2

The Study of Chromaticism

By

The study that follows is an attempt to systematize those aspects of chromaticism that permit systematization, or at least that tempt one to make a try at it. In order to do this, it has been necessary to remove from the forefront of the study the assumption of long standing that chromaticism consists of "seven tones plus five tones". This assumption must now be placed in a proper perspective, one that credits it with partial insights only. More significant and profitable for the theorist is the assumption that the study of chromaticism is based ultimately on a scale of twelve tones, each with ascertainable functions related to a diatonicism which, in practice, is sometimes immediately present, sometimes remotely so, but which remains a prime ordering factor. To carry this out

WILLIAM J. MITCHELL

it has been necessary to grant existence to the chromatic scale as an entity which can be examined on its own terms, which can be compared and eventually fused with diatonic scales. Such an admittance of the chromatic scale to the company of musical materials should not be difficult, for the scale has been with us for many generations.

Chromaticism in its most inclusive and persistent meaning, is the relationship established by practice between the organizing powers of the diatonic system and diffusive features of the chromatic scale. Some of the simplest forms of chromaticism have become so completely assimilated that they are often accepted as types of pure diatonicism. A case in point is the use, through the introduction of an accidental, of the leading tone in diatonic modes, such as the minor, in which the seventh and eighth steps lie a whole tone apart. Although the minor mode in this chromaticized form is often assumed to be the basic or "true" minor, there was a time when the terms musica falsa and musica ficta were used, at least in part, to describe the raised seventh step as a chromatic deviation from purely diatonic procedures. On the other hand, in such works as Tristan and Isolde, chromatic elements are present in such profusion that some have held, as expressed by Paul Hindemith, that "beyond doubt, the diatonic scale was here replaced by the chromatic as the basis for all lines and chords".*1 Although this is a decidedly moot point, there is music, chiefly from our own century, in which chromatic factors are so dominating that diatonic structural forces seem altogether absent or only insignificantly present. Such musical textures are best described, perhaps, as being panchromatic rather than chromatic, for this latter term has a different, well established set of basic references.

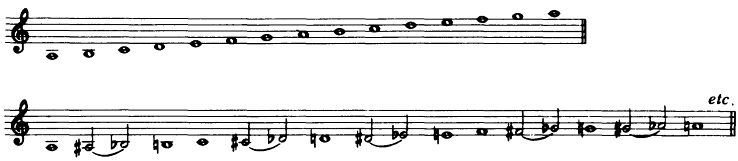
The dividing line between chromatic and panchromatic textures is not hard and fast; in fact, panchromatic and other such terms often represent analysts' frustrations or dislikes rather than objectively observable textural conditions. Nevertheless, in the main, the presence or absence of diatonic order, or the employment of structural factors other than those of diatonicism can serve to distinguish the two. The scope of the present study will be those musical styles in which the chromatic scale and the diatonic system are cooperative.

Comparison of Diatonic and Chromatic Scales

Chromaticism is ordered expansion, order being a prime diatonic attribute, while the possibility of expansion is provided by the tones of the chromatic scale. These two properties which, fused together, characterize the styles of chromaticism, can most readily be understood by a comparison of diatonic and chromatic scales, for it is in abstract scalar patterns that basic structure is most apparent.

As a basis for comparison, a two octave segment of the diatonic system from A, and a chromatic scale, built from the same tone, appear in Example 1. The chromatic scale has been notated enharmonically in part, in order to make explicit the Enharmonic Relation (see below), a prime attribute of chromaticism, at least in equal temperament.

Example 1

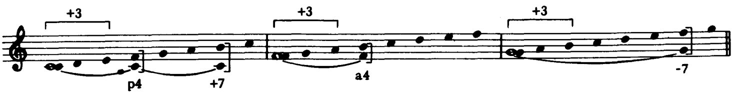


An initial comparison of the two scales reveals a basic and significant difference between them. The diatonic scale pattern is asymmetric in its irregularly filled octave*2 (half steps separate groups of 2 and 3 whole steps). The chromatic scale is completely uniform in its unremitting succession of half steps. The asymmetric diatonic pattern imparts a high degree of uniqueness to each tone as it forms a differentiating set of intervals with other tones, as indicated in Example 2. Example 2a presents those tones (C, F, and G) that are related because they form major thirds with other steps. But F, which forms an augmented fourth, and G which forms a minor seventh are thereby distinguishable from C, and from each other. Example 2b is distinguishable from Example 2a because it represents two tones (D and A) that form minor thirds with other tones. But these are separable from each other because D forms a major sixth, while A forms a minor sixth. Similarly, Example 2c represents those tones (E and B) that form minor seconds. These, separable from the earlier groups because of the minor second, are also separable from each other because E forms a perfect fifth, while B forms a diminished fifth. Example 2d transposes all of the diatonic scale patterns with their characterizing interval sets, to C, for purposes of direct comparison. Observe, here, how each middle C is differentiated from the others through its varying interval relations.

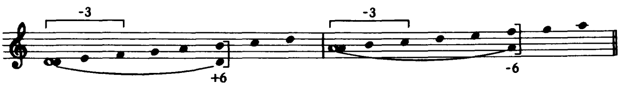
The uniform pattern of the chromatic scale leads to opposite results. Each tone forms a set of intervals identical with that formed by any other tone, as indicated for the tones C and D in Example 3. Hence, none is distinguishable from the others. The differentiated tones of the diatonic scale are an ordering force; the undifferentiated tones of the chromatic scale are a diffusing force.

example 2

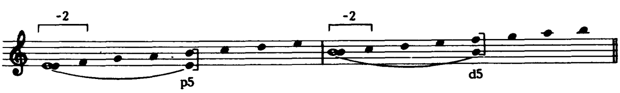
a



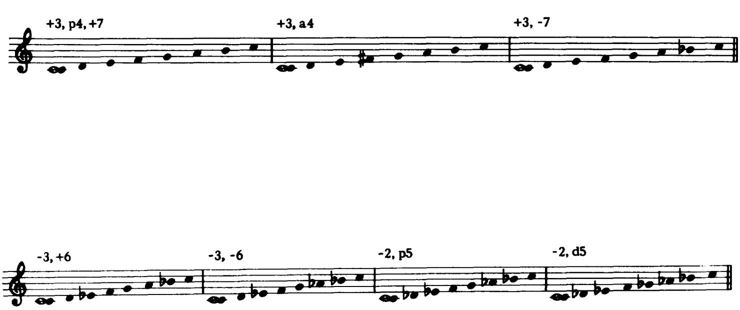
b



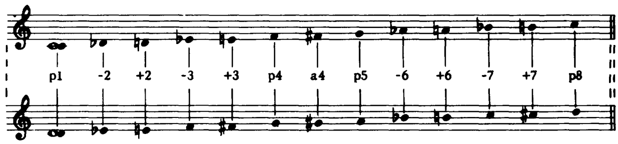
c



d



Example 3



In the diatonic system, as illustrated in Example 1, there is only one diminished fifth, B to F, along with its inversion, the tritone, F to B. The normal diatonic half step progression of this interval as it moves to C-E (or E-C), illustrated in Example 4, has a marked tendency to establish C as a center of tonal orientation, thus giving it the status of a tonic degree. But the fixing of the tonic degree, fixes the relation to it of all other diatonic tones. All become "degrees," for each has not only a unique character, but also a unique position with relation to a tonal center. Thus, it is possible to impart to a tone the character of a degree in the diatonic system. Further, it is possible to move from one such recognizable degree to another. These two diatonic functions, Degree Identification and Degree Progression, are basic for our study.

Example 4

Here too the chromatic scale presents an opposite situation. A diminished fifth and an enharmonically related tritone can be built from each of the twelve tones. Even if the behavior of these intervals is restricted to the diatonic "key defining" progression, two mutually exclusive results follow, as illustrated in Example 5a. Further, since this dualism is transposable to all tones, as suggested in Example 5b, a prime ordering force of diatonicism becomes a dispersing force of the chromatic scale. Thus, where each degree of the diatonic major scale is imbued with a single meaning, due to its characterizing interval set and its distance from a tonic degree, the tones of the chromatic scale have multiple meanings; for none is separable from the others by its interval set, hence none has an inherent, prior right to the status of a tonic degree. The assumption is sometimes made that the first or last tone of a chromatic series is the tonic degree, or that the completion of the octave cycle is an orienting factor, or that degrees are determined by absolute pitch levels. None of these desiderata rests on inherent faculties of the chromatic scale.

Example 5

Because scales are customarily thought of as melodic relationships, only a partial insight into their nature can be gained. Certainly, the scales of harmonically oriented music can be represented profitably in a harmonic pattern whereby the several degrees, now representing roots of chords, are placed a descending fifth or an ascending fourth apart, as in Example 6. Such a descending scale bears the same generic relationship to harmonic progressions as the melodic form does to melodic progression. Observe in Example 6 that the quality of each triad is predetermined by the available tones of the scale. Of more basic significance is the fact that the directive tritone, (indicated by black notes) now dispersed among several chords, plays a critical role in directing the harmonic motion toward the final tonic chord which, in fact, clears the air of the tritone. The structural nature of such a progression is apparent.

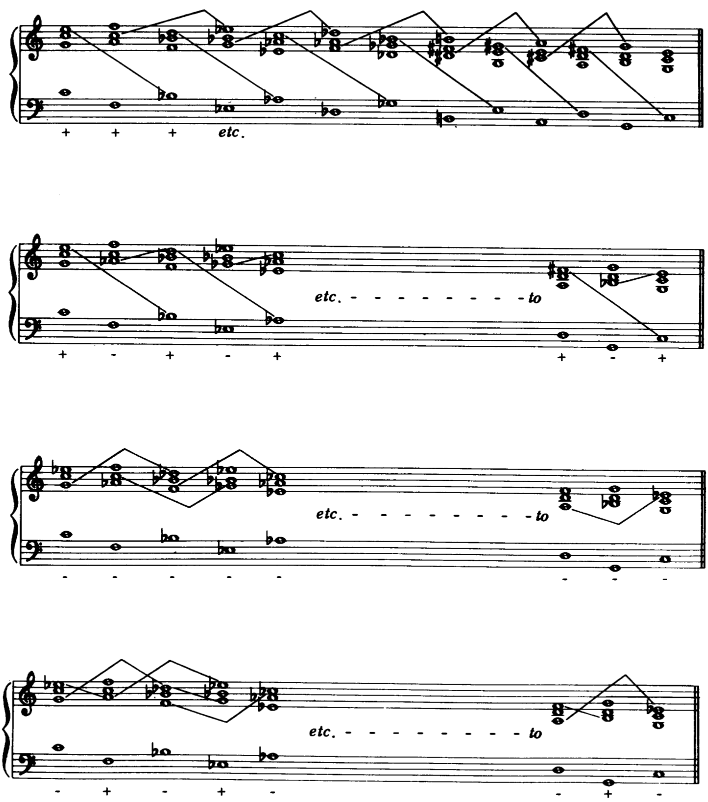
Triad qualities must be chosen arbitrarily in the chromatic scale, for each tone can generate equally well a major, minor, diminished, or augmented chord, since the necessary completing tones are readily available. However, because it is within the nature of chords, insofar as they reflect the lower part of the partial series, to assume a major quality, and because the only remaining simple triad quality is minor, these can be selected as a means of testing the descending harmonic progression in the chromatic scale. In the various chord series of Example 7, tritones exist in profusion, each contradicting the preceding. As a result the series can be arrested at any point or it can just as easily go on in perpetuity. The most effective braking device is an appropriate diatonic cadence at a selected halting point.*3

Thus, melodically, intervallically, and harmonically, the diatonic scale, especially as represented by the major mode, stands as a strong ordering force, while, by the same measurements, the chromatic scale stands as a marked diffusing force. Chromaticism, or the union of the two forces represents a constant play of the centripetal powers of diatonicism against the centrifugal character of the chromatic scale.

The task of the student of chromaticism is less the memorizing of virtually endless chromatic minutiae — inflections, chords, progressions — than it is 1), the comprehending of the expansive nature of chromaticism against a diatonic base, or 2) the discovery of structural factors in a chromatic environment. In simpler textures where diatonic elements are immediately present to perform their clarifying role, the first procedure recommends itself; but as chromatic textures grow in complexity and diatonic elements become hidden in the background or are held in abeyance for a period, the second procedure must be followed. It should be kept in mind, in

example

7



short, that musical processes are of such a nature that not all chromatic techniques can be related directly to diatonic models. Rather, one should be prepared to deal with the fact that a given chromatic technique, having identified itself with diatonic structure, may itself become the starting point for other chromatic techniques, and so on. Against a pervasive ordering factor, chromatic techniques are cumulative and build upon each other. Chromaticism is dynamic and can neither be taught nor learned in terms of static, fixed concepts.

The Introduction of Chromatic Elements

There are two ways in which chromatic elements appear in diatonic textures, by Interpolation and by Replacement. Interpolation refers to those instances in which the chromatic half step is introduced between diatonic tones, as in Example 8a. Replacement occurs, often as an abbreviation of interpolation, when a chromatic variant is substituted for a diatonic element, as in Example 8b. Example 8c combines both in a single illustration. It is of basic importance to recognize that all of these illustrations, diatonic and chromatic, express the structure of C major, some in the boldest manner, the others enriched.

The Four Functions of Chromaticism

The many ramifications of interpolation and replacement are classifiable in terms of four functions, Degree Identification, Degree Progression, Degree Inflection, and Degree Transformation. Degree identification and degree progression are of diatonic origin and refer to factors of structural orientation already discussed*4, namely those that describe the components of a diatonic scale not merely as tones, but as characterized degrees bearing a determinable relationship to a tonal center, the tonic degree.

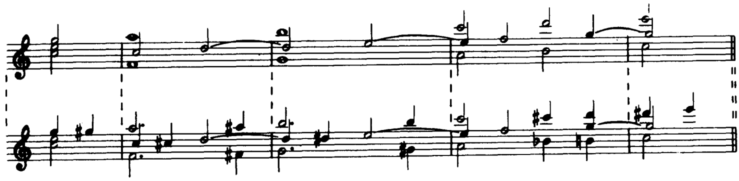
Degree inflection is a function of chromaticism which bestows identical meaning on chromatic variants of a given pitch name, such as Db, D, and D#. Where pure diatonic functions are expressed only through a single pitch name for each degree, chromaticism has the power of inflecting a degree upward or downward without sacrifice to its identity. Thus the second step of C major can retain its meaning as a second step progressing to a first step even though it is expressed as Db. Similarly, in moving to the third step, D may be inflected to D# and still represent a second step, as indicated earlier in

12

example

8

a



b

c

Example 8b.

A recurrent use of degree inflection occurs when the thirds of triads are varied, major becoming minor, or minor becoming major, the latter as in the case of the so-called Picardy third. The few simple illustrations of Example 9 will suffice here, for a function that has many applications, melodic and harmonic.

Degree transformation, an aspect of the enharmonic relationship, is a function of chromaticism whereby a given pitch may express the meanings of more than one pitch name. Thus a notated Cx, D, and Ebb represent different aspects and capabilities of the same pitch, assuming as always in a chromatic music that equal temperament prevails (see Tuning, below).

In practice, two reasons can be found for the use of enharmonic notation. The first applies to those cases where a composer wishes to notate accurately, diverse and remote functions of the same pitch, as in Example 10. Only this type of enharmonic notation expresses the function of degree transformation.

The second reason, equally prevalent, relates to the practice of notating in a simple or convenient form close relationships in remote keys. Such relationships, though simple, would otherwise require a complicated, if perhaps a theoretically correct, notation. A simple illustration will suffice. Imagine a composition in A major which, at one point, changing to A minor, expresses the functions of the tonic minor and then the sixth degree, each with relevant cadences. Even with passage work no grave complexities of notation arise as can be seen in Example 11a. But if the base of operations happens to be Ab major, the region of the minor mode VI requires Fb major, Gb minor, and Cb major chords, all relatively unfamiliar in appearance. An enharmonic notation makes it possible to present these in a manner more accessible to the performer, as indicated in Example 11b.*5 In such cases degree transformation is not operative, for structure is in no way involved.

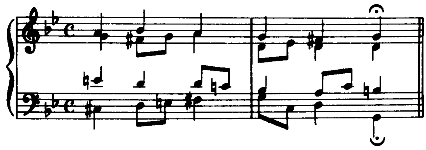
A related use of enharmonic notation, but as a necessary convenience, occurs as a result of one of the foibles of our system of notation, the discrepancy between the simple octave, and the intervals spanned by twelve fifths, three major thirds, four minor thirds, or six major seconds. Twelve ascending fifths from C lead to a B#, as do three ascending major thirds, six ascending major seconds, and four descending minor thirds,

example

9

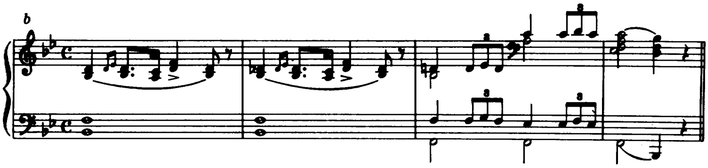
J.S. Bach: Chorale, Es stehen

a



Schubert: Pause (Schöne Müllerin)

b

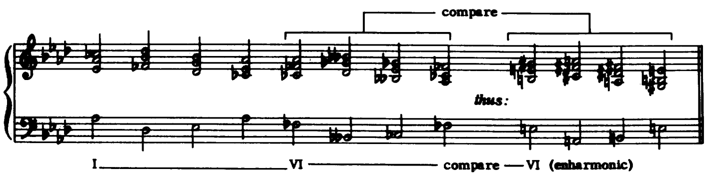


10

Beethoven: Piano Sonata in C minor, Op. 13

a

b



as in Example 12a. But twelve descending fifths, three descending major thirds, six descending major seconds, or four ascending minor thirds lead to Dbb, as in Example 12c. In equal temperament all lead, in fact, to an octave and, by virtue of an enharmonic shift of convenience are so notated, as indicated in Example 12b and d. Here again, degree transformation is no part of this process, which calls upon enharmonic notation simply as a convenience.

Finally, although degree transformation, by its nature, represents an enharmonic change, the change itself is not always notated. In Example 13a, the Bb at the end of bar one refers to properties of the A chord; but as the tone proceeds to the B chord of bar 2 it functions as an A# as in Example 13b (bars 37-38). Bach evidently did not feel it necessary to notate the transformed function for so small a detail, the more so because the B chord, itself, turns out to be an aural chimera which disappears immediately afterwards.

In summary: Of the four functions of chromaticism, two, degree identification and degree progression, are of diatonic origin, while degree inflection and degree transformation are chromatic by origin. Degree transformation implies and often makes use of an enharmonic notation. However, not all notated enharmonic changes represent degree transformation and, in fact, the function is often represented without the use of enharmonic notation.

Notation

The discussion at the end of the preceding section leads inevitably to the troublesome topic of chromatic notation. Our system of notation is essentially a diatonic system, fitted for the "correct" notation of only diatonic and, by extension, a relatively few chromatic relationships. Thus, although it can be said with assurance that there is only one proper way to notate the major and minor scales, no such assurance is forthcoming with regard to the notating of the chromatic scale. To be sure there is a rule of thumb for the latter, according to which, successive degrees in ascent are raised, and in descent, lowered, except that in descent it is customary to raise the fourth degree rather than lower the fifth, as illustrated in Example 14.

example

12

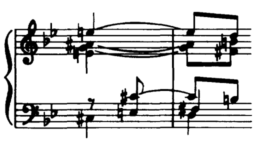
a
b
c
d

13

J.S. Bach: Prelude and Fugue in G minor for Organ

a

b



Example 14

However, such a rule of the thumb is precisely that, and nothing more than a rough guide, for aside from the practical advantage that it offers, of reducing close to the minimum the number of required cancellation signs, it is basically arbitrary and subject to constant modification.

Since the chromatic scale usually appears within a diatonic frame of reference, its notation varies with the underlying model. Thus, the scale of Example 14 might serve for a chromaticized C major, since all of the tones of C major are represented. But in C minor, D#, G#, and A# must give way to Eb, Ab, and Bb, the tones native to C minor, as in Example 15.

Example 15

Furthermore, as keys increase in sharps and flats, a chromatic notation of convenience rather than one of presumed correctness is much to be preferred. For example, in G# minor, the chromatic filler between G# and A# is better notated as A than as Gx. Similarly, in Db major, D is simpler and more accessible to the reader than Ebb. So long as the essential diatonic scale steps are represented correctly, including the raised seventh step of the minor mode (for example, Fx in G# minor), the guides for notating the chromatic scale should be simplicity and readability. In fact a rival claimant for the putatively correct notation of Example 14 is that of Example 16, in which equal representation is given to both C major and C minor, which in a chromatic style, are very often commingled.

Example 16

It might seem that special care must be exercised in writing chromatic scales for string, woodwind, and brass players. But inquiries addressed to such musicians usually result in contradictory answers. Here too, representation of essential tones and simplicity must remain the guides.

Chords, as well as keys, exercise a formative influence on the notation of chromatic passage work. An arresting case can be found at the end of the introduction to Beethoven's Sonata pathétique, Op.13. In the six-four position from G, the descending chromatic scale is written with a Db, but as the chord changes to a seven-five-three, a C# takes its place. Beethoven evidently preferred not to alter, in descent, the fifth, D, of the G chord.

Sometimes special factors play a determining role, as in the case of Chopin's G# minor Etude, Op.25/6. Chopin was wisely desirous of maintaining, in the notation for the right hand, a constant representation of thirds, as a convenience for the performer. In carrying out this aim, the score is perforce at sharp variance in many places with chromatic scales as they are usually notated in such a key as G# minor. Only at certain critical cadences, near the end, does Chopin write a diminished fourth, Fx to B, in order to represent the leading tone.

The problems connected with the notation of certain chromatic chords, as distinguished from passage work within chords, seem to disturb composers less than those theoreticians whose life work is evidently the naming of all chords in terms of Roman numerals. An interesting case presents itself in the Andante of Beethoven's Piano Sonata, Op.14/2, where a passage is repeated three times with variations. Observe in Example 17 that Bb appears twice and, for the identical

example

17

relationship, A# also appears twice. From a harmonic theorist's point of view two of these must be wrong. From Beethoven's point of view, which is far more important, it would seem that when he used full chords (the first and third times), he preferred the Bb which suggests more directly the attributes of G, in the approaching cadence. When only figuration appears, the notated A# maintains a sixth relationship against the bass, which is an advantage to the performer. Both the Bb and the A# are correct within their respective frames of reference.

Through experience the student of chromaticism soon learns the normal or "correct" notation of most of the common chromatic variants of diatonic models, but eventually he will discover a broad area wherein no indisputably correct notation is available. The reasons will probably be, first, that no decisively clear diatonic model can act as a guide, or, second, that the chromatic scale will be visiting its own native powers, often ambiguous, upon the passage in question. The core of the problem is the occasional difficulty, even the impracticability, of distinguishing between the functions of degree identification and degree transformation, such as the differences in function between a D# and an Eb, on the one hand, and on the other, between degree progression (say, D# to E) and degree inflection (Eb to E). For generalizing purposes it will suffice to establish an order of procedure for chromatic notation:

1 In most cases where a clear diatonic model is the basis of the relationship a notation based on the model should be employed.

2 If, however, such a theoretically correct notation looks overly complex or unfamiliar, enharmonic equivalents should be tried.

3 For those relationships that are generated more and more from the chromatic genus, the simplest, more playable notation should be employed, and "correctness," if it appears to be a debatable point, should be given only secondary consideration.

Tuning

A fully developed chromaticism can be achieved only in a tuning based on the principles of equal temperament, wherein twelve pitches and their octaves can express, in reasonable tune, all varieties of pitch names. Equal temperament has often been described as the tuning method which makes it possible to play all twenty-four keys equally in tune. From the chromaticist's point of view a different emphasis must be made. It is more pertinent to say that the expanding powers of chromaticism as represented by the four functions of degree identification, progression, inflection, and transformation become fully available for employment in the service of any given key only under the conditions of equal temperament.

The history of intonation is an absorbing, and in various respects a controversial subject.*6 Although many would feel their spirits sagging as the necessary mathematical computations grow in complexity, nevertheless, the main outlines are clear and simple enough, for they are concerned with successive attempts to harness for service in music, certain basic and definitive interval relationships, namely the perfect fifth and, secondarily, the major third. The crux of the matter is that four successive conjunct perfect fifths and fourths (for example, C-G-D-A-E) create a sharp "Pythagorean" third (C-E). Conversely, a true or just major third as represented by the fourth and fifth partials can contain these fifths and fourths only if the fifths are slightly flat and the fourths slightly sharp. Furthermore, a cycle of twelve pure fifths or their by-products, three Pythagorean thirds, will create a sharp octave; but three just thirds will create a flat octave. The ramifications are many, but the moral is clear: Just or pure fifths and thirds will live together harmoniously in an isolated sound, but they cannot be made to reproduce each other in a continuous relationship, nor will they produce a pure octave.

Equal temperament resolves these and related kinds of pitch incompatibility by envisioning a just or pure octave divided into twelve equal semitones. In the process all fifths are tuned slightly flat, all major thirds sharp, though not as sharp as Pythagorean thirds, and similar adjustments are visited on all other intervals. The result is a completely enharmonic octave made up of universal pitches rather than the specific pitches of earlier tuning methods. Pitch names such as C# and Db, which were mutually exclusive pitches before, now find reconciliation in a single embracing pitch. Gone are octaves made up of similar intervals of varying sizes, octaves wherein a distinction must be drawn between a small and a large semitone, a small and a large major second, between consonant fifths and the dissonant, "out of bounds" Wolf fifth. Under such circumstances chromaticism comes of age, for all of its four functions become capable of unrestricted realization.

Equal temperament is a principle of tuning in which pitch ratios are expressed in irrational numbers such as 1.05946+ for the semitone. In practice the tuner of keyboard instruments can only approximate such ratios, or, in certain tuning procedures, even willfully depart from them without violating the principle. In the case of singers, stringplayers and others who perform on instruments of variable pitch, the approximations must be made in the course of performance. Chromatic compositions cannot be played by way of pure fifths and thirds without inviting disaster. Either the general pitch level will rise or fall or eventually a pitch adjustment will have to be made, of a more or less radical nature, depending on the variety and the number of antecedent pure fifths and thirds that create the need for it. In performance such adjustments are preferentially made continuously and minutely; thus they remain in accord with the principles of equal temperament. As expressed by J. M. Barbour: "Equal temperament does remain the standard, however imperfect the actual accomplishment may be".*7

Interval Connotation

Because equal temperament expresses musical relationships in a limited number of pitches, it might seem that it should lead to a reduction in the total number of intervals. The pitches that produce a major third (for example, C to E) are exactly the same as those that produce a diminished fourth (C to Fb); likewise, those that produce an augmented second are the same as those that produce a minor third, etc. Furthermore, it is common experience that if an isolated interval is struck, it will be construed in its simpler rather than its more complex connotation.*8 Thus, a minor sixth will be chosen instead of an augmented fifth, a major sixth instead of a diminished seventh, and so on, as illustrated in Example 18, wherein the preferred construction, when an isolated interval is struck, appears in half notes. No decisive choice, it should be noted, is possible in the case of the equally complex augmented fourth and diminished fifth.

Example 18

The normal preference for the simpler construction, when isolated intervals are played, is buttressed by the fact that the pitches of equal temperament form intervals that are closer in sound to the simpler than to the more complex intervals of just intonation, a tuning system which employs, insofar as it is possible to do so, just fifths and major thirds.*9 The tempered minor third (and augmented second) = 300 cents; the just minor third = 316 c.; but the augmented second of just intonation = 274 c. The equal tempered minor third is thus .08 of a tone lower than the just minor third, but .13 of a tone higher than the augmented second of just intonation. Further, the equal major third (or diminished fourth) = 400 c.; the just major third = 386 c., but the diminished fourth of just intonation = 428 c. Thus the equal major third is .07 of a tone higher than the just major third, but .14 of a tone lower than the diminished fourth of just intonation. Similar results can be adduced for the inversions of these, as well as for other interval sets.

Admittedly these differences, reconciled by equal temperament, are slight, although the total difference between the intervals of each enharmonic pair (.21 of a tone) is clearly perceptible. The important point, however, is that the intervals of equal temperament are truer to those which are heard preferentially. It might be tempting, therefore, to conclude that equal temperament leads to the eventual triumph of the simpler interval connotations and the abolishment or atrophying of the more complex.

Such a conclusion would be an oversimplification of the nature of musical relationships, for, whatever a pair of pitches might represent as an isolated sound, as soon as it participates in a continuum of musical relationships, its nature becomes completely dependent on its surroundings. It can no longer be regarded as a single sound, even a single sound in company with other sounds. In a context, it forms a maze of relationships with tones that precede or follow it. The vertical construct now enters into horizontal and oblique relationships with its surroundings. Connotation is determined ultimately by the interplay of all contextual forces, regardless of the nature of individual, isolated sounds. It can be stated axiomatically that the aggregate of relationships is always more determinative than the detail.

For the present a few brief examples will suffice to illustrate the determinative power of context. Let us start with the minor third-augmented second pair. The equal tempered intervals G# to B and Ab to B are identical in sound. Struck simply as an interval, both sound like a minor third, the simpler relationship. However, when struck first in an E major environment (Example 19a) and then in a C minor environment (Example 19b), the clear difference, created solely by context, is that between a minor third and an augmented second. Example 19c illustrates a context that determines an augmented second (B# to A), while ruling out the otherwise preferred connotation of a minor third.

Example 20a, bars 7 and 8, provide a striking illustration of the way in which musical environment can persuade us to hear a diminished fourth (E to Ab) rather than a major third. Of interest is the fact that this interval appears in the company of major and minor thirds. Determinative, however, are the C chord and the Bb major environment which frame the bars in question as illustrated in Example 20b.

A highly unique category is made up of compositions that begin with an interval, unsupported by a clarifying chord or other element. In such cases it is best to suspend judgement until a relevant context appears. Example 21 illustrates two similar openings with dissimilar results. Beethoven's notated diminished seventh proves to be such, while Chopin's is, momentarily, a major sixth. For this remote chromatic succession, Chopin preferred a notation that emphasizes in the initial interval an affinity to Bb minor, and a temporary function that reveals to us the versatility of equal temperament. The relationship of the upper tone, Db, to Bb minor is apparent; the eventual bass progression represents the function of degree progression, E to F to Bb, rather than the more remote function of degree inflection, Fb to F to Bb. Notation, here, communicates vital information about the structure of the passage.

Thus context can determine the exact connotation of intervals. But contexts vary. So long as the ordering forces of the diatonic system dominate, the relatively limited number of pitch

example

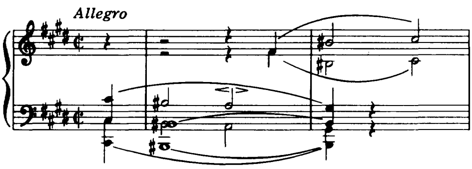
19

a

b

Beethoven: String Quartet, Op. 131 (7th mvt., m.29-31)

c

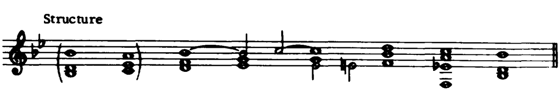


20

Haydn: Symphony in B^{b} major, No. 102 (Finale, m.249-261)

a

b



relationships of equal temperament remain capable of an inclusive variety of meanings. However, it has already been noted that the chromatic scale is uniformly constructed. Symmetrical order tends to reduce all parts to a norm. Hence, the degree of preciseness by which a detail can be characterized will vary with the degree of chromaticism that forms its environment. In a highly chromatic music the simpler connotations tend to become ascendant; there is less place for diminished thirds and diminished fourths and correspondingly more for major and minor thirds. Likewise there is in highly chromatic textures little necessity for distinguishing between equal pairs such as the diminished fifth (C to Gb) and the augmented fourth (C to F#), unless a diatonic resolution should intrude.

An arresting case from Tristan and Isolde (Example 22) will serve to clarify these distinctions between a predominantly diatonic and a predominantly chromatic context in shaping interval meanings. Note in Example 22, reduced from the full score, how Wagner seems to use flats and sharps indiscriminately. In bars 4 and 5, G# and Ab are played at the same time. This is not the result of carelessness, but stands as a clear indication that the generalized absorbent pitches of equal temperament are required. Pity the plight of a Tristan who is determined to sing his intervals with literal purity. His Ab of bar 4 will be a fifth tone higher than his G# of bar 2. Equal temperament must prevail.

The inclusive sense of the passage is clearer than the precise connotation of each interval, for the whole represents a chromatic extension of the E chord of bars 1 and 5. Ultimately this chord proves to be a dominant when it progresses, some 14 bars later, to an A chord. This diatonic ordering factor acts to clarify the meanings of participating intervals. The chromatic extension is wild, but behind it and behind Wagner's aim to present the characteristic "Tristan chord" in three transpositions (bars 2, 3, 4), lies a rational chromatic technique as illustrated in the five sketches of Example 23. Example 23a presents the outline of the technique in its generic form; Example 23b introduces complementary coloring motions in various voices;*10 Example 23c is the same as b but more or less in Wagner's enharmonic notation; Examples 23d and e approximate the leaps of the score first in enharmonic notation, then in a consistent sharp notation.

It would be possible, but aimless, to argue for the accuracy of the notation of Example 23e. The intervals of significant

example

21

Beethoven: Piano Sonata in C minor, Op. 111

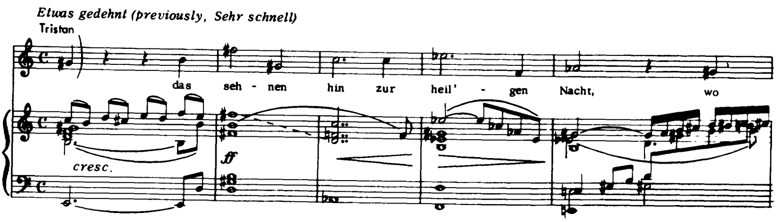
a

Chopin: Sonata in B^b minor, Op. 35

b

22

Wagner: Tristan and Isolde (Act II, Scene 2)



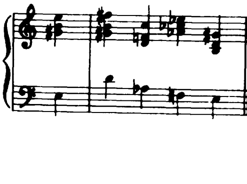
23

a

b

c

d



e

connotation are those that form the embracing diatonic E chord progressing ultimately to an A chord; the remaining constructions, belonging in the realm of chromatic extension, are best heard in their simplest interval connotations, however minutely they might be subjected to clinical examination and appraisal. A chromatic extending technique such as this often brings into kaleidoscopic juxtaposition chords which have other simpler associations and surroundings. Interval meanings tend to submit to the simpler connotations of such origins. Of course, the analyst who pursues his analysis in terms of associated origins will end with a patchwork of harmonic functions never heard, keys never represented, and a passage not analyzed.

In summary:*11 Equal temperament reduces to twelve the total number of pitches within an octave. As a result enharmonic groups are represented by identical pitch relationships. In a diatonic context such intervals retain their nuances of differentiation. As contexts become more chromatic the differences tend to disappear to the point where the enharmonic groups eventually surrender their separate connotations to simple constructions. Ultimate meanings, however, are determined by context.

The Nature of Context

There is no ready road to the mastery of chromatic textures, for, as might be suspected, unique as well as general factors play an important role in establishing frames of reference which might bring understanding to the constantly shifting nuances of chromatic relationships. The ear, of course, is the basic tool of inquiry, but it must be a tutored ear, a shrewd and a wily ear which not only hears, but evaluates as well. Evaluation, however, is less a matter of the contemplation of details, than it is the drawing upon relevant contextual factors. Chords and other textural elements are like intervals; they are known by the company they keep.

Contexts may be broad and inclusive or narrow and immediate. They may comprise a total composition or a temporarily separable part of it. Contextual factors that influence the evaluation of a detail or a technique inevitably combine both harmonic and linear forces. Hence the chord analyst who bestows gratuitous Roman numerals on vertical details, and the linear analyst who resolves all in terms of horizontal drives will only create tangential problems different from those evoked by the music itself. The one will be of little help in answering questions about why chromatic chords, often very strange bedfellows, can move to each other in such striking but convincing succession; the other will be unable to tell us what it is that binds the lines together. The successful chromaticist must be prepared to recognize linear and harmonic forces in both broad and immediate contexts.

Beyond this, many other factors must be given consideration. Among these are rhythmic features, motific elements, musical design, the expressive aim where it can be ascertained, accompanying texts or dramatic action, timbre, scoring, the style of a period, a composer, a composition. In the face of such frequently competing considerations the successful student of chromaticism cannot be passive. He should bring to a composition his own or someone else's norms of inflections and techniques. Likely as not norms will be represented in the piece only in highly particularized forms. They will be revealed to him only after he has engaged in a kind of aural catch-as-catch-can with the music, and wrested from it enlightening and corroborative features of context. However, mere aural athleticism is not advocated here; a touch of intelligence will always prove helpful.

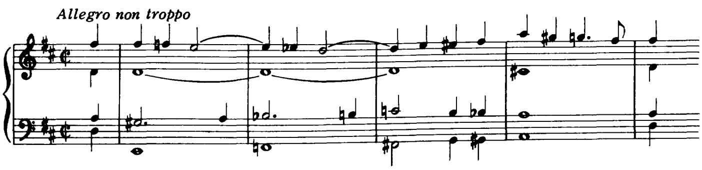
One simple demonstration of the clarifying role of immediate context in relation to the details of a passage will serve to summarize these points. The bars quoted in Example 24 are symptomatic of much of the music of the end of the 19th century in that the chromatic element serves as a kind of caulking compound applied to a diatonic framework. Chiefly, this is chromaticism by interpolation, the only chromatic replacement being the G# of bar 1 which takes the place of a diatonic G♮.

The chromaticist might well ask questions about the chords in bar 2 and the second half of bar 3. Fatal would be any attempt to answer such questions solely in terms of the formations themselves. The various illustrations of Example 25 aim at explaining all details in terms of vertical and horizontal norms and a frame of reference provided by the entire passage. Examples 25a and b present the harmonic basis and the linear genesis with its extended double neighbor; Examples 25c and d introduce a critical extension of the II chord, first diatonically and then chromatically, as it seeks its way, in the manner of well behaved II chords, to the V. Example 25e, now close to the original passage, presents rhythmic and metric features of importance. Note the role of Bb in bar 2 as an accented passing tone; the chord created by this rhythmic-linear accident

example

24

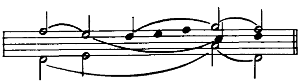
César Franck: Symphony in D minor (1st mvt., m. 422-427)



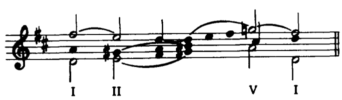
25

a

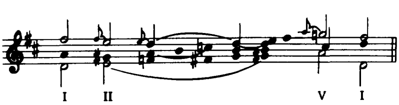
b



c



d



e

should never be given a Roman numeral name. A thorough bass designation will suffice. The same remarks apply to the rhythmic-linear derivatives at the end of bar three. The brackets above bars 1, 2, and 4 are intended to point out parallel constructions. Throughout Examples 25a to d, the various note values and slurs refer to differing degrees of structural significance and to groups of notes that carry out extending missions or that form parallel relationships.

r e f e r e n c e s

1 Paul Hindemith, The Craft of Musical Composition, Book I, p.49. Tr. by Arthur Mendel. (Associated Music Publishers, New York, 1945).

2 The tetrachordal system plays no role in the structure of modern scales, for its disjunct and conjunct features are meaningless and it denies the formative nature of the tonic triad.

3 As employed by Brahms in his concise use of this technique. See Paganini-Brahms Variations, Book II, Variation I, second part. Brahms also introduces a major triad on E, a dominant warning, just before the final cadence.

4 See Comparison of Diatonic and Chromatic Scales above.

5 See Schubert's Waltz in Ab major, Op. 9a/2 for a similar example.

6 See: J. Murray Barbour, Tuning and Temperament (Michigan State College Press, 1953).

7 Ibid., p.201. See also Chapter VIII, p.185ff. for a discussion of equal temperament in performance.

8 Simpler here means those intervals that appear early in the partial series, or to put it another way, those that have simpler vibration ratios.

9 The computations that follow are based on those given in Barbour (op.cit.), p.99, Table 96. This table, based on a just tuning of Marpurg, is described on p.100 as representing "the model form of just intonation".

10 A form that Wagner uses elsewhere, such as in Act II, scene 2, starting nine bars before "So starben wir".

11 Compare this summary with that giver above regarding procedures of notation. In brief, so long as diatonic forces are immediately present, interval differentiation is relatively clear and should be accurately notated. Highly complex chromatic textures, however, should be notated as simply as possible.