THE HARMONIC THEORIES OF KIRNBERGER AND MARPURG

by

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During the years 1722-1760, Jean-Philippe Rameau published the series of treatises in which he developed his theory of harmony, a theory that changed the musico-theoretical thinking of his own time and greatly affected that of future generations. Certain of his contemporaries were quick to recognize the value of his ideas; others rebelled against what they considered to be abstract theorizing far removed from actual musical problems. Friedrich Wilhelm Marpurg (1718-1795) belonged to the first category. He regarded himself as the first disciple of Rameau in Germany, the official disseminator and interpreter of his theories. This was most unfortunate for Rameau, for Marpurg did not understand the full significance of Rameau's theories and, as we shall see, questioned statements without having fully understood their context. For example, he missed entirely one of Rameau's most basic views: that melody, even unaccompanied melody, has its roots in harmony. Indeed, he even states a contrary view: "Aus Tönen entstehen Intervalle, und aus Intervallen Accorde [Handbuch bei dem Generalbasse, Vol. 1, 2nd ed., p. 4]." And the basis of Marpurg's method for deriving a scale is the erroneous experimental observation of a subharmonic series reported by Rameau in his Génération Harmonique (1737) and later corrected in Démonstration du principe de l'harmonie (1750). Marpurg seems never to have read the latter; at least, he did not correct his mistake.

In contrast to Marpurg, Johann Philipp Kirnberger (1721-1783) regarded himself as a practical theorist. He bitterly opposed theories which he regarded as being far removed from practical musical problems. Some aspects of his work reflect the thought of the generation of his teacher, Johann Sebastian Bach, but the most significant aspects of his work face the future and are reflected in the writings of a later generation.[1]

Before making a closer comparison of the ideas of Kirnberger and Marpurg it may be helpful to survey their major writings.

Marpurg wrote prolifically on many subjects: counterpoint, harpsichord playing, ornamentation and performance practice, and music theory. His theoretical works are listed below.

Des critischen Musicus an der Spree, 1750 [Musicus]. A periodical containing a series of articles which outline a theory of harmony.

1. In, for example, the writings of Türk, Kollmann, Gottfried Weber, Richter, and others.

This was developed more fully in the Handbuch bei dem Generalbasse listed below.

Abhandlung von der Fuge..., 1753-54.
A detailed treatise on the fugue.

Handbuch bei dem Generalbasse . . ., 1755-1760 [Handbuch].
A large and comprehensive textbook on harmony, composition, and theory of harmony.

Herrn d'Alemberts... Systematische Einleitung in die musikalische Setzkunst nach den Lehrsätzen des Herrn Rameau, 1757.
According to Shirlaw [5, 308] this is primarily a translation of d'Alembert's Élémens de Musique (1752).

Anfangsgründe der theoretischen Musik, 1757.
This is principally a treatise on tempered tunings.

Kritische-Briefe über die Tonkunst, 1760-64.
A large collection of essays on almost every aspect of music. Of particular interest is a letter to C. P. E. Bach (p. 25) in which Marpurg defends his harmonic theories.

Historisch-Kritische Beyträge zur Aufnahme der Musik, 1760.
A collection of essays on music in five volumes. The long article entitled "Untersuchung der Sorgischen Lehre von der Entstehung der dissonirenden Sätze" in Vol. 5 [Untersuchung], contains the core of Marpurg's harmonic theory.

Herrn Sorgen's Anleitung zum Generalbasse mit Anmerckungen von F. W. Marpurg, 1760 [Anleitung].
It is in this work that Marpurg repeats Rameau's misconception of the nature of the partial series, an erroneous thesis upon which he bases his own construction of a chromatic scale.

Versuch über die musikalische Temperatur nebst einem Anhang über den Rameau- und Kirnbergerschen Grundbasse, 1776 [Anhang].
The Anhang of this work and the Untersuchung provide the essential material of Marpurg's harmonic theory. The Anhang is made up of extensive quotes from Kirnberger's Die wahren Grundsätze zum Gebrauch der Harmonie together with critical remarks on the quoted passages.

Unlike Rameau, Marpurg did not develop and change his theories in successive publications. His first theoretical writings in the Musicus are only preliminary sketches for a theory. The Handbuch is the first and most comprehensive statement of the completed theory. Except for minor alterations, and the fuller explanation of his views on dissonant combinations given in the Anhang and the Untersuchung, his ideas remain essentially the same. Marpurg is a man quick to point out and to attack those whom he considers to have strayed from Rameau's straight and narrow path. And in his polemical writings, in the Anhang and the Untersuchung, for example, he is sometimes given to excessively arbitrary general statements and abusive language. However, his respect for Kirnberger was genuine [Anhang, 233], and although he disagreed with him violently he spared him from the more

picturesque figures of speech with which he attacked Sorge.

The theories of Kirnberger are contained in two works: Die Kunst des reinen Satzes, 2 vols., 1771-79 [Kunst]; and Die wahren Grundsätze zum Gebrauch der Harmonie, 1773 [Harmonie]. The first is the definitive work; the latter is shorter, giving more attention to the fundamental bass and problems of musical analysis. Its relationship to the Kunst as well as to Kirnberger's student, J.A.P. Schulz, are explained by Siegfried Borris [2, 97-8]. A second and even more condensed treatment of harmony is his Grundsätze des Generalbasses, 1781 [Grundsätze].

Kirnberger is a more lucid and reasonable writer than Marpurg. However, when his common-sense aural approach to theoretical problems, which is basically sound, is displaced by purely intellectual speculation, the results are sometimes unfortunate. Yet, in matters of practical theory and harmonic analysis, he seems to be a man of greater musical insight than Marpurg. In the remainder of this paper the theories of each of these men will be taken up separately, beginning with those of Marpurg. Primary attention will be given to their views on basic chord material, its derivation, and dissonant combinations such as the 9th, 11th and 13th chords. We will then use the Anhang as the basis for a comparison of their views on the fundamental bass and certain problems of harmonic analysis involving the question of essential and "accidental" (non-essential) discords.

Throughout his writings Marpurg seems to be unaware of the evident inconsistency between his avowal of French apostleship and his openly dissenting opinions. We have quoted him as saying, "Aus Tönen entstehen Intervalle, und aus Intervallen Accorde." The extent to which this statement is at odds with the theories of Rameau becomes apparent when one understands that by "Tönen" Marpurg means scales. This meaning is clear not only from the discussion that follows the statement [Handbuch, 4-5] but also from the order in which various musical materials are considered. First he discusses the means by which scales (diatonic and chromatic) are derived. He then obtains his chord material from this melodic material. Rameau, however, first derives intervals from the senario, then major and minor harmony, and only after that does he construct scales.

Marpurg considered Rameau's system to be incomplete [Untersuchung, 136] and offered instead a "combined Rameau-Marpurg system." In order to be complete, he maintained, a system must contain all possible tones, intervals, and chords, insofar as they are possible practically. This requires twenty-one pitches in an octave — although Marpurg does not give a table of them; and from a two, three, or four-fold combination of these, all possible intervals and chords may be derived [Untersuchung, 136]. The basis for his method of scale construction is an error of observation made by Rameau in his Génération Harmonique (1737). In a series of expériences Rameau seems to discover not only the origins of major harmony in the senario of a vibrating string, but also the origins of minor harmony in the co-vibration of strings whose

lengths are multiples of the agitating string. Marpurg restates this observation both in the Anleitung (p. 5) and in the Untersuchung (p. 145), but without any of Rameau's mathematical "proofs." Except for his treatises on tuning, Marpurg's theoretical works deal primarily with practical observations and speculations and only summarily with acoustical and mathematical proofs. With major harmony (C-E-G) provided by the "erklingende" tones (the upper-partials) and minor harmony (F-A^{b}-C) by the "erzitternde" tones (the fictitious lower-partials, or "sub-partials") he proceeds to construct a scale, using only the "erklingende" and "erzitternde" fifths provided by Rameau's erroneous observation. Beginning with the Grundnoten C, E, and G, Marpurg obtains the notes G, B, and D from the erklingende fifths C-G, E-B, and G-D. Next, he obtains the notes F, A, and C from the erzitternde fifths C-F, C-A, and G-C. D, $F^{\#}$, and A then are obtained as erklingende fifths from G, B, and D, while B^{b}, D, and F arise as erzitternde fifths from F, A, and C. By the above method of pitch-derivation, Marpurg obtains all the necessary tones, intervals, and chords from three basic triads: C-E-G, G-B-D, and F-A-C. However, he says that we need only the kinds of intervals found within the range of a primary key and its five nearly related keys, and which "in relation to C major and A minor [representing a major key and its relative minor] arise from the various combinations of the twelve half-tones, C, $C^{\#}$, etc." [Untersuchung, 146]. The proportions of the intervals are obtained by, first, comparing the upper partials, C, c, g, c', e', g', and c" with the resonating body C. This yields the following ratios:

1:2 = C:c - the octave

1:3 = C:g - the twofold fifth (die zweyfache Quinte)

1:4 = C:c' - the twofold octave

1:5 = C:e' - the threefold major third

1:6 = C:g' - the threefold fifth

1:8 = C:c - the threefold octave

From these the following set of ratios is derived:

1:2 - octave

2:3 - fifth

3:4 - fourth

4:5 - major third

5:6 - minor third

5:8 - minor sixth

3:5 - major sixth [Untersuchung, 146-7]

Having thus obtained the ratios for all intervals, with the exception of the different species of seconds and sevenths, Marpurg now proceeds to "higher" mathematics. From the previous ratios he obtains the proportion 1:2:3:4:5:6:8, and by various mathematical operations he obtains all the missing ratios. The square of the fifth 2:3 yields the major

ninth 4:9 = C:d. This may be reduced to a major whole-tone by raising the lower partial an octave, viz. 8:9 = c:d [Untersuchung, 148]. Its inversion, 9:16, yields the minor seventh D:c. The addition of a fifth and a minor third produces the ratio 5:9 for the minor seventh E:d; and its inversion 9:10 produces the minor whole-tone d:e. From the addition of a fifth and a major third comes the ratio 8:15 for the major seventh. Its inversion 15:16 gives the major half-tone. Finally, from the square of the major third 4:5 comes the augmented fifth 16:25. When the ratio of the fifth 2:3 is taken from this, the minor half-tone 24:25 remains [Untersuchung, 149]. Marpurg has now accounted for every interval which he considers essential to his system.

The foregoing has shown that Marpurg comprehended and accepted Rameau's theory of inversion. Since his discussion of sixth chords and six-four chords adds nothing new it will not be dealt with here. Marpurg also accepts Rameau's idea that the basis of chord construction is the manipulation of thirds. However, in giving his reasons for using thirds and in his description of their use and function he wanders far from French territory. Rameau justified his use of thirds by his observation that all chords in fundamental position are formed in a series of thirds. Marpurg also makes this observation, but proceeds to justify it further by listing all intervals according to frequency of occurrence in the complete system of twenty-one scales and twelve major and twelve minor keys. He is distressed by the fact that the minor third occurs more often (18 times) than the major (17), but he dismisses this observation, remarking that this is not at all detrimental to what he deems the "natural superiority" of the major third [Untersuchung, 151], by which he means that in the senario 4:5, the major third, occurs before 5:6, the minor third. In discussing the construction of the major and minor triad, he says that both are composed of a third and a fifth from the fundamental, therefore composed of thirds. He observes the difference between the characteristic thirds but not the fact that each triad is made up of one major and one minor third.

The actual formation of 7th and 9th chords gives Marpurg no trouble. The 7th chord is formed by superimposing a third above the fifth, the highest tone thereupon forming a seventh with the bass, and the full chord remaining within the octave [Untersuchung, 162]. Marpurg follows Rameau's basic precept that even if the range of a complete chord exceeds the octave its roots must lie within that interval. Thus, the 7th chord is essential, its root a real root. To form a 9th chord a tone is added a third below the root of the 7th chord [Untersuchung, 169; Musicus, 171-2]. And to be consistent with his theory of chord formation, Marpurg finds the root of the 11th chord by adding two thirds, the root of the 13th chord by adding three thirds below the root of the 7th chord. However, he explains, these middle thirds are not practicable and are not in the Rameau-Marpurg system. Having eliminated these he leaves us with tones at the distance of a third, fifth, and seventh below the real root (the root of the fundamental 7th chord) as the "subposed" (untergeschobenen) roots of the 9th, 11th, and

13th chords, and thus completes his system of chordal formation.

With all chords thus accounted for, Marpurg then proceeds to speak of their nature and function. Both in these discussions and in his arguments with Sorge he reveals two weaknesses. First, he does not seem to grasp the real reason that notes are not added above the seventh to form 9th, 11th, and 13th chords; for, having only a dim comprehension of Rameau's basic premise that melody comes out of harmony, he does not fully understand that to add notes above rather than below would involve a discussion of suspensions, a discussion which undoubtedly would weaken this basic premise. That is, superposed notes might be explained as melodic events, as retardations of the essential chord notes. When, however, chords are constructed by "subposing" thirds the essential unity of the chord, the 7th chord, and the integrity of its root remain intact. Thus, if a 9th chord is constructed by superposing a third above the 7th chord, E-G#-B-D, the ninth, F, may be regarded merely as a retardation of the essential note, E. However, if a 9th chord is constructed by "subposing" a third below E, the ninth remains a member of the essential chord, E-G#-B-D. Even if it were regarded as a retardation it would resolve to C, a replica of the subposed root, which is not a member of the essential chord. Unfortunately, the last sentence of Sorge's one clear statement regarding the suspended, freely entering ninth spoils the whole, for it contains a vulnerable point which Marpurg is quick to attack, leaving unanswered the more important question of suspension [5, 315]. Secondly, he seems to be unaware of an important corollary to Rameau's principle of inversion. This principle, which is based on the assumption that octave tones are merely replicas of each other, states that the notes of any invertible chord must lie within the range of an octave. Therefore, the subposed roots cannot participate in inversions since their inclusion as real roots would extend the compass of the complete 9th, 11th, and 13th chords beyond an octave. Although Rameau makes this quite clear [Traité, 33], it seems to have escaped Marpurg, for in at least two instances he has included a subposed root in inversions. The first of these involves a 9th chord [Handbuch, 75], the second an 11th chord [Untersuchung, 174].

Although the greater part of Marpurg's theoretical writing is devoted to discussions and arguments on the subject of 9th, 11th, and 13th chords, (primarily on the necessity of subposed roots as a means of keeping the essential chord and the real root within the range of an octave) he shows no real insight into the nature of these chords. He employs fundamental bass progression to show that the real root is that of the 7th chord [Untersuchung, 179-81]. He does not do the same when discussing the inversions of these chords. These discussions serve to point up the difference between the view that 9th, 11th, and 13th chords are the result of melodic embellishment, as proposed by Sorge and Kirnberger, and Rameau's view that these chords are essential dissonances. While he remains the confused middleman, Marpurg inadvertently helps to clarify the arguments of each side for the 20th-century reader.

In order to maintain his position that the 7th chord and its root

are the essential elements in the construction of 9th, 11th, and 13th chords, Marpurg is forced to consider the diminished 7th chord as a fundamental chord [Untersuchung, 186; Musicus, 175; 181]. However, as his various descriptions of that chord reveal, Marpurg is by no means completely secure in his opinion. In the Untersuchung the diminished 7th appears as one of several types of 7th chord, and is described as the diminished 7th chord constructed from the minor diminished triad G#-B-D-F which is found only on the raised 7th degree in A minor [Untersuchung, 165]. In an earlier part of the Musicus he flatly states that the diminished 7th chord is not a fundamental chord. It is a "borrowed harmony" (eine erborgte Harmonie) on the raised leading-tone in minor derived from the inversion of the chord of the augmented second on the natural 6th degree in minor, F-G#-B-D [Musicus, 181]. Yet, further on, in his description of the construction of 9th, 11th, and 13th chords, we find these examples: 1) the 7th chord B-D-F-A^b as the essential chord of the 11th chord E/B-D-F-A^b;[2] 2) in minor, the fifth (E-B) of the chord is often changed to a minor sixth, in which case this 11th chord A/F-G#-B-D is derived from the augmented-2nd chord F/F-G#-B-D; 3) the chord with major third and diminished fifth E, G#, B, D, F, which does not differ from the foregoing chord except that the ninth is minor, the 7th chord B/B-D#-F-A, and the 11th chord derived from it E/B-D#-F-A [Musicus, 211]. These statements of course do not outweigh those of the Untersuchung which was written ten years later. There Marpurg maintains a sphinx-like silence when on such dangerous ground.

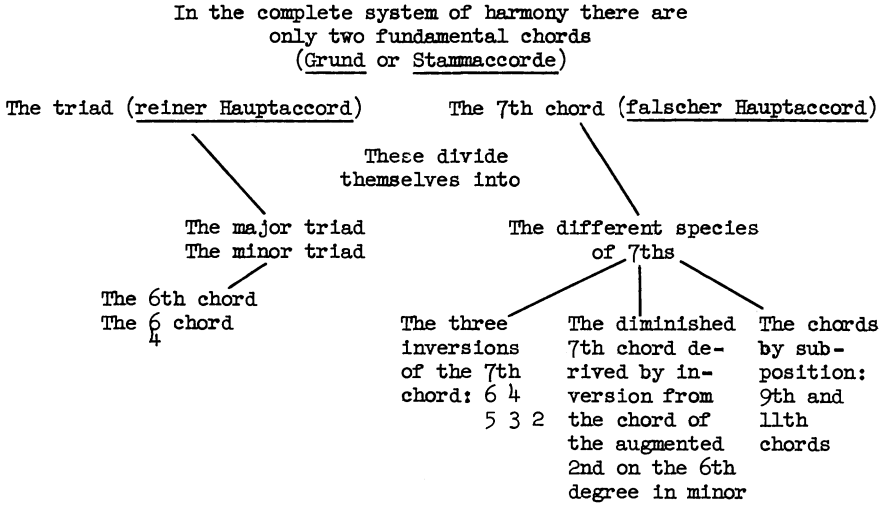
In the last examples from the Musicus (B/B-D#-F-A and E/B-D#-F-A) Marpurg has touched upon another thorny question, that of the augmented 6th chord. Although the examples of 9th chords given in the Musicus include such chords as the 9th chord derived from the augmented second on the 6th degree in minor (which is built by subposing a root, not at the interval of a third, but at the interval of a fourth below the "7th" chord F/F-G#-B-D), and the 9th chord G/B-D#-F-A derived from the "fantastic" 7th chord B/B-D#-F-A, there is no reference to anything resembling an augmented 6th chord [Musicus, 202]. Yet, ten years later Marpurg came perilously close to recognizing the augmented 6th chord when he stated that the chord F-A-B-D# came from the "fantastic" 7th chord B-D#-F-A. The augmented 6th chord F-A-C-D# comes, he says, from the 7th chord D#-F-A-C. Of the two, the former is the more frequently used, and both chords result from the mixing of two keys, A minor and E minor [Untersuchung, 167]. Although he describes these chords as belonging to a species of 7th chord which is used only in an inverted form, he does not say that they are fundamental chords, as are most of the 7th chords.

One of Marpurg's few concrete statements is his system of chord classification. We can follow the development of this from its first appearance in the Musicus, through its middle stages in the Handbuch, to

2. These are shorthand musical examples. The letter to the left of the slant represents the actual bass note.

its final form given in the Untersuchung. Since these three classification systems afford a neat summary of Marpurg's theories, as well as a chronological view of the development of the theories they are presented in full below.

I. From the Musicus (p. 220)



II. From the Handbuch (p. 28)

I. Fundamental chords of the first rank (all non-inverted chords found within the range of an octave)

1) consonant harmonic triad C-E-G, A-C-E.

2) dissonant harmonic triad B-D-F, C-E-G#.

3) 7th chord G-B-D-F

All these are constructed in a series of ascending thirds.

II. Fundamental chords of the second rank (all chords by subposition)

1) the 9th chord E/G#-B-D-F

2) the 11th chord C/G#-B-D-F

3) the 13th chord A/G#-B-D-F

III. From the Untersuchung (p. 16)

A. Classic chords (those which are based only in one key). These are divided into:

1) triads (Hauptaccorde), major and minor

2) related triads (Verbindungsaccorde), dissonant because of their position in the key, which are

a) minor diminished triads on the 7th degree in major

b) major augmented triads on the 3rd degree in minor

B. Fantastic chords (those which arise from the mixing of two or more keys).

He cites the previously discussed 7th chords B-D♯-F-A, D♯-F-A-C and asks which of the triads B-D♯-F, G♯-B-D, D♯-F-A, or E-G♯-B♭ has priority over the other. This, he says, may be answered by reconsidering the progression of fifths from which he derived his system of 21 tones. Since B and E were obtained before D♯ and G♯, the triad B-D♯-F has priority over the triad D♯-F-A.

These "mixed triads" are also mentioned in the Handbuch, but only perfunctorily and not as part of a system of chord classification.

In the Anleitung Marpurg develops a relational scheme of keys, according to which there are two kinds of harmonic relationship. The first is based on a similarity of triads; the second, on an agreement [Uebereinkunft] between notes. For example, the two triads C-E-G and A-C-E would not be related under the first condition, because one is major and the other minor; but because of the coincidence of the notes C and E they would be related under the second.

Marpurg then tabulates all the keys according to degrees of relatedness based on the progression of fifths from which he first derived his system of 21 tones. Thus, in major, G(B-D) is related to C(E-G) in the first degree but to D(F♯-A) only in the second degree [Anleitung, 57-62]. The complete table of relationships for all major keys is given below [Anleitung, 55].

	8	G#	B#	D#	
	7	C#	E#	G#	
Erklingende	6	F#	A#	C#	
oder	5	B	D#	F#	
aufsteigende	4	E	G#	B	
Töne	3	A	C#	E	
	2	D	F#	A	
Grad	1	G	B	D	
		C	E	G	(Grundharmonie)
Grad	1	F	A	C	
	2	B^b	D	F	
Erzitternde	3	E^b	G	B^b	
oder	4	A^b	C	E^b	
absteigende	5	D^b	F	A^b	
Töne	6	G^b	B^b	D^b	
	7	C^b	E^b	G^b	
	8	F^b	A^b	C^b	

Minor is tabulated in the same manner, using A(C-E) as the central key. Minor and major are related among themselves, but are they related to each other? Marpurg finds that they are always related in the first degree because of the agreement of the tones of the two scales. He remarks that relationships of the first degree between a major and a minor key mean an intervallic separation of a third, not a fifth as is the case in first degree relationships between two major keys or two minor keys.

Kirnberger occupies a curious position in the history of music theory. While his important contribution, his concept of essential and non-essential dissonance, is certainly of his own time, many aspects of his theoretical work belong to the preceding period. His views on essential and non-essential dissonance will be closely examined during a later section where they will be compared to those expressed by Marpurg in his Anhang über den Rameau- und Kirnbergerschen Grundbass. In the present section a resumé of certain of the outstanding features of his harmonic theory is given.

Kirnberger begins his Harmonie with a preface in which he expresses his impatience with the French penchant for foggy acoustical explanations of the origins of musical material. The first chapter then opens with this direct statement:

> The whole of harmony rests on only two fundamental chords, from which come all other chords . . . a) the consonant triad which may be major, minor, or diminished b) the dissonant essential 7th chord which may be the minor seventh with perfect fifth and major or minor third, or with diminished fifth and minor third, or the major seventh, perfect fifth, and major third . . .of these two the first is more perfect [Harmonie,3].

Both the Kunst and the Harmonie take up the materials of music in the same order as does Rameau (minus the initial proofs). Both treatises begin with chords and intervals, then deal with the construction of scales. The latter is dealt with more fully in the Kunst, where Kirnberger obtains from the 1st to the 40th partials the diatonic, the chromatic, and the enharmonic scales. As shown below, the diatonic scale is completed by the fourth octave, the chromatic by the fifth, while the sixth octave contains the quarter-tones of the enharmonic scale [Kunst II, 68].

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
C	c	g	c	e	g	x	c	d	e	f	g	a	x	b	c	(diatonic)

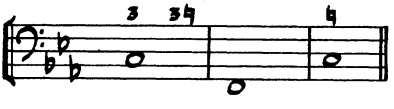
16	17	18	19	20	
c	c#	d	d#	e	etc. (chromatic)

32	33	34	35	36	37	38	39	40		
c	c+	c#	C#+	d	d+	d#	d#+	e,	etc.	(enharmonic)

But as we shall see later in the discussion of Marpurg's Anhang, Kirnberger is concerned more with the manner in which chords function in a key, with the manner of their progression, than he is with their structure or their acoustical origins.

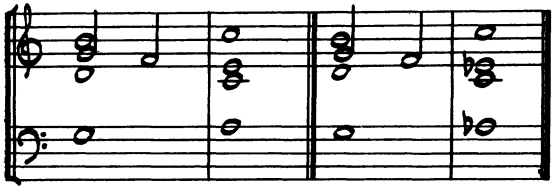
The chapter in the Kunst entitled "Remarks on the nature and use of chords . . ." deals with leading-tones and cadences. Of leading-tones he says: 1) the major third of dominant harmony must never be doubled [K, 35]; 2) if the tone B is in C major it must act as a leading-tone, but if it is in G major it need not. He remarks that although previous harmonists always ended a piece with a major triad, regardless of mode, at present it is not considered necessary. In Chapter VI, on periods and cadences, he augments these remarks. A perfect cadence is V^7-I, which is its most perfect form. Less perfect is V^6_5-I and V^4_3-I, and least perfect is V^4_2-I. A somewhat more perfect cadence is I-IV-I. However, when this cadence is used in the minor mode one must replace the minor third with the major shortly before the close and also in the cadential chord itself [Kunst I, 95]. In this as in many other instances Kirnberger reveals his sensitivity to unprepared chromatic changes which involve fundamental harmonies. Here the major third of the cadential tonic chord is prepared by a major third in a triad which, to use more modern parlance, serves as a secondary dominant embellishment to the subdominant triad.

Example 1.



A third type of cadence is that which the French call rompue. According to Kirnberger this is most successful when the third of the final chord is doubled [Kunst I, 99]:

Example 2.

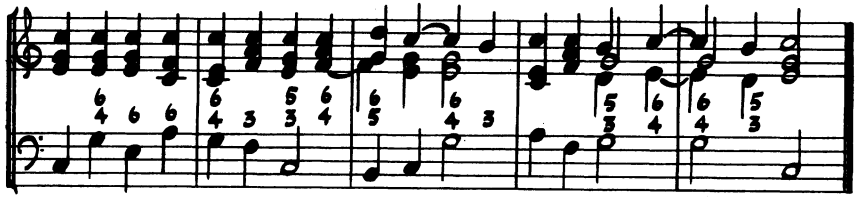


In Harmonie he gives a table of the best bass progressions. The strongest and best are by fifths and fourths, next by thirds and sixths, and finally, the weakest, by seconds.

Of considerable interest is the distinction which Kirnberger draws between two kinds of diminished triad. The triad on the second degree of a minor scale is vermindert. It is a consonant chord, any interval of which may be doubled. This is unusual in view of the cardinal rule of the time that the major sixth could never be doubled when accompanied by a minor third. The triad on the leading-tone (semitonum modi), however, is consistently referred to, not as vermindert, but as falsch.

A strong connection exists between Kirnberger's views on the six-four chord and those on essential and non-essential dissonance. The consonant six-four chord, like any essential dissonance, can occur either on a weak or on a strong beat. It may be taken without preparation and any note may be doubled. In fast eighth-note passages it is treated as passing and not figured. The dissonant six-four chord, like any unessential dissonance, can occur only on the strong beat — as a suspension or as an appoggiatura. It must be treated as a dissonance, with both fourth and sixth prepared and resolved. In the former instance the six-four chord represents a triad in second inversion; in the latter it is a triad with the fifth and third delayed by suspension or appoggiatura [Kunst I, 51-2; Harmonie, 13]. There is also a third case, in which the sixth may enter freely but the fourth is treated as a dissonance, as a suspension to the third. In this case the six-four chord represents a sixth chord whose third is delayed by suspension or appoggiatura [Grundsätze, 67]. Examples of all three may be seen in the passage below, which is taken from the Grundsätze.

Example 3.



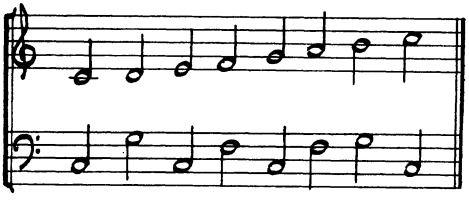
Marpurg's interpretation of Kirnberger's remarks on the six-four chord demonstrates the wide divergence between their points of view: "A six-four chord may be generated in two ways, one by inversion of a triad, the other by suspension. A triad may be a fundamental chord or not." Marpurg then goes on to ridicule Kirnberger's example of a 5-6 suspension in which an E-minor triad occurs at the point of suspension and subsequently resolves to a sixth chord over E. He asks: "What composer would ever think that the triads A-C-E or E-G-B could have a C triad as fundamental chord? Not even a double-contrapuntist [Anhang, 292]."

It was stated above that although Kirnberger's most important contribution to music theory (his definition of essential and non-essential dissonance) shows a progressive turn of mind, there are scattered throughout his writings elements of theories belonging to an earlier generation. For example, he consistently uses the older word Verwechslung instead of the contemporary Umkehrung, the standard German word for harmonic inversion;[3] and in the Grundsätze (p. 10) he suggests the use of the old German nomenclature for accidentals: all sharps.

Kirnberger shows a distinct preference for an unequal temperament in which one can distinguish the difference between keys. Equal temperament, he says, leaves us with only two differences in character, major and minor [Kunst I, 1-10]. He is still greatly concerned with the affective qualities of key and interval. The Kunst contains an interesting list of intervals and their "affection" [Kunst II, 103], as well as a table of the affective qualities of each of the modes; a chorale is provided in each mode [Kunst II, 51]. Obviously none of this would be discernable in equal temperament and Kirnberger deplores this loss.

Interesting sidelights on Kirnberger's concerns are offered by the frontispieces he selected for two of his books. The frontispiece for the Grundsätze is a C-major scale in the bass clef with the word "problema" above it. In the Kunst we find the answer [Kunst I, 25]:

Example 4.



The frontispiece to the Anleitung zur Singecomposition is an engraved emblem with the words "mi-fa et fa-mi est tota musica."

3. He does use Umkehrung in the Kunst, but only in connection with interval inversion.

The last of Marpurg's theoretical works contains the Anhang in which he discusses and attempts to refute Kirnberger's conception of the fundamental bass. It reads like an actual argument, for Marpurg has sprinkled the Anhang with liberal quotes and examples from Kirnberger's Gebrauch and Kunst. At the heart of the conflict in these discussions lies the different conception of essential and non-essential dissonance held by each man. When Marpurg attacks Kirnberger for misunderstanding the nature of the fundamental bass, it becomes evident that the real issue does not concern the fundamental bass but, rather, essential and non-essential dissonance. Kirnberger appears to use the fundamental bass to show the aural logic of a progression. This is definitely outside the proper realm of the fundamental bass as originally conceived by Rameau. Marpurg is quick to seize on the error and to pronounce Kirnberger's fundamental bass "not a real fundamental bass." Having done this, he is inclined to regard questions of essential and non-essential dissonance as side issues; they are important but they have little to do with the intrinsic nature of Kirnberger's fundamental bass. Thus, the battle lines are never clearly drawn, since Marpurg, by separating the issues of fundamental bass and essential and non-essential dissonance, stops just short of perceptive refutation of Kirnberger's fundamental bass. And on the other hand, because Kirnberger's conception of essential and non-essential dissonance was still in the formative stage, his reasoning is sometimes faulty or superficial. An evaluation of this passage-at-arms perhaps is best made after a presentation of the essentials of the argument — in the original words of the opponents insofar as possible.

Fortunately, both men are quite precise in their description of a fundamental bass. Marpurg entitles the preface in which he defines fundamental bass ". . . on the general difference between the fundamental bass of Rameau and that of Kirnberger" [Anhang, 229]. Here, as is always the case in Marpurg's writings, the debate is not between Marpurg and the opponent but between Rameau, represented by Marpurg, and the opponent. His definition reads as follows:

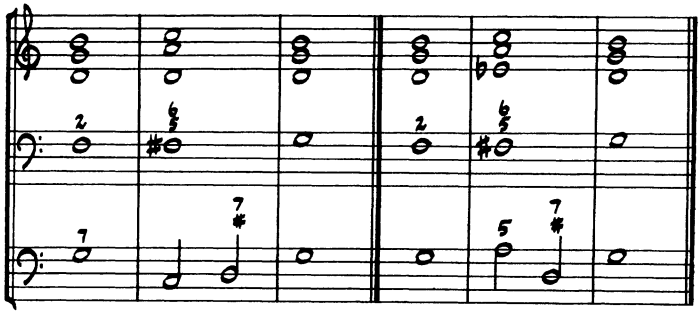
> By the word fundamental bass Rameau means a bass which is nothing more than a row of fundamental chords derived from the figured bass of a piece, a mixture of chords without the least connection. I say without the least connection, because in the exposition [Darlegung] of the fundamental chords, they are not to be considered in the manner of their progression; rather, each separate chord of the figured bass is reduced directly to its fundamental chord. Thus, it is immaterial whether a fundamental chord has a regular or an irregular connection with either the previous or the following fundamental chord, as it is likewise immaterial whether the fundamental bass-tone stands in regular or irregular relationship with the completed voices (Anhang, 232).

In the Kunst Kirnberger has written a 3-voice fugue and has placed below it an analysis in the form of two basses (Ex. 5, p. 185).[4] One of these is a fundamental bass, but Kirnberger apparently feels that this is inadequate because it shows only the root-position chords. A second bass is needed to show the dissonances by suspensions and appoggiaturas. He explains his system thusly:

> The lowest of the three staves is what the French theorists call the fundamental bass. It contains the actual [wahren] fundamental chords, namely the triads and 7th chords upon which the harmony is based. The following staff shows the non-essential [zufalligen] dissonances, or appoggiaturas [Vorhälte] wherever such occur. On the top staff the figured bass shows which inversion of the triad or 7th chord has been used for each harmony. Along with this are given the appoggiaturas (Kunst I, 249).

Marpurg asserts that the fundamental bass of Kirnberger is not a pure fundamental bass but an "interpolated" bass [Interpolirbass] [Anhang, 276].

Example 6.



Of the foregoing example (Ex. 6) taken from Kirnberger's work, he says:

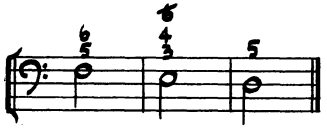
> The $\frac{6}{5}$ arises by inversion of the 7th chord D-F#-A-C. The diminished 7th chord F#-E♭-A-C is its own fundamental chord. He [Kirnberger] finds the progression from G-B-D-F to D-F#-A-C unharmonic because the seventh, F above G, is not first resolved. Since this resolution is possible in many forms, there are many forms of fundamental bass; as many as there are possible resolutions... What comes of this? Kirnberger's fundamental bass is not a real fundamental bass.... The pure fundamental bass cannot contain more or less than what is contained in the written voices, and is possible only in one form [Anhang, 276-7].

4. Additional analyses are to be found at the end of Die Wahren Grundsätze zum Gebrauch der Harmonie. These analyses are of the B-minor Fugue from Bach's Well-Tempered Clavier, Vol. I, and the A-minor Prelude from Vol. II of the same work. The analyses were carried out by Schulz, according to his own testimony, under the supervision of Kirnberger [2, 97].

If Kirnberger does indeed regard his bass as "what the French theorists call the fundamental bass," Marpurg certainly has proved him to be in error. His last sentence contains the essence of the French point of view. The fundamental bass, as originally conceived by Rameau, cannot contain more than what is contained in the original example. Therefore, in this sense Marpurg is correct when he calls Kirnberger's fundamental bass an "interpolated" bass.

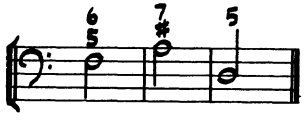
In the Gebrauch Kirnberger explains his interpolations in the fundamental bass, asking first: "What harmonies are fundamental to this passage?:"

Example 7.



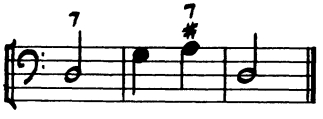
Are they those of Rameau?:"

Example 8.



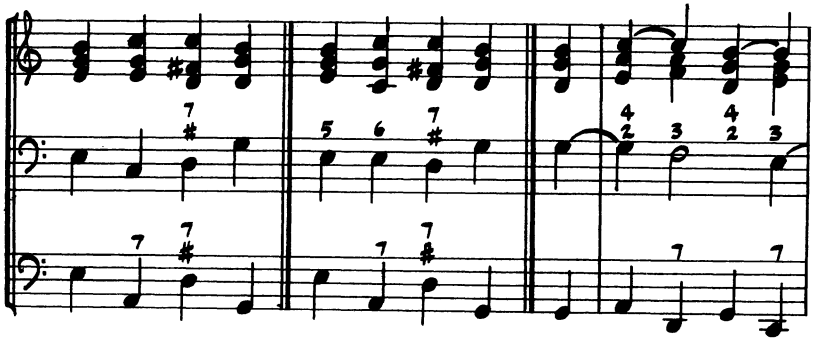
"From this one would never guess that the first two chords could follow one another; does one not sense that between the first and second chord there is an ellipsis of resolution [Uebergang der Resolution], and that the following must necessarily be the harmony [Gebrauch, 41-2]?"

Example 9.

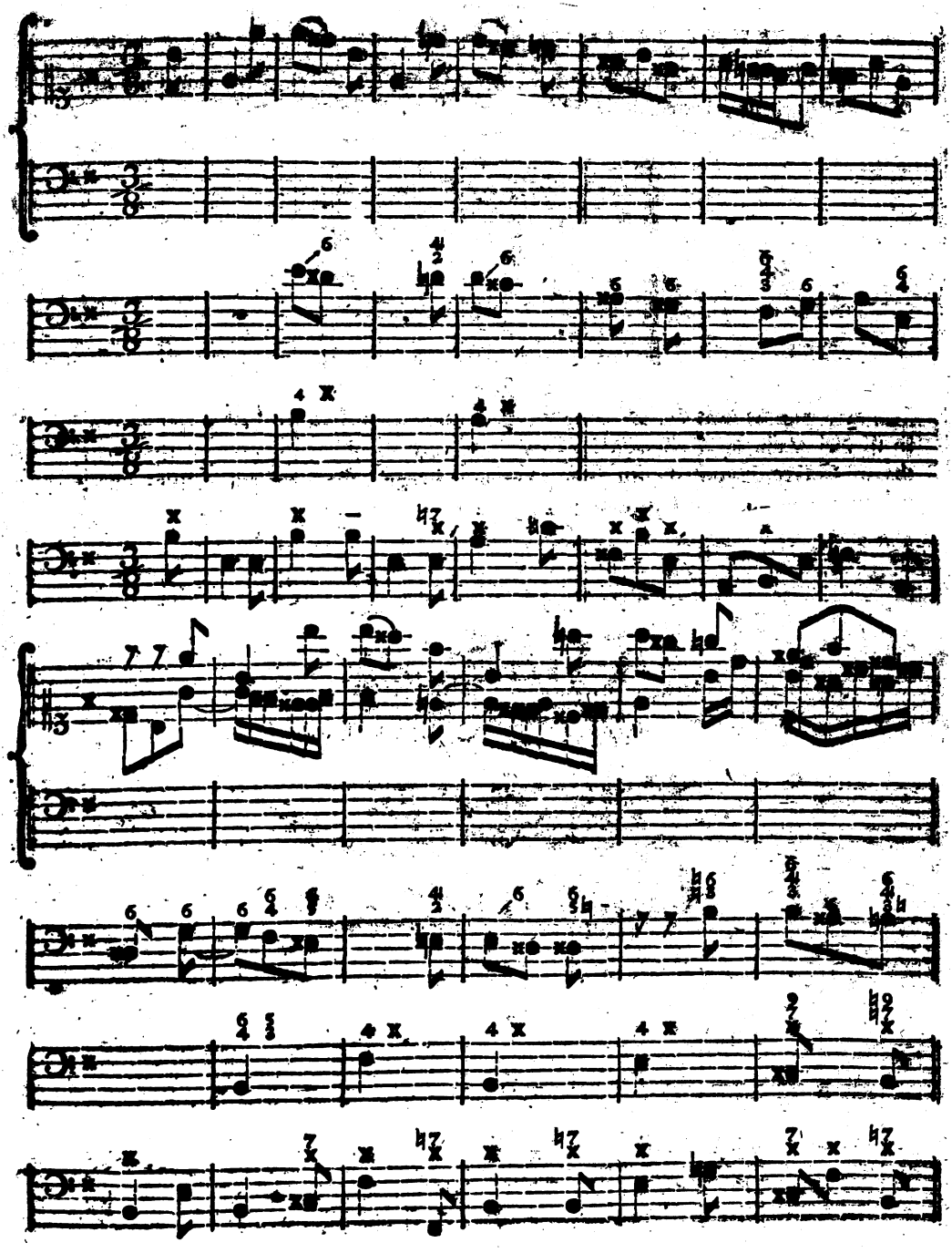


Further amplification is provided by Kirnberger's comment on the following chord successions:

Example 10.



Example 5.

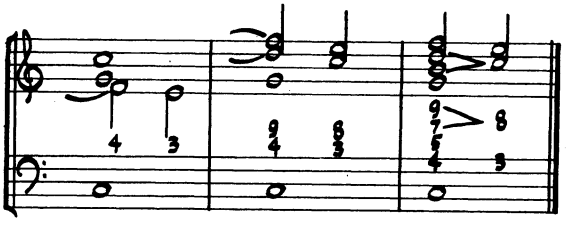


> The rule cannot be repeated too often that one must pay close attention to the progression of every chord, for through progression the same chord is often completely different than what it seems. Therefore, we have constructed for the uninitiated the following examples of different chord progressions, along with their fundamental chords. Although their explanation is already evident from the foregoing, they will disconcert those who have an imperfect grasp of the theory of harmony or who lack a sense of natural progression...[Gebrauch, 104].

Marpurg's comment on this passage is: "It is perfectly correct that if in a figured bass a consonant chord is changed to a dissonant chord, the fundamental harmony is also changed, just as if a dissonant chord were changed to a consonant chord. But what justifies this alteration? The fundamental bass should not say what the composer could have said had he so wished, but rather what he actually did say [Anhang, 285]." Although Kirnberger is in error in this instance, Marpurg's last statement again reveals his real difficulty in comprehending Kirnberger's point of view. Marpurg regards the fundamental bass as an exact, literal indication of the root of each successive vertical combination of pitches. Kirnberger, as will be seen even more clearly in the discussion below, feels that it is necessary to accept melodic explanations for certain complex combinations, and therefore his fundamental bass often takes into consideration not only the written note but also its resolution.

A primary reason for Kirnberger's erroneous usage of the fundamental bass can be seen in his definition of dissonance. In the first part of the Kunst he separates dissonances into two groups: essential [wesentlich] and non-essential [zufällig]. The non-essential are described first, in terms of single suspensions 9-8, 7-6, and $\frac{5}{4}$-3, then double suspensions $\frac{9-8}{4-3}$, $\frac{9-8}{7-6}$, and $\frac{6-5}{4-3}$, of which Kirnberger says: "In order to make the entrance of the harmony more attractive from time to time, or to arouse in the hearing a longing after the same, an occasion can arise in which the Grundton is not struck; rather, something is omitted in order to give correspondingly greater satisfaction to the ear shortly thereafter [Kunst I, 127]." A similar passage in the Harmonie is more explicit: "In the progression from one chord to another, any tone, regardless of the voice in which it lies, either alone or with other tones, can be delayed from above or below by a tone which precedes it, a tone which dissonates and soon thereafter enters its essential position, or resolves. In this way there arise a number of dissonant chords whose resolution is to the same Grundaccord, of which they are appoggiaturas [Harmonie, 8]."

Example 11.

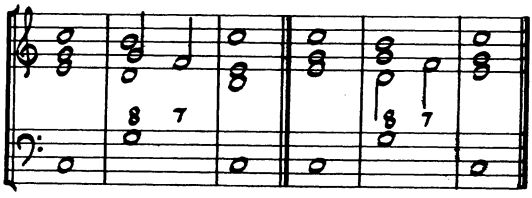


Marpurg's comments upon this passage further indicate the limited extent of his comprehension of Kirnberger's thesis:

> It is known that all chords which have the same origin [Ursprung] are related, and that all related chords can be substituted one for another.... Can these chords [Ex.11] be used one for another? No,... none of these chords are related; therefore they do not have the same origin. And if they do not have the same origin, the alleged Grundaccord, namely, the bass-tone C with the major triad, is incorrect. One must not derive chords by considering the way in which the first musicians came upon the notion of dissonances, or by considering the way in which preparation and resolution of dissonances can be explained, but rather by considering the way in which nature presents them...[Anhang,288].

Further on in the Kunst Kirnberger comes directly to the matter of essential dissonance: "...since these suspensions are not necessary we will call them non-essential dissonances. In addition to these dissonances there are others of a different sort which one can call essential, because they do not take the place of a consonance, to which they immediately yield, but rather maintain their own positions. Their origin can be represented in the following way [Kunst I, 30]:"

Example 12.

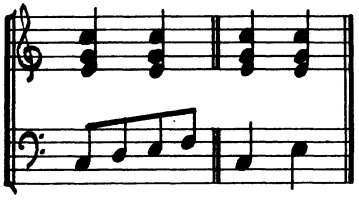


Kirnberger subsequently strengthens and clarifies this definition: "One can take as a general rule that after every essential dissonance the bass ascends four tones or descends five tones and has a triad as its harmony unless an inversion of this chord is taken [Kunst I, 64]."

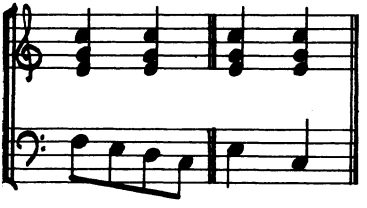
Marpurg's definition of essential and non-essential dissonance reads as follows:

> Every dissonance which is used purely for the sake of the melody — and with regard to the harmony could be there as well as not — is called a non-essential dissonance in the theory of harmony. Of such nature are all passing and changing-notes, or, as they are also called, regular and irregular passing-notes. Thus the passing-notes and the changing-notes shown here [Exx.13,14 on p.188] are non-essential dissonances. Every dissonance which is there for the sake of melody as well as harmony is called an essential dissonance. Of such nature are: 1) those dissonances which result from suspension [Exx. 15,16 on p.188] 2) those dissonances which result from the anticipation of a regular passing-note [Exx.17,18,19, 20 on p.189] [Anhang,240].

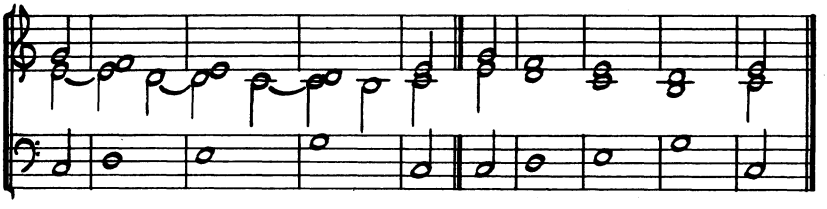
Example 13.



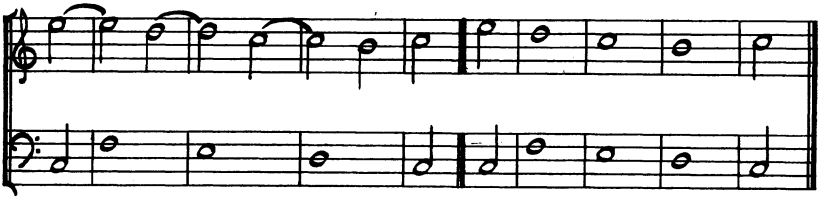
Example 14.



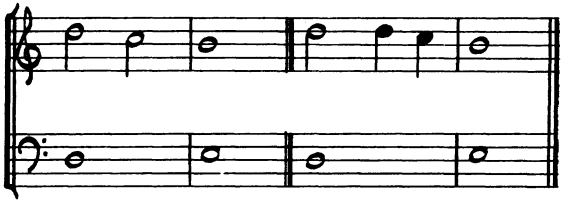
Example 15.



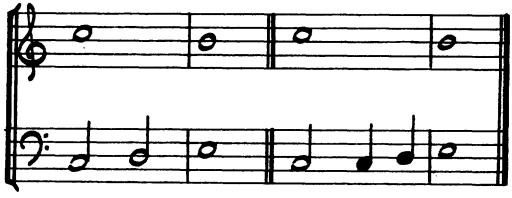
Example 16.



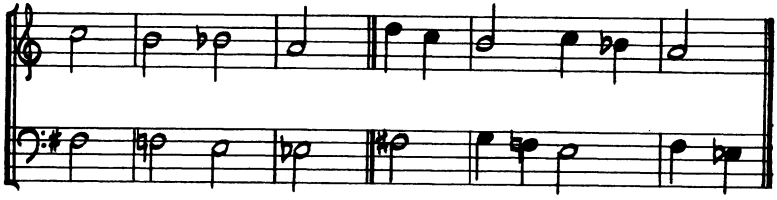
Example 17.



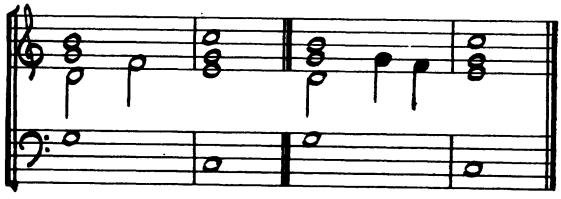
Example 18.



Example 19.



Example 20.

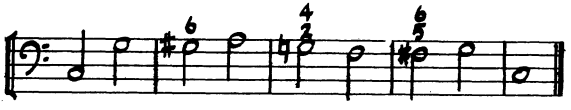


In Harmonie Kirnberger further specifies his first definition of essential and non-essential dissonance by appending two additional methods for identifying non-essential dissonance. Essential dissonances fall either on weak or on strong beats, whereas non-essential dissonances fall only on strong beats. This is interpreted by Marpurg to mean that 7th chords may fall on either beat, but that 9th and 11th chords may occur only on the strong [Anhang, 295]. Further, Kirnberger says that the resolution of non-essential dissonances occurs over the same bass note, whereas essential dissonances resolve over a different bass note. If a seventh resolves to a sixth it is non-essential; if not, it is essential [Harmonie, 16]. To this, Marpurg replies: "In general the minor seventh may resolve on the same bass or on a different bass. Thus, it remains an essential dissonance [Anhang, 304]." Kirnberger says that it is incorrect to explain G#-B-D-F as a fundamental chord or to add a third beneath it as its real root if it enters freely and resolves on the sixth over the same bass note [Harmonie, 19]. Marpurg replies: "This is impossible since a 7th chord is a 7th chord the world around [Anhang, 309]." Kirnberger goes on to say that this chord, even if it were to resolve to a chord on a different bass note, could be regarded as a chord consisting of a ninth and seventh from a root (E), the ninth being an appoggiatura and the seventh essential [Harmonie, 19]. Marpurg does not really understand this, and his only response is an ill-tempered paraphrase of Kirnberger's definition of essential and non-essential dissonances according to bass-progression. He explains Kirnberger's chord as the first inversion of an augmented second F-G#-B-D on the sixth degree of A minor with E as a subposed root [Anhang, 313, 318].

Kirnberger's views on the six-four chord have already been dealt with. Marpurg consistently presents the root of the triad as the fundamental bass of the six-four chord. He does not take into account its resolution, even in the case of the tonic six-four. He quibbles with Kirnberger's term "dissonant six-four" as applied to the tonic six-four, saying that a consonant triad is consonant in all inversions [Anhang, 298].

Another interesting point of difference comes up at the end of the Anhang. Kirnberger has said that the following bass can be analyzed completely in C major because non-essential accidentals do not change the key.

Example 21.



Marpurg holds that a modulation does take place, albeit a passing one, since there is no G# or F# in C major [Anhang, 313].

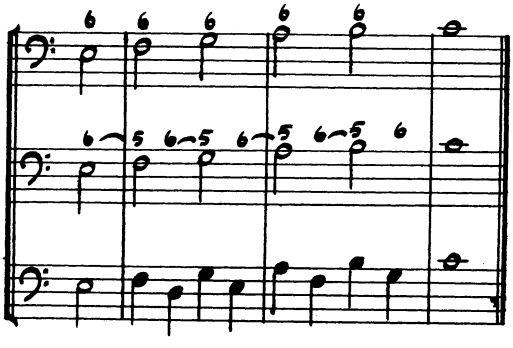
Thus, Marpurg and Kirnberger have expressed diametrically opposed points of view on two important questions:

1) Does chord progression affect the determination of the fundamental bass? Kirnberger says yes. Marpurg says no.

2) Are suspensions essential or non-essential dissonances? Kirnberger says they are non-essential. Marpurg says they are essential.

Marpurg is forced to consider suspensions as essential dissonances because of his views on the structure of 9th chords. (The ninth must be viewed as an essential dissonance to conform to Rameau's "melody from harmony" principle.) By regarding suspensions as essential dissonances Marpurg is forced to consider each vertical combination of pitches in isolation. To Kirnberger the fundamental bass, in association with this view of suspension and essential dissonance proved to be an inadequate and restricted tool of harmonic analysis. Marpurg, committed as he is to his views of suspensions and essential dissonance, is not free to hear the longer span of harmonic relationships which Kirnberger appears to comprehend. The length of these spans is sustained by what to Kirnberger seems to be the most natural harmonic progression, up a fourth or down a fifth. He has defined essential dissonance in terms of this bass progression, and with very few exceptions his "interpolations" and Uebergänge der Resolution are made in favor of "that progression which makes the harmony more natural." In analysis his predilection for this progression sometimes leads him astray, for example in his analysis of the following passage:

Example 22.



> ... it is impossible that these successive sixth chords are inversions of triads. In such a short time, how can we have E major, D minor, E minor, etc. which are incapable of possessing such a close [temporal] relationship?... the following analysis of these six chords shows that they are nothing less than six chords with an anticipation in the upper voice, and are thus built from a natural progression of fundamental harmony [Harmonie, 45].

The fundamental bass for the extended example in the Kunst (Ex. 5, p. 185) moves almost entirely in fourths and fifths. Kirnberger has analyzed the passage to show a series of dominant-tonic relationships. And although the fundamental bass he has given is a travesty of the original conception of fundamental bass, it is completely logical aurally, to modern ears at least.

For all their differences, Kirnberger and Marpurg have two characteristics in common. First, neither was an acoustician. The derivation of the materials of music was relatively unimportant to them. In the preface to the Gebrauch Kirnberger expresses extreme annoyance with foggy French mathematics and begins his book with the unequivocal statement that the basic chords in music are the triad and the 7th chord. Although Marpurg was more interested in acoustical problems than was Kirnberger his theoretical treatises do not treat them in great detail. Both men were practical theorists concerned primarily with immediate problems of harmony and analysis. Finally, Marpurg and Kirnberger have equally little affinity for the theories of Rameau: Marpurg by virtue of misunderstanding (and misrepresenting) them, Kirnberger by virtue of his more advanced point of view.

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