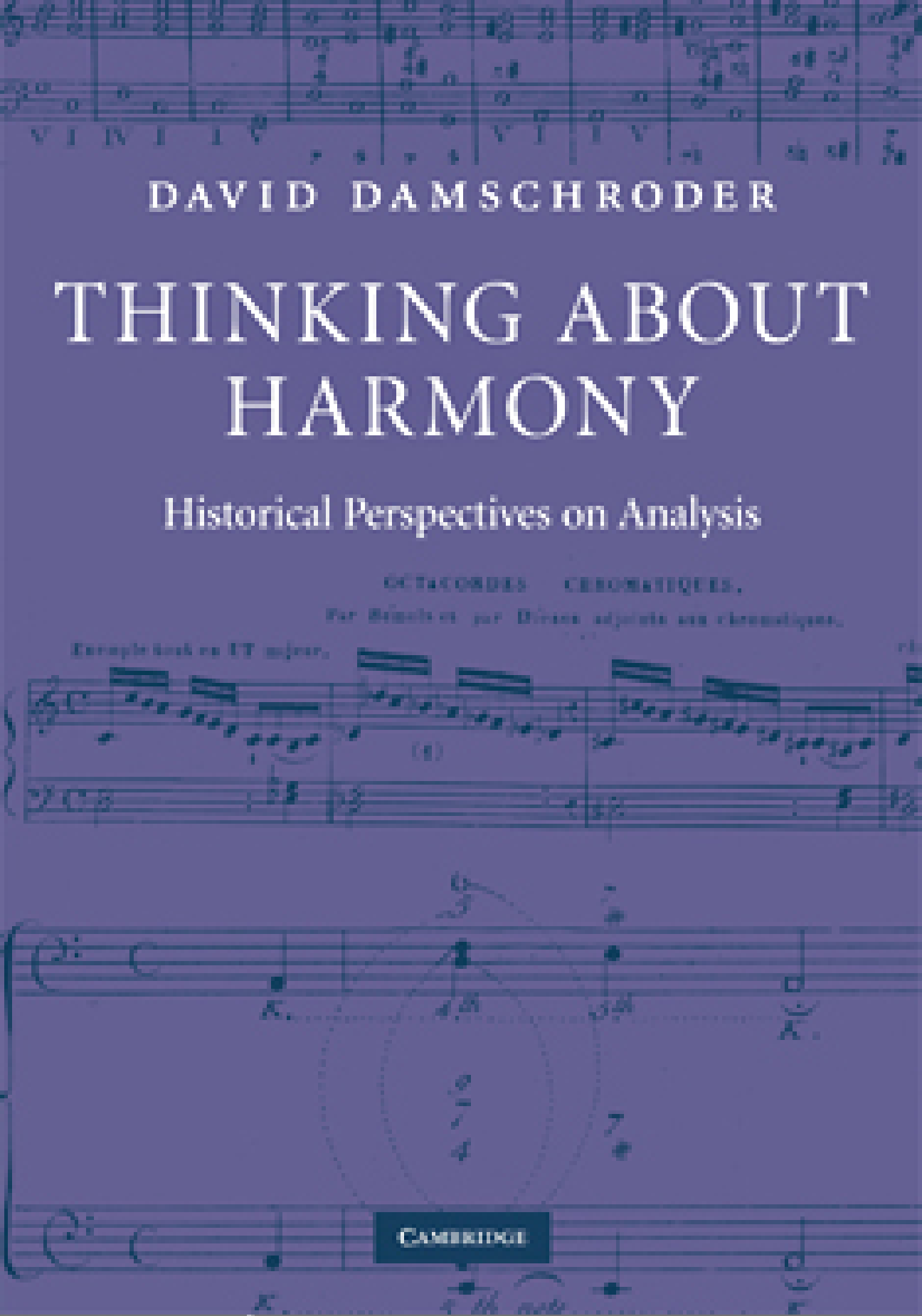

DAVID DAMSCHRODER

THINKING ABOUT HARMONY

Historical Perspectives on Analysis

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Thinking About Harmony

Focusing on music written in the period 1800–50, *Thinking About Harmony* traces the responses of observant musicians to the music that was being created in their midst by composers including Beethoven, Schubert, and Chopin. It tells the story of how a separate branch of musical activity – music analysis – evolved out of the desire to make sense of the music, essential to both its enlightened performance and to its appreciation. The book integrates two distinct areas of musical inquiry – the history of music theory and music analysis – and the various notions that shape harmonic theory are put to the test through practical application, creating a unique and intriguing synthesis. Aided by an extensive compilation of carefully selected and clearly annotated music examples, readers can explore a panoramic projection of the era's analytical responses to harmony, thereby developing a more intimate rapport with the period.

David Damschroder is Associate Professor of Music Theory at the University of Minnesota School of Music, where he teaches courses on tonal harmony and form, the history of music theory, and Schenkerian analysis. His current research is focused on harmony in the music of Franz Schubert, complemented by performance activities on fortepiano. His previous books include *Music Theory from Zarlino to Schenker* (with D. R. Williams), *Listen and Sing*, and *Foundations of Music and Musicianship*.

Thinking About Harmony

Historical Perspectives on Analysis

DAVID DAMSCHRODER
The University of Minnesota

CAMBRIDGE
UNIVERSITY PRESS

CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK
Published in the United States of America by Cambridge University Press, New York
www.cambridge.org
Information on this title: www.cambridge.org/9780521888141

First published in print format 2008

ISBN-13 978-0-511-40223-4 eBook (Adobe Reader)

ISBN-13 978-0-521-88814-1 hardback

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Preface

"In the following Sheets I presume to lay before the Public, an Essay, calculated for the use of those who wish to *study* musical composition, to *teach* music with propriety, or to *judge* of the music they hear, practise, and encourage." So begins the Preface to Augustus Frederic Christopher Kollmann's *An Essay on Musical Harmony, According to the Nature of That Science and the Principles of the Greatest Musical Authors* (1796). And so begins mine. Kollmann's premise – that one's engagement with music is enhanced through attention to the mechanics of its construction – has withstood the test of time, even if what goes by the name "music" in Western culture by now has become so variegated that few essayists could presume to address it globally. I certainly am not so qualified or so disposed. Instead, I propose to focus my investigation of how harmonic analysis emerged as a field of musical endeavor principally on how musicians during the first half of the nineteenth century practiced it. My scope widens beyond that frame to accommodate eighteenth-century ideas that formed the foundation for developments after the turn of the century and to engage authors who refined existing approaches even as compositional and analytical practices headed in new directions later. Practitioners of a wide range of modern methodologies will find antecedents in abundance, though the authors I address did not regard their contributions as antecedent to anything: they were in the thick of things, co-participants in the musical culture defined by the composers whose works they scrutinized, and thus they felt themselves to be ideally qualified to make judgments and to propose productive modes of thought. Though I mention Riemann, Schenker, and Schoenberg on occasion, my principal interest is in assaying what the analytical landscape was like before those well-studied giants emerged. There was never a unified analytical practice that composers, critics, performers, and music lovers of the early nineteenth century all embraced; nevertheless the ideas I present are representative of what at least some citizens of that period regarded as worth the effort and expense of publication. Even if from our modern perspective their conceptions occasionally seem peculiar or off the mark, a careful exploration of their contributions offers a means for developing a more vibrant and intimate relationship with the music and the era.

We now take it for granted that professional musicians will possess the array of skills necessary for analyzing musical scores. How this aspect of musicianship

evolved in conjunction with the shaping of the tonal music repertoire is a fascinating story. Aided by an extensive compilation of carefully selected and clearly annotated music examples, readers are invited to explore a panoramic projection of the era's analytical responses to harmony, thereby developing a keener rapport with the period and at the same time expanding their own capacities to think carefully about the art.

On the pages that follow I endeavor to integrate two distinct areas of musical inquiry: the history of music theory and music analysis. The intersections and juxtapositions that permeate the work should offer much to researchers and analysts who generally confine themselves to a narrower purview. Various notions that shape harmonic theory are put to the test through practical application. The synthesis of these two areas of study should prove to be one of the book's most intriguing and revelatory features.

In his *Observations sur la musique (*1779), Chabanon ponders the relationship between musical creations and the principles of the art: "One has never seen basic principles spring up before exempla, nor reason dictate to genius what it must do. Genius operates under the influence of a guiding sensibility, creating laws inadvertently. Later, contemplating the works borne of genius, the faculty of reason reveals to their creator the secret of their inner workings. From such exempla, reason formulates the principles of the art." I introduce and assess a broad range of analytical techniques with the intent of vividly recreating modes of thinking current in the nineteenth century. These ideas are not all congruous: the process of exploration and invention that unfolded over centuries is a story of competing priorities, conflicting strategies, and clashing notational systems. Readers whose prior exposure to analysis stems from a single source – say, the ubiquitous undergraduate harmony textbook written by a seemingly infallible author – may be in for a shock: hardly anything you have learned is accepted universally. Be forewarned that my account does not dismiss or temper the conflicts, contradictions, and occasional dead ends that were and remain inevitable in a communal creative process that has as its focus such a wondrous and complicated subject as the corpus of music written by the likes of Beethoven, Schubert, and Chopin.

As author I have learned to play the role of chameleon, adopting whatever analytical and notational practices I am presenting at a given moment. It is my hope that a clear presentation, extensive and abundantly annotated music examples (many of them reprinted directly from the original sources), and informative endnotes will provide a framework congenial to my readers. Also note that a thumbnail sketch of each author appears in the Biographies of music theorists at the end of the book (beginning on p. 244). (These sketches include a listing of the treatises cited, along with an English translation of each title.)

Idealistically I might hope that all musicians for whom the performance and study of tonal music is a daily occupation would find the contents of this book pertinent and fascinating, yet I suspect that its most avid readers will be scholars in the disciplines of music theory and musicology at the graduate level and beyond. My coverage emphasizes breadth, under the assumption that readers stimulated by what I present will want to proceed directly to the treatises cited. (Though my research was done the old-fashioned way – microfilms, interlibrary loans, visits to rare book rooms – certainly many readers will live at a time when the sources cited are available on a virtual internet library.) I have purposefully steered clear of influences from modern agendas as much as possible. I gratefully acknowledge my debt to several generations of scholars who have come before me. For any translation that I borrow, the source is named within the citation. All other translations are my own.

I wish to thank the University of Minnesota Graduate School for a Grant-in-Aid of Research, Artistry and Scholarship, which enabled me to acquire an immense collection of microfilms and antiquarian editions of theoretical treatises to supplement the holdings of the University library, and for the support of a Bush Supplement Sabbatical Program Award. The digital photography units of the Sibley Music Library (Eastman School of Music), the Yale University Library, and the University of Minnesota Library have created a collection of vivid images that allow the authors under discussion to communicate directly with modern readers. My work has evolved from formative study under several inspiring teachers, whom I wish to acknowledge here: Allen Forte, John Rothgeb, David Russell Williams, and the late Douglass Green and Claude Palisca. I also thank four of my students who assisted in the project's final stages: Christopher Brody, Carl Heuckendorf, Peter Purin, and Peter Smucker.

Conventions regarding note relations, chords, keys, and Roman numerals

Throughout the book, harmonic (vertical) pitch combinations (such as C-E-G on p. 9) are indicated with a hyphen (-), while melodic (horizontal) pitch successions (such as C–E–G–C on p. 26) are indicated with a dash (–).

Keys and chords are distinguished as follows: C Major (with a capital M) is the key of C Major; C major (with a small m) is a C major chord.

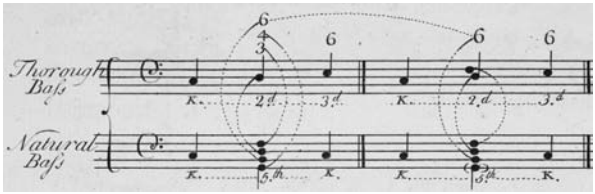
During the discussion of a historical analyst's methodology, his analytical notation will be adopted. In all other contexts Roman numerals are presented in capital letters regardless of a chord's quality, though modified by an accidental if the chord is altered. Thus C Major: I–II–V–I and not I–ii–V–I; and C Minor: I–II–V♯–I♯ (closing on a major tonic), not i–ii°–V–I.

1 | Chord identification

Arabic and Roman numerals

The pitches C, E, and G are used in three of the most basic chords of Baroque thoroughbass practice: $\begin{smallmatrix}G\\E\\C\end{smallmatrix}$ (a chord in $\frac{5}{3}$ position), $\begin{smallmatrix}C\\G\\E\end{smallmatrix}$ (a chord in $\frac{6}{3}$ position), and $\begin{smallmatrix}E\\C\\G\end{smallmatrix}$ (a chord in $\frac{6}{4}$ position). The esteemed Berlin theorist Johann Philipp Kirnberger, writing in 1771, asserts that "these three consonant chords are really just three different representations of one and the same chord, the perfect triad."[1] Though the chords could be compared in ways that emphasize their differences, pitch content is here proposed as their defining feature. $\begin{smallmatrix}C\\G\\E\end{smallmatrix}$ is more closely allied with $\begin{smallmatrix}G\\E\\C\end{smallmatrix}$ than with $\begin{smallmatrix}B\\G\\E\end{smallmatrix}$ or other chords with bass E, or with $\begin{smallmatrix}D\\A\\F\end{smallmatrix}$ or other chords in $\frac{6}{3}$ position. The principle of chordal inversion, first disseminated by German authors in the early seventeenth century, has by now become a potent tool for simplifying the classification of chords.[2] As had Jean-Philippe Rameau,[3] France's preeminent authority on music theory, Kirnberger espouses a root-oriented approach, as the traditional thoroughbass perspective organized around characteristic intervallic numbers gradually waned. Though neither Rameau nor Kirnberger develops a practice of analytical chord labeling akin to modern Roman-numeral usage, their persuasive assertion of the chordal root's importance became a bedrock within the analytical practice that was emerging around them.

John Frederick Lampe, a German musician who migrated to London in the 1720s, charts two divergent paths for analysis in his 1737 thoroughbass manual for keyboardists [**1.1**]. First he analyzes the score's bass line (labeled Thorough Bass). For performing musicians, these notes were the traditional focus of attention, since the figures of thoroughbass practice were dependent upon them. For example, the symbol $\frac{6}{3}$ (or its abbreviation ^{6}) placed above or below a bass note instructs the performer to play the bass along with a simple or compound sixth and third above it. Without mentioning Rameau, Lampe mirrors the Frenchman's occasional practice of labeling these bass pitches according to their positions within the scale. Rather than translating Rameau's space-demanding terms "not[t]e tonique" (or "son principal"), "seconde note du ton," and "mediante," he employs conveniently thin symbols: K. for the key note (tonic), $2^{\underline{d}}$ and $3^{\underline{d}}$ for the second

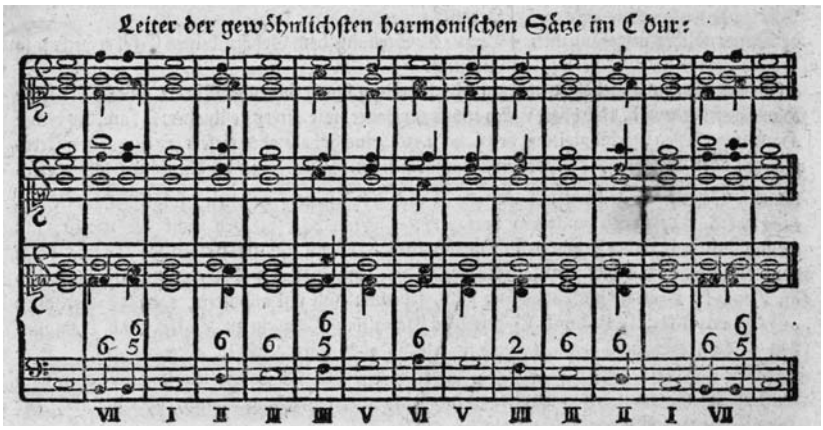


1.1 Lampe: *A Plain and Compendious Method of Teaching Thorough Bass* (1737), plate 6 (adjacent to p. 29), ex. XVI.

"But let the 4th [G above bass D] be sounded or not sounded, it is still the *Fifth Cord* with the *seventh* Note to that, which accompanies the second *Note* to the *Key*" (p. 31). Lampe here displays the kinship between D-F-G-B and D-F-B, both derived from the dominant seventh, G-B-D-F. "K." is Lampe's abbreviation for "Key Note" (tonic). Lampe's commentary spells out in words what we now often abbreviate with symbols: "the *Fifth Cord* with the *seventh* Note to that" is our V^7; "the second *Note* to the *Key*" is our $\hat{2}$.

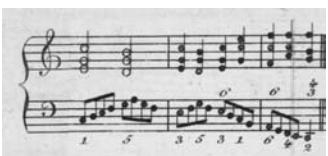
and third scale degrees.[4] Another potential source for Lampe's practice is a German tradition, surviving in several manuscript copies of compositions by J. S. Bach, in which the bass notes are marked by numbers and the letter f (for *Finalis*).[5] In the second layer of analysis in **1.1**, Lampe focuses on the progressive element, the progression of chordal roots, which he displays on a separate staff labeled Natural Bass. (Lampe's natural bass corresponds to Rameau's *basse fondamentale*, or fundamental bass, which likewise is often presented on its own staff below the bass, as in **1.17**.[6]) The symbols "K . . . 5th. . . . K," simple though they may seem, and appearing within this unassuming manual for keyboardists, mark the inauguration in print of harmonic analysis in the modern sense. What Lampe conveys corresponds to what the symbols "I–V–I" convey today. Falling within a theoretical outlook generally referred to by the German term *Stufentheorie* (scale-step theory), the procedure tracks the positions of a harmonic progression's roots within the scale of the prevailing key. The parenthetical G below Lampe's fifth chord hints that determining a chord's root (natural bass or fundamental bass) is not necessarily a mechanical process. It is in fact a topic we shall explore in detail later in this chapter.

Whereas Lampe's analysis of the natural bass translates comfortably into Roman numerals as I–V–I, that of the thorough bass into I–II–III may now seem peculiar. Yet similar analyses, employing either Roman or Arabic numerals, persist among authors both renowned and obscure well into the nineteenth century, as examples by Christoph Gottlieb Schröter, Emanuel Aloys Förster, Siegfried Dehn, and Johann August Dürrnberger illustrate [**1.2**]. Even past the middle of the twentieth century Carl Dahlhaus questions



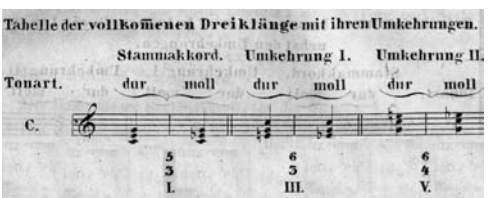
1.2a Schröter: *Deutliche Anweisung zum General-Baß* (1772), p. 191.

"Scale of the most common harmonic settings in C Major." Schröter's Roman numerals indicate the scale degrees of the *bass* pitches – not the roots.



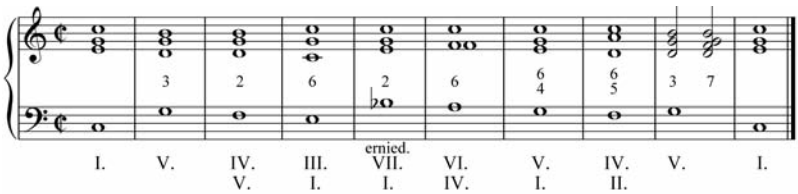
1.2b Förster: *Anleitung zum General-bass* [1805], examples appendix, p. 16, ex. 140.

The use of Arabic numerals both for traditional figured bass and to indicate the scale degrees of the bass pitches could easily cause confusion. An Arabic 6 was inadvertently omitted above bass E at the downbeat of measure 2.



1.2c Dehn: *Theoretisch-praktische Harmonielehre* (1840), table 1 (adjacent to p. 106).

"Chart of the perfect triads with their inversions." The complete chart from which this sample is extracted fills an entire page. The root-position chord (*Stammakkord*) is transformed into both first and second inversions (*Umkehrung I*, *Umkehrung II*). The Roman numerals I., III., and V., corresponding to the scale degrees of the bass pitches, are employed. Dehn's perspective perpetuates an eighteenth-century tradition: for example, the "Carte des accords de musique" in Pierre-Joseph Roussier's *Traité des accords, et de leur succession* (1764) contains chords corresponding to Dehn's, under which the terms "tonique," "médiante," and "cinquieme-note" are positioned; whereas Louis-Charles Bordier employs the terms "tonique," "mediante," and "dominante" for these chords in his *Traité de composition* ([ca. 1770], p. 10).



1.2d Dürrnberger: *Elementar-Lehrbuch der Harmonie- und Generalbaß-Lehre* (1841), plate XIII.

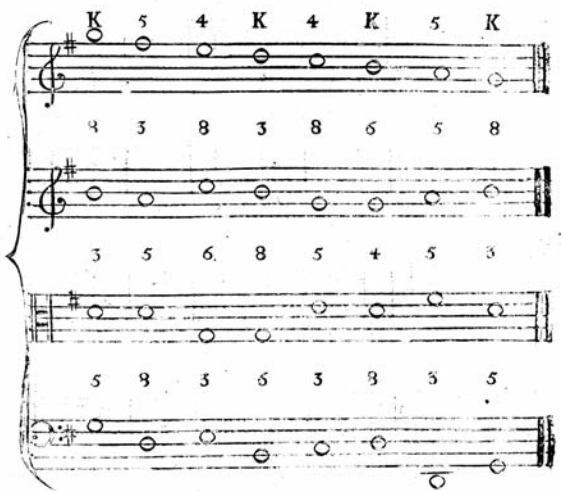
As did Lampe over 100 years earlier, Dürrnberger indicates the positions of both the bass and the root pitches within the prevailing key. The label "ernied. VII." abbreviates the German verb *erniedrigen* (to flatten a note), acknowledging bass B♭ as the lowered seventh scale degree in C Major.

the importance of differentiating "between $\frac{5}{3}$ and $\frac{6}{3}$ sonorities that share the same bass pitch. Chordal connection is based on the actual bass, not on the abstract *basse fondamentale*."[7]

Though on occasion Lampe applies analytical notation to a natural bass, most of his examples and keyboard exercises display only the thorough bass, which he often analyzes lavishly. In contrast, in *Two Essays on the Theory and Practice of Music* (1766) the Irish musical amateur John Trydell analyzes the natural bass progression even when a staff displaying the root progression is not shown [**1.3**]. The incorporation of Trydell's work as the "Music" article in the *Encyclopaedia Britannica* (Edinburgh, 1771) helped acquaint a wide, mostly British audience with a root-oriented perspective.

Clearly Arabic numerals are overworked in these analyses. Using the same symbols for traditional figured bass, for measuring intervals above the bass, and for indicating the scale-degree positions of either bass or root pitches likely stymied some readers. John Holden, a Scotsman who was influenced by both Lampe and Rameau, uses Lampe-inspired Arabic numerals for harmonic analysis in the early portion of his *Essay towards a Rational System of Music* (1770) but converts to Roman numerals later, in the context of yet another use of numbers, intervallic ratios (in a chapter he calls "Of Harmonical Arithmetic"). He explains: "The degrees of the scale are here denoted by numeral letters, instead of figures, to avoid the confusion of too many figures."[8]

Both Lampe and Holden are sensitive to alteration via an accidental: Lampe employs symbols such as "6th." and "7th." for raised pitches, while Holden employs the symbols "♯IV." (which occurs in the "Scale of the adjunct fifth": V. VI. VII. K. II. III. ♯IV. V.) and "VII♭." (which occurs in the



1.3 Trydell: *Two Essays on the Theory and Practice of Music* (1766), plate 19, ex. 49.

Trydell employs Arabic numerals for two contrasting purposes. The lower three rows of numerals represent interval sizes, calculated from the bass. The top row of numerals indicates the scale degrees of the chordal roots. As with Lampe, "K" identifies the key note. This analysis conveys approximately the same information as the modern notation

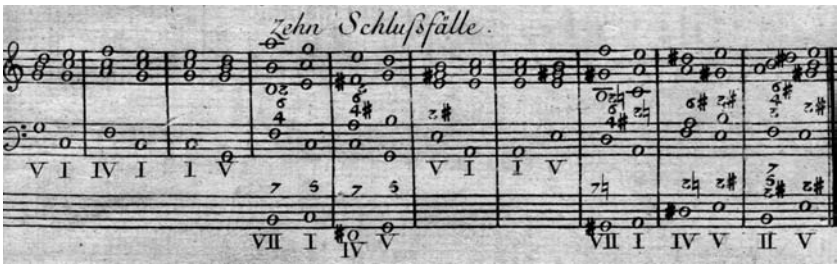
I V IV^6 I^6 IV I^6_4 V I .

"Scale of the adjunct fourth": IV. V. VI. VII♭. K. II. III. IV.). Trydell employs "♭6" and "♭7" in his analyses of minor-key progressions: for example, for F major and G major chords in the key of A Minor.

Meanwhile in Germany the analytical deployment of Arabic numerals, mentioned as a possible source for Lampe's practice, begins to appear in print. Georg Andreas Sorge offers the following chart of triads in his *Vorgemach der musicalischen Composition* [1745–47]:

5.	g	a	h	c	d	e
3.	e	f	g	a	h	c
1.	c	d	e	f	g	a
	1	2	3	4	5	6

In his *Compendium harmonicum* (1760) Sorge employs the terms *Grundharmonie*, *Secundharmonie* (major keys only), *Terzharmonie*, *Quartharmonie*, *Quintharmonie*, *Sextenharmonie* (or *Sextharmonie*), and *Septimenharmonie* (for the subtonic in minor keys).[9] Georg Joseph Vogler, the most creative, productive, and influential practitioner of harmonic analysis in the late eighteenth century, employs similar language in his



1.4 Vogler: *Gründe der Kuhrpfälzischen Tonschule in Beispielen* [1778], table XXI, fig. 5.

In this example of "Ten Cadences," Vogler employs both consonant chords (diatonic I, IV, and V) and some more colorful options: half and fully diminished seventh chords and augmented sixth chords. Inverted chords receive two figured-bass analyses: one for the original chord, another for its root-position formulation. Vogler pays careful attention to alterations of pitches above the bass (note the numerous accidentals beside the figured-bass numbers) but has not yet formulated notation to mark a corresponding distinction between diatonic and modified roots (e.g. the label IV is employed both for root F and root F♯ in C Major). Justin Heinrich Knecht borrows from Vogler's model, including the use of Roman numerals, for the "Cadence" article in his *Kleines alphabetisches Wörterbuch der vornehmsten und interessantesten Artikel aus der musikalischen Theorie* (1795). He adds two additional cadences: V–VI and II–I.

Tonwissenschaft und Tonse[*t*]*zkunst* (1776): "denn betrachtet man den siebenten ohne die Siebente, und den fünften mit der Siebenten z. B.

fünfter G h d f:
siebenter H d f . . .,"

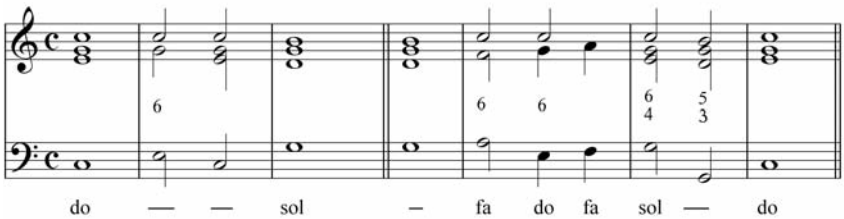
whose translation merits some bracketed amplification, as: "for if one looks at the [chord on the] seventh [scale degree] without the seventh and the [chord on the] fifth [scale degree] with the seventh . . ."[10] He also employs a Roman numeral:

"VII vom C H d f as"

indicates that the pitches of the VII chord in C Minor are (capitalized) root B, D, F, and A♭, which he juxtaposes with its enharmonic equivalent:

"VII vom A h d f Gis,"

(B, D, F, and root G♯ in A Minor).[11] A Roman-numeral label appears below each chord in his table of cadences published two years later [**1.4**]. At this point he does not acknowledge chromatic alterations of roots. In his later and more definitive *Handbuch zur Harmonielehre* (1802) he incorporates the analytical labels IV♯ and VII♯, in which the sharp indicates a raised root. This increased precision may reflect the influence of Johann Gottlieb Portmann,

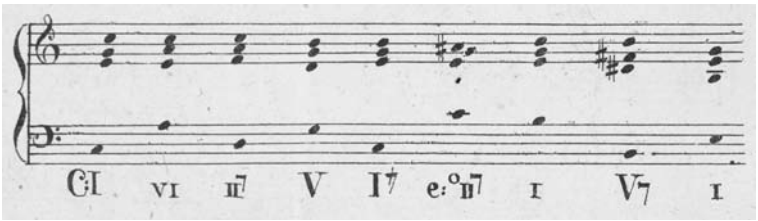


1.5 Crotch: *Elements of Musical Composition* (1812), plate 10, ex. 148.

This example employs the three principal major chords in the key of C Major. In other examples the labels do, fa, and sol (with underlines) denote minor chords on A, D, and E, respectively.

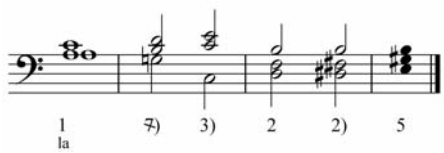
who in his *Musikalischer Unterricht* (1785) employs the label $\frac{7}{4+}$ for a seventh chord on the raised fourth scale degree (e.g. F♯-A-C-E in C Major).[12]

Roman-numeral, Arabic-numeral, and non-numeral strategies competed as notation for harmonic analysis. In England, William Crotch dispenses with numbers altogether, instead employing sol-fa in his *Elements of Musical Composition* (1812) [**1.5**]. In Germany, Heinrich Christoph Koch in his *Versuch einer Anleitung zur Composition* (1782) presents a chart in which the roots of various inverted chords are indicated by Arabic numerals. For example, the number 6 is placed beside C-E-G-A in C Major. "The added number in each compartment containing a six-five, four-three, or [four-]two chord indicates the scale degree on which its root-position chord is built."[13] The Roman numerals in Gottfried Weber's *Versuch einer geordneten Theorie der Tonse[t]zkunst* (1817–21) appear in one of three guises – capital, small, or small preceded by a degree circle – to indicate each triad's quality (major, minor, or diminished, respectively), while an Arabic 7, if present, is either unadorned or slashed to indicate the chordal seventh's quality (minor or major, respectively) [**1.6**]. Translations of Weber's treatise had appeared in Copenhagen, Boston, and London by mid-century. In France, Daniel Jelensperger's harmonic analyses in *L'harmonie au commencement du dix-neuvième siècle* (1830) incorporate a variety of supplementary symbols applied to Arabic numerals [**1.7**]. Whereas Weber's symbols announce every chord's quality, Jelensperger is selective: he employs additional notation only when a chord's construction departs from the diatonic norm, be it major, minor, augmented, or diminished. The publication of Jelensperger's work in a German translation in 1833 provided an impetus for the Arabic-numeral analysis in the treatises of Johann Christian Lobe after the middle of the century, contrasting the Weber-inspired Roman numerals of Ernst Friedrich Richter's popular *Lehrbuch der Harmonie* (1853).[14]



1.6 Weber: *Versuch einer geordneten Theorie der Tonse[t]zkunst* (1817–21, [2]1824), vol. 2, table $11\frac{1}{2}$, fig. 193 [Warner, p. 347].

This example shows the full range of Weber's qualitative symbols. Ernst Friedrich Richter adds a prime after a capital Roman numeral (e.g., III') to designate an augmented triad, which Weber avoids, and places the circle after rather than before a small Roman numeral to designate a diminished triad in his *Lehrbuch der Harmonie* (1853). Salomon Jadassohn follows Richter's practice in his *Lehrbuch der Harmonie* (1883). Concerning the augmented sixth chord, here labeled °II7, see pp. 166–171, below.



1.7 Jelensperger: *L'harmonie au commencement du dix-neuvième siècle* (1830, [2]1833), p. 49 [Häser, p. 44].

In Jelensperger's system an ascending virgule (⁄) through a number indicates a raised root, while a descending virgule (\) indicates a lowered root. Parentheses signify modifications of chordal quality from the diatonic norm: a left parenthesis for minor quality, a right parenthesis for major quality, both left and right parentheses for diminished quality. The leading tone serves as seventh scale degree in Jelensperger's minor scales. In this example the second chord, because major in quality and built on the lowered seventh scale degree, is labeled 7). In that the 3 chord in Jelensperger's minor keys is of augmented quality, a right parenthesis here accompanies the 3 below the third chord to indicate major quality. (Jelensperger regards C-E as a representative of C-E-G♮.) Likewise since 2 in a minor key is of diminished quality, a right parenthesis is applied to indicate the modification to major. For further discussion of this example, see pp. 310–311, n. 31, below.

Harmonic analysis organized with reference to scale steps (the *Stufentheorie* perspective) was pursued and developed chiefly by British and German musicians. Though Jelensperger worked in and published from Paris, he had arrived there from German-speaking Mulhouse (near Basel), and his treatise's German translation appears to have had a greater impact than did the French original. (Jelensperger's death the year after the work was published certainly was a blow to scale-step thinking in

France.) The gradual extension of the *Stufentheorie* perspective – how it was adapted to chart modulation from key to key, how it absorbed a wide range of dissonant and chromatically altered chords, and how a sense of chordal hierarchy gradually evolved among some of its practitioners – will be a central focus in the chapters ahead.

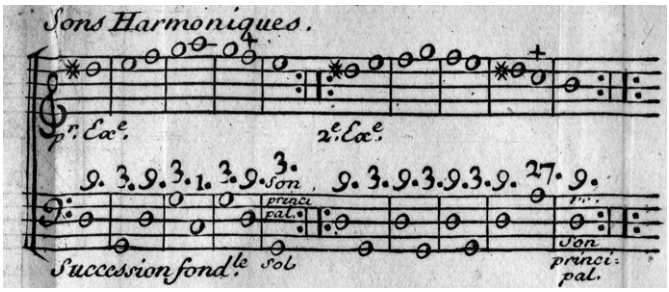
Yet we should acknowledge from the outset that not all musicians who concerned themselves with issues of harmony followed this path. The music examples in most French treatises lack a chord-by-chord harmonic analysis. And in Germany an alternative premise for analytical investigation was formulated early on. In 1756 a young musician named Johann Friedrich Daube published a provocative work called *General-Baß in drey Accorden* – Thoroughbass in Three Chords. Only three chords? The idea was in the air – it had even been hinted at by Rameau, whose perspective was beginning to make inroads east of the Rhine – and a number of musicians gave it serious attention. A few even proposed some analytical terms and symbols for practical application. Before continuing our discussion of the *Stufentheorie*, we now take some time to explore the early formulation of this competing conception, now generally referred to by the German term *Funktionstheorie* (function theory). Its development during the period on which our study is focused was not extensive, compared to the flourishing of numerous strains of *Stufentheorie*. Yet it blossomed belatedly with bursts of insight and analytical savvy at the end of the nineteenth century.

Daube's three chords and the emergence of a function theory

Each analytical chord label in the preceding examples corresponds to the position of a favored pitch – bass or root – within a diatonic scale, as befits a theory of scale steps (*Stufentheorie*). Johann Friedrich Daube takes a different tack: he reduces a key's harmonic substance to three principal chords (*Haupt-Accorden*). He explains:

> We turn now to those chords that one must know in every key when learning thoroughbass. These are the perfect, governing chord, which occurs at the beginning of a composition and also at its close, and its two subordinate chords, namely the second and third chords, which occur over the course of the melody. Their harmony is thoroughly differentiated from the governing chord. This will be explained presently.[15]

In C Major these chords are constructed using most or all of the following pitches: (1) C-E-G; (2) F-A-C-D; and (3) G-B-D-F. Daube's perspective is



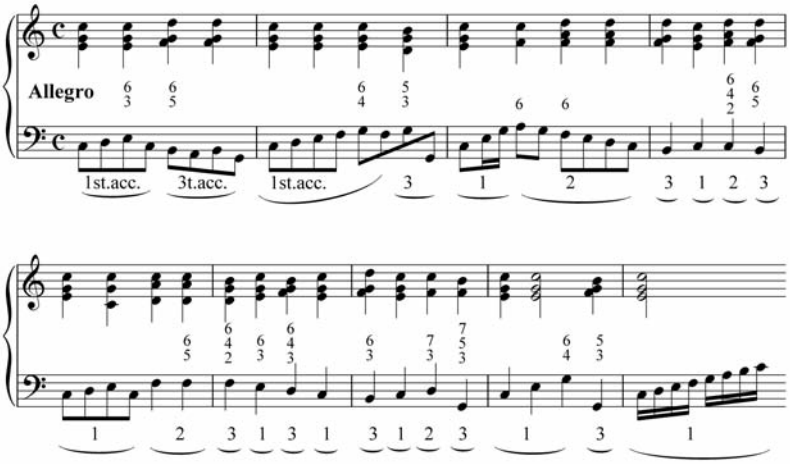
1.8 Rameau: *Génération harmonique* (1737), ex. X.

Rameau's two examples demonstrate how consecutive numbers within a geometric progression correspond to compositional practice. The chords in the first example are generated by the "triple progression" 1:3:9, wherein 3, the *middle* number, represents tonic (the *son principal*) in G Major (*sol*). The chords in the second example correspond to 3:9:27, wherein 9 represents tonic in D Major (*ré*). In a geometric progression, each pair of adjacent numbers is in the same proportion: x is to y as y is to z. Whereas 1:2:3 and 1:3:5 are arithmetically arranged, 1:2:4 and 1:3:9 are geometrically arranged. In musical terms, only the geometric progression generates intervals of the same size: 1:2:4 corresponds to octaves, 1:3:9 to twelfths. Observe that Rameau compresses the 1:3, 3:9, and 9:27 twelfths into fifths.

closely allied to some of Rameau's thoughts on chord progression, though now geared to a more explicitly analytical enterprise through the use of the numerical labels 1, 2, and 3.[16] The roots F, C, and G derive from the "triple progression" 1:3:9, a fact that Rameau had exploited [**1.8**].[17] That Daube regards F, rather than D, as his second chord's root (*Grundton*) accords with Rameau's notion of a "chord of the added sixth" (*accord de la grande sixte*), discussed below (p. 22).

Daube's mature perspective develops out of an earlier formulation, boldly declared in the title of his first treatise of 1756: *General-Baß in drey Accorden* (Thoroughbass in Three Chords). From that point onward, early formulations of a function theory (*Funktionstheorie*) offered an alternative to the scale-step (*Stufentheorie*) approach. Between 1756 and 1770 Daube removed traces of scale-step thinking suggested by his original terminology for the second and third chords: "Accord des 4ten Intervalls" and "Accord der 5 der Tonart," which reference the fourth and fifth scale degrees. Beginning in 1770 he adheres to the rigorously functional labels 1, 2, and 3. Two years later his septuagenarian compatriot Schröter mimics the conception, employing Roman-numeral labels that advance the dominant to second in rank: C-E-G is "I," G-B-D is "II," and F-A-C is "III."[18]

On occasion Daube analyzes an extended progression [**1.9**]. Since this is a novel undertaking he offers a careful explanation:



1.9 Daube: *Der musikalische Dilettant: Eine Abhandlung des Generalbasses* (1770–71), p. 89.

The numbers 1, 2, and 3 serve as labels for the three principal chords of C Major. Additional examples of Daube's numerical analysis appear in *Der musikalische Dilettant: Eine Abhandlung der Komposition* (1773), page 26 [Snook, p. 56], and in *Anleitung zur Erfindung der Melodie und ihrer Fortsetzung* (1797–98), vol. 1, p. 7. The continuation of this example, demonstrating modulation to G Major and then to F Major, appears as **6.5**, below.

To facilitate the learning of thoroughbass in the key of C Major we here have marked the bass line with slurs placed below the notes in such a way that one sees exactly how many bass notes are played for one chord, and which of the three chords it is. A practitioner who has correctly understood the three chords can often play the chords as they appear there: the keyboardist may simply observe the number placed inside the slur and accordingly perform the chord which it represents without paying attention to the chords published in music notation. Likewise it does not matter if the keyboardist plays the three chords in another range or configuration from how they are presented here on the upper staff – it yet remains always one and the same chord. It is anyway by no means intended that the practitioner should always perform the chords as they appear here: for these have no other purpose than to demonstrate when and where a chord can be sounded with a bass part, which to a beginner is no small service.[19]

Koch espouses a similar perspective, though without the numerical analysis that Daube occasionally supplies. In his *Versuch einer Anleitung zur Composition* (1782) he distinguishes between essential triads (*wesentliche Dreyklänge*) rooted on tonic and its upper and lower fifths and incidental triads (*zufällige Dreyklänge*) on the other scale degrees.[20] Several authors of later generations group triads in a similar fashion. For example, scale-step advocate Gottfried Weber refers to the "most essential harmonies of the key"

En ut *mode majeur.*							*En* ut *mode mineur.*						
ré			*sol*			*ut*	*ré*			*sol*			*ut*
si			*mi*			*la*	*si*			*mi*♭			*la*♭
SOL	*la*	*si*	UT	*ré*	*mi*	FA	SOL	*la*♭	*si*	UT	*ré*	*mi*♭	FA
2			1			3	2			1			3

1.10 Momigny: Entry "Ton" in Framery's *Encyclopédie méthodique*, vol. 2 (1818), p. 529.

"Other accounts of the fifth scale degree fly in the face of usage by naming this note *dominant*. Considering its influence and its role in caesuras, through which one may reasonably determine the rank and importance of notes, one must name it the *second note* of the *key*, because it is indeed the most meritorious after the tonic, equipped with its perfect chord, just as is the tonic with its.

The third note of the *key*, with regard to importance and merit, is the fourth scale degree, such as C Major's F. One must observe carefully that each of these notes is the foundation for a major triad in the major mode, and that, in the minor, the dominant is the only one that retains its major quality."

["C'est abusivement que, dans les autres relations de la cinquième note de la gamme ou de l'octave de la tonique, on appelle cette note *dominante*. En égard à son influence & aux repos, par lesquels on peut juger avec raison du rang & de l'importance des notes, on devroit la nommer la *seconde note* du *ton*, parce qu'elle est en effet la plus digne après la tonique, armée de son accord parfait, comme la tonique du sien.

La troisième note du *ton*, relativement à l'importance & à la dignité, est la quatrième note de l'octave de la tonique; c'est le *fa* en *ut*, & l'on doit observer avec attention, que chacune de ces notes porte son accord parfait majeur dans le mode majeur, & que, dans le mineur, la dominante est la seule qui conserve le sien majeur."]

(*wesentlichste Harmonieen einer Tonart*) and to the "kindred or appropriate accessory harmonies of the key" (*eigenthümliche Nebenakkorde der Tonart*).[21] The imaginative French author Jérôme-Joseph de Momigny employs the labels 1, 2, and 3 in Daube's manner (though with Schröter's ranking) in a single example but does not pursue the notion further [**1.10**]. And the Bohemian August Swoboda, a Vogler pupil who worked in Vienna, distinguishes between three fundamental harmonies (*Grundharmonien*) and various derived chords (*künstliche Accorde*), such as the diminished seventh on the leading tone, that imbue the harmonic progression with "many an unexpected turn" and "furnish greater variety."[22] As with Daube's chord 2, his fundamental *Unterdominante* (subdominant) chord may be constructed employing a fifth, a sixth, or both (i.e. in C Major: F-A-C, F-A-D, F-A-C-D and their inversions), its principal roles being to create variety ("so that one doesn't have to listen to the tonic and dominant all the time") and to serve as intermediary between the other two chords.[23]

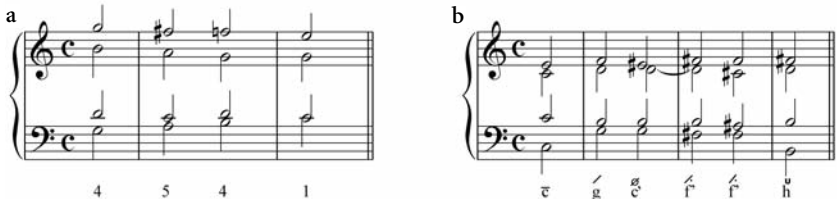
More sophisticated in conception and abundantly illustrated in examples, the functional system of Portmann (whom we have already encountered for

his earlier contribution to analytical notation within the scale-step perspective) comprises six foundational chordal structures (*Grundharmonien*) from which a large number of chords (*Grundaccorde*) can be derived. For C Major, these structures are as follows:

a	f	d	e	h	e
f	d	h	c	g	c
d	h	g	a	e	a
h	g	e	f	c	fis
g	e	c	d	a	d
e	c	a	h	fis	h
C	A	F	G	D	G
1	2	3	4	5	6
Hauptprimenharmonie		Quartenharmonie		Wechseldominantenharmonie	
	Sextenharmonie		Dominantenharmonie		Doppeldominantenharmonie[24]

Each structure's "dissonant side" extends as far as the thirteenth, though when present in a chord these upper pitches often resolve into lower ones, as in a *Dominantenharmonie* that proceeds from G-c-e (root-eleventh-thirteenth) to G-h-d (root-third-fifth). The root, and even the third, may be omitted: e-g-h, a chord of the "second order," derives from the *Hauptprimenharmonie* C (with seventh); while h-d-f, a chord of the "second order," and d-f-a, a chord of the "third order," derive from *Dominantenharmonie* G (with seventh, or with seventh and ninth).[25] The *Wechseldominantenharmonie* is of particular interest. This compound noun merges three individual terms, two of which have English cognates. The German verb *wechseln* has the sense of "exchange" or "change places." In the context of a major key, the *Wechseldominantenharmonie* relates to the *Dominantenharmonie* in the same way that the *Dominantenharmonie* relates to the *Hauptprimenharmonie*. (Nowadays this relationship is often described as an "applied" or "secondary" dominant, or as "V of V.") In a minor key, it takes on a more potent dissonant aspect. In A Minor the *Wechseldominantenharmonie* is spelled as H dis f a c e g, from which chords containing the augmented sixth – f a dis, f a H dis, and f a c dis – are derived. Portmann uses the numbers 1 through 6, corresponding to the six *Grundharmonien*, as analytical symbols only in his introductory demonstration [**1.11a**]. More characteristically he supplies letter names surmounted by various symbols to indicate the *Grundharmonie* roots and chordal functions [**1.11b**].[26]

A little-known treatise proposing a three-chord functional theory much like Daube's appeared in London in 1850, the work of Spaniards José Joaquín de Virués y Spínola (who died a decade before the work was



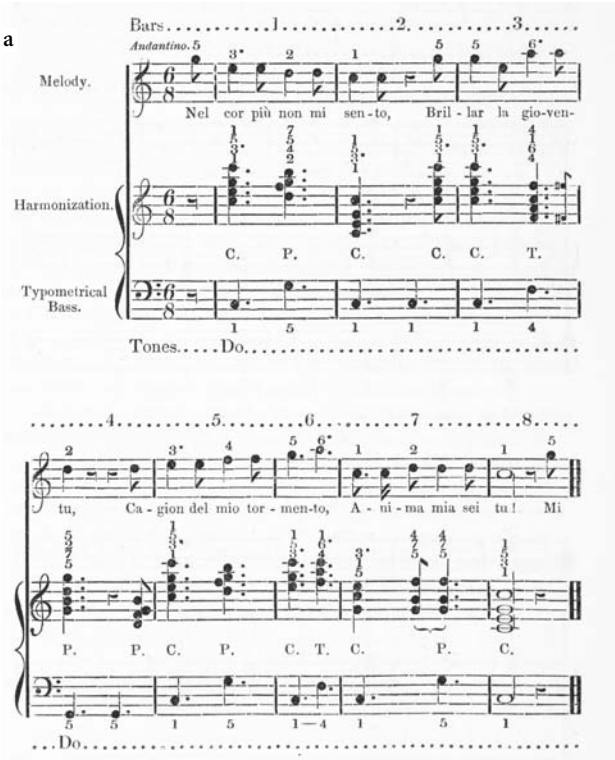
1.11 Portmann: *Die neuesten und wichtigsten Entdeckungen in der Harmonie, Melodie und dem doppelten Contrapuncte* (1798), pp. 20, 123. (Tablature realized in staff notation.)

(a) In Portmann's system the numbers 1, 2, and 3 correspond to *Primenharmonien*: chords rooted on the tonic (*Hauptprime*), the sixth scale degree, and the fourth scale degree, respectively; while 4, 5, and 6 correspond to chords with dominant function: the *Dominantenharmonie* (built on the fifth scale degree), the *Wechseldominantenharmonie* (built on the second scale degree and including the raised fourth and diatonic sixth scale degrees), and the *Doppeldominantenharmonie* (used in the context of a pedal point on the dominant and containing elements of both other dominants). (b) In an alternative notational system that he employs more extensively, Portmann places functional symbols above alphabet letters corresponding to the chordal roots. (In what appears to be an almost anorexic obsession for thin symbols, these letters may be followed by raised or lowered commas in lieu of accidentals: for example, c' stands for c♯.) Among the functional symbols are a horizontal line and a curved line (¯ and ˘) placed above a letter to indicate a *Primenharmonie* with major and minor quality, respectively; an ascending virgule (´) to indicate a *Dominantenharmonie* in a major key and an ascending virgule followed by a dot (´·) for such a chord in a minor key; a double virgule (´´) to indicate a *Wechseldominantenharmonie* in a major key and a slashed circle (ø) for such a chord in a minor key. This example shows how a *Dominantenharmonie* in C Major (ġ) becomes a *Wechseldominantenharmonie* in B Minor (ø = C♯-E♯-G-B-D-F♯-A) through the reinterpretation of F as E♯. Though Portmann's conception and symbols contrast Weber's [**1.6**], both regard what is nowadays referred to as a "German" augmented sixth chord as the third, fifth, seventh, and ninth of a chord rooted on the prevailing key's second scale degree.

published) and F. T. Alphonso Chaluz de Vernevil (who brought the work to fruition). Each chord is given a convenient name: "Since the chord hitherto called *perfect*, and composed of the notes 1–3–5 of the heptachord, takes the name of *Cadence*; the chord of *seventh – sensible*, composed of the notes 2–4–5–7 of the heptachord, will henceforth be called the *Precadence*; and the chord of subdominant, composed of the notes 1–4–6 of the heptachord, which naturally follows the cadence, will take the name of *Transcadence*."[27] In fact, the authors sometimes work with three functions [**1.12a**] and sometimes with only two [**1.12b**].

Hugo Riemann, a distinguished German musicologist whose voluminous theoretical writings span nearly half a century, from 1872 to 1918, is often regarded as the founder of *Funktionstheorie*.[28] Indeed, in his hands the notion took on a sophisticated new life, replete with highly developed

a



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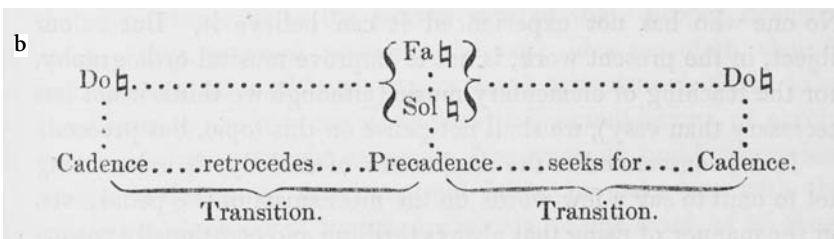


1.12 Virués y Spínola and Chaluz de Vernevil: *An Original and Condensed Grammar of Harmony, Counterpoint, and Musical Composition* (1850), pp. 123, 395.

(a) This excerpt from an analysis of Paesiello's Cavatina, "*Nel cor più non mi sento*," which continues through 20 measures and includes key shifts from Do to Re and to Sol, displays scale-degree numbers for all pitches: thus 1, 4, and 5 below the "Typometrical Bass" refer to bass rather than to root values (though in these measures the bass and the root pitches coincide). The harmonic analysis is placed above these bass pitches, using abbreviations for the terms Cadence, Precadence, and Transcadence.

(b) "Our readers may have inferred that, in music, all consists in going towards or seeking for the tonic, and shunning or flying from the tonic. We have demonstrated that there are no more than two sonorities; viz. the precadence and the cadence. It is obvious, therefore, that they must be the two terms and the two objects of that attraction, as well as that repulsion – of that research, as well as of that flight" (p. 395). Here the word "research" is employed in a now uncommon sense: "The act of searching (closely or carefully) *for* or *after* a specified thing or person" (*Oxford English Dictionary*).

(though sometimes dubious) foundational underpinnings and an array of new analytical symbols. That development had repercussions in German scholarship and pedagogy throughout the twentieth century and is being explored anew today. It is curious that, as author of a monumental *Geschichte der Musiktheorie im IX.–XIX. Jahrhundert* (1898), Riemann barely acknowledges his functional predecessors.

Our narrative traces the emergence and development of strategies for harmonic analysis across the swath of territory from the British Isles through Bohemia. The far north (Scandinavia and Russia) and far south (Spain and Italy) remain for the most part spectators to this enterprise. To be sure, some books with progressive contents penetrated these regions (mainly German writings northwards and French writings southwards), and a few works were translated early on. (For example, the erudite Giovanni Battista Martini studied several of Rameau's treatises in manuscript Italian translations before reporting on the Frenchman's theories before Bologna's Accademia delle scienze in the early 1760s.) Yet even confining ourselves to this more limited territory, our plot is sometimes tortuous. Though it might be convenient to regard function theory as essentially a German enterprise, we noted a hint of it from Momigny in France. And how can we explain the aberration of a system much like Daube's early formulation being offered by two Spaniards, in English no less?

Concerning function theory, the relatively obscure Portmann offers the most interesting ideas and analytical methodology to emerge during the era that is our principal focus. Unfortunately he did not have a powerful immediate successor, someone comparable to Gottfried Weber, whose major thrust in Roman-numeral scale-step analysis began just three years after Vogler's death. Thus the functional perspective lay dormant during much of the nineteenth century.

Whether an analyst subscribes to the scale-step or to the function perspective, or simply notates each chord's fundamental without further analytical observation, achieving a persuasive correlation between the chordal entities of a composition and the foundational entities operative within the theoretical framework is of critical importance. For example, a D-F-A chord in C Major would be interpreted by a practitioner of Portmann's method as a representative of the *Dominantenharmonie*, rooted on G. One wonders how persuasive that notion was, particularly to musicians inclined towards the scale-step perspective. Though a larger

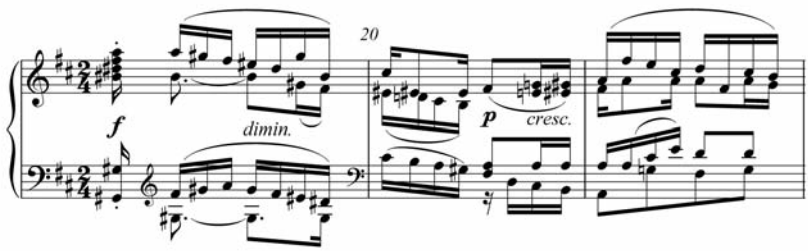
number of basic entities – seven roots, some occasionally modified chromatically – are available when scale steps ground the system, even then some chords may be assigned to categories in a way that arouses controversy. Already we have observed disagreement regarding the chord B-D-F. Is its root B, as Vogler would assert? Or G, as Lampe would assert? It is time to take a closer look at practices of assigning chordal roots.

Chordal roots

Crafting chord labels for a progression of fundamental pitches within a single key is a mechanical process. Though the symbols employed in a scale-step perspective may vary from analyst to analyst, and though some may pack more information regarding quality, chord components, inversion, and chromatic alteration into their symbols than others, the outcome is predictable. In contrast, determining a chord's fundamental can be an engaging, challenging occupation. Analysts guided by contrasting basic principles may offer wildly divergent views concerning a chord's root; or, the same chord may be interpreted in different ways depending upon its context. Recall that Lampe regards a pitch not even present in a chord as its root [**1.1**]. What justifies such a choice?

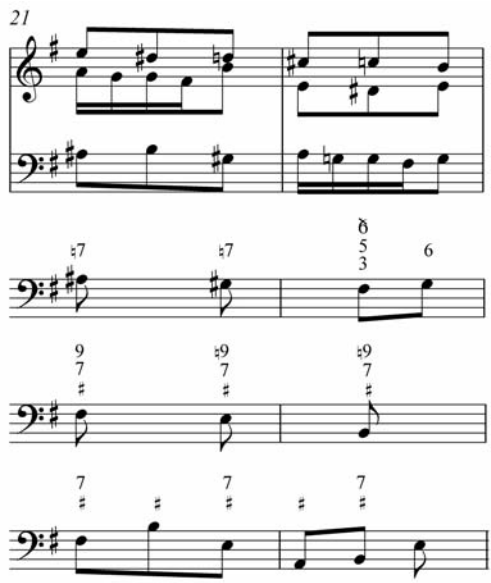
A chord may in certain contexts be understood as an incomplete or modified representative of some other chord. Gottfried Weber, expanding upon Vogler's discussion of multiple meaning (*Mehrdeutigkeit*) in music, presents an apt example: a chord consisting of two Bs and a D. He suggests numerous possible interpretations: it could represent a G chord (G-B-D), or G^7 (G-B-D-F); or °h (B-D-F), or °h^7 (B-D-F-A), or h (B-D-F♯), or h^7 (B-D-F♯-A); or E^7 (E-G♯-B-D), or e^7 (E-G-B-D); and so on.[29] Mendelssohn exploits the multiple meanings of a similarly meager chord in his Song without Words in D Major (op. 102, no. 2), where two F♯s and an A (measure 20) may represent f♯ (F♯-A-C♯) to follow the preceding $C♯^7$ chord or D (D-F♯-A) to inaugurate the return of D Major [**1.13**].

If a four-note chord can be represented by two of its component pitches, then Lampe's analysis [**1.1**], in which three of a chord's four members are present, may seem less wayward. Yet whereas any chord that contains only two pitches *must* be analyzed in terms of some imaginative chord-completing operation, Lampe's imaginative effort is triggered instead by the theoretical premises of his analytical practice. He simply will not sanction having a diminished fifth above the chordal root: "There are only six Cords which consist of Sounds distinguished to be all natural."[30] (For C Major, he



1.13 Mendelssohn: Song without Words in D Major, op. 102, no. 2 (1845), mm. 19–21.

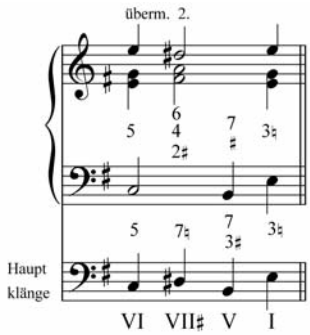
Do the pitches F♯ and A at beat 2 of measure 20 represent tonic in F♯ Minor, tonic in D Major, or both?



1.14a Kirnberger: *Die Kunst des reinen Satzes in der Musik* (1771–79), vol. 1 appendix, p. II [Beach and Thym, p. 272].

Kirnberger regards the diminished seventh chord to arise "from the first inversion of the seventh chord with the suspended minor ninth" (vol. 1, p. 90 [Beach and Thym, p. 107]). These seventh chords appear on the lowest staff of Kirnberger's analysis, while the suspended minor ninths are displayed among the figures above the second-lowest staff.

For example, the progression's first chord is:		A♯		E	G.
(Sixteenth-note A is a suspension, resolving to G.)					
It represents $^{\flat 7}$ on A♯, whose complete realization would be:		A♯	C(♯?)	E	G.
The origin of this chord is $^{9}_{7}$ on F♯, where G is a suspension:	F♯	A♯	C(♯)	E	G.
Resolving the suspension, that chord becomes $^{7}_{\sharp}$ on F♯:	F♯	A♯	C(♯)	E	F♯.



1.14b Vogler: *Handbuch zur Harmonielehre* (1802), table IV, ex. l.

Vogler takes the diminished seventh chord (beat 2) at face value, interpreting D♯ as its root and treating C as an essential chord member. (Kirnberger would analyze C as an incidental dissonance – a suspension – resolving to root B in a chord that spans beats two and three.) Vogler's progression of roots (*Hauptklänge*) contains an augmented second. (The German adjective *übermäßig* means excessive or, in the context of an interval, augmented. Yet the augmented second to which Vogler refers in his caption is that between bass C and soprano D♯ on beat 2, not the melodic augmented second that appears among the *Hauptklänge*.)

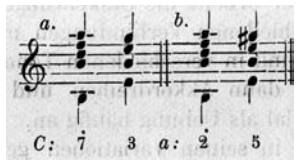
displays minor triads on A, D, and E and major triads on C, F, and G.) Thus he is compelled to regard B-D-F as an abbreviation of G-B-D-F, a perspective shared by musical thinkers of many generations.[31]

Chords such as B-D-F-A♭ and B-D-F-A offer additional challenges. As does Vogler [**1.4**], one could take them at face value, with no imaginative insertions or substitutions. Yet the diminished fifth B-F would again induce some to posit G as root. Rameau regards A♭ as a substitute for G:

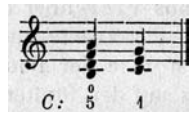
> We may accept the diminished seventh chord as long as the fundamental is not destroyed by the transposition of the lowest sound [up a minor second, as in G-B-D-F to A♭-B-D-F]. We must therefore consider this lowest and fundamental sound to be implied in the sound substituted for it, so that the source continues to exist.[32]

In a related conception, Kirnberger in Berlin juxtaposes the absent root and the ninth, displaying $\frac{9}{7}$ chords beneath diminished seventh chords and resolving their "suspended" ninths to produce conventional seventh chords [**1.14a**]. The ninths are "incidental" dissonances and therefore can be removed, whereas the sevenths are "essential" dissonances, or *bona fide* chord members.[33] Comparing Kirnberger's and Vogler's perspectives [**1.14a, b**], we observe that the resultant fundamental bass lines are of distinctly contrasting characters: Kirnberger's is dominated by perfect fourths and perfect fifths, while Vogler's includes an augmented second.

a

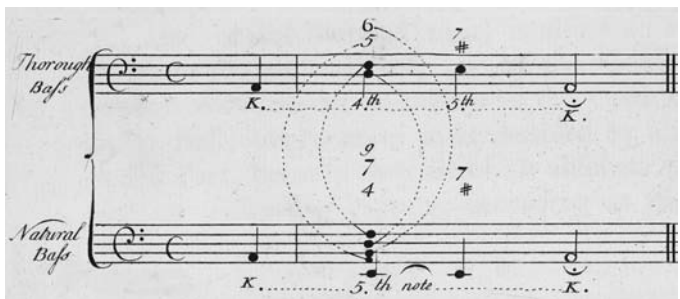


b



1.15 Lobe: *Lehrbuch der musikalischen Komposition*, vol. 1 (1850, [2]1858), pp. 204, 206.

In Lobe's Jelensperger-inspired notation a dot above an Arabic numeral indicates a minor seventh (here A above root B) and a circle indicates a ninth (here A above absent root G). Similar examples employing Roman numerals, such as one in Friedrich Schneider's *Elementarbuch der Harmonie und Tonse[t]zkunst* [1820], p. 28, appear as well.



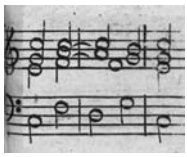
1.16a Lampe: *A Plain and Compendious Method of Teaching Thorough Bass* (1737), plate 7, ex. XX (near p. 35).

To achieve a *perfect* fifth above the root, Lampe chooses E as foundation for D-F-A-B despite what may seem a curious alliance with the chord that follows.

Concerning B-D-F-A, Lobe presents a nuanced reading that takes context into account: its root is B if a chord rooted on E follows, but G if a chord rooted on C follows [**1.15**].

Lobe's "*C:* $\dot{7}$3" and "*a:* $\dot{2}$5" readings reflect a tolerant attitude towards the diminished triad, B-D-F, as a chord-building component. Certainly its justification does not emanate from B's overtone series.[34] More conservative analysts were compelled to find alternative solutions. Seeking the root of D-F-A-B in the context of A Minor [**1.16a**], Lampe rejects not only B (because its fifth F is diminished) but also B's lower third, G♯ (because its fifth D is diminished as well). He embraces E, which supports a fifth (5 is absent from his figures), a seventh (7), a ninth (9), and an eleventh (figured as 4). As a result his example displays natural bass E as a shared foundation for D-F-A-B and the E-G♯-B-D chord that follows. Portmann offers a similar interpretation of B-D-F, as "either an incomplete dominant seventh chord in a major key [G-B-D-F], from which the root has been omitted, or

b



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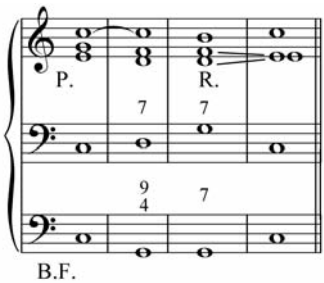
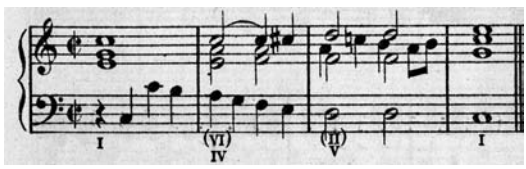


1.16b Portmann: *Die neuesten und wichtigsten Entdeckungen in der Harmonie, Melodie und dem doppelten Contrapuncte* (1798), plate 3, figure 35.
1.16c Rey: *Exposition élémentaire de l'harmonie* [1807], p. 61.

(b) Portmann's example corresponds to a chart (p. 62) that labels the third chord's D, F, A, and C as the 5th, 7th, 9th, and 11th, respectively, of C Major's *Dominantenharmonie*. (See p. 13, above.) Root G and third B are absent, though they arrive later in the measure when the dissonant 9th and 11th resolve to lower elements of the *Dominantenharmonie*.
(c) Rey's caption for this example is "Emploi de l'Accord de Septième de Seconde" – the use of the seventh chord on the second scale degree. C, the seventh above bass D, is an eleventh (figured as 4) above root G, shown in the unperformed *basse fondamentale* line. Rey's "P" indicates dissonant C's preparation and "R" its resolution.



1.16d Halm: *Harmonielehre* (1900, [2]1925), plate XI, ex. 30a.

"A subordinate triad can represent one of the two primary triads from which it is constituted, and indeed the one we expect in accordance with the rhythm . . . Consequently [in this example] the subordinate triad VI, on a downbeat and appearing when we expect IV, has the meaning of a suspension chord of this IV; . . . the subordinate triad II arises through a similar substitution: certainly . . . it is meant as a suspension [chord] that delays the arrival of V."
["Ein Nebendreiklang kann auf einen der beiden Hauptdreiklänge, deren Kombination er ist, bezogen werden, und zwar auf denjenigen, welchen wir dem Rhythmus nach erwarten . . . So hat bei a der Nebendreiklang VI, betont und auf eine Zeit eintreffend, wo wir die IV erwarten, die Bedeutung eines Vorhaltsakkords zu dieser letzteren; . . . demselben Wechsel unterliegt der Nebendreiklang II: er wird . . . schon als Vorhalt auf V bezogen" (pp. 62–63).]

an incomplete dominant ninth chord in a minor key [E-G♯-B-D-F], from which two chord members [root and third] have been omitted."[35]

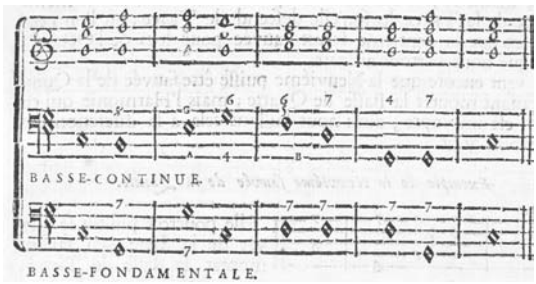
Such interpretations are pursued not only in order to avoid placing diminished triads in foundational roles. Portmann in Germany and Jean-Baptiste Rey in France employ a similar strategy even in a major key, where

D-F-(A)-C contains no diminished interval [**1.16b, c**]. The analysis hinges on the question of whether A and C derive from D, or whether they instead displace pitches derived from G. That issue was still generating provocative commentary a century later, in the writings of August Halm [**1.16d**].

While descending a third or a fifth below the lowest pitch of a chord's stacked-thirds configuration may restore a missing or displaced root, ascending a third or a fifth above that pitch in quest of the root was practiced as well, especially by Rameau and his followers. Heeding the view of his Italian predecessor Gioseffo Zarlino, Rameau rejects the viability of a chord that extends in thirds beyond an octave above its fundamental. If one extends beyond the seventh to a ninth or an eleventh, "the fundamental of the harmony will then be confused." By placing the root within, rather than at the bottom of, these stacked-thirds configurations, he also converts the stack's highest element into a seventh.[36] Limiting himself to the third, fifth, and seventh above, his chordal constructions must extend below the fundamental by a third or a fifth as well, in a practice he calls supposition (*supposition*), or sub-position, because the "added sound will suppose the fundamental, which will be found immediately above it"[37] [**1.17**]. Pitches figured as "9" or "4" above the sounding bass function as "7" above their fundamentals, and at least in theory they will behave as would a seventh. The notion initially found some favor, and was expanded to include the thirteenth in the writings of Rameau's champions Jean Laurent de Béthizy in France and Friedrich Wilhelm Marpurg in Germany. Yet, as we shall see, even Rameau did not consistently adhere to this formulation.

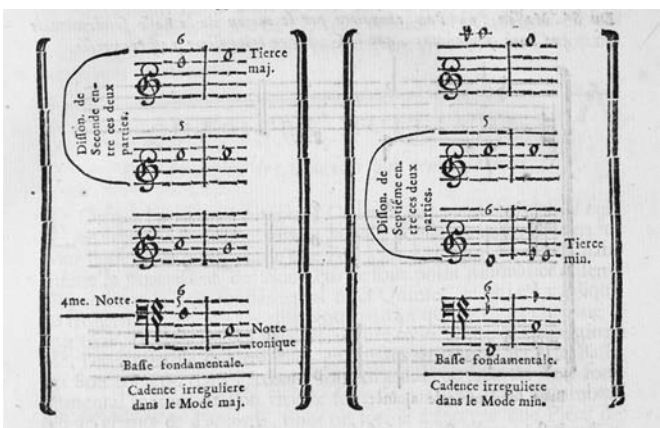
Rameau's "Irregular cadence" incorporates perhaps the most celebrated instance of a root residing among the interior pitches of a chord's stacked-thirds configuration [**1.18**]. Whereas the chord F-A(♭)-C-D may in some contexts represent an inversion of D^7, here F is indicated as *basse fondamentale*, while D converts the triad into a "chord of the added sixth" (*accord de la grande sixte*), the sixth serving as a sort of dissonance to propel the chord onward just as a seventh is added to the dominant triad for that purpose.

Contrasting these various modes of interpretation, which reduce the number of distinct chord types and eliminate some problematic intervallic relationships between adjacent roots within a progression, is the option of simply embracing all common pitch combinations as chordal and categorizing them according to their stacked-thirds configurations. One particularly robust inventory along these lines appears in Johann Anton André's *Lehrbuch der Tonse*[*t*]*zkunst* (1832).[38] The *triangle* symbolizes the triad. A number placed within the triangle indicates which of five basic triad types



1.17 Rameau: *Traité de l'harmonie* (1722), p. 278 [Gossett, p. 296].

Rameau interprets the first chord of measure 2, E-G-D-F, as G^7 with supposed third E and the first chord of measure 4, G-G-C-D, as D^7 with supposed fifth G. The fundamental-bass progression C–D–G in measures 2 through 4 warrants further explanation, which Rameau was not yet prepared to supply in 1722. Later, in his *Génération harmonique* (1737), he would promote the concept of "double employment" (*double emploi*): F-A-C-D (measure 3) could be regarded, upon arrival, as a "chord of the added sixth" (*accord de la grande sixte*) with root F. Upon departure, D takes over as root. The resulting fundamental-bass progression C–F/D–G emphasizes Rameau's preferred interval of the fifth and notably eliminates the problematic C-to-D root succession. (The issue of consecutive roots separated by a step will be addressed in chapter 4, below.) Following the model of *Génération harmonique* (e.g. Example XV), a cursor (⟿) representing F might be placed below fundamental-bass D at the downbeat of measure 3 to indicate the alternative foundation pitch for this chord.



1.18 Rameau: *Traité de l'harmonie* (1722), p. 65 [Gossett, p. 74].

These examples display the "irregular" cadence. In his *Génération harmonique* (1737), p. 72, Rameau employs the term "imperfect" for this cadence type: *Cadence imparfaite ou irréguliere*. In both examples Rameau indicates that the chordal dissonance (a second or a seventh) occurs between two upper voices, not against the bass. (In this instance the line labeled as *basse fondamentale* is the sounding bass.) Observe that Rameau's caption for the first example includes the terms "4me. Notte." and "Notte tonique," a model that Lampe would have rendered as "4th. . . K."