Dean Roy Elveton of Carleton College for supporting the project's last stages. Finally I must thank Professor Dahlhaus for his help, for his encouragement, and for his thought-provoking contributions to our understanding of the history of tonality in Western music.

Robert O. Gjerdingen
Cambridge, Massachusetts
1987

A Note on Pitch Designations:

The pitches extending from the piano's middle C to the B a seventh above are represented as **c′**, **d′**, . . . **b′**. Pitches in the next higher octave are indicated by a double prime (e.g., **c″**). Pitches in the octave below middle C are represented by lower-case letters (e.g., **c**), and those in the octave below that by upper-case letters (e.g., **C**). In any octave, note names meant to specify particular pitches are set in bold type. Note names referring instead to a general class of pitches (e.g., all "c"s) are set in plain type.

Within the historical treatises cited by Professor Dahlhaus there are several divergent systems of designating pitches. Translated passages from these works use only the system described above. The original pitch designations, however, are preserved in the companion passages in the original languages.

A GUIDE TO THE TERMINOLOGY OF GERMAN HARMONY

Robert O. Gjerdingen

It may strike some as odd that there could be such a thing as German harmony as opposed to English harmony. After all, the phenomena in question—chords, keys, progressions, modulations—are presumably perceived much the same in Bonn as in Boston. But the words used to describe these perceptions derive from different traditions, traditions influenced not only by different music theorists but also by famous pedagogues whose textbooks have consolidated divergent national terminologies.

At the core of present-day German terminology stands the colossus of Hugo Riemann, a musical scholar of vast erudition who produced work in practically every field of music history and theory. His writings, never timid, frequently created such a stir that they could still dominate discussions a generation after his death. In addressing the subject of harmony, Riemann set himself characteristically grandiose goals: to uncover the roots of "musical logic" and to discern the underlying dynamics of "musical syntax." Drawing on the scientific work of Helmholz, the dialectics of Hegel, and the speculative musical theories of Hauptmann and von Oettingen, he formulated his famous theory of functions. Its central claim is that every chord represents one of three functional categories: tonic, dominant, or subdominant. The categories themselves are of course shared in the English tradition, and their names go back to Rameau and the beginnings of modern harmonic theory. But what separates the German tradition is the extent to which these categories have reshaped the terms for other chords and their interrelationships.

The German names for triads on the so-called primary or tonal degrees of the major or minor scale (I, IV, V) are familiar to English-speaking musicians: "tonic," "subdominant," and "dominant." But the names for the so-called secondary degrees may strike the English reader as foreign in both sound and concept. In the major mode, triads on degrees two, three, and six—"supertonic," "mediant," and "submediant" in English—are known as the "subdominant parallel," the "dominant parallel," and the "tonic parallel," commonly abbreviated Sp, Dp, and Tp. Here one sees cast the long shadow of

Riemann. The name of each secondary triad connects it with a primary triad, and so with one of Riemann's three functional categories. The relationship supporting this connection, what the Germans call the "parallel" relation, is known in English as the "relative" relation: the association of major and minor scales sharing the same diatonic pitches (e.g., A minor and C major). To complete the reduction of the major-mode diatonic triads to the three harmonic functions, all that remains is to interpret the triad on the leading tone as an incomplete dominant seventh chord (often symbolized as "D^7" with a diagonal slash through the "D").

At this point German harmony still does not depart markedly from English harmony. Both traditions presume harmony to be "functional," though the meaning of this term is less clear in English than in German. Both are ultimately descended from Rameau, though filtered through various theories of fundamental progressions based on the primacy of root movement by fifth. Both are often expressed in terms of Roman numerals, writers in German using only upper-case letters, writers in English often using upper-case letters for major and augmented triads, lower-case letters for minor and diminished. And both traditions symbolize triadic inversion or chordal elements beyond the triad with the venerable figures of the thoroughbass.

Yet in its treatment of the minor mode, German harmony demonstrates the penchant for bold systematization that was a hallmark of later 19th-century German scholarship. While English harmony generally discusses the minor mode as an analogue of the major mode, German harmony has been greatly affected by Riemann's decision to treat minor as the inversion of major. The consequences of his decision have been far-reaching, and at one time, in the late 19th and early 20th centuries, resulted in a vast symmetrical constellation of chords and relationships known as "dualistic" harmony.

Riemann's goal was to provide for each chord or relation in the major mode a corresponding, and inverted, chord or relation in the minor mode. But the goal of thoroughgoing dualism conflicted with aspects of his own theory of functions, with factors of harmonic practice, and with major-minor relationships that are analogous and parallel rather than inverse and symmetrical. Several compromises were necessary, and their cumulative effect in the face of the continuing desire for symmetry was the creation of an entire new class of chords, the *Leittonwechselklänge* explained below.

From the perspective of dualistic harmony, the presence of the reference tone—the "root"—of a major triad at the *bottom* of both a perfect fifth and a major third (**c** in **c–e–g**) requires the reference tone of a minor triad to be located at the *top* of a perfect fifth and

a major third (**g** in **c**–**e**♭–**g**). With this point in mind, let us create the three secondary triads in minor by inverting their major counterparts. In C major, the tonic parallel (Tp = A minor) differs from the tonic triad (T) by a single tone, an **a** one whole step *above* the fifth of the chord. So in C minor, the tonic parallel should differ from the tonic by a single tone one whole step *below* the fifth of the chord. The "fifth," however, is **c** itself, since the Riemannian root of this minor chord is **g**. The tone below the fifth is thus **B**♭ and the tonic parallel of C minor is consequently E♭ major, symbolized as "tP" (upper case representing major, lower case minor). Following the same line of reasoning, the subdominant parallel in C major (Sp = D minor) has its C-minor counterpart in an A♭-major triad (sP), and the dominant parallel (Dp = E minor) its counterpart in a B♭-major triad (dP).

If one class of secondary chords—the parallel chords—could be formed by exchanging a primary chord's *fifth* for the tone above it in major or below it in minor, then a second class of chords could be formed by exchanging a primary chord's *root* for the tone below it in major or above it in minor. The tone involved in this exchange (*Wechsel*) is the leading tone (*Leitton*), either the tone a half step below the root in major or a half step above the "root" in minor. The result is a tonic *Leittonwechselklang*, customarily abbreviated Tl in the major mode, tL in the minor mode. As one might expect, there are also subdominant and dominant *Leittonwechselklänge*. In C major the complete set is Tl = E minor, Sl = A minor, and Dl = B minor. In C minor the inverted set is tL = A♭ major, sL = D♭ major, and dL = E♭ major. (One will occasionally see the term *Gegenklang* [lit. "contrast chord"] in place of *Leittonwechselklang*. The term *Gegenklang* emphasizes the contrast of mode and the major-third relationship between a function and its corresponding *Leittonwechselklang*.)

This is clearly not a simple system. Three functional categories can appear in any one of three chordal guises in either of two modes, eighteen possibilities in all: T, Tp, Tl, t, tP, tL, S, Sp, Sl, s, sP, sL, D, Dp, Dl, d, dP, dL. Why all this complexity? Perhaps the central reason is that this ingenious, occasionally convoluted system enabled Riemann to achieve a grand and masterful synthesis of both the old and the new in late 19th-century music. Ostensibly remote triads could be interpreted through the traditional terms of the I–IV–V–I, or now T–S–D–T, cadential schema. A sequence of A♭-major, B♭-major, and C-major chords, for example, could be neatly interpreted as a subdominant (sP) to dominant (dP) to tonic (T) progression in C-major, a reading of these chords not without support in certain late-Romantic cadences. And a chord that often perplexes harmony students, the Neapolitan chord of D♭ major in a C-major context, could be shown

to be nothing more than a minor-mode subdominant *Leittonwechselklang* (sL).

The rise and partial fall of Riemann's system follows that of the late 19th-century harmony to which it was wedded. Thus in the first decades of the 20th century it was reaching new heights of complexity while simultaneously being undermined by doubts over its fundamental premises. In the course of this ferment several different symbolizations of the system arose. Today many are unfamiliar even to German musicians and are footnoted by Professor Dahlhaus where they occur. Two special symbols that nevertheless still retain some currency are the plus sign ($^+$) and the degree sign (°). The plus sign next to a note name or chord symbol indicates that the lower tone of the "fifth" is the reference tone. Thus "$^+$**d**" would mean that **d** is the reference tone of the major triad **d–f♯–a**. The degree sign indicates the inverse relationship—that the upper tone is the reference tone. Thus "°**a**" would mean that **a** is the reference tone of the minor triad **d–f–a**. Readers wishing a fuller account of the complete range of functional harmonic systems and their symbols should refer to the book by Renate Innig (*Systeme der Funktionsbezeichnung in den Harmonielehren seit Hugo Riemann* [Düsseldorf: Gesellschaft zur Förderung der systematischen Musikwissenschaft, 1970]).

The overtly dualistic elements of Riemannian harmony were among the first to fall out of favor, though earlier in this century their presence can still be strongly felt. For example, prewar German writers routinely used the term "dominant harmony" to refer not to a type of chord, V, but to a type of harmony based on a tonic with *two* dominants: an upper one, V, and a lower one, IV. And the notion of there being both a lower leading tone (**b** in C major) and an upper leading tone (**a♭** in C minor) is a matter of course for someone like Ernst Kurth. In more recent years the notion of *Leittonwechselklänge* has faded somewhat, but the concept of parallel chords remains strong and firmly entrenched in the standard terminology.

The remaining terms current in German writings on harmony have well-known English equivalents because they derive from a shared tradition antedating Riemann, that of *Stufentheorie* or "the theory of fundamental progressions." *Stufe* is an ambiguous term. Literally "step" or "scale degree," it connotes not only the diatonic triad on a particular scale degree but also that degree as the harmonic root of several possible chords and as a participant in one or more fundamental progressions, somewhat like a Roman numeral in English theory. The "IV" chord is thus the scale degree IV "writ large" (and in this sense one might view the theory of fundamental progressions, *Stufentheorie*, as the apotheosis of the thoroughbass).

Now just as in Riemann's theory of functions, the theory of fundamental progressions attempts to reduce the diversity of possible chord successions to an underlying model of one preferred progression, in this case V–I or the circle of fifths. The result, often achieved through "supposition" (=sub-posing; i.e., placing a conjectured bass a third or fifth below the real bass), is a profusion of "dominant" relationships. Those involving chromatic tones and known as "secondary dominants" in English are termed *Zwischendominante* or *Wechseldominante* in German and generally symbolized by a "D" in parentheses. A *Doppeldominante* is also a secondary dominant—the dominant of the dominant. It may be symbolized by two overlapping "D"s. (The fully dualistic system also requires the complementary symbol of two "S"s—the subdominant of the subdominant.) Finally, in cases where a dominant implies a tonic but the tonic is not realized in the music, the implied chord can be placed within square brackets. Thus, in a C-major context, (D)[Tp] might indicate an E-major chord *not* followed by an a-minor chord. That is, the square brackets indicate a missing tonic parallel (a-minor) which is preceded by its dominant (the major triad or dominant seventh chord on E).

Some may at first be put off by the overt theorizing apparent in German harmony, wishing perhaps that a choice be made once and for all between Riemann's *Functionstheorie* and the older *Stufentheorie*, or possibly believing that so-called linear theories have settled all earlier disputes. Yet this ongoing conflict between antithetical theories, with its attendant uncertainties and complexities, has special merits. In particular, whereas an English-speaking student may falsely believe that he or she is learning harmony "as it really is," the German student encounters what are obviously theoretical constructs and must deal with them accordingly. The sophisticated historical view of harmony that can arise within this tradition of competing theories is evidenced in Professor Dahlhaus's *Studies on the Origin of Harmonic Tonality*.

Studies on the Origin of Harmonic Tonality

INTRODUCTION

In 1844, F. J. Fétis defined "tonality," a term borrowed from Castil-Blaze, as the "set of requisite relationships, simultaneous or successive, among the tones of the scale" [collection des rapports nécessaires, successifs ou simultanés, des sons de la gamme].[1] A result of mankind's historical and ethnic diversity would, of course, be a multiplicity of tonalities (*types de tonalités*). But the theory that Fétis developed was restricted to *tonalité moderne*.

In contrast to Fétis, Hugo Riemann was convinced that the many *types de tonalités* could be reduced to a single *natürliches System*, that of the tonic, dominant, and subdominant chordal functions. The comprehension of tones as representatives of the tonic, dominant, or subdominant was to be taken as an innate norm of musical perception. But historians and ethnologists, shunning the forced constraints of systematization, rejected Riemann's thesis as empirically unsubstantiated. So "tonality," the phenomenon whose theory Riemann had developed, had to be more narrowly defined as "harmonic tonality" and removed from other *types de tonalités*. And in consequence, Riemann's "tonality" became a historical phenomenon whose origin could be described.

To be sure, it is a matter of dispute exactly when harmonic tonality—the representation of keys through chordal relationships—arose and developed. Many researchers seek its origin in the 14th (A. Machabey) or 15th centuries (H. Besseler), others in the 16th (E. E. Lowinsky) or 17th (M. Bukofzer).

The divergence of historical opinion rests to no small degree on contradictions between theoretical hypotheses. For this reason the first chapter, "The Theory of Harmonic Tonality," examines several systematic expositions of harmony: the fundamental-progression or "degree" theory [*Stufentheorie*] of Jean-Phillipe Rameau and Simon Sechter, the functional theory of Hugo Riemann, and the "energetic" theory of Ernst Kurth. To extract historically relevant criteria from theories that present themselves simply as universal musical systems, it is necessary first to narrow the range of their validity. Then an attempt must be made to resolve the contradictions between them.

Tonal harmony rests on two assumptions: first, that a triad constitutes a primary, direct unity; and second, that the progression of chordal

roots establishes the key. In the second chapter, "Intervallic and Chordal Composition," conclusions about the development of a consciousness of chords and root progressions will be drawn from a study of modifications in compositional practice. Of course two preliminary conditions must be satisfied if the result is to be historically well founded: first, an attempt must be made to define the older principle of harmony that formed the backdrop for tonal harmony ("The Principle of Contrasting Sonorities"); and second, there is the unavoidable discussion of the thesis that tonal harmony originated in the 15th century ("15th-Century Harmony").

From musical notation alone it is not possible to make a direct determination of whether a vertical combination of tones was or was not intended to be a chord. Thus one must naturally combine several methods, not only assembling documentary evidence on the conception of polyphonic compositions ("Compositional Types and Formulas in the 15th and 16th Centuries") and the view of chords ("The Development of Chordal Theory") but also demonstrating, with analyses of compositional rules and procedures, the range of applicability of the traditional rules of counterpoint and the significance of deviations from the norm ("The Treatment of Dissonance," and "Figured-Bass Harmony").

From the 17th through the 19th century, the characterization of key and the grammar of chords were two sides of the same coin—tonality was determined harmonically, through chordal relationships, and harmony was defined tonally. By comparison, in music from the 14th through the 16th century the two factors are mutually independent—the method of linking vertical combinations of tones did not primarily serve the presentation of the mode. The third chapter, "Mode and System," describes the same development considered in the second chapter (there in terms of compositional practice) from the point of view of conceptions of key.

The underlying hypotheses are, of course, so unclear that a detailed presentation, sometimes appearing to stray from the subject, is unavoidable. First, the notion must be considered that the transition to harmonic tonality was connected with modifications in the tonal system ("The Evolution of the Tonal System"). And second, musicologists' opinions differ so fundamentally on the meaning of mode in 15th- and 16th-century polyphony that it would be arbitrary to accept any single such thesis as a point of departure ("Modal Polyphony").

The evolution toward harmonic tonality can best be observed in changes in the function and disposition of cadences ("Key Relationship and the Disposition of Clausulas"). In addition, an attempt will be made to describe the intermediate stage—that of the "no longer" and the

"not yet"—that facilitated the transition to harmonic tonality ("Between Modality and Major-Minor Tonality").

In the fourth chapter, complete groups of works are analyzed. In the motets of Josquin des Prez, one can observe circa 1500 the significance of the c- and a-modes, proto-forms of major and minor. The analysis of some *frottole* by Cara and Tromboncino is motivated by the often-expressed thesis that it is in this genre that one can find the origin of tonal harmony. And finally, with reference to Monteverdi's madrigals, it will be demonstrated that the transition to tonal harmony was tied to changes in rhythmic organization and musical form.

. . .

The studies presented here were accepted as an inaugural dissertation in the winter semester of 1965/66 by the humanities faculty of Christian-Albrecht University, Kiel, West Germany.

I would like to thank both Professor Walter Wiora for including this manuscript in the *Saarbrücker Studien zur Musikwissenschaft* and the German Research Association for providing a publishing subvention.

CHAPTER I

THE THEORY OF HARMONIC TONALITY

Tonality and Harmony

Hugo Riemann defined "tonality" as "the special meaning that chords receive through their relationship to a fundamental sonority, the tonic triad" [die eigentümliche Bedeutung, welche die Akkorde erhalten durch ihre Bezogenheit auf einen Hauptklang, die Tonika].[1] Since Riemann termed these chordal meanings "functions," "tonality" is thus the embodiment of chordal functions.

The term, first coined by Castil-Blaze, was given formal definition by François Joseph Fétis. In conceiving the notion of tonality, Fétis experienced a dramatic enlightenment: "Suddenly the truth came to me; the issues were plainly set out, the darkness vanished, the false doctrines fell in shreds round about me" [Tout à coup la vérité se présente à mon esprit; les questions se posent nettement, les ténèbres se dissipent; les fausses doctrines tombent pièce à pièce autour de moi].[2] The mental image that Fétis connected with the term "tonality" is, of course, incompatible with Riemann's definition. To Fétis, the concept of functions was just as foreign as the idea of defining tonality primarily in terms of relationships among chords.

Riemann's system of tonality differs in four main points from the theory developed by Fétis: first, in the intellectual tradition in which the category "tonality" is based; second, in the designation of tonality's constituent features; third, in the conception of the relationship between the system of chords and the underlying scale; and fourth, in the determination of the theory's range of validity.

1. Riemann took over the thesis that tonality is based on acoustical fact from a tradition of "physicalism" (Jacques Handschin) extending back to Rameau. Thus the dominant tends toward the tonic because the dominant chord is contained within the harmonic series of the tonic chord's root.[3] But Fétis's concept of tonality represents the opposite thesis, the conviction that it is a mistake to explain musical relationships in terms of mathematics or acoustics. Fétis seized on the word "tonality" so as to have at hand a term expressing his view that scales and tonal systems are based not on the nature of sonic material but on diverse historical and ethnic circumstances. "For the elements of music, nature provides nothing but a multitude of tones differing in pitch, duration,

and intensity by the greatest or least degree . . . The conception of the relationships that exist among them is awakened in the intellect, and, by the action of sensitivity on the one hand, and will on the other, the mind coordinates the tones into different series, each of which corresponds to a particular class of emotions, sentiments, and ideas. Hence these series become the various types of tonalities" [La nature ne fournit pour éléments de la musique qu'une multitude de sons qui diffèrent entre eux d'intonation, de durée et d'intensité, par des nuances ou plus grandes ou plus petites . . . L'idée des rapports qui existent entre eux s'éveille dans l'intelligence, et sous l'action de la sensibilité d'une part, et la volonté de l'autre, l'esprit les coordonne en séries différents, dont chacune correspond à un ordre particulier d'émotions, de sentiments et d'idées. Ces séries deviennent donc des types de tonalités].[4] As a "purely metaphysical principle" (by "metaphysical" Fétis means "anthropological"), *tonalité* is the antithesis of the "natural principle" to which Rameau had reduced harmony. "But one will say, 'What is the principle behind these scales, and what, if not acoustic phenomena and the laws of mathematics, has set the order of their tones?' I respond that this principle is purely metaphysical. We conceive this order and the melodic and harmonic phenomena that spring from it out of our conformation and education" [Mais, dira-t-on, quel est le principe de ces gammes, et qui a réglé l'ordre de leurs sons, si ce ne sont des phénomènes acoustiques et les lois du calcul? Je réponds que ce principe est purement métaphysique. Nous concevons cet ordre et les phénomènes mélodiques et harmoniques qui en découlent par une conséquence de notre conformation et de notre éducation].[5]

2. According to Riemann, tonality is the embodiment of chordal meanings, and chordal meanings—subdominant, dominant, subdominant parallel, and dominant parallel—are based on "affinities between tones" [*Tonverwandtshaften*]. It was from Moritz Hauptmann that Riemann adopted the axiom that perfect fifths and major thirds are the only "directly intelligible" intervals,[6] and from the perfect fifth and major third Riemann deduced not only the structure of chords but also their relationship. Thus the major triad is composed of a perfect fifth and a major third above its root, the minor triad of a perfect fifth and major third below its fifth. And the relation between the tonic and dominant, or the tonic and subdominant, is due to the fifth-relation between the chordal roots in major or between the fifths in minor.

In contrast to Riemann, whose theory of tonality is a theory of "affinities between tones," Fétis saw the fundamental factor of *tonalité moderne* (the harmonic tonality of the 17th through the 19th century) residing in the contrast between triad and seventh chord, between the "consonant harmony called *accord parfait*, which has the quality of rest

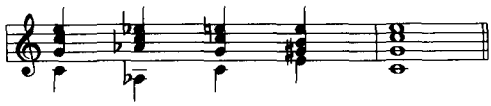
and conclusion, and the dissonant harmony, which causes tendency, attraction, and movement . . . Thus are determined the requisite relationships among tones that one designates, in general, by the name of tonality" [harmonie consonnante appelée accord parfait, qui a le caractère du repos et de la conclusion, et l'harmonie dissonante, qui détermine la tendance, l'attraction et le mouvement . . . Par là se trouvent déterminés les rapports nécessaires des sons, qu'on désigne en général sous le nom de tonalité].[7] The alternation of "rest" and "tendency" appears to be the governing principle of tonal relationship. Degrees I, IV, V, and vi of the major scale are "tones of rest" [*notes de repos*] and admit root-position triads. Degrees ii, iii, and vii, on the other hand, "cannot be considered tones of rest" [ne peuvent être considérées comme des notes de repos] and for that reason require a "derivative chord" [*accord dérivé*]—a sixth chord (**d–f–b**, **e–g–c′**, **b–d′–g′**). "Hence according to the tonal order, they can only be accompanied by derivative harmonies" [Suivant l'ordre tonal, ils ne peuvent donc être accompagnées que d'harmonies dérivées].[8] Fétis excludes the triads on degrees ii, iii, and vii from the *tonalité*. During chordal sequences that do include a triad or seventh chord on ii, iii, or vii, the feeling of tonality is suspended. "The mind, absorbed in the contemplation of the progressive series, momentarily loses the feeling of the tonality" [L'esprit, absorbé dans la contemplation de la série progressive, perd momentanément le sentiment de la tonalité].[9] Thus Fétis's concept of tonality does not comprise the totality of chordal relationships that are possible and significant in tonal harmony. Instead, it characterizes only a portion of them.

Fétis's theory seems irresolvably opposed to Riemann's. Yet a reconciliation is not out of the question. The assertion by Fétis that an *accord parfait* on the second or third degree of the scale is an exception to the rule of *tonalité* can be given the interpretation, without doing violence to his thesis, that a triad on the second or third degree *seems* to be an *accord parfait*, but is actually not. And the result of this "translation" is none other than Riemann's theory of "apparent consonances" [*Scheinkonsonanzen*]: the assertion that the apparent root of the subdominant parallel or dominant parallel is in fact a *sixte ajoutée*, a sixth added to the subdominant or dominant harmony. And conversely, Riemann's thesis that only the tonic, dominant, and subdominant are "consonances," while the tonic parallel, dominant parallel, and subdominant parallel are "dissonances," seems less strange if, following Fétis, one interprets "consonance" as *repos* and "dissonance" as *tendance*.

3. According to Riemann, tonality is a system of chords or "harmonies." The thesis of the primacy of the chord vis-à-vis the individual

tone, and of the chordal context vis-à-vis the scale, is one of the founding principles of the theory of functions. "1. We always hear tones as representatives of chords (i.e., consonant chords), of which there are only two kinds, namely the major chord (*Oberklang*) and the minor chord (*Unterklang*). 2. Similarly, we hear chord progressions (likewise melodies, which of course, following the first principle, represent chords in their simplest form) as a unitary relationship maintained with a principal chord (Rameau's *centre harmonique*, the tonic triad), against whose background the other chords are clearly understood and harmonically *related*" [1. *Wir hören Töne stets als Vertreter von Klängen*, d. h. konsonanten Akkorden, deren es nur zwei Arten gibt, nämlich den *Durakkord* (Oberklang) und *Mollakkord* (Unterklang). 2. *Akkordfolgen* (desgleichen Melodien, welche ja nach diesem Prinzip Akkordfolgen in einfachster Form darstellen) hören wir in ähnlicher Weise als eine Einheitsbeziehung auf einen Hauptklang (Rameaus *Centre harmonique*, die *Tonika*) wahrend, gegen welchem die andern Klänge wohlverständlich mit welchem sie harmonisch *verwandt* sind].[10] The major and minor scales are viewed as the result of disassembling the tonic, dominant, and subdominant chords into their constituent tones; the scale is secondary—a consequence, not a basis. The chordal context is independent of the scale.

As an extreme consequence of the hypothesis that the perfect fifth and major third establish "directly intelligible" tone and chord relationships there results the assertion that the A♭-major and E-major triads can be related directly to a C-major tonic. As an analog of the chord progression C–F–C–G–C, there appears C–A♭–C–E–C. "Hence the C-major tonality prevails as long as the harmonies are understood in their orientation to the C-major chord. For example, the admittedly audacious but effective and euphonious progression shown below



Example 1

defies definition in terms of an older doctrine of key. But in terms of a C-major tonality, it consists of the tonic triad, counter third-chord, tonic triad, plain third-chord, and tonic triad. That is, it consists only of closely related chords contrasted with the tonic triad" [So ist also die C-dur-Tonalität herrschend, solange die Harmonien in ihrer Stellung zum C-dur-Akkord verstanden werden; z. B. ist die zwar kühne, aber kräftige und wohlklingende Folge: (ex. 1), im Sinne einer Tonart älterer Lehre gar nicht zu definieren; im Sinne der C-dur-Tonalität ist

sie: Tonika—Gegenterzklang—Tonika—schlichter Terzklang—Tonika, d. h. es sind der Tonika nur nah verwandte Klänge gegenübergestellt].[11] But the direct "third-relation" postulated by Riemann implies nothing short of suspending the distinction between diatonicism and chromaticism. If, in contrast to Riemann, one clung to the distinction, it would then be necessary to interpret the A♭-major chord as the parallel of the minor subdominant, and the E-major chord as a chromatic alteration of the dominant parallel. The A♭-major chord would be based on a "change of diatonic system" (an exchange of the C-minor for the C-major scale), while the E-major chord would be based on a chromatic alteration of the C-major scale. By contrast, an A♭-major or E-major chord related directly to C major is neither diatonic nor chromatic—the distinction is abolished. And it is in this suspension of diatonicism as the basis of chordal relationships that Riemann saw the distinctive feature of "tonality," as opposed to the "older doctrine of key" founded on the diatonic scale.

This is in glaring contrast to Fétis, who saw the prerequisite for tonality in the diatonic scale. "Tonality," wrote Fétis, "is formed from the set of requisite relationships, simultaneous or successive, among the tones of the scale."[12] To be sure, Fétis's account of the relationship between tonality and scale is contradictory, or at least appears to be. On the one hand, tonality is the "regulating principle" (*principe régulateur*) of relationships among tones: "Now the regulating principle of the relationships among tones, whether in the successive or simultaneous category, is generally designated by the name of tonality" [Or, le principe régulateur des rapports des sons, dans l'ordre successif et dans l'ordre simultané, se désigne en général par le nom de tonalité].[13] On the other hand, tonality "results" from the scale: "That which I call tonality is then the system of melodic and harmonic events that results from the arrangement of tones in our major and minor scales" [Ce que j'appelle la tonalité, c'est donc l'ordre de faits mélodiques et harmoniques que résulte de la disposition des sons de nos gammes majeure et mineure].[14] And a founding principle of tonal relationship—in addition to the scale—is also seen in the opposition between dominant seventh chord and triad, between "*tendance*" and "*repos*."[15] These contradictions are not, however, irresolvable. The various definitions of tonality, all of them well founded, come into conflict because they are formulated as if each were comprehensive, while in reality they constitute mere portions of a larger definition, a definition that Fétis had in mind but did not articulate. That is, *tonalité*—more precisely *tonalité moderne*—is a historically and ethnically conditioned way of hearing that comprehends tone and chord relationships under the categories of *tendance* and *repos*. It is most clearly marked in the

contrast between dominant seventh chord and tonic triad, a contrast that stands in reciprocal relationship to the restriction of scales to major and minor. If Fétis alternately "defines" tonality as the result of historical and ethnic conditions (*le principe métaphysique*), as the relationships among tones (*les rapports nécessaires des sons*), as the contrast between dominant seventh chord and tonic, and as the major and minor scales, it is not that he involves himself in objective contradictions. Rather, he makes use of a rhetorical figure, claiming a part as the whole.

4. "If one asks," wrote Riemann, "wherein properly lies the task of a theory of art, then the answer can only be that it must fathom the selfsame natural lawfulness that consciously or unconsciously rules the creation of art and set it forth in a system of logically coherent theorems" [Fragt man sich worin eigentlich die Aufgabe der Theorie einer Kunst bestehe, so kann die Antwort nur lauten, daß dieselbe die natürliche Gesetzmäßigkeit, welche das Kunstschaffen bewußt oder unbewußt regelt, zu ergründen und in einem System logisch zusammenhängender Lehrsätze darzulegen habe].[16] The "system of logically coherent theorems" that Riemann had in mind is the theory of functions, and he had no doubt but that the "natural lawfulness" discerned through his theory was also "intuitively comprehended"[17] in ancient and medieval times, of course without becoming unambiguously formulated. "Even the simple monophonic melody set down in the preserved monuments of ancient art rests completely on a harmonic foundation" [Auch die einstimmige, einfache Melodie, wie sie in den erhaltenen Denkmälern antiker Kunst vorliegt, beruht durchaus auf harmonischer Grundlage].[18]

Fétis was more cautious. He mentioned different "*types de tonalités*"[19] without attempting to reduce them to a single principle. And in remarking about the "major scale of the Chinese" and the "minor scale of the Irish," he said, "Our harmonic progressions would be impracticable in these tonalities" [Les successions de notre harmonie deviendront inexécutables dans ces tonalités].[20] Still, for Fétis, just as for Riemann, *tonalité moderne* is the only system whose tonal relationships he could experience as "requisite." For him, even the *tonalité ancienne* of the 16th century was foreign and incomprehensible. To be sure, he defined *tonalité ancienne* as the "uni-tonic order" [*ordre unitonique*] and *tonalité moderne* as the "trans-tonic order" [*ordre transitonique*].[21] But the appearance that this definition is based on an explanation of *tonalité ancienne* is an illusion. The antithesis is incorrectly formulated, in fact even under Fétis's own assumptions.

For Fétis, the features of *tonalité moderne* are, first, the dominant seventh chord, and second, the method of using sixth chords to mark the half-step degrees 3 and 7 of the major scale as *notes de tendance*.

The definition of *tonalité moderne* as the "trans-tonic order" means no more than that the dominant seventh chord, which establishes the key, is at the same time a means for introducing a modulation. Thus *tonalité moderne* can be "trans-tonic," but need not be. As the earliest document of *tonalité moderne*, Fétis cites mm. 9–19 and 24–30 of Monteverdi's madrigal *Cruda amarilli*: "In the passage quoted here from Monteverdi's madrigal, one sees a tonality determined by the characteristic of the *accord parfait* on the tonic, by the sixth chord assigned to the third and seventh degrees, by the optional choice of the *accord parfait* or the sixth chord on the sixth degree, and finally, by the *accord parfait* and, above all, by the unprepared seventh chord (with major third) on the dominant" [On voit, dans le passage ici rapporté du madrigal de Monteverde, une tonalité déterminée par la propriété de l'accord parfait sur la tonique, par l'accord de sixte attribué au troisième et au septième degré, par la choix facultatif de l'accord parfait ou de l'accord de sixte sur la sixième; enfin, par l'accord parfait, et surtout par celui de septième sans préparation, avec la tierce majeure, sur la dominante].[22] Fétis characterizes *tonalité ancienne*, the harmonic language of Palestrina, only in a negative fashion—as a deviation from the norms of *tonalité moderne*. Since the dominant seventh chord is missing and the sixth chord is employed arbitrarily, it suffers from a lack of "*tendance*" and "*attraction*."[23] "There one finds nothing but a succession of mutually independent *accords parfaits*" [On n'y trouve qu'une suite d'accords parfaits indépendants les uns des autres].[24] The distinction that Fétis has in mind, but does not express, is that between what is well defined and what is undefined. *Tonalité ancienne*, as Fétis understands it, is vague, not "uni-tonic"; and the strongly outlined and, by means of the dominant seventh chord, unequivocally defined *tonalité moderne* can be either "trans-tonic" or "uni-tonic." Whether the key is varied, or a single key is maintained, is a secondary characteristic that Fétis interpreted as a primary one in order to formulate the antithesis between "trans-tonic" and "uni-tonic" and to avoid the admission that he was unable to define *tonalité ancienne*.

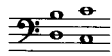
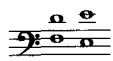
. . .

Nothing could be more wrong than to see the antitheses between Riemann and Fétis—the contrast between a "natural" and a "historico-ethnic" foundation of tonality, between the deduction of tonal contexts from "affinities between tones" and the appeal to the opposition of *tendance* and *repos*, between the claim of a comprehensive theory and the restriction of a theory to a limited range of applicability—as dead issues from the past. Three important questions remain problematical

today: first, whether a "natural" foundation of harmonic tonality is possible; second, whether only chordal relationships, or also pitch relationships not based on chordal associations, should be termed "tonal"; and third, whether the centering of tone or chord relationships on a tonic pitch or triad should be considered an essential or incidental feature of tonality.

1. To avoid misunderstandings, one must differentiate the various aspects of Fétis's thesis that tonality is a "purely metaphysical principle" independent of natural constraints. He would not deny that consonance—more precisely, the ranking of intervals according to their degree of consonance—is a fact of nature and not merely the result of a "convention" [*Setzung*]. But according to Fétis, only the disposition of intervals falls under the concept of tonality, not their independent existence and individual characteristics. Not the fourth *per se*, but only the placement and function of the fourth in a scale is a "tonal" phenomenon. "The mathematical division of a string and the numerical ratios that determine intervallic proportions are powerless to form a musical scale because, in their numerical operations, intervals occur as isolated facts without requisite connections among themselves, and without anything that determines the order in which they should be linked together; whence he (Fétis) concluded that every gamut or musical scale is the product of a metaphysical law born of certain human needs or circumstances" [La division mathématique d'une corde et les rapports de nombres par lesquels se déterminent les proportions des intervalles, sont impuissants à former une échelle musicale, parce que, dans ses opérations numériques, les intervalles se présentent comme des faits isolés, sans liaison nécessaire entre eux, et sans que rien détermine l'ordre dans lequel ils doivent être enchaînés; d'où il conclut que toute gamme ou échelle musicale est le produit d'une loi métaphysique, né de certains besoins ou de certaines circonstances relatives à l'homme].[25] The perfect fifth and major third are facts of nature, but "isolated facts"; the connection of "isolated facts" depends on a "metaphysical law." By "metaphysics," Fétis means nothing more than anthropology: "Thus he (Fétis) came to see that the lascivious dispositions of Oriental peoples gave birth to the small intervals of their languorous songs; that the discouragement of enslaved peoples created minor scales among them all" [C'est ainsi, qu'il fit voir que les dispositions lascives des peuples orientaux ont donné naissance aux petits intervalles de leur chants langoureux; que le découragement des peuples asservis a fit naître chez tous les gammes mineures].[26] To Riemann's system Fétis would object that although the perfect fifth and major third are "directly intelligible" intervals, even facts of nature, the decision to base a system upon them is still "metaphysical."

The "Lipps-Meyer law"[27] and Jacques Handschin's theory of "tone association" [*Tongesellschaft*] should be understood as attempts, based on the nature of acoustics or cognition, to account not just for the "isolated facts" but also for their "requisite connections."

a) The "Lipps-Meyer law" purports that the impression of closure, the "effect of finality," of a melodic interval depends on "whether or not the end tone of the interval can be represented by the number two or a power of two" [ob der Zielton des Intervalls durch die Zahl 2 bzw. eine Potenz von ihr repräsentiert wird oder nicht].[28] The law attributes an "effect of finality" to the melodic progressions **g–c**, **e–c**, **d–c**, and **B–c**, and an "effect of indicated continuation" to their inversions **c–g**, **c–e**, **c–d**, and **c–B**. The representatives of the number 2 are the lower tones of the perfect fifth (**c–g** = 2:3), the major third (**c–e** = 4:5), and the whole step (**c–d** = 8:9), and the upper tone of the diatonic half step in "just" intonation (**B–c** = 15:16). According to the Lipps-Meyer law, the Ionian, or major, mode is "natural," the Phrygian "artificial"; the Ionian tonic draws to itself "effects of finality" (**g–c**, **e–c**, **d–c**, and **B–c**), while that of the Phrygian "effects of indicated continuation" (**d–e**, **f–e**, **a–e**, **c–e**). Hence the Lipps-Meyer law implies a "natural" foundation for the major mode. The question must be left open, however, whether the law is a natural law of musical cognition, or whether, as a result of experiments with subjects brought up in the tradition of major-mode tonality, it assumes the very tonality it seems to prove. And even an attempt to support this law with historical arguments would be difficult, if not futile. From the 14th through the 16th century, it was possible to have not only the Ionian clausula  , to which the Lipps-Meyer law attributes an "effect of finality," but also the Phrygian clausula  , which according to the same law has the character of "indicated continuation." Yet the presumption that the Phrygian clausula was perceived as a weaker cadence would be a historically relevant hypothesis only if there were special historical circumstances that it would be in a position to explain.

b) According to Jacques Handschin,[29] the set of seven diatonic pitches represents a closed system founded on the interval of a perfect fifth. A tone's position in the **F–c–g–d′–a′–e″–b″** circle of fifths determines its special character, the character of e being more like that of a or b than that of c or f. Thus the property of a tone that Handschin terms its "character" [*Charakter*] is an embodiment of relationships. The character of a tone is, as it were, its internalized position in the system, or conversely, its position in the system is the externalized representation of a tone's character. Handschin, however, defines a

tone's character not only in terms of form, as a correlate of its position in the system, but also in terms of content—the "lower" tones of the circle of fifths, **F**, **c**, and **g**, are "steadier, more affirmative" [*gesetzter, affirmativer*] than the "upper" tones **a′**, **e″**, and **b″**.[30] And this characterization of inherent content implies a "natural" foundation for the major mode.

F, c, and g are the roots, a, e, and b the thirds, of the subdominant, tonic, and dominant triads in C major. For Handschin, major-mode tonality thus provides a striking illustration of the natural property of f, c, and g to be "steadier, more affirmative" than a, e, and b.[31] In C major, of course, a is directly related to f as a harmonic third, not indirectly as a tone four fifths away. And Handschin's interpretation of the major mode would be self-contradictory if it presumed that the tones' characters were bound solely to a conception of the diatonic set as a circle of fifths. Yet it seems that the difference between the **F–c–g–d′–a′–e″–b″** system of fifths and the **F–A–c–e–g–b–d′** system of fifths and thirds would not alter the fact that the similarity or dissimilarity in tone characters still depends on the proximity or remoteness of the tones in the series of fifths. Even in C major, which takes for granted the **F–A–c–e–g–b–d′** system of fifths and thirds, the chordal thirds a and e are more alike in their "characters" than the chordal third a and the subdominant root f. Thus the fifth-third system of tone relationships and the fifth system of tone characters are not mutually exclusive.

Minor-mode tonality, however, turns tone characters into their opposites. The assertion would be paradoxical that, as chordal thirds in A minor, f and c are "steady and affirmative." To be sure, f and c are, in minor just as in major, more alike than f and d, or c and a. Their similarity, whose index is the interval of a fifth, remains. Yet it changes its inherent content. Accordingly, only the formal definition of a tone's character as its "internalized" position in the system is irrefutable. But if the definition of inherent content is abandoned, then at the same time the "natural" foundation of the major mode is invalidated.

2. When Hugo Riemann spoke of tonality, he had in mind the same phenomenon as did Fétis. But in contrast to Fétis, he was convinced that the *types de tonalités* could be reduced to a single principle—the schema of three chordal functions: tonic, dominant, and subdominant. Historians and ethnologists, shunning the forced contraints of systematization, rejected Riemann's thesis as empirically unsubstantiated dogma. And the realization that the validity of the three-function schema was limited to the harmony of the 17th through the 19th century resulted in the concept of tonality losing its firmly drawn outlines. Scholars could have either reverted to Fétis's term, which included all

types de tonalités, and abandoned Riemann's interpretation, or, conversely, clung to Riemann's equation of tonality with the three-function schema and designated as "tonal" only the harmony of the 17th through the 19th century. But since neither possibility was dropped, the term "tonality" became ambiguous.[32]

If confusion is to be avoided, one must differentiate "melodic" tonality from "harmonic" tonality. Relationships among tones need not be reducible to chordal contexts in order to fall under the concept of tonality.

On the other hand, the tonality defined by melodic categories, which preceded the chordally based, harmonic tonality of the 17th century, can be defined as "modality." And, when intended as the opposite of "modal," it may be permissible to shorten the expression "harmonically tonal" to just "tonal." The concept of "tonality" therefore not only encompasses that of "modality," but can also become its opposite.

3. It is uncertain, or seems to be, whether the centering of tone and chord relationships around a tonic pitch or triad should be considered an essential or an incidental feature of tonality. Renouncing the defining feature "centering" causes "tonality" to fade into a general designation for relationships among pitches. "Tonality" and "tonal system" [*Tonsystem*; can imply only a "tuning system"] become synonymous expressions (provided one does not conceive of "tonality" as an "inner principle," and "tonal system" as its "outward manifestation"). "Tonality undoubtedly means that it is possible to establish a system of relationships and interdependencies between the harmonies that inhabit the area of a sound language."[33] Yet first, it is superfluous to use a second term to label the circumstance already referred to by the expression "tonal system." And second, renouncing the defining feature "centering" leads to linguistic fussiness: one must supplement the term "tonality" with a postscript expressing that one means contexts of tones and chords based on a center, or instead, following a suggestion by Rudolf Reti, speak only of "tonicality."

The renunciation of "centering" is, of course, not as unmotivated as it seems. It is negatively based: in the aversion toward naming "atonal" those tone and chord relationships that do not group themselves around a center. To avoid having to speak of "atonality," one stretches the concept of tonality until it means no more than that tones form an association and are not randomly juxtaposed.

The dilemma appears unavoidable. If Edward E. Lowinsky characterizes the harmonic technique of many 16th-century madrigals as "triadic atonality,"[34] and means by the term that chords were linked together without being related to a center, then there should be no logical objection to his usage. Lowinsky, however, fails to recognize

that "tonality" is not only a theoretical, but also a historical category. The tonality of the 16th century and that of the 19th century are stages in a coherent development. But the "atonality" of the 16th century is in no way connected with that of the 20th century. In contrast to the two "tonal" situations just mentioned, those Lowinsky named "atonal" form no relationship that justifies their inclusion under the same category. Transferred from the music of the 20th century to that of the 16th century, "atonality" becomes an omnibus and perplexing concept without objective content.

. . .

The conclusions can be summarized in a few sentences.

1. The expression "harmonic tonality," synonymous with Riemann's *Tonalität* and Fétis's *tonalité moderne*, signifies the representation of a key by means of associations among chords related to a center—a tonic triad.

2. It must remain an open question whether, or to what extent, harmonic tonality is based on the nature of music or of man. The theme of this study, the origin of harmonic tonality in 16th- and 17th-century polyphony, can be treated without having to decide whether the "origin" should be interpreted as an exclusively historical occurrence or as the expression of a situation already pointed out by nature.

3. The centering of relationships on a tonic triad is taken to be an essential feature of harmonic tonality. On the other hand, when it is absent one should not speak of "atonality." The phenomena that E. E. Lowinsky calls "atonal" are, as will be shown, based on a principle that can be defined positively, making the negative characterization superfluous.

A Digression on the Concept of Harmony

While "counterpoint" is a concept and technical term of musical composition, "harmony" is a term taken from philosophy and less denotes than interprets specifically musical relationships.

"Harmony" implies an agreement [*Zusammenstimmen*] of disparate or contrasted elements. Up to the 17th century (following the Pythagorean-Platonic tradition), scholars looked to numerical proportion to provide an explanation of, and basis for, harmony. In music, the concept of harmony has included, since the early Middle Ages:[1] (1) the combining of tones into a sequence of tones, or even groups of tones into a melody; (2) the agreement of the two tones in a dyad,

or of the tones and intervals in a triad; (3) the connecting of dyads into an intervallic progression; (4) the relationship among the voices of a polyphonic composition; and (5) the joining together of chords into a chord progression.

1. In the early Middle Ages, the application of the term harmony to melody, *modulatio*, meant no more than that the distances between tones were understood to be rationally determinable intervals—*consonantiae*. "Harmony, or ἁρμονία, is the regulated motion of tones and the consonance of many sounds" [Harmonia est modulatio vocum et consonantia plurium sonorum vel coaptatio ("coaptatio" being an Aristotelian coinage for the Greek ἁρμονία)].[2] But in the 15th century, melodies were defined as harmony not only because their tones formed rational intervals, but also because a melody was to be composed of disparate, not similar, sequences of tones. The complement of *harmonia*—the combining of contrasted elements—is *varietas* [variety]. If Tinctoris, in his *Diffinitorium*, uses the expressions *harmonia* and *melodia* synonymously, and in his *Liber de arte contrapuncti*[3] forbids repetitions of like sequences of tones, then through these apparently unrelated formulations he is able to show two aspects of the same thing. It is crucial not only that there be an agreement of elements, but also that the agreeing elements be disparate.

2. Since the 13th century, the concept of harmony has also been applied to simultaneous combinations of tones. Anonymous 1, who relies on Franco's *Ars cantus mensurabilis* in almost all the sections of his treatise (but not in the following definition), defines *concordantia* [consonance] as a "harmony of two or more sounds extended for the same length of time" [harmonia duorum vel plurium sonorum in eodem tempore prolatorum].[4] Gafurius, writing in 1518, admits as harmony only consonances of three tones, not of two. But this restriction does not imply an anticipation of the concept of harmony "in the modern sense."[5] "Hence those who held consonance and harmony to be the same should be judged wrong. For although a harmony is a consonance, not every consonance forms a harmony. Consonance is begotten from a high and a low sound, but harmony is brought about by a high, a low, and also a medial sound" [Hinc falso sunt arbitrati qui consonantiam & harmoniam idem esse posuerunt. Nam quamquam harmonia consonantia est: omnis tamen consonantia non facit harmoniam. Consonantia namque ex acuto et gravi generatur sono: Harmonia vero ex acuto & gravi conficitur atque medio].[6] The narrowing of the concept of harmony would appear to have been necessary because Gafurius, in order to categorize three-tone consonances as perfect or imperfect, needed a third determining factor. In addition to the greater or lesser variety of the tones, and the simplicity or complexity of the numerical

proportions, he required the superiority of "harmonic" over "arithmetic" and "geometric" proportion. With the theory of proportions, one could mathematically prove the imperfection of the fourth-octave chord (the arithmetic proportion 4:3:2 [e.g., **c–f–c′**; the ratios represent string lengths]) and the perfection of the fifth-octave chord (the harmonic proportion 6:4:3 [e.g., **c–g–c′**]). "From the arrangement of three tones according to the harmonic mean . . . is then produced a *melodia* which we properly call a harmony. This of course consists of two unequal consonances that are brought together out of dissimilar proportions (the larger proportion from the larger numbers, the smaller proportion from the smaller numbers [e.g., in the harmonic proportion mentioned above, **c–g–c′**, the larger numbers 6 and 4 represent the larger interval, the fifth **c–g**; the smaller numbers 4 and 3 represent the smaller interval, the fourth **g–c′**.])" [Dispositis vero tribus chordis secundum harmonicam medietatem . . . ea tunc producetur melodia: quam proprie harmonicam uocamus. Haec nempe duabus consonantiis inaequalibus constat: quae ex dissimilibus proportionibus majore quidem majoribus numeris: minore minoribus: conducuntur].[7]

Yet this principle, if one measures it by the musical reality of 15th-century counterpoint, is open to a *reductio ad absurdum*. For in the first place, Gafurius is compelled to declare the octave-twelfth chord perfect (the harmonic proportion 6:3:2 [e.g., **c–c′–g′**]); but the fifth-twelfth chord imperfect (the arithmetic proportion 3:2:1 [e.g., **c–g–g′**]); and the double-octave chord totally defective, representing as it does the geometric proportion 4:2:1 [e.g., **c–c′–c″**] and being composed of like, not disparate, intervals (thus not satisfying the prerequisite of the concept of harmony). And in the second place, by ancient tradition the intervallic proportions are invertible: the lower tone could correspond to the larger, but also to the smaller, number. [Thus an arithmetic proportion in one system could be mathematically transformed into a harmonic proportion in another.]

3. The application of the concept of harmony to dyadic interval progressions can be observed in the *Tractatus de contrapunctu* (1412) of Prosdocimo de' Beldemandi. Prosdocimo permits the parallel voice leading of imperfect consonances but limits their use because a succession of thirds or sixths not interrupted and articulated by an octave or fifth would create a harshness contradicting the harmony (harmony being the principle of combining disparate or contrasted elements). "The fourth rule is this: that we ought not to make counterpoints with unbroken combinations of imperfect intervals (no combination with a perfect consonance being interposed), since this would then be hard to sing, because by itself it will be found to have no harmony at all, the harmony in which is seen to exist the aim of all music" [Quarta

regula est hoc, quod contrapunctare non debemus cum combinationibus imperfecte concordantibus continue, nullam combinationem perfecte consonantem interponendo, quum tunc ita durum esset hoc cantare, quod in ipso nulla penitus reperiretur armonia, que armonia finis totalis musice existere videtur].[8] What is new is not the prohibition of an unbroken succession of thirds or sixths, but rather basing the prohibition on an appeal to the concept of harmony. The regular alternation between perfect and imperfect consonances is taken as a rule of composition: "In singing, consonance and dissonance should alternate . . . We can perform two, three, or more dissonances, and then there should follow a consonance . . . Consonance and perfect consonance are the same, and dissonance and imperfect consonance are taken to be the same" [Semper una consonantia et altera dissonantia cantari debet . . . Possumus facere duas vel tres ad plus dissonantias et postea sequi debet consonantia . . . Consonantia et consonantia perfecta idem sunt, et dissonantia et consonantia imperfecta pro eodem habentur].[9]

4. The 16th-century concept of harmony, as can be gathered from Zarlino's use of the word, embraces all the factors of polyphonic composition: the combining of tones into a sequence of tones; the agreement of the two tones in a dyad; the connection between successive dyads; the compounding of dyads into a triad;[10] and the relationship among the melodies and rhythms of different voices. The main principle of, the origin of, and the point of departure for musical harmony is the rationally determinable interval. "Thus it is clear that if someone hears a composition that expresses nothing save harmony, he takes pleasure in it only through the proportion that is found in the distances between the instrumental or vocal tones" [Come è manifesto: che se alcuno ode una cantilena, che non esprime altro che l'Harmonia: piglia solamente piacere di essa, per la proportione, che se ritrova nelle distanze de i suoni, o voci].[11] The prerequisite of a *harmonia* is a *varietà* or *diversità* [diversity]. According to Zarlino, not only parallel perfect consonances but also parallel imperfect consonances of equal size violate the principle of *varietà*, and thus also that of *harmonia*. "Because they well knew that harmony can arise only from things diverse, discordant, and contrary among themselves, and not from those things that agree in every respect. Thus if harmony does arise from such a variety, it will be necessary that in music not only the parts of the composition be separated from each other in highness and lowness, but even that their melodies be different in their movements, and that they include various consonances composed of diverse proportions" [Conciosiache molto ben sapevano, che l'Harmonia non può nascere se non da cose tra loro diverse, discordanti et contrarie et non da quelle ch'in ogni cosa convengono. La onde se da tal varietà

nasce l'Harmonia sara dibisogna che nella Musica non solo le Parti della Cantilena siano distanti l'una dall'altra per il grave et per l'acuto me etiandio che le lor modulationi siano differenti ne i movimenti et che contenghino varie Consonanze contenuti da diverse proportioni].[12]

Both successive and simultaneous intervals are viewed as different manifestations of the same harmony. In his explication of the rule that a composer wishing to express *asprezza*, *durezza*, and *crudeltà* [asperity, harshness, and cruelty] through a "harmony" should use intervals without a half step, Zarlino mentions not only harmonic intervals like the major thirteenth, but also melodic intervals like the whole tone.[13] And even rhythm is subsumed under the concept of harmony in the definition of counterpoint as a "type of harmony that contains in itself diverse variations of instrumental or vocal tones, with a sure law of proportions and measure of time" [modo di Harmonia, che contenghi in se diverse variationi di suoni, o di voci cantabili, con certa ragione di proportioni et misura di tempo].[14] The syntactic construction *non solamente, ma anco* [not only, but also] is characteristic of Zarlino's thought. And his concept of harmony, which embraces all the factors of composition, admits of no one-sided interpretations that allude to a precedence of voice leading or chord progressions, of dyads or triads.

5. D'Alembert, Rameau's exegete, termed as "harmony" not individual chords but their combination. "The mixture of several tones heard at the same time is called a *chord*; and harmony is properly a series of chords that, by their succession, please the ear" [On appele accord le mélange de plusieurs sons qui se font entendre à-la-fois; et l'harmonie est proprement une suite d'accords qui en se succédant flattent l'organe].[15] Consonance and dissonance are apparently intended to be the contrasted factors that unite into a harmony, for the change of chordal quality is one of the basic factors of tonal relationship in Rameau's system. The dominant and subdominant are primarily defined as chordal types, not as degrees of a key (V and IV). Every seventh chord is a *dominante*, every triad with a *sixte ajoutée* [added sixth, e.g., **f–a–c'–d'**], a *sousdominante* [subdominant]. The direct connection to the tonic is the feature by which one distinguishes a *dominante tonique* (V^7) from a *simple dominante* not immediately followed by the tonic (ii^7 and vi^7). The tonic is the goal and result of a resolution of dissonance, not a presupposed relational center: the seventh of the *dominante tonique*, by a descending step, and the *sixte ajoutée* of the *sousdominante*, by an ascending step, are both resolved to the third of the tonic triad. The unity of a key presented through chords is thus a harmony that arises out of an opposition, out of the contrast between a dissonant *dominante* or *sousdominante* and a consonant *tonique*.

Root Progression and Key

The fact that Jean-Philippe Rameau is the founder of modern harmonic theory seems so unequivocally established that one would attribute any doubt about it to a desire for paradox. "Rameau seized the initiative for the new treatment of harmonic theory as a theory of the significance of harmonies for the logic of musical composition. This honor remains his in any case, even if his system must be characterized as being in no way complete" [Die Initiative für die neue Behandlung der Harmonielehre als einer Lehre von der Bedeutung der Harmonien für die Logik des Tonsatzes ergriff Rameau; dieser Ruhm bleibt ihm auf alle Fälle, wenn auch sein System als ein keineswegs abgeschlossenes bezeichnet werden muß].[1] Both the theory of fundamental progressions and the theory of functions arose from fragments of the system outlined by Rameau. Yet the distinctive feature of Rameau's theory is neither the concept of fundamental progressions nor that of functions. Rather, it is the idea that chords, in order to form an association, must be linked by dissonances. And it is doubtful whether a theory that develops the "logic of musical composition" out of the simple opposition of dissonance and consonance represents a true theory of harmony in the 19th-century sense.

Rameau's fundamental idea is taken to be the reduction of all chords to triads and seventh chords—the differentiation of a *basse fondamentale* from the actual lowest voice, the *basse continue* [thoroughbass]. The *centre harmonique* of a chord is the lowest tone in its stack of thirds. "The basis of harmony resides not merely in the perfect chord, from which the seventh chord is formed, but even more precisely in the lowest tone of these two chords, which is, so to speak, the harmonic center to which all the other tones should be related" [Le principe de l'Harmonie ne subsiste pas seulement dans l'Accord parfait, dont se forme celuy de Septiéme; mais encore plus précisément dans le Son grave de ces deux Accords, qui est, pour ainsi dire, le *Centre harmonique*, auquel tous les autres Sons doivent se rapporter].[2] The progression of chordal roots—*centres harmoniques*—forms a *basse fondamentale* distinct from the actual bass voice (the *basso continuo*). And it is the *basse fondamentale* that must be understood as the hidden foundation of harmonic progression.

That the principle of chordal inversion had been anticipated in the 17th century by Johann Lippius,[3] Thomas Campion,[4] and Heinrich Baryphonus,[5] and in the early 18th century by Saint-Lambert[6] and Roger North,[7] is of little or at least of secondary importance—only through Rameau did it force its way into the general consciousness.

What is crucial is not that the idea was already old, but that in Rameau's theory it forms a dependent cofactor that cannot be plucked out of the context in which it is situated. The "tertian structure of chords," according to Hugo Riemann "the true system of Rameau the constructivist theorist" [das eigentliche System des konstruktiven Theoretikers Rameau],[8] is explained with a reserve that reveals that the principle of inversion is not self-substantiated, but obtains its meaning only from the system into which it fits. Both Rameau's confusions and the eventual disintegration of his system into antithetical theories—those of fundamental progressions and functions—are based on the difficulty of adequately representing a system of interrelated cofactors. "To make things more familiar, one may for the time being consider thirds as the sole elements of all chords: thus to form a perfect chord one third must be added to another, and to form all the dissonant chords three or four thirds must be added to one another" [Pour se rendre les choses plus familieres, l'on peut regarder à present les *Tierces* comme l'unique objet de tous les accords: En effet, pour former *l'accord parfait*, il faut ajoûter une *Tierce* à l'autre, & pour former tous les *accords dissonans*, il faut ajoûter trois ou quatre *Tierces* les unes aux autres].[9]

Rameau's system stems not from a rigid axiom, but from the notion that tonal harmony is based on the correlations between the resolutions of dissonance, the progressions of the fundamental bass, the meanings of chords, and the scale degrees of a key. In Rameau's presentation it remains an open question which of the factors (different aspects of the same thing according to Rameau) ought to be considered primary and fundamental. But this issue need not be resolved, because the essential feature of his system is the correlation of factors and not their unfolding from a single principle. Attempts to emphasize certain isolated components—the concept of the fundamental bass, or the categories of tonic, dominant, and subdominant—and to dismiss other components as incidental both miss and distort the sense of Rameau's theory.

The *double emploi* of the six-five chord **f–a–c′–d′** in C major is an exemplary case of the correlation that Rameau has in mind. The dissonance **c′–d′** is ambiguous. One can treat **c′** as a dissonant suspension resolving to **b**, or regard **d′** as a passing tone incorporated into the chord and continuing on to **e′**. The determination of the fundamental bass depends on the resolution of the dissonance. According to Rameau, a regular progression of the fundamental bass is by fifth or fourth, an irregular progression by second. "The real heart of composition, whether as regards harmony or melody, is chiefly (and