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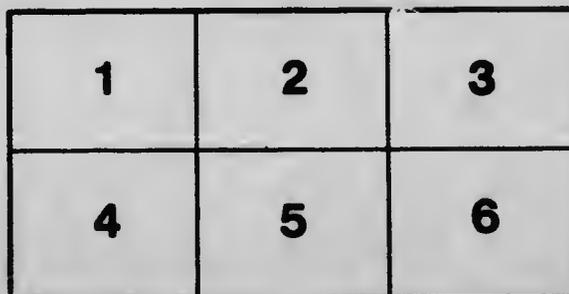
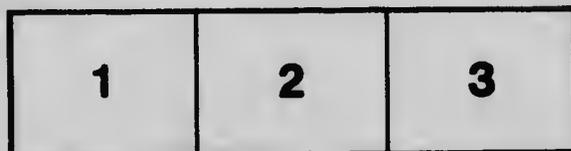
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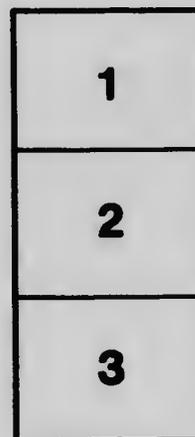
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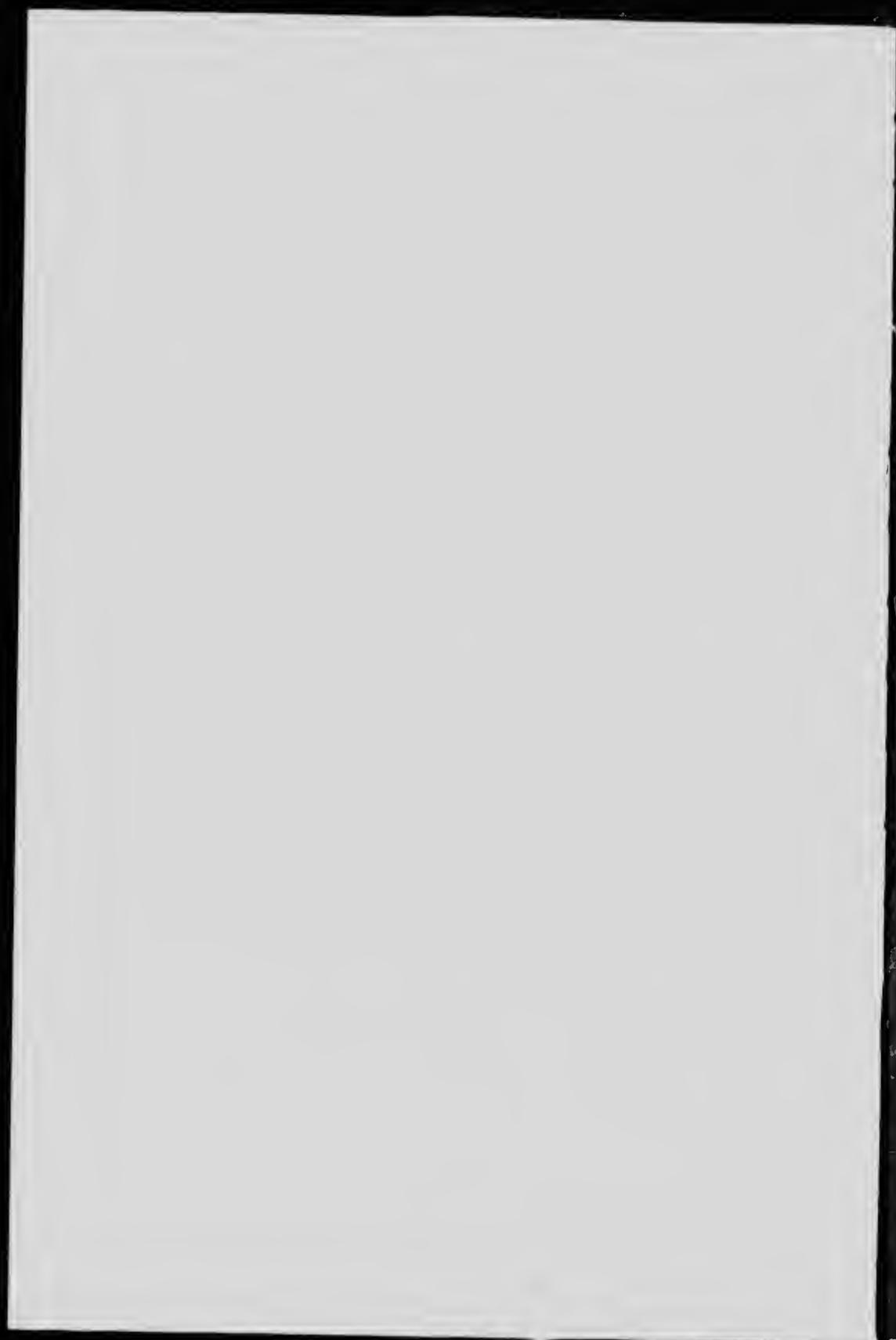


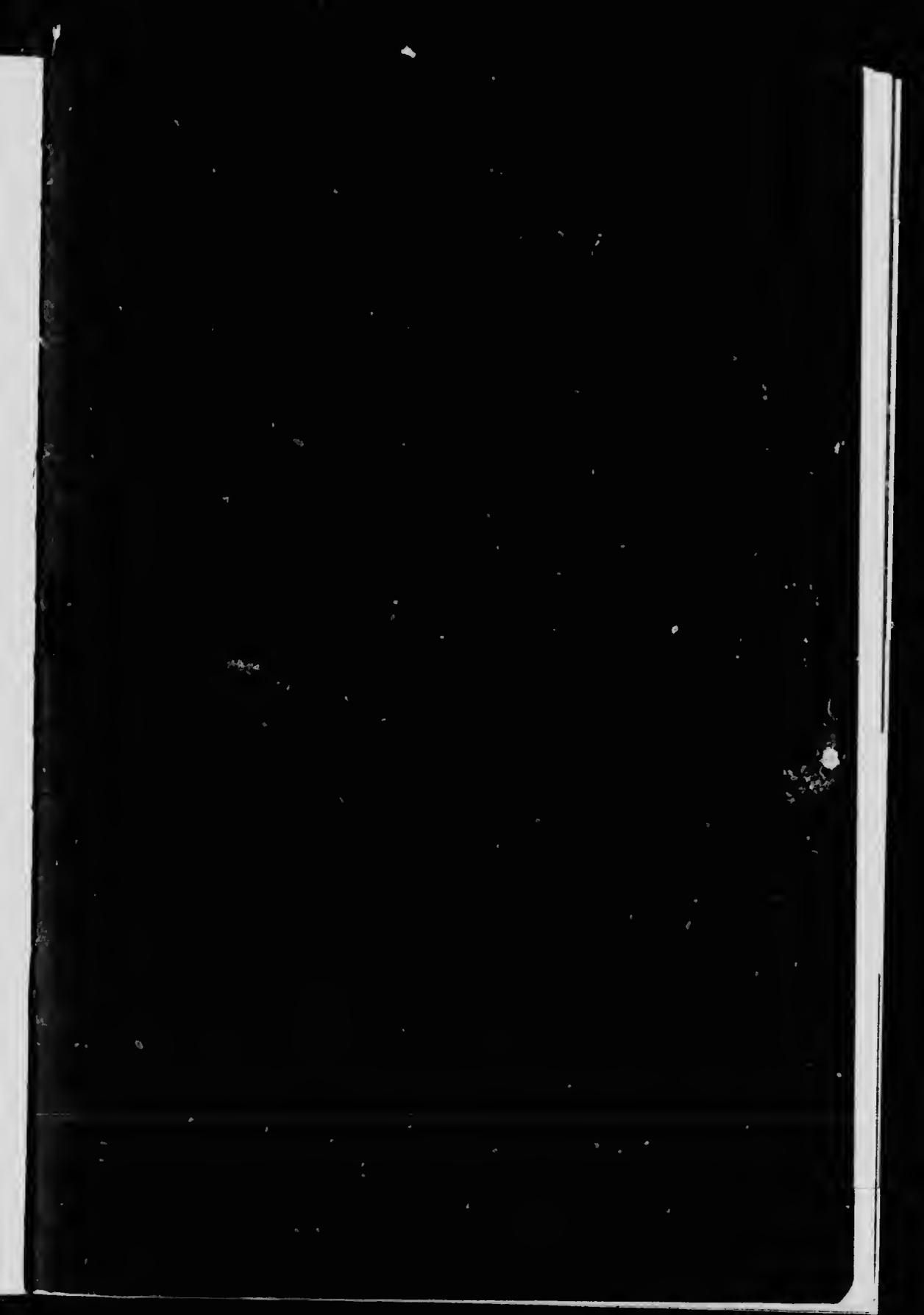
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# Modern Enharmonic Scale

As the Basis of the Chromatic  
Element in Music

(A NEW PHASE IN THE SCIENCE OF HARMONY)

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## A Lecture

Delivered at the Toronto Conservatory of Music

(under the auspices of the Toronto Clef Club),

December 1st, 1906

BY

**J. Humfrey Anger**

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## THE MODERN ENHARMONIC SCALE.

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**A**LTHOUGH the subject of this paper is nominally that of a scale, yet the object, and real purpose in view, is to offer to the world of music a new theory of Harmony; a theory having reference to the origin, basis and use of the chromatic element in Music; and a theory to supersede that originated by Dr. Day, which fails to explain satisfactorily the progressions employed by modern composers.

■ Sir Hubert Parry, the musical director of the Royal College of Music, in the article on "Day," in Grove's Dictionary of Music and Musicians, says: "This is not the place to point out in what respects Dr. Day's hypothesis is vulnerable." Is not this an avowal on the part of one of the most eminent of living composers and theorists, that the Day theory is vulnerable? and vulnerable means open to attack and defeat. Again quoting from this article: "No other theory yet proposed," says the author, "can rival it in consistency and comprehensiveness." This distinguished musician, therefore, is presumably of the opinion that a theory may yet be proposed which will be both more consistent and more comprehensive.

A modern author of a valuable text-book on Harmony,\*

\*Dr. Charles Vincent, author of "Harmony, Diatonic and Chromatic." The theories on the origin of the chromatic element in modern music, about to be proposed, differ materially, however, from those advocated by Dr. Vincent.

says that he bases his system "on the Diatonic, Chromatic, and Enharmonic scales, and ventures to prophesy that the text-book of the future must and will follow some such plan, in order consistently to explain modern combinations, which, under the theoretical systems at present in vogue, require a wrong application of the laws of acoustics and a complex multiplication of roots."

Another work on Harmony, one of the most recent works on this subject,\* in the chapter on Chromatic Triads, contains the following significant statement: "The works of modern composers, such as Dvorak, Grieg, and Wagner, show that it is possible to employ a major triad on every chromatic degree of the scale. For the present, however, the student should confine himself to the chords here given." Again, in the chapter on Other Chords of the Seventh, a similar statement is made, namely, that "the works of modern composers, *e.g.* Dvorak, Grieg, and Wagner—furnish examples of many other chromatic sevenths used in a key without modulation. It is well for the student at present to use only those already given." Here we see the genuinely honest intentions of the authors completely baffled by the limitations of their theory. The work is admitted to be based on the system advocated by Macfarren, the immediate successor of Day; it is therefore one of the many existing treatises on the Day theory, and consequently *the works of the best modern composers are not written in accordance with this theory.* With regard to the expression, "for the present," it may be said that the "present" lasts throughout the work, so that the student (the hapless student) is left to discover for himself what chromatic triads and chords of the seventh are at his command when he enters the realm of composition.

\* "A Course of Harmony," by Sir Frederick Bridge and Dr. Frank J. Sawyer, a work written at the request of the Council of the Royal College of Music.

With regard to the theory that is about to be proposed, in one sense it may not be new; it is, possibly, the theory upon which the older classical masters, such as Bach and Beethoven, wrote their immortal compositions, and it is probably the theory adopted by modern composers, such as Dvorak, Grieg, and Wagner. This theory is simply reduced to a *practical system*, so that the works of the great masters may be analysed without the necessity of having to offer any apology, or what is worse, without the necessity of having to state that they—the great masters—employed incorrect notation, which is one of the most unfortunate features and defects of the theory advocated by Dr. Day.

And with regard to the Modern Enharmonic Scale, it is simply a chromatic scale, in which certain notes—to be exact, three of the chromatic notes—appear each under two different names. This scale is intended for students of *harmony* only, and particularly for those who are taking up *composition*, so that they may see at a glance what chromatic notes are available for use, and that they may be able to understand the principles upon which the great composers employed the chromatic element in music.

It must be apparent to every lover and connoisseur of music that a great change has been effected in the art of music during the past 30 years or so. This change may be said to have been inaugurated by Richard Wagner. The school, of which Wagner is the prototype, was, thirty years ago, ironically alluded to as "the music of the future," but many a true word is spoken in jest, and the music of the future it proved to be, notwithstanding the critics of the last generation. Wagner now holds the honored position of being regarded as one of the greatest of musicians. The names of Dvorak and Grieg have already been mentioned; to these may be added such names as Brahms, Coleridge-

Taylor, Elgar, Leoncavallo, MacDowell, Mascagni, Parry, Puccini, Saint-Saens, Strauss, Tschaikowsky, Widor, and many others whose compositions are not only fresh and original, but are also illustrative of the marvellous and inexhaustible resources of the art.

A brief review of the past will bring to mind the fact that a change in the style of musical composition is not confined to one generation, it would seem to occur in a greater or less degree with every generation. Thirty years prior to Wagner's triumphs at Bayreuth, we find Schumann at the height of his fame, and honored with the degree of D. Phil. (1840); while it may also be mentioned that the first Conservatory of Music was founded by Mendelssohn in this same decade (1843) at Leipzig. Thirty years earlier, 1810-1820, Beethoven, the generally acknowledged greatest genius of all, was in "his freest and most joyous creative period." Thirty years earlier, again, and we find Mozart at the zenith of his career (1780-1790); while his great contemporary, Haydn, about this time founded the modern orchestra, and established the form of the sonata and symphony. And, one generation earlier brings us to the days of Bach and Handel, in whom is to be found the fountain-head of the modern art of music. To Bach, be it said, we are indebted for the establishment of equal temperament, that is to say, the division of the octave into twelve exactly equal semitones, as now employed in music. But with all the advance that has been made in composition since the middle of the nineteenth century, what advance has been made in that science which is the fundamental basis of composition—Harmony? Is not the system employed by Beethoven, and the other great composers, sufficient for all time, so long as music is based upon the laws of equal temperament? Can the progressions employed in modern compositions be satisfactorily

explained by the theories at present in vogue? Such questions as these will now be considered, but, it may here be said that little or no advance has been made in the science of Harmony since the year 1850; that the theory which arose about that date fails to meet modern requirements; and that the system employed by Beethoven is the only true system, but that it has never, hitherto, been either *consistently* or *comprehensively* expounded.

Just as the diatonic scales constitute the basis of diatonic chords, so the origin of chromatic chords is to be found in a chromatic scale.

The introduction of the chromatic element into musical composition is attributed to Orlandus Lassus (Roland di Lattre), 1520-1594, and though employed more or less freely by all succeeding composers, yet from neither a melodic nor harmonic standpoint was any attempt apparently made to *systematize* the subject until about the middle of the nineteenth century, when the notable work on Harmony by the above-mentioned Dr. Day appeared.

The text-books of Germany, the home of the greatest masters of music; of France, a country noted for its scientific researches; of Italy, the birth-place of modern music; and of England,\* second to none in her love for the art; all simply refer to a few of the most frequently employed chromatic chords, explaining their treatment and giving examples of their use; but, while the diatonic element is treated systematically, in no case is the chromatic element so treated, in no case is the origin, from which chromatic notes are derived, explained, and in no case is the theory expounded in such a manner that the student

\* Whenever reference is made in this paper to the "English" theory, it is understood to be that which was in existence prior to the advent of the Day theory. The English theory comprises chords of the ninth and their derivatives, a feature not generally accepted by the German authors.

can grasp the principles upon which the great composers obtained their chromatic effects, or learn what material is available for use in his own compositions.\*

The theory enunciated by Dr. Day has given rise to much controversy in the world of music, though rejected by many of the most eminent theorists as being illogical, it has, nevertheless, been accepted by other very eminent theorists as the correct basis of the chromatic element; consequently, the modern student, whatever his views may be, should at least be familiar with this theory.

The following brief account of Dr. Day is taken from the above-mentioned article in Grove's Dictionary.

"Alfred Day, M.D., the author of an important theory of harmony, was born in London, in January, 1810. In accordance with the wishes of his father, he studied in London and Paris for the medical profession, and, after taking a degree at Heidelberg, practised in London as a homœopathist. His father's want of sympathy for his musical inclinations in his earlier years having prevented him from attaining a sufficient degree of practical skill in the art, he turned his attention to the study of its principles and formed the idea of making a consistent and complete theory of harmony, to replace the chaos of isolated rules and exceptions, founded chiefly on irregular observation of the practice of great composers, which till comparatively lately was all that in reality supplied the place of system. He took some years in maturing his theory, and published it finally in 1845, three years only before his death, February 11, 1849."

Dr. Day's theory, even before his work on harmony was published, was endorsed by Sir George Macfarren (1813-

\*This assertion is made in good faith; the author is not aware that any attempt has been made to *systematize* the chromatic element in music in any work on Harmony other than that by Dr. Day, or in a work founded on the Day theory.

1887), who in 1860 published his own work, entitled, "The Rudiments of Harmony," in which he not only advocated, but also somewhat further developed, the principles originated by Dr. Day. Macfarren succeeded Sir Sterndale Bennett as Professor of Music at Cambridge in 1875, in the following year became principal of the Royal Academy of Music, and in recognition of his services in the cause of music, was knighted in 1883. With such a champion, the Day theories were rapidly promulgated, and before the end of the nineteenth century many eminent theorists in both Europe and America had adopted the same, had taught the same to their pupils, and had written further treatises upon the same. Yet, notwithstanding its numerous adherents, since, theorists, equally eminent, have refused to accept the Day theory, would it not appear, and may it not be assumed, that up to a certain point this theory must be logical, and the arguments conclusive, but that beyond this point it and they give rise to diversity of opinion ?

Dr. Day divides the subject of Harmony into two distinct parts, namely, (1) the Diatonic or strict, and (2) the Chromatic or free; each part is treated independently of the other, but they are united, as it were, by a chapter on what he terms, Diatonic free harmony. Since the principles enunciated in Part I. have not been adopted, so far as any original treatment of the subject is concerned, by any of his successors, and since they have practically no bearing on the subject under consideration, namely, the chromatic element in music, it will not be necessary to devote any attention to them on this occasion. It is in his treatment of "Chromatic harmony, or harmony in the free style," as he calls it, that Dr. Day's reputation was established.

"His explanation of the chromatic system," says Sir Hubert Parry, in the able article on Day, above mentioned, "was quite new, and his prefatory remarks so well explain

his principles that they may be fitly quoted. After pointing out that the laws of diatonic harmony had been so stretched to apply them to modern styles that they seemed 'utterly opposed to practice,' he proceeds: 'Diatonic discords require preparation because they are unnatural; chromatic do not because they may be said to be already prepared by nature—since the harmonics of a root note give the notes which form with it the combinations he calls fundamental discords. The harmonics from any given note are a major third, perfect fifth, minor seventh, minor or major ninth, eleventh, and minor or major thirteenth.' And this series gives the complete category of the fundamental chords of Day's chromatic system. Moreover, with the view of simplifying the tonal development of music, and giving a larger scope to the basis of a single key—and thereby avoiding the consideration of innumerable short transitions—he gives a number of chromatic chords as belonging essentially to every key, though their signatures may not be sufficient to supply them, and with the same object builds his fundamental discords on the basis of the supertonic and tonic as well as on the dominant. In respect of this he says: 'The reason why the tonic, dominant, and supertonic are chosen for roots is, because the harmonics in nature rise in the same manner; first the harmonics of any given note, then those of its fifth or dominant, then those of the fifth of that dominant, being the second or supertonic of the original note. The reason why the harmonics of the next fifth are not used is, because that note itself is not a note of the diatonic scale, being a little too sharp (as the fifth of the supertonic), and can only be used as a part of a chromatic chord.' The advantages of this system of taking a number of chromatic chords under the head of one key will be obvious to any one who wishes for a complete theory to analyse the progressions of ~~keys~~ *chords* in

modern music as well as their harmonic structure. For instance, even in the early 'Sonata Pathétique' of 'Beethoven, under a less comprehensive system, it would be held that in the first bar there was a transition from the original key of C minor to G; whereas under this system the first modulation would be held to take place in the fourth bar, to E flat, which is far more logical and systematic."

From this extended quotation it will be seen that Dr. Day advocates the formation of a chord upon the dominant consisting of a series of super-imposed thirds, and comprising every note in both the major and minor mode; this chord, known as the dominant thirteenth, could be employed in the following four different forms.



(a) With the major ninth and major thirteenth, (b) with the minor ninth and minor thirteenth, (c) with the ninth major and thirteenth minor, and (d) with the ninth minor and the thirteenth major.

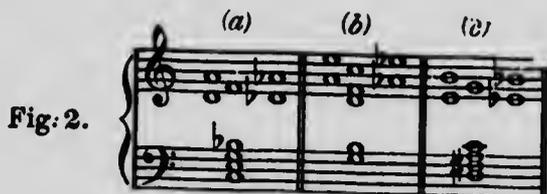
It is not to be supposed that all the notes of these gigantic chords were intended to be sounded simultaneously, although such a discord might under certain conditions be possible; the special use of these chords was apparently in connection with the analysis of chords. The convenience of the system is most patent, for, since the chord at *a*, for example, contains all the notes of the major diatonic scale, so every diatonic chord might be regarded as a more or less incomplete form of this chord, and therefore could be readily explained.

Chords of the ninth, eleventh, and thirteenth, it may here be said, are mentioned in the work on Harmony by Albrechtsberger, 1736-1809, but the chords in this case are formed by adding a third, a fifth and a seventh, respectively, *below* a chord of the seventh. The idea of adding another third above a chord of the ninth, so forming a chord of the eleventh, and then another third, so forming a chord of the thirteenth, was presumably original on the part of Dr. Day.

The most important feature in the Day theory, however, is the *systematic method* in which the chromatic element in music is treated. Fundamental (or primary) sevenths on the tonic and supertonic are, for the first time in the history of music, regarded as chromatic chords; and the arguments brought forward to prove that these chords may be employed in a key without inducing a modulation should be sufficiently convincing to every modern theorist. Chords of the major and minor ninth on the tonic and supertonic are next considered. The chord of the eleventh on these notes is forbidden by Dr. Day: "The chord of the eleventh," he says, "unlike the chords of the seventh and ninth, can only be taken on the dominant." The reason given for excluding this chord, is "because its resolution if taken on either tonic or supertonic, would be out of the key." Finally, the chords of the thirteenth on the tonic and supertonic, the ninth and thirteenth being either major or minor, as in the case of the dominant thirteenth, are considered.

Although Dr. Day excluded the eleventh from the tonic and supertonic thirteenths, and notwithstanding that Macfarren endorses this particular feature of the theory, yet more modern authors have not only included the eleventh in these chords, but have also advocated the use of the chords of the tonic and supertonic eleventh.

The three chords of the thirteenth in their complete forms may be exhibited thus :



These chords, having once been established, became the harmonic basis of the chromatic scale which Dr. Day adopted, and which has since become known as the harmonic form of the chromatic scale. But, it may be said, so far as this scale itself is concerned, that it is obtainable from the chords of the minor ninth on the tonic, dominant and supertonic, without any reference to the elevenths or the major or minor thirteenths.

Mention must be made of Dr. Day's valuable arguments on the difference between the diatonic and chromatic semitone. He conclusively proves that theoretically the diatonic semitone is the larger of the two, in other words, that the interval C to D flat is slightly greater, from the standpoint of acoustics, than the interval C to C sharp. This point, however, is of no practical importance in connection with harmony, for, according to the laws of equal temperament, these semitones are identically the same in point of size ; they differ only in notation and use.

Reference must also be made to one particular chord which is considered under the heading of the dominant eleventh, namely, the chord generally known as the " Added sixth." This chord is claimed to be the third inversion of the dominant eleventh, the root and third of which are, of course, omitted.

After the treatment of the fundamental discords has been thoroughly exhausted, Dr. Day next considers the chords of the Augmented sixth. For these chords, probably for the first time in the history of music, a double root is claimed. The bass-note of the following chords, for example, is regarded as a primary harmonic of the generator

(a)            (b)            (c)  
Italian      French.      German.

Fig. 3.

G, the dominant, while the upper notes are regarded as primary harmonics of the generator D, and, therefore, as secondary harmonics of G. By secondary harmonic is understood a note generated from one of the harmonics of a given generator. Dr. Day states that the interval of the augmented sixth "should not be inverted, because the upper note, being a secondary harmonic *and capable of belonging only to the secondary root*, should not be beneath the lower, *which can only belong to the primary root.*" The three forms of this chord may occur, not only on the minor submediant, as exemplified in Fig. 3, but also on the minor supertonic; in the latter case the tonic and dominant are the roots.

The chromatic element in music is finally considered in connection with "Passing notes in the free style," when, in certain cases, the necessity for the use of the melodic form of the chromatic scale, which has hitherto been excluded, is recognized. After which a chapter on enharmonic modulation brings this notable treatise on harmony to a conclusion.

Up to the chord of the dominant seventh, the German, the English, and the Day theories of harmony are practically in perfect accord, from this point onward, however, they commence to diverge. Chords of the seventh, or tetrads, as they may more conveniently be called, on other degrees of the scale, are acknowledged by the German and the English, and sometimes by the Day theory; at other times such chords are regarded as being derived from the dominant, with the dominant omitted, and not as independent chords.

Chords of the ninth, or pentads, are acknowledged by both the English and the Day theories, but according to the German theory, the ninth is regarded in the light of a suspension or an auxiliary note; and though undoubtedly the ninth is treated as one of these discords in the great majority of cases, yet there are exceptions, as in the following transcription from a string quartet by such a composer of the strictly German school, as Haydn :



According to the English theory the chord at \* is the dominant major ninth. It would be interesting to know what name would be given to this chord by a theorist of the German school; possibly the ninth would be regarded as a "Changing note," a term which seems to be applied by some writers to any kind of auxiliary note when employed not in accordance with the generally accepted laws.

The chord of the seventh on the leading-note of the major mode, according to the Day theory, is known as "the first inversion of the dominant major ninth"; but, since this chord does not contain the dominant, and consequently not the distinguishing interval of the ninth above the dominant, the name is little short of a misnomer. According to the English theory this chord is regarded as a derivative of the dominant ninth, and is known as "the leading seventh"; but even this name, though satisfactory when applied to a derivative of the *dominant* ninth, is not applicable to a derivative of any other chord of the ninth, such as the tonic or supertonic ninth.

The chord of the seventh on the leading-note of the minor mode, according to the Day theory, is known as "the first inversion of the dominant minor ninth," also for the same reasons as given above, really a misnomer. According to the English theory this chord is also regarded as a derivative of the dominant ninth, and is known as the chord of "the diminished seventh"; Dr. Day, be it noted, also refers to this name for the chord, but Macfarren totally ignores the name. It is also called the chord of the diminished seventh by German theorists, but they seem to have no name for the leading seventh, other than "the chord of the seventh on (or of) the seventh degree."

Since the derivative of a fundamental or primary minor ninth is called a chord of the diminished seventh, after the name of the interval between the third and ninth of the generator, so the derivative of a fundamental or primary major ninth may be called a chord of the minor seventh, after the name of the interval between the third and ninth of its generator. Although the interval of the minor seventh, unlike that of the diminished seventh, occurs in other chords, yet the use of the term "minor seventh" will only be necessary when the chord comprises, like that

of the "diminished seventh," a *diminished fifth* and a *minor third*. The interval of a minor seventh occurs not only in the chord under consideration, but also in the dominant seventh and in all primary sevenths, and in the secondary seventh on the supertonic and on other degrees of the scale, but no confusion will arise in this respect, for, all chords of the seventh other than the minor and the diminished seventh are named after the *root* upon which they are formed.

The convenience of this term, "chord of the minor seventh," or "minor tetrad," will be seen from the following example. The chord at *a* is the diminished tetrad on the mediant; that at *b*, the minor tetrad on the mediant; in each case the tonic, C, is the generator. The name "leading seventh" for the chord at *b* would be incorrect, for, E (the root) is not the leading-note; while the name "first inversion of the tonic major ninth" is only applicable to a degree, for, there is no tonic present, nor according to the figuring would the presence of the tonic be justified, while this name is distinctly applicable to the chord at *c*, which though similar to, is not the same as, that at *b*.

Fig. 5.

(a) (b) (c)

$\flat 7$   $\flat 5$   $7$   $\flat 5$   $7$   $6$   $\flat 5$

In other respects, that is to say, setting aside the different views with regard to chords of the ninth and their derivatives, the English and the German theories may be said to be practically the same; the Day theory, however,

not only proceeds to the chords of the eleventh and thirteenth, thereby differing from the other theories in the matter of diatonic chords, but it also treats of the chromatic element in harmony from an entirely different standpoint. In the Day theory, as was stated above, chromatic harmony is reduced to a system, but this is not the case with the older theories. That the great classical composers based their chromatic progressions upon *some* system there can be little or no doubt, and it is often said that this system was based upon the happy-go-lucky rule that chromatically raised notes must be resolved by ascending and chromatically lowered notes by descending; but it should rather be said that this rule arose from the system, and not the system from the rule. In any case this free and easy rule is not applicable to the Day theory of chromatic harmony, wherefore, the great composers did not write in accordance with this theory.

The adherence given to the Day theory by so many eminent musicians is probably traceable to two considerations, firstly, a desire to have *some* system, rather than none at all, in connection with chromatic chords, and secondly, the fact that it is a *convenient* theory; for, since the dominant thirteenth comprises all the notes of the diatonic scale, so any and every *diatonic* chord may presumably be explained, and since the three fundamental discords of the thirteenth comprise the notes of a complete chromatic scale, so any and every *chromatic* chord may presumably be explained.

With regard to the chord of the eleventh, it may be said that even Dr. Day himself apparently regards this chord in the light of a stepping stone to the chord of the thirteenth, for, in the case of the tonic and supertonic fundamental discords, the use of the eleventh is forbidden, notwithstanding that the thirteenth is regarded as an essential note.

The principal use of the dominant eleventh, according to Dr. Day, seems to be in connection with the above-mentioned much abused chord of the "Added sixth," which, as was said above, he regards as the dominant eleventh with the dominant and the leading-note omitted. This almost reminds one of the play of *Hamlet*, with Hamlet and Ophelia (the leading lady) omitted. According to the German theory the root of this chord is the supertonic, but Helmholtz, the great German philosopher, and Rameau, a noted French author, both claim the subdominant as the root of this chord. The mystery surrounding the chord is probably attributable to the fact that there are *two* chords consisting of identically the same notes, one of which naturally resolves upon the tonic chord, while the other naturally resolves upon the dominant.

Fig. 6.

(a)

(b)

(c)

6 6 5 6

4 3 5

6 4 6 4 6 8 7

5 2 5 2 5

The chord marked \* in the example at *a* is the "Added sixth," and its resolution upon the tonic chord constitutes

a variation of the plagal cadence. This chord is really a subdominant triad, to which a sixth is added, hence the name; the *sixth* is, therefore, the *dissonant* note, and the chord may be regarded as a *diatonic modification*. The sixth is frequently introduced as a passing note, as at *b*, when it is very evident that the root of the chord is the subdominant. According to the Day theory this chord is a dominant eleventh, G being the root; but as the root and third are omitted the seventh and ninth become consonant intervals, while of course D—the sixth—is also consonant.

The chord marked \* in the example at *c* is the first inversion of a secondary tetrad on the supertonic; the *fifth*, therefore, is now the dissonant note, and as such it is prepared and resolved in the usual manner. The whole passage is a sequence of secondary sevenths, a dominant sequence, that is to say the roots rise a fourth or fall a fifth, consequently the root of this chord is D; F, in this case, could not be the root. According to the Day theory G is the root not only of this chord but also of all the other tetrads in this passage, with the result that consonances become dissonances, and dissonances, consonances; and the theory, whether it be regarded as convenient or anything else, becomes contrary, illogical, and inconsistent.

With regard to the chord of the thirteenth, though at first sight it may appear *convenient* to be able to call any chord by this name, which cannot be satisfactorily explained in any other way, yet since there are so many possible combinations of the notes of this chord, the name—dominant thirteenth—is most *indefinite*, and especially is this the case, when it is remembered that the dominant minor thirteenth (with minor ninth) is available for use in the major mode. Dr. Day furnishes no less than *seventy* different examples of the use of this chord, some in four-part and some in five-part harmony, many of the latter

being of an extremely harsh character. Each of these examples is accompanied with one or more rules, to which there are sometimes exceptions, so that the whole chapter results in a mass of complications leading to "confusion worse confounded."

Two forms of this chord must be briefly considered, that at *a* which comprises the dominant with its third and thirteenth, and that at *b* which is the same chord with the seventh included.



The chord at *a* is figured 6, and the name "dominant sixth" is therefore just as applicable and quite as justifiable as the name "dominant thirteenth." This chord is figured  $\frac{13}{3}$  by Macfarren, but it is not customary in figured basses to employ any figure higher than the number 9, that is to say, any double figures at all. Now place C in the tenor instead of B, and the chord is converted into a 6-4 on the dominant, but according to the Day theory it should still be called the dominant thirteenth; and now, place C in the bass, retaining C in the tenor and not changing the treble and alto notes, and the chord is converted into the common chord of C, but why should this chord not be termed the fifth inversion of the dominant thirteenth? If, because it would be incorrect to double the eleventh, then place G in the tenor instead of C (doubling the dominant as in the chord at *a*), it will still be the common chord of C, and the ridiculous extent to which this theory may be carried becomes abundantly evident.

This chord, the dominant sixth, must not be confused with the first inversion of the mediant triad; the latter chord is rarely employed except in sequences, while the former is of common occurrence.

This chord at *b*, is figured  $\overset{7}{6}$ , and this is the chord, the one chord, to which reference is almost invariably made when the term 'dominant thirteenth' is employed; the name "dominant sixth and seventh," however, is *no* definite, for it exactly describes this particular chord, whereas "dominant thirteenth" is occasionally employed for a great number (sixty-nine ?) of other chords.

Upon the treatment of this chord (Fig. 7, *b*) depends entirely the question as to whether or not it should have a distinctive name. When, as in Fig. 8, the treble note is either preceded as at *a*, or followed as at *b*, by the note below, that is to say by the fifth of the root, the chord is simply a dominant seventh, with the sixth introduced ornamentally as an auxiliary note; at *a* the sixth is employed as a free turning note; at *b* the fifth is temporarily displaced, the sixth being either a suspension or an accented auxiliary note. When the fifth is not introduced at all, that is to say, when the fifth is absolutely displaced (as in Fig. 7), then a distinctive name is desirable, and a definite name is preferable to an indefinite name in this and in all cases.

Fig. 8.

The figure shows two musical examples, (a) and (b), on a grand staff. Example (a) shows a treble clef with a note on the second line (F) and a bass clef with notes on the second line (C), third space (E), and fourth space (G). A treble note on the first space (A) is preceded by a bass note on the second line (C). Below the notes are the figures  $\overset{7}{5}$  and  $\bar{6}$ . Example (b) shows a treble clef with a note on the second line (F) and a bass clef with notes on the second line (C), third space (E), and fourth space (G). A treble note on the first space (A) is followed by a bass note on the second line (C). Below the notes are the figures  $\overset{7}{6}$  and  $\bar{5}$ .

These chords (Fig. 7, *a* and *b*) are equally available for use in the minor mode, when the sixth, which is almost invariably placed in the treble, becomes a minor interval. The general treatment of these chords is the same, whether the mode is major or minor. The natural resolution of the dominant sixth and seventh is shown in Fig. 9; *a*, in the major mode, and *b*, in the minor.

Fig. 9.

The figure shows two musical examples, (a) and (b), in a grand staff. Example (a) is in the major mode and example (b) is in the minor mode. Both examples show a chord with a '6' below the bass line, indicating a dominant sixth chord. The notes in the treble clef are G4, A4, B4, and C5. The notes in the bass clef are E3, F3, and G3. The key signature for (a) is one sharp (F#) and for (b) is one flat (F).

The following chords, which, it will be seen, are identically the same on the piano, must now be considered.

Fig. 10.

The figure shows two musical examples, (a) and (b), in a grand staff. Example (a) is marked with '7 #5' below the bass line and example (b) is marked with '7 6' below the bass line. Both examples show a chord with a '7' below the bass line, indicating a dominant seventh chord. The notes in the treble clef are G4, A4, B4, and C5. The notes in the bass clef are E3, F3, and G3. The key signature for (a) is one sharp (F#) and for (b) is one flat (F).

According to Dr. Day, these chords are not only identically the same from an instrumental standpoint, but they are also identically the same in name and in effect; and this *may be said to be the crucial point in the Day theory*. The names, "dominant eleventh and thirteenth" can at least be tolerated, but when Dr. Day claims that an augmented fifth, a dissonant interval, is identically the same as a

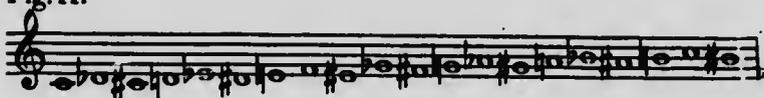
minor sixth, a consonant interval, it can readily be seen why so many eminent musicians have rejected his theory. Dr. Day, moreover, does not stop at this point; he states and claims that whenever the chord at *a* is employed, the composer—whosoever he may be—is guilty of *false notation*, in other words, has written an incorrect note. It is truly a convenient theory, for it is certainly a matter of much convenience, when a progression occurs which is not in accordance with the principles of the theory, to be able to qualm the conscience by saying that the composer is wrong; but, if musical works are to be judged and analysed on these lines, it will be found that all the great composers are systematically wrong in their use of certain chromatic notes, namely, the hyper-tonic, the hyper-supertonic (the note employed in the present instance) and the hyper-dominant. The prefix "hyper" here indicates "chromatically" raised.

It was stated above that Dr. Day drew a line of distinction between the diatonic and the chromatic semitone, claiming that the latter was theoretically smaller than the former; admitting this to be the case from the standpoint of acoustics, the diatonic semitone being in the ratio of 15 : 16, and the chromatic, 24 : 25, he might at least have credited the great composers with recognizing the same difference, and might have granted them the privilege of employing that one which, for the time being, appealed to their emotions. This privilege, however, is emphatically denied, and the theory, therefore, contradicts itself; *it accepts the difference but rejects the distinction.*

A passing reference may here be made to a modern German text-book, *A Manual of Harmony*, by Dr. S. Jadasohn, in which it is claimed that the chromatic semitone is the larger of the two, because of its tendency to rise, while the tendency of the diatonic semitone is to fall. This view

of the difference between the two semitones is not generally held, in fact, it is *erroneous*, and the following irregular succession of sounds given as illustrating "the true pitch of the tones" is contrary to the first principles of scale construction.

Fig. 11.



The above is called "the enharmonic-chromatic scale," and it is here quoted in order that no confusion may arise between this and "the modern enharmonic scale," which is about to be considered.

Reverting now to the chords in Fig. 10, it may be said that the augmented fifth of the dominant in the major mode and the minor sixth of the dominant in the minor mode, are often introduced ornamentally in connection with the perfect cadence, as shown in the following example.

Fig. 12.

At *a* the fifth of the dominant (in the treble) is followed by a chromatic semitone; at *b*, it is followed by a diatonic semitone. In each case the natural resolution of the chord is given; without the resolution, the emotional effect of the semitone would not be obtained. Let each of these

progressions be played slowly, two or three times, on the piano, and notwithstanding the fact that the D sharp and the E flat are identically the same in pitch, it will be found that a difference in effect is clearly discernible ; an æsthetic difference, the augmented fifth of the root—the hyper-supertonic—is tinged with *joy*, while the minor sixth of the root—the minor mediant—is tinged with *sorrow*. According to the Day theory, the D sharp is false notation, the note should be E flat in each case. Musical notation may be defined as the art of transcribing to paper the effect of musical sounds ; and this effect is as readily appreciated with the eye as with the ear by the true musician. If, therefore, the above progressions differ from one another when played on the piano, then they should be *notated* differently when transcribed to paper. Beethoven, it is well known, composed his greatest works whilst suffering from total deafness ; he, with the *eye* alone, could appreciate the majestic harmonies of the "Choral Symphony." Wherefore, it is a reflection upon the genius of the great composers, to state that they wrote one thing but intended another, or to claim that they heedlessly or needlessly sacrificed correct notation for convenient notation.

Now, the notes D sharp and E flat, instead of being introduced *after* the dominant chord, may be employed *in* the dominant chord, in the treble, in place of the fifth of the root, which thus becomes absolutely displaced, as shown in Fig. 10. The chord at *a* thus becomes a chromatic modification, and the chord at *b*, a diatonic modification, but the resolution is the same, and the resultant effect practically the same, as when the notes D sharp and E flat are introduced ornamentally, as in Fig. 12. They are, therefore, two entirely different chords, they naturally belong to two different keys (C major and C minor), and, moreover, they must have two different names. Their

names, respectively, are "the dominant augmented fifth and seventh," and "the dominant minor sixth and seventh," names, which may not be as convenient as the name "dominant thirteenth," but which at least possess the merit of definitely determining the character of the chord, a feature far more desirable than that of mere convenience.

With regard to Dr. Day's statement that the interval of the augmented sixth cannot be inverted, it need only be said that this statement is not in accordance with facts, for the third inversion of the German sixth, when the interval is, of course, inverted, has been employed by the best composers.

It is unnecessary to consider other points in this notable theory, sufficient has been said to show that it does not furnish the correct chromatic material at the command of the composer, and consequently it fails to furnish a satisfactory explanation of certain chromatic chords. As a theory, so far as chords of the ninth are concerned, and these in relation to the tonic, the dominant and the super-tonic, as roots or generators, it holds good for the *minor* or artificial mode only ; when applied to the major or natural mode it signally fails. The whole question may be summed up thus : if the Day theory of the chromatic element in music is correct, then the principles upon which chromatic progressions have been written by the greatest exponents of the art of music, are incorrect, and, *ex necessitate rei*, the converse must hold good.

But, it is one thing to *oppose* a theory, and it is another and a very different thing to *propose* a theory. The theory upon which the chromatic element in music is based, as now about to be explained, it may be said, is not the result of a momentary deliberation ; it has stood the test of constant application for several years, and though presumably it has never hitherto been expounded, yet there seems to be

no doubt whatever that it forms the basis on which the greatest composers of the past have written their chromatic progressions, and in which the composers of the future may find new and unending combinations of tone color, like the ever varying changes of the kaleidoscope.

A chromatic chord may be defined as a chord which contains one or more notes foreign to the diatonic scale of the key in which it is introduced, but which does not effect a modulation. A chromatic scale, though usually defined as a scale ascending or descending regularly by semitones, should be regarded, not from the melodic standpoint alone, as a succession of semitones, but also from the harmonic standpoint, as the basis of chromatic chords. A chromatic scale may be said to be the tonal extension of a diatonic scale; it, therefore, comprises seven diatonic and five chromatic notes; but the chromatic, as well as the diatonic, all belong equally to the key.

There are three forms of the chromatic scale in use at the present day; these in relation to the note C as a tonic, are shown in the following example.

Fig. 13.



2. 3. 4. 5. 7.

The scales at *a* and *b* are respectively known as the harmonic and melodic forms of the chromatic scale; the scale at *c* is employed in instrumental music only, and the notation is the result of the simple plan, adopted frequently by even the best composers, of forming the chromatic notes by accidentally raising diatonic notes in ascending, and by accidentally lowering them in descending, in order to reduce as much as possible, the number of absolutely necessary accidentals. This, the instrumental form of the chromatic scale, will not be considered further, as it is strictly a melodic scale, for, the notes A sharp (ascending) and G flat (descending) possess no harmonic relationship whatever with the key of C; they can only be employed in this key as chromatic auxiliary notes.

The notation of the scale at *a*, it will be seen, is the same in descending as in ascending. In the notation of the scale at *b*, while three of the chromatic notes in ascending differ from those in the scale at *a*, yet in descending, these two scales are precisely the same. Similar scales may be formed from any other key-note, but it is necessary to employ identically the same intervals in relation to the key-note as are employed in the above scales. The chromatic notes in these scales are regarded as *borrowed* notes; the source from which they are borrowed will be duly considered.

The scale at *a* was adopted by Dr. Day as the basis of his theory of the chromatic element in music; the scale at *b* was totally ignored by him as the basis of chromatic chords; it was employed solely in connection with chromatic auxiliary notes.

The scale at *a*, as will be duly shown, constitutes the basis of the chromatic chords of the minor mode; that at *b*, the basis of the chromatic chords of the major mode. The Day theory, therefore, is applicable to the minor mode alone.

The scale at *a* is rarely, very rarely, employed for ascending passages by the great composers; they almost invariably employed the scale at *b*, or even that at *c*, both for ascending and descending passages. In the Fantasia in D minor, by Mozart, and the Concerto in G by Beethoven, use is made of the notation at *a* for ascending chromatic passages, but these very isolated examples simply prove that the great masters were acquainted with this form of the chromatic scale; while the constant use of the notation at *b* proves their predilection for the melodic form of the chromatic scale.

The important point of difference between these two forms of the chromatic scale is to be found in the use of the chromatically raised tonic, supertonic and dominant; these three notes, which are characteristic of the melodic form, are disallowed, and their use strictly forbidden, in the harmonic form.

And now, considering the chromatic scale not as simply a succession of semitones, but from the broader standpoint, as the basis of chromatic chords, the whole question of the chromatic element in music depends upon the one point, as to whether the hyper-tonic, the hyper-supertonic, and hyper-dominant, that is to say, the notes C sharp, D sharp and G sharp in the key of C, may or may not be employed, and consequently whether their use can or cannot be justified. According to the arbitrary laws of Dr. Day, these notes are forbidden, because their presence cannot be explained by the theory which he originated; nevertheless, these notes are employed not only by Wagner and composers of the modern school, but also by Beethoven and, indeed by all the greatest masters of classic music.

Since, the chromatic scale is but an extension of the diatonic scale, so the origin of the chromatic element will be found in the origin of the diatonic element, namely, *natural science*.

In the fourth, fifth and sixth harmonics of a given generator is to be found the common chord of nature; and the major and minor thirds which compose this chord constitute the basis of all chords. Having obtained one common chord, or triad, as it is also called, two attendant common chords are formed, one of which has for its root the fifth of the given chord, while, the other has for its fifth the root of the given chord; in these three chords, known as the primary triads of the key, are to be found the notes of the major diatonic scale. The notes thus obtained from nature are tempered, or tuned, for the purposes of art, in order that all the semitones may be exactly equal, so that any note may be taken as a key-note. The major scale is divisible into two similarly constructed tetrachords, and by means of these tetrachords the attendant major scale are formed, and then their attendants, and so on, until a major scale is formed on every possible note.

Unlike the major, the minor common chord is not derived from the harmonics of a given generator; the major triad is natural but the minor is artificial. The minor triad is obtained from the major triad. It may be formed by two entirely different methods, the one, diatonic, the other, chromatic. The diatonic or relative minor triad is obtained by placing a minor third *below* the given major third, thus reversing the order of nature; the chromatic or affinitive minor triad is obtained by accidentally lowering the third of a major triad, thereby making it minor, and at the same time making the upper third major.

The minor triads thus obtained become the tonic chords of related minor scales, respectively known as the relative and the affinitive scales, the former being in diatonic and the latter in chromatic relationship with the given major scale. The minor triad, like the major, has two attendant minor triads, and in these three triads is to be found the signature

of the minor scale. The scale thus obtained is the *normal* or ancient form of the minor scale; the seventh degree of this scale is now chromatically raised again for the purpose of art, it then becomes a proper leading-note. The minor scale, therefore, like the minor chord, is also artificial. The scale, as *thus* obtained, is known as the harmonic form of the minor scale; the distinguishing feature of this form of the scale is the interval of an augmented second which occurs between the sixth and seventh degrees; in order to avoid this unmelodious interval, another form of the minor scale, known as the melodic form, is frequently employed, but the harmonic is the true form of the modern minor scale. Other forms of the minor scale also exist, but as they are only in occasional use, and as they do not in any way affect the chromatic element in music, it will not be necessary to consider them in this connection.

Besides the major and minor triads, there are also the diminished and the augmented triads, the former being naturally diatonic and the latter invariably chromatic; but all four triads play a very important part in the formation of chromatic chords.

The fourth, fifth, sixth and seventh harmonics of a given generator constitute a chord of the seventh, or tetrad, as it is called. When a tetrad comprises a major third, a perfect fifth and a minor seventh, as in this case, it is called a primary tetrad, to distinguish it from other chords of the seventh, known as secondary tetrads.

The fourth, fifth, sixth, seventh and ninth harmonics constitute a chord of the ninth, or pentad, as it may be called; in this case, as the ninth is major, the chord will be a primary major pentad. A primary minor pentad is obtained from the eighth, tenth, twelfth, fourteenth and seventeenth harmonics.

It is unnecessary to continue this series of fundamental discords beyond chords of the ninth.

By omitting the root of a pentad, a tetrad is obtained, known as a derivative of the pentad; but these derivatives are obtained from primary pentads only. The derivative of a major pentad is called a minor tetrad, and that of a minor pentad, a diminished tetrad. These are the only cases in which a tetrad is called after the name of its component seventh; in all other cases the tetrad is named according to its root.

A triad, a tetrad, and a pentad, may be formed upon any note of the major and minor (harmonic) scales. The pentad on the leading-note, however, on account of its extreme harshness, is of very rare occurrence.

The tetrads on the dominants of both modes are naturally primary discords; when formed upon other notes they are called secondary tetrads.

The pentads on the dominants of both modes are also naturally primary discords; when formed upon other notes they are called secondary pentads. The ninth in a secondary pentad is generally treated as a suspending note, or as an auxiliary note, in which case the chord may be regarded as a modified tetrad.

The chromatic element in music is obtained from a series of six primary minor pentads. The tonic, as the generator of all that appertains to the key, is taken as the root of the first pentad; then the fifth of the tonic—the dominant—is taken as a root; and, thirdly, the fifth of the dominant—the supertonic—is taken as a root. So far this is in accordance with the theory of roots as advocated by Dr. Day. The reason why these notes are chosen, he states, is "because the harmonics in nature rise in the same manner." At this point Dr. Day stops, in fact, he gives a definite reason why the harmonics of the next fifth are not

used, namely, "because that note itself is not a note of the diatonic scale, being a little too sharp (as the fifth of the supertonic), and can only be used as part of a chromatic chord." It is this very note, the submediant, however, which must be taken, in spite of Dr. Day, and upon which another primary minor pentad is formed; followed by another upon its fifth, the mediant; and lastly, by another upon its fifth, the leading-note.

A series of fundamental discords is thus obtained, the natural evolution of which, from the original tonic as a generator, will be seen in the following example.

Fig. 14.



The whole-notes in the above example are the roots of the successive chords; the quarter-notes, in each case, form a diminished tetrad (or, chord of the seventh). These chords, it will be seen, extend over a compass of exactly four octaves, commencing and ending on the tonic of the key.

A scale may now be formed from the notes comprised by the above chords, a scale which will meet all the requirements of the modern composer, a scale containing not only the diatonic and the chromatic, but also the enharmonic element, and which, therefore, will be termed

#### THE MODERN ENHARMONIC SCALE OF C.

Fig. 15.



The value of the notes in the above scale in no way refers to the question of time in performance; the scale should be played as a regular succession of semitones. The half-notes are the diatonic notes of the scale of C major; the two quarter-notes represent what may be called the perfect chromatics, which are not enharmonically changeable; while the eighth-notes, which may be called the imperfect chromatics, may be employed in either form.

The six generators occur each three times; the subdominant (the only note of the scale which is not employed as a generator) and the perfect chromatics occur twice; while the imperfect chromatics occur once only in each form. The subdominant may be regarded as the "patriarch" of the key, for it is among the upper harmonics of this note, namely, numbers 24, 27, 30, 32, 36, 40, 45 and 48, that the natural scale of the tonic is found.

The term "modern," as applied to this scale, may, if desired, be omitted; it is employed in the first place to distinguish the scale from the ancient enharmonic scale of the Greeks, and, in the second place, to distinguish it from the weird unmusical scale, containing intervals smaller than a semitone, which may be performed on the violin or by the voice. The term "enharmonic" is employed to designate a scale comprising certain notes, the pitch of which may be represented by two different names.

The notation of this scale is applicable to the key of C major only; by transposition, however, it may be employed as the harmonic basis of any other major key.

The origin of the chromatic scales is to be found in the above series of primary minor pentads. The pentads on the tonic, the dominant, and the supertonic furnish the notes of the harmonic form of the chromatic scale, while the notes of the melodic form are obtained from the series as a whole. The modern enharmonic scale, it will therefore

be seen, is simply the melodic form of the chromatic scale written in another form, the enharmonic form, and so written in order to avoid the necessity of writing this scale both ascending and descending.

The melodic form of the chromatic scale is the basis of the chromatic element of the major mode; the harmonic form, it will be duly shown, is the basis of the chromatic element of the minor mode.

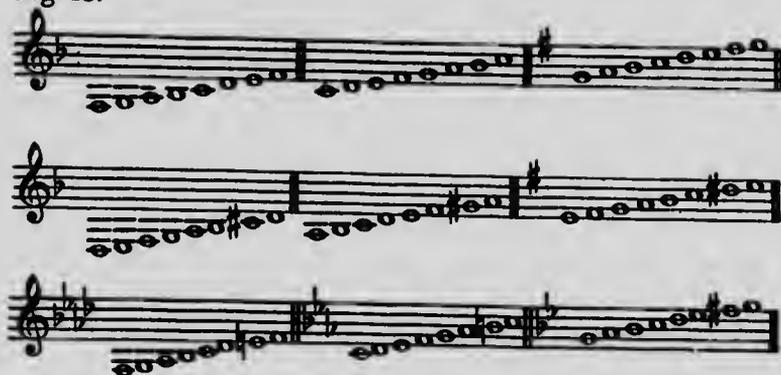
Chromatic chords are divided into two classes, namely, the ordinate and the subordinate. Ordinate chromatic chords are regarded as *borrowed* chords, the source from which they are borrowed being the scales most closely related to the given scale, namely, the relative and affinitive scales, together with the dominant and sub-dominant, and their relative and affinitive scales. These scales are known as the "*associated scales*." Subordinate chromatic chords are such as may be formed from the modern enharmonic scale, but which do not belong to any of the associated scales.

The associated scales of C major are shown in the following table :

	Subdominant	Tonic	Dominant
Major Scales	F major	C major	G major
Relative minors (Diatonic relationship)	D minor	A minor	E minor
Affinitive minors (Chromatic relationship)	F minor	C minor	G minor

The above scales comprise the notes of the modern enharmonic scale of C, no others, and none omitted. For the purpose of comparison these scales are shown in the following example.

Fig. 16.



It will readily be seen that the number of chromatic chords at the command of the modern composer is considerably in excess of those available for use under the restrictions of the Day theory.

The associated scales of C minor are shown in the following table :

	Subdominant	Tonic	Dominant
Minor Scales	F minor	C minor	G minor
Relative majors (Diatonic relationship)	A flat major	E flat major	B flat major
Affinitive majors (Chromatic relationship)	F major	C major	G major

The above scales comprise the notes of the harmonic form of the chromatic scale ; no notes occur under two names ; there is, therefore, no necessity for an enharmonic scale in connection with the minor mode. For the purpose of comparison, these scales are shown in the following example :

Fig. 17.



It has been shown that the minor triad is artificial, that the minor scale is artificial, and now it will be seen that the chromatic chords of the minor mode differ essentially from those of the major. Furthermore, whereas in the major mode, in addition to the chords borrowed from the associated scales, there are certain extra, subordinate, chromatic chords, in the minor mode the very opposite obtains, for not only are there no subordinate chromatic chords, but even some of the major and minor triads of the associated scales are not available for use as borrowed chords.

Having now considered the origin of the chromatic element in music, it is necessary to revert to Dr. Day's argument with regard to the fifth of the supertonic, which he states is not a note of the diatonic scale, being "a little too sharp." This statement is perfectly true from the standpoint of acoustics, but Dr. Day, in his endeavors to establish a principle, overlooks one very important point, namely, that *acoustics and equal temperament are by no means one and the same thing*. Acoustics is the basis of the *science* of music, but equal temperament is the basis of the *art*. B flat, for example, as the minor seventh of C, is also out of tune (again a little too sharp), with B flat the seventh

harmonic of the generator C, nevertheless it is the *out-of-tune* note which is employed in equal temperament ; and again, even the major third of art is not *perfectly* in tune with the major third of nature.

Another, and an interesting illustration of this point will be seen in *the major and minor tones*. The interval between the first and second degrees of the major scale, is a major tone, with the vibration ratio of 8 to 9, while the interval between the second and third degrees is a minor tone, with the ratio of 9 to 10. Now the first and second degrees in the key of D, for example, are exactly the same, *according to the laws of equal temperament*, as the second and third degrees in the key of C; wherefore, if the note D has, say, 288 vibrations, then the note E, in the key of D, will have 324 vibrations, whereas in the key of C this selfsame note, E, will have only 320 vibrations. Theoretically this is a fact, practically it is absurd. The difference between theory and practice in this and in similar instances, may be explained on the grounds, that *the demands of equality in art have necessitated the sacrifice of inequality in science*. Even supposing that the violinist and the vocalist can exemplify the difference between the major and the minor tone, the effect would not be in accordance with the principles upon which the modern major diatonic scale is constructed for the fundamental principle of this construction is equal temperament.

Equal temperament may be defined as the division of the octave into twelve exactly equal semitones. These semitones constitute a chromatic scale, seven of the semitones being diatonic and five chromatic ; but whether diatonic or chromatic they are all *mathematically* equal. It follows, therefore, that *all the perfect fifths* will also be equal, and equal in every respect ; for, it is upon this very principle of equality that the modern system of scale construction is

based, every new scale being the exact counterpart of the last, exact in every particular except that of pitch alone. Wherefore, Dr. Day's statement, that one of these perfect fifths is out of tune, is erroneous.

In the old meantone, or unequal temperament system, the semitones were not all equal, and consequently the perfect fifths were not all equal, with the result that certain keys, called "wolves," could not be employed at all. The mighty genius of the great Johann Sebastian Bach, however, struck the death blow to this system in the immortal "Wohltemperirtes Klavier," in which there are two preludes and fugues in every key; and after his death (1750) the old system gradually passed away, and the modern or equal temperament became, and has since remained, the definitely established system.

In the equal temperament system the perfect fifths are tempered (hence the name), that is to say, tuned slightly flat; but so slight is this flatness that the human ear can scarcely appreciate the difference between the tempered and the natural fifth. To be exact, the tempered fifth is  $\frac{1}{11}$  of a comma flatter than the natural fifth; and a comma (the name for the difference between a major and a minor tone) is about  $\frac{1}{2}$  of a diatonic semitone. This tempering, which is the basis of the art of piano-forte tuning, is indispensable for the purposes of harmony, and equal temperament alone enables the composer to write in any and in every key, and to modulate to or from any key by means of enharmonic changes.

There are, therefore, now no "wolves," and no fifths "a little too sharp," and no difference between the diatonic and the chromatic semitone; wherefore, the primary minor ninth on the submediant, the mediant and the leading-note may be taken for the purpose of extending the principles

of the chromatic element beyond the inconvenient and illogical limitations of the Day theory.

The reason for not extending this system beyond the leading-note is twofold ; in the first place the perfect fifth above this note, not being a diatonic note of the scale could not be taken as a generator; and in the second place, the system is complete without it.

With the enharmonic scale as the basis of all the possible chords in the key of C major, three important new triads, namely, A major, E major, and B major, besides others, are added to the already accepted chromatic concords. These, it will be seen, are the dominant triads of the three attendant minor keys, and by their acceptance the whole family of attendant keys becomes even more closely united with the original tonic key than heretofore. By the addition of these triads, together with their sevenths and ninths, *a theory of harmony* is obtained by which *every chord* in the works of the great composers can be *justified*. Furthermore, the modern composer will find at his command a major triad on every semitonal degree of the key, except alone on F-sharp (or G-flat), which, having no note common to the diatonic scale, is naturally altogether foreign to the key. At the same time, *seemingly boundless possibilities in the realm of tone color* are presented to the composer, possibilities which indeed may *never be exhausted* so long as the art of music is based upon these very principles of *equal temperament*.

The chief defects of the Day theory may be briefly summarized as follows :—

(1) It was altogether *unknown* to the great classical masters of the *Bach* to *Beethoven* period (and even later); indeed, it frequently happens that chords employed by these composers cannot be explained by the Day theory, in which case the chords are said to be written in *False notation*.

(2) The *compound* intervals of the eleventh and thirteenth being represented in figured basses by their *simple* forms—the fourth and sixth, the names “*dominant fourth and dominant sixth*” are just as applicable and quite as justifiable as the names “*dominant eleventh and thirteenth.*”

(3) These names, furthermore, are very *indefinite*. Dr. Day furnishes *thirty-two* different examples of the use of the dominant eleventh, and as many as *seventy* different examples of the use of the dominant thirteenth.

(4) The theory completely overthrows the generally accepted theory of *roots*, and, consequently, *root progressions*, for any diatonic triad or chord of the seventh may be regarded as an *incomplete form* of the dominant thirteenth.

(5) The *harmonic form of the chromatic scale* being the basis of this theory, and this scale being derivable from the chords of the *ninth* on the tonic, dominant and supertonic, *nothing is gained* by adding the eleventh and thirteenth to these generators.

(6) It is founded (as has been shown above) upon a false estimate of the true significance of *equal temperament*, in which, for the purpose of enharmonic changes, all the semitones—whether diatonic or chromatic—must be regarded as being *absolutely equal*.

(7) Finally, when applied to the works of the great modern composers—*Wagner*, and his contemporaries and successors, this theory *signally fails*, for, in the chromatic extensions of the modes now in vogue, a primary seventh (to mention one chord alone) may be employed not only upon the tonic, the dominant and the supertonic—as advocated by Dr. Day—but also upon *all the degrees* of the major scale.

The chromatic major triads in the key of C major, according to the enharmonic system, are shown in the following

example ; the triads at *a*, *b*, *c*, *e*, and *g* are admitted in the Day theory, but the triads at *d*, *f*, and *h* are not recognized in this theory.

Fig. 18.



From the above example it will be seen that, with the exception alone of the major triad on F-sharp (or G-flat) all the major triads in music are available for use in the key of C major. To each of these triads except two (those at *a* and *e*), a minor seventh may be added, when the chord becomes a primary tetrad. The chromatic primary tetrads in the key of C, according to the enharmonic system, are shown in the following example :

Fig. 19.



Of the above chords, those at *a* and *b* are alone recognized as "fundamental sevenths" in the Day theory; those at *e* and *g* are also recognized, but as incomplete forms, respectively, of the "dominant and tonic minor thirteenths." The notes of the chord at *d* occur in the harmonic form of the chromatic scale, but this chord does not belong to any one of the three great chords of the thirteenth of the Day theory, with all their chromatic modifications.

The chords at *f* and *g*, not being dominant sevenths in any of the associated keys, are subordinate chromatic chords, but they are available for use equally with the borrowed chords.

Although a minor seventh cannot be added to the major triads on the minor supertonic and minor submediant, yet

its enharmonic equivalent, an augmented sixth, may be added to these triads, when two chords of the German 6th are obtained. These chords, but no other German 6ths, are recognized in the Day theory, while in the enharmonic system there are three others; the former two are shown at *a* and *b*, and the latter three at *c*, *d* and *e*, in the following example :



The normal bass-note of the German sixth is regarded as the root of the chord, and this form of the chord of the augmented sixth, together with the Italian and French forms, and certain other chromatic chords, are known as "chromatic modifications."

It has already been seen from Fig. 14, that according to the Day theory there are three chords of the diminished seventh in the key of C, and that according to the enharmonic system there are three other chords of the diminished seventh; the latter three are but enharmonic equivalents of the former three, of course, for, from an instrumental standpoint there can be but three chords of the diminished seventh in any case, but their place in the present chromatic theory is justified by their use in the compositions of the great masters.

When to the chords which have already been mentioned are added the chromatic minor triads, secondary tetrads, primary major pentads, and their derivatives, together with the various chords included under the name of chromatic modifications, it will be seen that the present theory of the chromatic element in music, is in reality, at least from the standpoint of the major mode, *more comprehensive* than that advocated by Dr. Day and his successors.

Chromatic chords should be studied systematically after the manner of diatonic chords; they may be divided into three classes, namely :

I. CHROMATIC TRIADS.

Concords, major and minor.

Discords, augmented and diminished.

II. CHROMATIC TETRADES AND PENTADES.

Primary tetrads.

Primary major pentads and minor tetrads.

Primary minor pentads and diminished tetrads.

III. CHROMATIC MODIFICATIONS.

Auxiliary notes.

Chords of the augmented fifth.

Chords of the augmented sixth.

Secondary sevenths, etc.

The works of the best composers, both ancient and modern, teem with chromatic chords, the analysis of which from the standpoint of the Day theory is complex and illogical, but from the standpoint of the enharmonic system is simple and natural; that the great masters employed the latter system as the basis of their chromatic progressions there can be and there is not the least shadow of doubt. That the chromatic element in music has not hitherto been reduced to a system is no argument in favor of the statement that the great composers did not employ any system at all in writing their chromatic progressions. Practice comes before theory in this case; that is to say, the laws of theory are but the result of the practice of the best composers.

As the strength of a chain depends upon its weakest link, so one example from a classical work will be sufficient to demonstrate the inconsistency of the Day theory. The following passage is taken from the Sonata in A minor, Op. 42, by Schubert (1797-1828).



This excerpt is unquestionably in the key of C major, it occurs in the first movement of the sonata, bars 194-6. The chord marked \* is unquestionably a chromatic chord in the key of C, for, it is immediately preceded and followed by chords which are definitely in this key. The name of this chord is unquestionably the common chord of B major, or the leading major triad. As a borrowed chord it occurs as the dominant triad in the key of E minor, the relative minor of the dominant of C, one of the afore-mentioned borrowing keys; this chord, it will be seen, occurs in No. 6, of the primary minor ninths in the key of C, Fig. 14; while its use, by one of the great classical masters, justifies the formation of *major* triads on diatonic notes other than the super-tonic, justifies the system of borrowing from relative minor keys, and indirectly justifies the complete series of primary ninths, which constitute the basis of the enharmonic scale of C.

If this chord be examined from the standpoint of the Day theory, the analysis will be as follows: since, the harmonic form of the chromatic scale of C does not contain the note D sharp, this note is therefore an instance of false notation, and the composer should have written E-flat (incidentally giving rise to false relation with the E-natural in the treble of the preceding chord, but this may be overlooked); with this change, the three notes of this chord will be found in the fundamental chord of the thirteenth on the

supertonic, as the third, the minor ninth and the major thirteenth, and the name of the chord, as employed by Schubert, will therefore be "the sixth inversion of the supertonic minor ninth and major thirteenth, with the minor ninth falsely notated, and the thirteenth doubled." *Poor Schubert!*

Further quotations would be superfluous.

When, in order to justify the presence of simply a major common chord, it becomes necessary to resort to such absurd extravagance, it will be seen that the present theory of the chromatic element in music, is in reality, at least from the standpoint of the major mode, *more consistent* than that advocated by Dr. Day and his successors.

Such is the general substance of the theory which is herewith offered to the musical world at large, as a substitute for that originated by Dr. Day. As to its intrinsic value, time—the supreme judge in musical matters—alone will determine; but, whatever the judgment ultimately may be, the author will feel that he has not labored in vain, if it be admitted that the enharmonic theory, as a theory, not only rivals but also supersedes the Day theory in both "consistency and comprehensiveness."

*Conservatory of Music,  
Toronto, Canada,  
December 1st, 1906.*

# A Treatise on Harmony

with Exercises

BY

J. Humfrey Anger.

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IT has been the privilege of the author to teach the theory of music, and *nothing but the theory*, for the past ten years. During this extended period he has naturally had exceptional opportunities for discovering the difficulties which confront the average student ; and the special purpose of this present work, the outcome of many requests from both past and present pupils, as well as from fellow teachers, is to assist the student to meet and master these difficulties, so that Harmony, which is one of the most important and, at the same time, one of the most charming studies in the art of music, may become a source of pleasure and enjoyment, instead of being, as so frequently happens, a source of worry and annoyance.

The author has endeavoured, in his treatment of the subject, to be as *simple*, as *concise*, and at the same time as *thorough* as possible ; simplicity being a necessity for the beginner in every subject ; conciseness, a necessity at the present day, when harmony is but one of the many studies which claim the attention of the student ; while a thorough explanation of the subject is not only absolutely necessary, but this, indeed, must also be on somewhat original lines in order to justify the publication of yet another work on a subject upon which so many excellent treatises have already been written.

It is not to be supposed, however, that any very original theories will be advanced in the early chapters of the present work ; on the contrary, the author is convinced that *the first object* of the student should be to acquire a perfect knowledge, as far as possible, of that purity of harmonic structure upon which the immortal compositions of a Mozart were based. The modern composer, to whom a new effect is always an object to be attained—for the

feeble platitude and the dishonesty of plagiarism should ever be avoided—will discover almost endless possibilities in the modifications of the chords in general use, either by the employment of auxiliary notes, or by the introduction of the chromatic element. Whatever originality there may be in the present work will be found, therefore, in a later chapter, wherein the author, in order to meet the requirements of modern composers, advocates the adoption of a new scale (see Ex. 5, page 11), the principal feature of which is the combination of the enharmonic element with the already accepted chromatic extension of the major scale.

Considerable attention has been devoted, throughout this work, to the exercises at the end of each chapter. These, it will be seen, are both numerous and of a *varied* character. In addition to figured basses, which may be regarded as the staple form of exercise, there are also exercises on the analysis of chords, on the introduction (including the preparation and resolution) of discords, on the harmonization of melodies and unfigured basses, on clothing blank rhythms with harmony, and on composing original passages, etc. In all cases the exercises have been carefully *graded*, and have been arranged with the special view of assisting candidates preparing for examinations. The student, however, is not necessarily expected to work all the exercises at the end of each chapter; many of them being of a suggestive character, may, at the discretion of the teacher, be omitted, or on the other hand, others of a similar type may be added either by the teacher or by the student himself.

It seems to be a moot question as to whether the student should, or should not, be taught to harmonize melodies from the beginning. The author is inclined to think not, but everything really depends on the student; for though one student will grasp the principles readily enough, and another will fail to do so, both of them may in the end prove to be equally successful in their general work. This matter must also be left with the teacher, and if the exercises on harmonizing melodies, etc., are omitted when the chapter is first studied, they will probably be found useful in review work at a later day.

No illustrations from the compositions of the great masters have been included, for though of considerable interest to the true musician, it is a question whether such examples are really of any benefit to the student. Speaking generally, it may be said, that for every example chosen to prove a rule, another example could probably be found, possibly in the works of the same composer, which might be quoted to disprove the rule; indeed, to furnish adequate illustrations, with exceptions and explanations, a work on harmony would become an extremely bulky volume, far exceeding both the intentions of the author and the limits of the present work.

In order to avoid unwieldy dimensions, this treatise has been divided into three parts, the contents of which may be summarized as follows :—

**PART I. *First Year* :** The major and minor diatonic scales, intervals, the common chord and its inversions, cadences, sequences, the dominant seventh, and natural modulation.

**PART II. *Second Year* :** Secondary sevenths, the dominant ninth with its derivatives—the leading and diminished sevenths, suspensions, auxiliary notes, and extraneous modulation.

**PART III. *Third Year* :** Chromatic concords and discords, enharmonic modulation, certain modified chords, harmony in other than four parts, contrapuntal part writing, and the string quartet.

No mention, it will be seen, is made in the above synopsis, of chords of the eleventh and thirteenth. To this theory of chord construction the author is altogether opposed, though at the same time fully appreciating the great work which Alfred Day, the originator of the theory, accomplished for the advancement of the art, and fully recognizing also the strong support which it has received at the hands of many of the most eminent theorists in England and America.

The various theories of harmony, however, after all is said and done, may well be likened to the different paths up Mount Parnassus. The originator of a theory is simply the discoverer of a new path, the teacher is the guide, and the student is the pilgrim. To reach the summit is the object of all. Are we not too frequently prone to believe that the path we ourselves trod is the only path? May not the pilgrim occasionally take another path? Should not the guide be acquainted with every path? Is it not the part of the discoverer to find, if possible, the smoothest path, to remove obstructions and to grade the road where necessary, and thus to prepare a way which from his heart he feels will be welcomed by all? A path of joy to the guide, a path of comfort to the pilgrim.



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Part III. and a Key to the Exercises in Part I. are being prepared for the press.

## APPRECIATIONS BY AUTHORITIES.

" *A Treatise on Harmony*, by J. Humfrey Anger, is preferable to almost any of the existing works on the subject."

GEORGE COLEMAN GOW, *Vassar College*.

" I have looked it over with much interest, and I certainly find it more intelligible than any similar work I have ever looked at." KATE S. CHITTENDEN, *American Institute of Applied Music*.

" I have carefully and critically examined *A Treatise on Harmony*, by J. Humfrey Anger, and must say that I never had a better book dealing with the subject, in my hands."

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" The advent of his *Treatise on Harmony* is significant in its timeliness and applicability to the present-day needs of the student of harmony who, if he be of an inquiring and sensitive mind, will more than likely feel the influence of the subtle spirit of ultra-modernity as expressed by the younger and freer school of music writers. That way lies perversion and madness for him unless he is well balanced and guided aright.

" Not that Dr. Anger has radically diverged from the straight and somewhat narrow path of traditional tenets and doctrines of music invention, but that out of the old dispensation and ruling latitude in which, by its very restrictions, originality of thought and expression was well nigh exhausted. To this much-needed end his new scale—" The Modern Enharmonic Scale of C"—seems to me the outcome of a natural evolution in scale formation; and its theoretical value is self-evident by at once providing a fundamental basis for the consistent and logical accounting of the many seeming irregularities in chord structure present in the works of the romantic and modern composers. Apart from this innovation I would earnestly commend the work for its lucidity and concise yet thorough treatment of an inexhaustible study; and to my mind it should appeal most strongly to the conscientious teacher and earnest student."

H. CLOUGH-LEIGHTER, *Composer and Critic, Boston, Mass.*



