

TWENTIETH CENTURY HARMONY

By

Donald R. Chittum

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Preface

The purpose of this dissertation is to investigate, organize, and discuss the harmonic materials used by composers of the twentieth century.

Techniques and materials do not evolve in an arbitrary manner. It is inconceivable that composers should, on the first day of January, 1901, abandon those techniques and materials which were characteristic of the nineteenth century in favor of those which we have come to associate with the twentieth century. On the contrary, the music of the early twentieth century not only exemplifies an amalgamation of Romantic techniques, but also indicates the direction in which composers were proceeding in their search for newer and richer harmonic combinations. Therefore, compositions which are essentially manifestations of nineteenth century techniques will not be discussed, even though they may have been written in the early part of the twentieth century.

I have made an effort to choose illustrations which most clearly illustrate the specific device or material under consideration. Because a work is quoted, however, does not necessarily indicate that I vouch for the artistic integrity of the composer or the intrinsic value of the work. When a choice was possible I tried to choose illustrations from the works of those composers who seemed to have the greatest success in exploiting a specific material or technique.

Finally, though this paper is primarily concerned with harmonic practice, no period can be effectively discussed solely from a harmonic point of view. In the twentieth century harmony and counterpoint have almost become fused into one, so that a discussion of either, by itself, tends to

place greater emphasis on one at the expense of the other. Similarly, the form of a work and the medium for which it is scored will also have an immediate affect on its harmonic direction. It will therefore be necessary, in various chapters, to make references to contrapuntal, formal, or orchestral devices used by various composers. These remarks, however, will be limited in so far as they shall comment on practices which direct, or are a product of, harmonic movement or organization.

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Chapter I

INTRODUCTION

It will often be convenient in analyzing various harmonies to speak of their tension; but, since the tension of a chord is solely governed by the relation between its intervallic constituents, I find it necessary to first discuss the tension of intervals.

For centuries composers have been calling upon the science of acoustics to justify their individual definition and treatment of consonant and dissonant intervals; however, when one asks acoustics to perform this function, he asks it to do something which it is neither equipped nor oriented to do. The function of the science of acoustics is to explain the physical nature of sound through the establishment of effective scales of measurement. Dissonance and consonance are not manifestations of sound's physical nature; they are, in reality, manifestations of sound's esthetic nature. Acousticians can measure the tension of various intervals and arrange them in a graduated series from those with the least tension to those with the greatest tension, such as the series in Example 1.

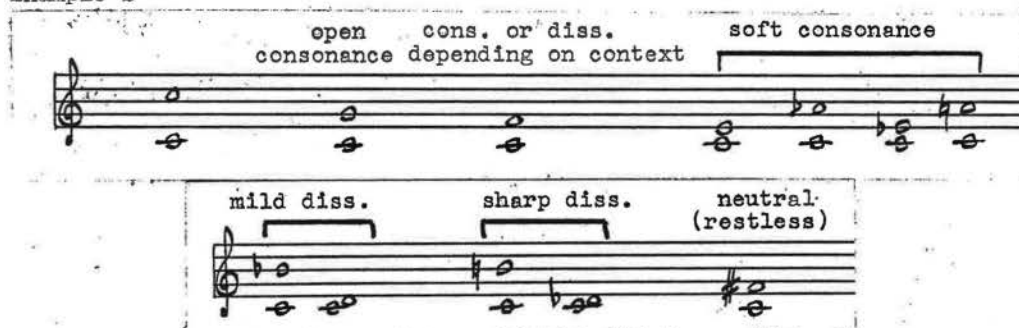
Example 1



But a series such as this is outside the realm of esthetic appreciation or criticism. It is a cold scientific observation which makes no inference as to how the intervals in this series should be combined or treated. In other words, acoustics can tell us only whether an interval possesses more or less tension than another, it cannot tell us whether that interval is, or ever was,

treated as a consonance or dissonance. Since dissonance or consonance is relative to the esthetic attitudes and practices of a period, it follows that as the esthetic attitudes and practices change, so will the concepts of dissonance and consonance. There has been, however, a general historical trend to accept intervals with greater degrees of tension as consonant. Example 2 illustrates how the contemporary composer classifies various intervals.

Example 2



This is, of course, just a general classification. Any composer can, and some very often do, arbitrarily choose to treat sixths and thirds as dissonant intervals, and seconds and sevenths as consonant intervals; however the practice of treating consonances as dissonances, and dissonances as consonances does not destroy or change the inherent character of these intervals. It is simply a device which allows the composer to manipulate a dissonant texture with a great degree of consistency; it does alter the esthetic purport of consonance and dissonance.

Because the tension of a chord is determined by its intervallic constituents, it is necessary to examine the number and kinds of intervals formed by those constituents, in order to best analyze its texture* and composite tension. All chords generally fall into one of two classifications: those containing no tritones, and those containing one, or more, tritones. The essential difference between chords containing tritones and those which do not is that chords containing tritones tend to have a restless, "dominant-like" quality, while chords without tritones, no matter how dissonant, tend

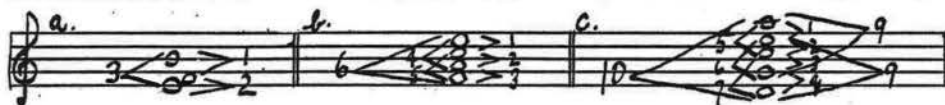
*The texture of a chord is governed by its most characteristic intervallic features. For instance, a chord composed mainly of perfect fourths is said to have a "fourthy" texture. Tension, on the other hand, refers to dissonant content.

to have a stable quality. These two classifications may be sub-divided into the following groups: those in which there are no dissonant intervals; those in which there is only one mildly dissonant interval; those in which there is more than one mildly dissonant interval; those in which there is only one sharply dissonant interval; etc.

The interval of the perfect fourth will lend some ambiguity to the analysis of certain harmonies, due to its ability to function either as a consonant or dissonant interval; however, when a perfect fourth appears in a chord containing mild or sharp dissonances it tends to sound like an open consonance, when it appears in a chord containing only soft consonances it tends to sound like a very mild dissonance.

In analyzing the intervals that comprise a chord, one must be sure that every interval is computed. For instance, in a three-note chord (Ex. 3a) there are three intervals, in a four-note chord (Ex. 3b) there are six intervals, and in a five-note chord (Ex. 3c) there are ten intervals.

Example 3



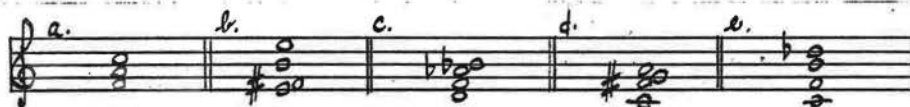
Through an analysis of every interval in the chord, its exact tension can be determined. For instance, chord (a) in Example 4 contains two soft consonances (F-A and A-C), and one open consonance (F-C). Chord (a) is quite consonant since it contains only consonant intervals, with soft consonances predominating. Chord (b) contains three open consonances (E-B, F#-B, and B-E)*, two mild dissonances (E-F# and F#-E), and one perfect octave.** Chord (b) is mildly dissonant, and derives its unique character from a superposition of only open consonant and mildly dissonant intervals.

*Here the perfect fourths are considered consonant, since the chord contains dissonant intervals.

**The perfect octave has no significance so far as the tension of a harmony is concerned.

Chord (c) contains one open consonance (F-B^b), three soft consonances (D-F, D-B^b, and F-A^b), one mild dissonance (A^b-B^b), and one tritone (D-A^b). Chord (c) is also mildly dissonant, with a restless quality caused by the presence of a tritone. Although both chords (b) and (c) are mildly dissonant, it is obvious that their textures are entirely different. Chord (b) is characterized by a texture consisting predominately of open consonances, while chord (c) is characterized by a texture consisting predominately of soft consonances. Chord (d) contains one open consonance (C-G), two soft consonances (C-A and F[#]-A), one mild dissonance (G-A), and one sharp dissonance (F[#]-G) and a tritone. This chord is even more dissonant than either chords (b) or (c), since it not only contains a mild dissonance, but also a sharp dissonance. The tritone, again, lends an unstable, restless quality to the chord. Chord (e) contains one open consonance (C-F), one soft consonance (F-D^b), one mild dissonance (B-D^b)*, two sharp dissonances (C-B and C-D^b), and one tritone (F-B). Chord (e) is even more dissonant than either of the preceding chords. Its texture is characterized by the superposition of sharp dissonances upon open consonances.

Example 4



The texture of a chord, and even its harmonic implication, can be further modified by various spacings, doublings, and instrumental colors. Today the spacing, doubling, or instrumental color of a chord is just as much an integral part of it as the tones of which it is comprised.

In the Classical and Romantic periods chords were considered invertible, i.e., any chord factor could appear in the bass, and the remaining chord factors arranged in any order without changing the chord's essential character.

* The contemporary composer usually tries to use the most practical spelling of a chord. What is important is not how the tones of a chord are spelled, but the distance between them in half or whole steps. The intervals B-D^b and B-C[#] are identical since they both contain two half-steps.

This device was quite valid for those periods, and still is today, to some extent; however, the contemporary composer only thinks of inversion as applicable to the most simple types of harmony, those with relatively low tension. In treating most of the large compound structures which have evolved in this century no inversions or redistributions are possible, for any change of spacing or bass tone would alter the character of the chord to such a considerable extent that it would hardly resemble the original chord. For instance, the chord in Example 5 is a four-note chord built in major sevenths. Any attempt to change either its bass tone or spacing would actually change its inherent textural quality. In this case its spacing is an inseparable part of the chord's character.

Example 5



Doublings and octave couplings may also have a great influence on the textural or structural significance of a harmony. Briefly, doublings and couplings are used in the following ways:

- 1) to solidify polychordal factors into a more compound sonority. In Example 6a there occurs a polychordal progression consisting of two major triads, a major second apart. In Example 6b, through the use of various doublings, these isolated polychordal units have become fused into compound harmonies, making it quite difficult to decide whether the progression consists of polychords, or whether it consists of straight eleventh or thirteenth chords. (The ultimate interpretation of these harmonies would now have to be justified by an examination of the entire harmonic structure of the hypothetical work from which it was quoted.)

Example 6



- 2) to enrich simple harmonies. The three part passage in Example 7a is thickened and made richer by the use of various doublings (Ex. 7b).

Example 7



- 3) to accentuate various types of motion. In Example 8 the parallel fifths in the upper voices are accentuated by being doubled in the bass.

Example 8



- 4) and to combine various texture, smoothly. In Example 9 the progression from a chord built in thirds to one built in fourths is made quite smoothly through the judicious use of certain doublings.

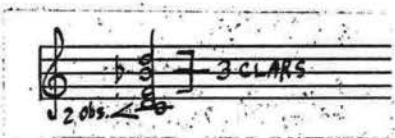
Example 9



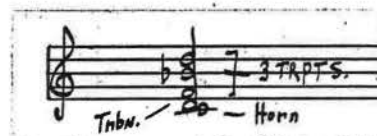
The character of a chord can also be modified by the instrumentation used by a composer. Through the use of various types of orchestration he is able to either emphasize or subordinate certain intervals, thereby altering the inherent structural characteristics of the harmony. For instance, the following chord can be scored in a variety of ways.



If one wished to accentuate the dissonant portion of this chord, it could be done this way:

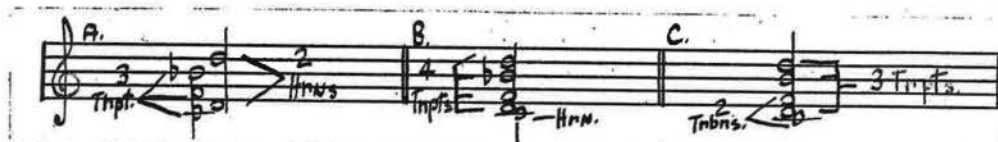


Or if one wanted to accentuate the consonant portion of this chord, it could be done this way:



The structural implications can also be modified to make the chord tend to appear as a chord by fourths with an added tone (Ex. 10a), a B^b major triad with an added tone (Ex. 10b), or a compound harmony (Ex. 10c).

Example 10



With the vast instrumental colors the orchestra offers, and with countless doublings and spacings, it is possible to score a specific harmony in an inexhaustable number of ways. The ultimate choice is governed by the objectives of the composer.

It may be observed, then, that harmonic structure is only a point of departure, and that countless modifications are made through the employment of various devices. In addition to those discussed, even more subtle distinctions are made through the effective use of dynamics, tempo, phrasing, and rhythmic stress.

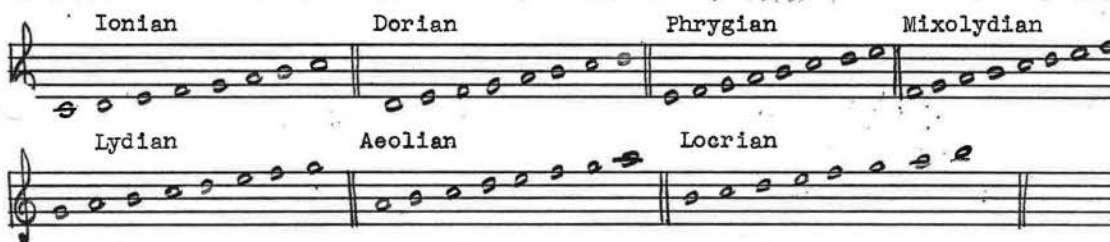
All of these phenomena are constantly functioning, and have a profound influence on the manner in which harmonic structures are perceived.

Chapter II

MODES AND SCALES

A scale is an arrangement of tonal materials according to pitch. A mode is a characteristic scale formation which has been given a specific name; and a passage based on a mode is said to be in that mode. Of the infinite number of scale patterns which have been used in the twentieth century, seven stand out because of their extensive use by various contemporary composers. Each of these seven diatonic modes is derived from an octave segment of the natural scale (C to c, D to d, E to e, etc.), and bears the name assigned to it during the Middle Ages.*

Example 11



It should be noted, however, that these modes resemble their medieval counterparts in name and intervallic construction, only. The essential differences between the modal practices of the twentieth century and those of the Middle Ages may be summarized by the following remarks:

- 1) In the Middle Ages both plagal and authentic modes were used**, while in the twentieth century only authentic modes are used.
- 2) In the Middle Ages modes were less extensively altered than they are in the twentieth century.
- 3) In the Middle Ages one mode usually served as the basis for an entire section of a work, while in the twentieth century interchange of mode*** is quite common.

* Glareanus (1488-1563), in his Dodechordon, refers to each of these modes, except the Locrian, which was added by later theoreticians.

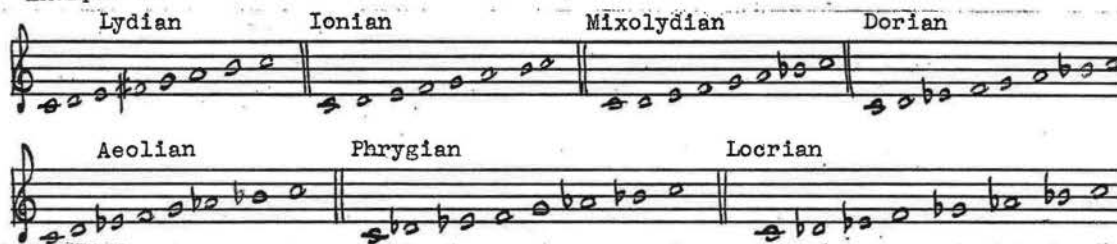
** In an authentic mode the first degree is the tonic, or final; in a plagal mode the fourth degree is the tonic, or final.

*** See p. 19

- 4) In the Middle Ages all principal and subordinate material was derived from only one specific mode, while in the twentieth century various combinations of modes and chordal constructions quite often appear simultaneously.
- 5) In the Middle Ages modes were not fully transposable as they are in the twentieth century.

In the following illustration each mode is constructed from C in order to facilitate the perception of certain structural relationships. After

Example 12



a comparative examination of these modes the following observations may be made: each mode has a true dominant (perfect fifth) except the Locrian; and of the six modes with true dominants three have major thirds and three have minor modes. Let us examine each of these groups separately.

The "major" group consists of the Ionian, Mixolydian, and Lydian modes. The Ionian** mode corresponds in construction to the major mode of the major-minor tonal system. The Mixolydian mode differs from the Ionian in that it has a minor seventh scale step. The lack of a true leading-tone** is the most characteristic feature of this mode. To illustrate: the third movement of Herbert Howell's Piano Quartet (Ex. 13) begins in the Ionian mode on G and remains there for eight measures. In the ninth measure the mode is

* One may wonder why this mode is called the Ionian rather than the major mode. There are two reasons: first, in order to keep nomenclature consistent for all seven modes; and second, to avoid the suggestion that the modes have been abandoned in favor of the major-minor system when in reality only a modal interchange has taken place.

⁴ A semitone below the tonic

changed through the introduction of an F natural, and is immediately followed by a series of cadential harmonies in G Mixolydian. This fluctuation between the Ionian and Mixolydian modes is a characteristic feature of the movement.

Example 13

Howell, Piano Quartet, 3rd Movt.

The Lydian mode corresponds exactly to the Ionian except for its fourth degree. The unique flavor of this mode is derived from its lower, whole-tone, tetrachord. Below are two illustrations.

Example 14

Robert Palmer, String Quartet No. 3

Example 15

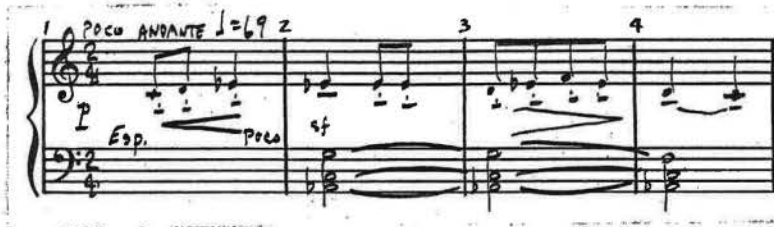
Bartok, Music for Strings, Celesta, and Percussion



The "minor" group consists of the Aeolian, Dorian, and Phrygian modes. The Aeolian mode corresponds exactly to the natural minor of the major-minor system. The folksong in Bartok's Ten Easy Pieces begins in this mode.

Example 16

Bartok, Ten Easy Pieces



The Dorian mode differs from the Aeolian mode in its sixth degree, which is major. A characteristic illustration of this mode appears in Bartok's Fourteen Bagatelles, No. 5.

Example 17

Bartok, Fourteen Bagatelles, No. 5



The most characteristic feature of the Phrygian mode is its minor second degree, which gives the mode a dark, "neapolitan" flavor. Bartok uses this mode in a scene from his opera, Bluebeard's Castle (Ex. 18).

Example 18

Bartok, Bluebeard's Castle

ALLEGRO RISOLUTO 112-116 BLUEBEARD

CL + OB.

TRBN.

WAS siehst du?

One of the most often performed works based on the Phrygian mode is Vaughan-Williams' Fantasia On A Theme By Thomas Tallis. Tallis' theme is in the tenor; the harmonization is Vaughan-Williams'.

Example 19

Vaughan-Williams, Fantasia On a Theme By Thomas Tallis

CL + OB.

TRBN.



The Locrian mode, as previously mentioned, is the only mode without a true dominant. Its tonic chord is a diminished triad, and any dominant-tonic progression involves chords whose roots are in tritone relationship. For these reasons many composers, even those who use modes quite frequently, avoid using this mode. Those composers who have ventured to use this mode have approached its inherent problems in one of two ways: they have either used the mode as any other, emphasizing its unique and distinctive character; or they have resorted to various devices in order to alter or disguise these characteristics which they find unmanageable. Most certainly in the former group is John Vincent, a faculty member of the University of California, who says ". . . the listener, unaccustomed to hearing the mode and prejudiced by his exclusive major-minor experience does not readily comprehend the component tones of the melody through their relationship to the strange tonic. In other words, it is impossible to feel the tonic as the tonal center of gravity, or at least the tonality is felt to be unstable...." He goes on to say, "It is a mistake to make final judgements purely on the basis of first impressions without careful consideration, without being able to sing a single Locrian melody from memory, and without making an effort to escape the tyranny of the major-minor concept."* Examples 20 and 21, both from his String Quartet, clearly illustrates his use of the Locrian mode.

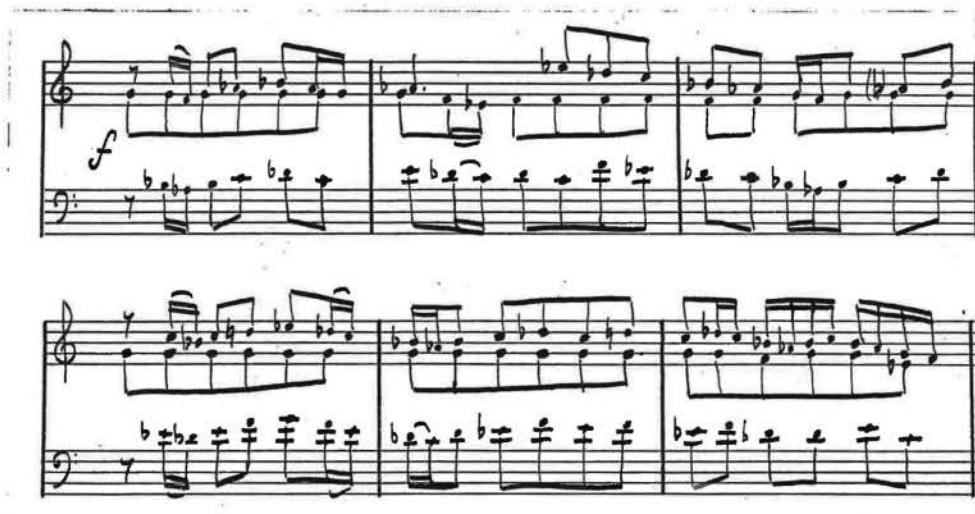
Example 20 is not only interesting because of its use of the Locrian mode but also because it illustrates some common modal practices. The mode here is G Locrian. (In the fourth and fifth measures two alterations appear which suggest G Phrygian; however there is not enough G Phrygian to consider

of the greatest problems in modal writing
 tonic. If the composer is not careful the
in Modern Music, p. 144

passage may unintentionally "modulate" to the major key bearing the same key signature (in this case, A^b major). To avoid this a composer may utilize such devices as melodic reiteration of the keytone, frequent return to the tonic chord, or the appearance of tonic harmonies in crucial cadences. In this illustration Vincent is able to maintain G as the tonal center through the use of a tonic pedal in the alto voice. The constant repetition of these G's more than nullify any pull A^b major might exert. To dramatize the importance of this inner voice I suggest the illustration be played without the alto part; what will be heard is pure A^b major.

Example 20

Vincent, String Quartet



The last ten measures of the second movement of Vincent's Quartet appear in Example 21. It may be observed that the composer is disposed to end on the tonic alone, the harmonic equivalent of a complete unison. The problem of a diminished tonic triad may also be solved in several other ways; the tonic triad may appear incomplete (with the fifth omitted), or altered (with the fifth raised); the tonic triad may appear in a less offensive position such as first inversion; or the triad may appear compounded with added tones which divert attention from the inherent instability of the chord.

Example 21

Vincent, String Quartet



Roy Harris, who has used these modes to a considerable extent, believes that another order of modal relationships is not only possible but, indeed, necessary in order to capitalize on the structural relationships which exist between various modes. Harris holds that some modes are brighter or darker* and a hierarchy, according to the degree of brightness or darkness, naturally exists between them. This modal brightness or

* See footnote on p. 30

darkness is governed by the aggregate proximity of the scale-steps to their tonic; the closer the scale steps to their tonic, the darker the mode. The darkest mode is the Locrian since it consists of a minor second, minor third, diminished fifth, minor sixth, and minor seventh. The

Phrygian mode is the next darkest with a minor second, minor third, minor sixth, minor seventh, and perfect fifth. By continuing in this manner one arrives at the following series:

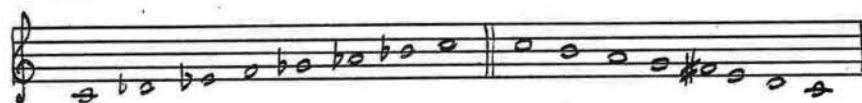
Example 22



A simple way to construct this series from any tone is to imagine the greatest number of flats or least number of sharps (according to traditional key signatures) which may be imposed on that tone without altering it. This will indicate the accidentals of the Locrian mode on that pitch. Then by subtracting one flat (or adding one sharp) one may move successively through the series.

Another symmetrical relation also exists between these modes. Notice that the disposition of tones and semitones is the same in the ascending Locrian as it is in the descending Lydian, and vice versa. In like manner

Example 23



the ascending Phrygian is similar to the descending Ionian, and the ascending Aeolian is similar to the descending Mixolydian. In other words each mode except the Dorian changes when inverted. This is of significant importance to a composer using the modes in contrapuntal forms since there will always be a change of mode whenever a subject is mirrored.*

* Inverted by exact interval

Modes are very often harmonized with chords involving similar construction, similar motion, or both. For instance the Phrygian theme in the fourth movement of Vaughan Williams' London Symphony (Ex. 24) is harmonized with successive major triads rather than harmonies derived from the Phrygian mode.

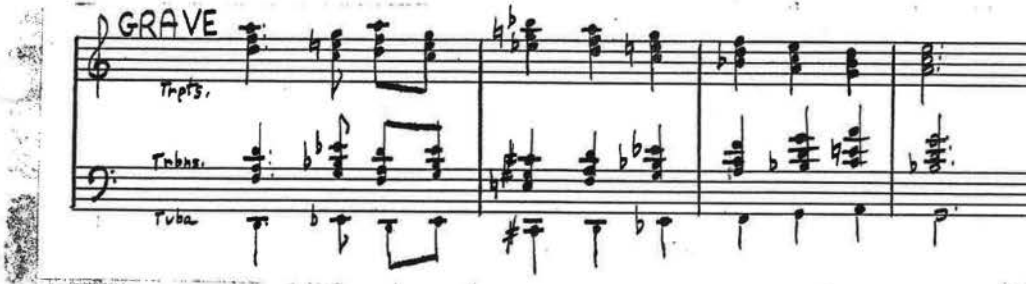
Example 24

Vaughan-Williams', London Symphony

Another, but more dissonant, example of this type of harmonization occurs at the beginning of Honegger's Symphony No. 5, where two sets of parallel triads moving in contrary motion are supported by a bass line in the Phrygian mode. (The C# is an altered leading tone.)

Example 25

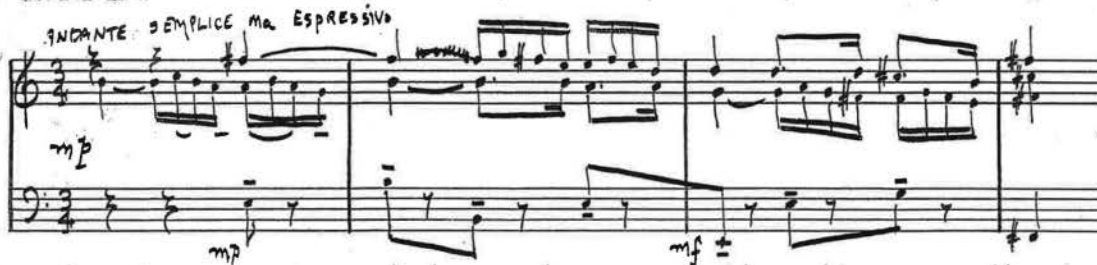
Honegger, Symphony No. 5



Modes are subject to the same types of treatment as any other scale formation. The composer may change mode or tonal center just as he does in other systems. For instance, the passage in Example 26 begins in B Phrygian and then modulates to F# Phrygian.

Example 26

Palmer, Piano Quintet (1950)



Changes of tonal center, retaining the same mode, are called modal modulations, while changes of mode, but retaining the same tonal center, are called modal interchanges.

It is possible to harmonize a theme with harmonies derived from a different mode, or to use two or modes simultaneously; such devices will be discussed in the chapter on "Polytonality, Polymodality, and Polyharmony".

It is necessary to differentiate between those scales which serve as the organic basis of a work and those scales which are only the result of a necessary compatibility between the melodic line and a governing harmony. A

simple illustration will suffice: in a clear B^b major passage an E^b might appear through the use of a supertonic secondary-dominant. It would be fallacious to suppose that this passage is in the Lydian mode on B^b since the E^b does not function as a diatonic degree, but rather as a simple alteration derived from the tonal center of F.

Most scales used in the twentieth century will fall into one of the following classifications: chromatic, diatonic, anhemitonic, and synthetic. Chromatic scales are those composed entirely of semitones; diatonic^{*} scales are those composed of major and minor seconds; anhemitonic scales are those which do not contain a semitone; and synthetic scales are those which are composed of major, minor, and augmented seconds.

I believe it is superfluous to describe in detail the various harmonic devices used in conjunction with these scales, since the basic techniques discussed in the previous section are also applicable to these scales. There is, however, one further observation I should like to make. When a composer wishes to project the character of an unusual scale a certain amount of harmonic clarity and simplicity is necessary; for, if, as is often the case in Messiaen, the scale is buried beneath, or fused between complex, altered harmonies the essential properties of the scale cannot be perceived and character of the scale assumes a subjective or secondary importance.

The two most extensively used anhemitonic scales are the whole-tone and pentatonic^{**} scales. The whole-tone scale, significantly exploited by the French Impressionists, is still used by certain French composers. The whole-tone scale, of which there are two^{***}, lacks the most fundamental musical intervals: the perfect fourth and fifth, and the leading-tone. The harmonies naturally derived from this mode can only be augmented triads, whole-tone cluster chords, or augmented triads compounded with added-tones.

^{*} The term diatonic is usually reserved for a seven-note scale built in five major and two minor seconds, and more specifically, one in which one minor second is followed by two major seconds and the other minor second by three major seconds; however, the term is also applicable to such a scale as C, D, E, F, G, A^b, B^b, C which also contains five whole steps and two half steps, but not in the order mentioned above.

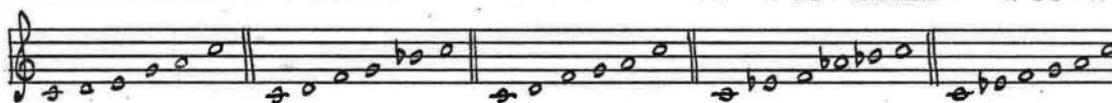
^{**} A hemitonic (containing semitones) pentatonic scale exists (C, E, F, G, B, C and C, E, F, A, B, C); however, it has only been used by modern Japanese composers and not those of the European Tradition.

^{***} C, D, E, F[#], G[#], B^b, and C; and C[#], D[#], F, G, A, B, and C[#].

The obvious static character of this scale is usually counterbalanced by the use of one of the following devices: 1) extensive harmonic alteration; 2) frequent change of tonal center; or 3) harmonization of whole-tone melodies with non whole-tone harmonies.

The pentatonic scale has been used by those composers who have attempted to incorporate various folk materials into their music. There are five different pentatonic formations:

Example 27



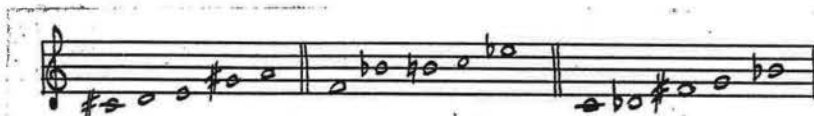
Of these five scales the first and third are the most frequently used. It may be observed that the scale lacks a leading-tone, and the harmonies naturally derived from it have a static character and are composed of various combinations of fourths, fifths, and thirds. For this reason the scale is more often used melodically than harmonically. For instance, while the melodies in the finale of Vaughan-Williams' Pastoral Symphony are based on pentatonic scales, the harmonies are distinctly diatonic.

The most interesting new scale formations, so far as the twentieth century is concerned, are the synthetic scales. Some of these scales are the result of a natural evolution, such as those used by some Hungarian composers, while others are the result of a conscious and deliberate attempt to expand tonal materials. Some of these synthetic scales have become so well known that they have been given names. These scales range anywhere from five to ten notes in size; however, the six-, seven-, and eight-note varieties are the most popular.

Lou Harrison uses three five-note scales (Ex. 28) in his dance-drama, Solstice. Notice that in the last two scales an interval of a perfect fourth occurs between two adjacent scale steps.

Example 28

Lou Harrison, Solstice



The first movement of Colin McPhee's Tabuh Tabuhan also contains a five-note scale which is an authentic Balinese mode (Ex. 29). Mr. McPhee

Example 29

McPhee, Tabuh Tabuhan

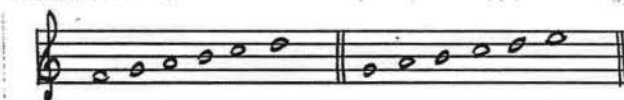


is held as an authority on the musical culture of Indonesia. He is not only familiar with their scales and melodies but is also able to play them on many of the authentic instruments.

Harrison, in conjunction with the previously mentioned five-note scales, also uses two six-note scales in Solstice. The essential diatonic character

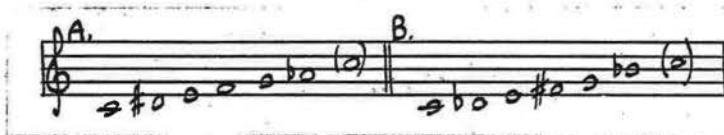
Example 30

Harrison, Solstice



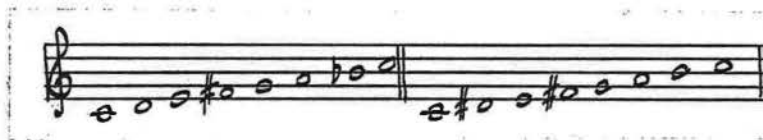
of these two scales quite appropriately contrast the other scales used in this work. Other typical six-note scales can be found in Henry Leland Clark's Monograph for Orchestra (Ex. 31a), and Jullian Carrillo's Concerto for Violin, Flute, and Violoncello (Ex. 31b).

Example 31



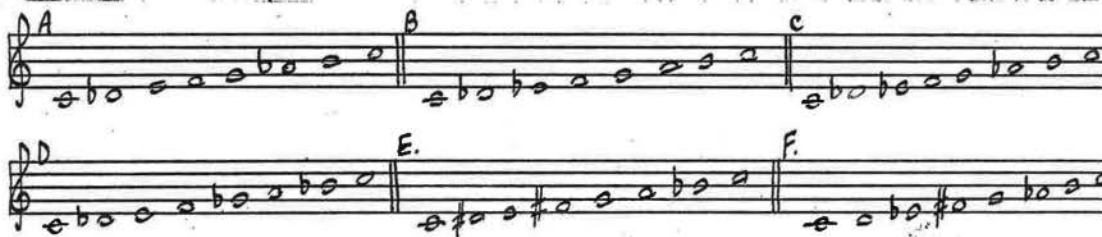
The largest group of synthetic scales is the seven-note group. Most of the synthetic scales used by Bartok, two of which are quoted below, fall into this category. The first scale is sometimes called Bartok's Mode, or the Overtone Mode. It is a combination of the Lydian and Mixolydian modes, i.e., the lower tetrachord is derived from the Lydian mode while the upper tetrachord is derived from the Mixolydian mode. The second scale is taken from his Fourteen Bagatelles, No. 3. These pieces, like the ones in the Mikrokosmos and the Ten Easy Pieces, each deal with a specific technique, problem, or material. They are stylistically homogeneous and demonstrate many of the materials and devices which became an integral part of Bartok's harmonic and contrapuntal vocabulary.

Example 32



Other types of seven-note modes used by members of the Hungarian School appear in Example 33; they are the double harmonic (or gypsy) scale (a); the neapolitan major (b); the neapolitan minor (c), the oriental (d); the Hungarian major (e); and the Hungarian minor (f).

Example 33



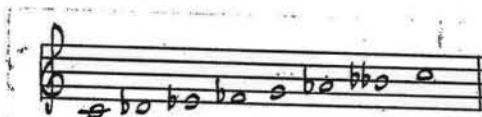
Oliver Messiaen has used various synthetic scales ranging in size from six to ten notes; two of his seven-note scales are quoted below. The first scale does not quite fill out the octave and has a unique chromatic flavor; and the second contains an unusually chromatic lower tetrachord followed by a diatonic upper tetrachord.

Example 34



Another seven-note synthetic scale can be found in Carrillo's Xochimilco.

Example 35



Octave modes larger than seven tones tend to assume a chromatic character, since some degree or degrees must appear with two accidentals. Robert Palmer uses an eight-tone original scale quite frequently. The illustration below is from his Four Hand Sonata. "Palmer likes to point

Example 36

Palmer, Four Hand Sonata



out that the scale is a synthesis of all the unique features of all the authentic church-modes:

- (I) Dorian, minor 3rd, major 6th, minor 7th
- (III) Phrygian, minor 2nd, minor 3rd

(V) Lydian, major 3rd, augmented 4th

(VII) Mixolydian, major 3rd & 6th, minor 7th

He goes on to say, "To be sure it lacks the perfect fourth which is such an important feature of the diatonic system that most theoretically Lydian melodies borrow it from the major mode. It lacks the leading-tone, but this is just the feature of the diatonic system that many 20th century ears find cloying."^{*} As Mr. Austin points out in his article, this scale can only generate cadential harmonies if the scale is recognizable; otherwise the harmonies will have a static, neutral effect. Palmer has tried to compensate for this tendency in his Second Piano Sonata by using frequent changes of tonal center.

Example 37

Palmer, Piano Sonata No. 2



Messiaen has also used several different eight-tone modes, and each has a characteristic interval distribution. The first mode in Example 38 is composed alternately of whole and half steps, and can be divided into four conjunctly connected groups of three notes each. The other two modes each consist of two five-note groups joined conjunctly and each having similar construction.

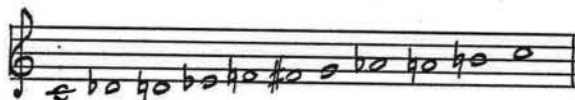
* William Austin, "The Music of Robert Palmer", Music Quarterly, Vol. 42, No. 1

Example 38



The second mode in Example 38 has been further expanded by Messiaen into the following ten-tone mode:

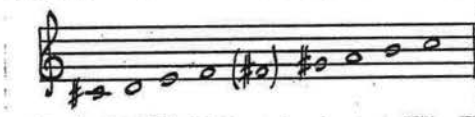
Example 39



It may be observed that Messiaen's scales are often constructed so that a tritone divides the scale into similarly constructed segments. It may also be observed that most of his scales lack a true dominant, and that a dominar tonic progression involves chords tritonally related. However one cannot consider this tritone chord as a substitute dominant* since it does not function cadentially.

John Verrall has used a socalled ten-note synthetic scale which in reality contains only nine different notes**. The scale consists of two tetrachords (C#, D, E, F and G#, A, B, C) naturally separated by the connecting tone F or F#.

Example 40



Verrall has used this scale in his String Quartet No. 2, String Trio,

* A substitute-dominant is a chord which is not the dominant that is treated as if it were.

** The composer even refers to this as a ten-note scale.

Serenade No. 1 (For Winds), Sonata for Viola and Piano, and his Symphony For Young Orchestras. He has said that the scale ". . . was a method of controlling chromaticism" and that ". . . it affords a tremendous amount of color within the framework of stable tonalities. I still use it on occasions, but now my works utilize a freer chromaticism."*

All of the scales discussed in this chapter have been one octave in size. There has been some speculation in the last few years concerning the practicality of a two-octave** scale. However, any significant music using such a scale is yet to be written.

* From a letter to this author, dated June 3rd, 1956

** There is a difference between a true two-octave scale and one which results from a superposition of two different one-octave modes. In a true two-octave scale there will be no return to the tonic until the entire scale has run its course.

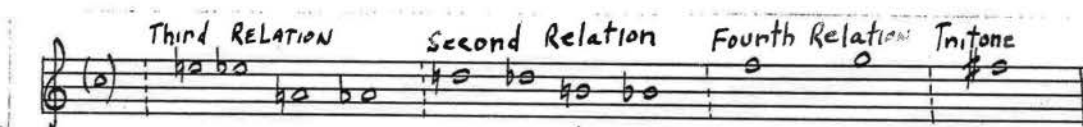
Chapter III

CHORDS BY THIRDS

The thread of musical evolution seems to have separated in the twentieth century so that some strands continue forward while others wind their way back to materials and constructions used by older composers; the former composers are primarily in search of fresh materials, and the latter in fresh relationships. In the twentieth century there has been a return to the use of simple triads, however in ways not emphasized by eighteenth and nineteenth century composers.

In the Classical period the main structural relationships were those involving the Tonic, Subdominant, and Dominant; almost all other harmonies revolved around one of these tonal pillars. And dissonance, through the anticipation of resolution, created tension and forward motion. In the twentieth century the emphasis of triads in fourth and fifth relation has been replaced by those in third relation; and the architectural function previously performed by dissonance has been replaced by the use of cross-relations, and the subtle tension resulting from roots rising and falling in various patterns of thirds. I do not wish to imply that third relation is the only one used. On the contrary, both second, and fourth and fifth relationship is frequently used, but not emphasized. The following chart illustrates triadal root relationships in order of their most frequent use. Only the roots are indicated since the quality of the triad may be either major or minor.

Example 41



Roy Harris. But to this date no one has been able to produce a system of analysis which is more efficient than Hindemith's system, or the traditional one.* The greatest mistake most writers have made is that they have approached the problem with preconceived ideas, resulting in systems which are permeated with half-truths, or conspicuously incomplete. Even Harris, himself, began a book in which he intended to explain his harmonic theories; however, this book was never published, or even completed, so far as I know. It is doubtful whether a composer whose harmonic style is so personal,** whose style is so inextricably tied to the intuitive and the subjective, could ever explain his music in objective, intellectual terms.

It may have been observed that triads are usually used in a four part texture, and very often in fundamental position. The voices containing the root and fifth (usually bass and tenor) frequently move in parallel fifths while the other voices move in oblique or contrary motion.

Example 43

W. Schuman, Symphony No. 4



Many have tried to analyze Harris through a study of root relations; however, such a system hinges entirely on the ability to find the real root, which is not as simple as it would seem. For instance, Harris might use a chord consisting of an E^b in the bass, and C and G above it. It would be rash to immediately label this harmony as C minor, since Harris, himself, sometimes considers it to be an incomplete E^b major triad with an added sixth.

** Harris has developed a theory of color values in which he labels certain progressions as "dark-calm", "savage-bright", "bright-luminous", etc. It is doubtful whether such labels can objectively describe the esthetic quality of these harmonies, or whether they are capable of meaning anything to anyone except Harris, himself.

Example 44

Juan Jose Castro, Alléluia

This type of movement, while it is solid and effective, has a tendency to become boring if overused. To divert attention from this weighty bass the composer usually resorts to such devices as extensive contrary motion, unusual and interesting voice leading, and periodic inversion.

Since the most characteristic interval of a triad in second inversion is a fourth, six-four chords progress to simple chords by fourths with relatively little disturbance in textural consistency. The use of the second inversion also creates a mild textural tension, and is effective when used in transitional passages to more dissonant harmonies. The first phrase in the following illustration consists of triads in fundamental position, and first and second inversion, ending with a strong third relation cadence. The second phrase is based on simple polychords.

Example 45

Harris, American Ballads For Piano, Set I, No. 1

Long triadal passages have a tendency to become harmonically incoherent if they are not periodically punctuated with strong cadences. Most composers have abandoned the dominant-tonic cadence formula, and depend upon modal (VII^b-I or II-I), third relation (VI-I or III-I), or plagal (IV-I) cadences to keep the work harmonically oriented. An illustration of typical triadal phrase structure appears in Example 43.

~~Example~~ Modulation is usually achieved through related tones rather than related chords. Harris holds that the root of a triad is equally and immediately accessible to triads on its dominant and subdominant, mediant and submediant, or where it serves the function of major or minor third. Since triads move so easily from one to another, and almost every relation is useable, modulation now presents a different type of problem than it heretofore had: Older composers, when modulating, were concerned with creating a smooth modulatory passage in which the modulation was the result of harmonic or thematic momentum; or in other words, where the modulation seemed to be inevitable and unavoidable. The contemporary composer, on the other hand, does not need to resort to a relatively extensive modulatory passage in order to reach a distant tonal center. His problem is one of discipline, of not allowing himself to replace growth and organic unity with superficial variety.

Whether or not a multi-tone chord is perceived as a chord by thirds depends to a considerable extent on its spacing and contextual use. A chord by thirds will usually display the following characteristics:

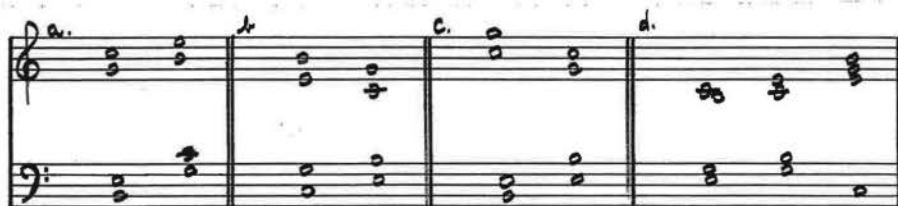
- 1) it is a single harmonic unit
- 2) it is spaced predominately in thirds (or sixths)
- 3) it is used in a context which suggests other chords by thirds

It is true that some of the larger chords by thirds were used in the eighteenth and nineteenth centuries; however, their treatment has undergone extensive changes in the twentieth century. Probably the greatest change, begun in the middle of the nineteenth century, has been in the composer's attitude toward the nature and function of dissonance. Stravinsky has said, ". . . dissonance has emancipated itself. It is no longer tied down to its former function. Having become an entity in itself, it frequently happens

that dissonance neither prepares nor anticipates anything."^{*} In other words, these chords neither need to be prepared nor resolved. Of importance, however, is that they be used in a consistent manner. The contemporary composer does this by first establishing the desired textural quality, then he either uses the same construction transposed to different pitches, or other harmonies which match it in tension and texture.

Seventh chords are susceptible to the same treatment as triads, such as the emphasis of parallel fifths, parallel construction, or the use of third relation progressions, etc. The spacing of a seventh chord largely depends upon the desired textural quality, and the character of the other harmonies in the passage. For instance, seventh chords may be spaced in a way which emphasizes fourths (Ex. 46a), fifths (Ex. 46b), a combination of fourths and fifths (Ex. 47c), or thirds (Ex. 47d).

Example 46



Two typical voicings appear in Examples 47 and 48. In the Milhaud excerpt in A major, fundamental seventh spaced in two perfect fifths move in parallel motion. The Ives excerpt displays a spacing similar to that in Example 46c.

Example 47

Milhaud, Suite Provencale (Jongleurs)



* Stravinsky, Poetics of Music, p. 36, Vintage Books, New York, 1956

Example 48

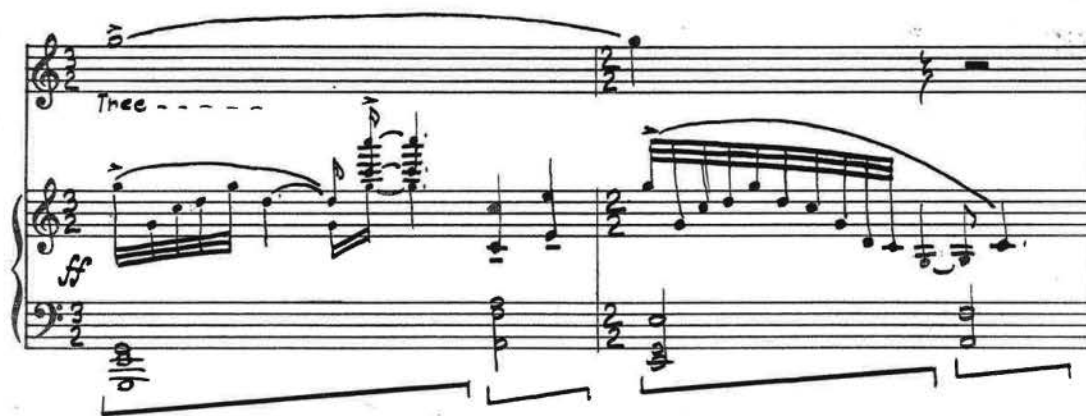
Ives, "Walking"



Seventh chords are often used in conjunction with chords by fourths (Ex. 49), chords by fifths (Ex. 50), or other chords by thirds (Ex. 51) In most cases the seventh chords are spaced in a way which makes them texturally consistent with the other chords in the passage.

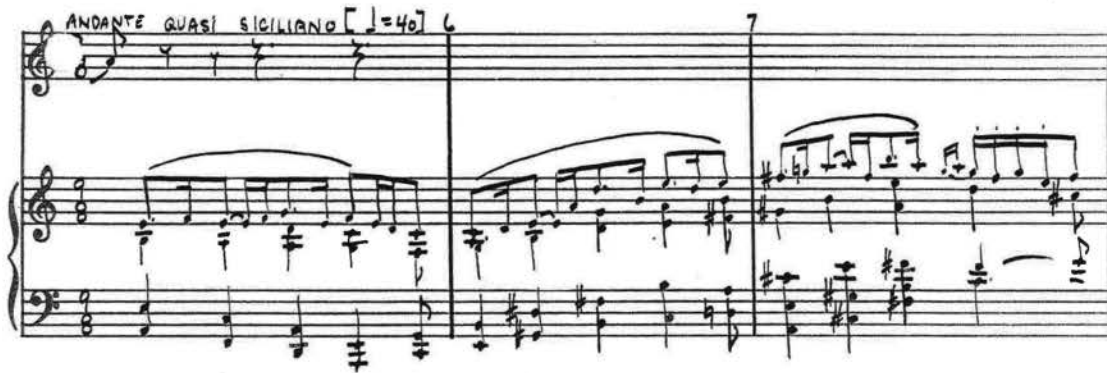
Example 49

Bergsma, Six Songs, No. 1



Example 50

Halsey Stevens, Sonatina for Flute and Piano



Example 51

Ives, "He is There"



Ninth chords lend themselves to the same type of treatment as seventh chords, however the increased harmonic weight often presents a problem of mobility. Most composers solve this problem by just touching on the ninth and then leaving it, unless a solid ninth quality is desired. This still gives the passage a ninth chord flavor, but without an increase in density.

Example 52

Copland, Our Town, "Grover's Corners"



Ninths are very often used with the more dissonant seventh chords or chords by fourths or fifths. In the illustration from Barber's Second Symphony (Ex. 53) a complete ninth is followed by a passage consisting of triads and four-note chords by fourths.

Example 53

Barber, Second Symphony

The musical score for Example 53 is from Barber's Second Symphony, specifically for the strings. It is in 5/4 time. The score is written for a string ensemble, with a treble staff and a bass staff. The treble staff contains a series of chords and melodic fragments, while the bass staff provides a more active accompaniment. Dynamics include *sf* (sforzando) and *mf* (mezzo-forte). The notation includes various chord symbols and melodic lines.

The music of the last two centuries illustrates an interest in successively larger and larger chord formations; and one might think that after the wide use of ninths in the post-romantic period composers would shift their attention to even larger chords by thirds. However, while there has been a more extensive use of eleventh and thirteenth chords in the twentieth century, they never have comprised more than a negligible portion of the contemporary palette. The reason for this is that the same textural effect

can be more economically achieved with other types of harmony. Eleventh and thirteenth chords contain many tones which serve a secondary function, somewhat like the fifth in a dominant seventh. While these secondary tones serve to further delineate the chord, they sometimes add an undesirable harmonic density. The contemporary composer has found that the textural effect of elevenths and thirteenth chords can be better achieved by harmonies in which there are relatively fewer unessential tones. Of course, when density, solidity, and strength are desired these large chords are quite appropriate.

The illustration below (Ex. 54) is taken from Stravinsky's Symphony In Three Movements and illustrates his particular use of these harmonies. The passage is in C major, and the first chord is a G major-minor chord* with an added sixth. The next chord is a dominant ninth in the fourth inversion, which is rare even in the twentieth century. And the last chord is a tonic eleventh.

Example 54

Stravinsky, Symphony In Three Movements

The musical score for Example 54 consists of three measures across three staves. The top staff is for Flute (Fl.), the middle staff is for Oboe (Ob.), and the bottom staff is for Harp. The key signature is C major, and the time signature is 3/8. The first measure shows a G major-minor chord with an added sixth (G, Bb, D, F, A). The second measure shows a dominant ninth in the fourth inversion (G, Bb, D, F, A). The third measure shows a tonic eleventh chord (G, Bb, D, F, A, C). The Harp part is marked 'HARP' and 'NON ARPEGG.' with a 'b' symbol. The Oboe part has a 'mf' marking and a '3' marking. The Flute part has a '7' marking.

* A major-minor chord is one that contains both major and minor thirds.

Another characteristic use of an eleventh chord appears in Vaughan-Williams' On Wenlock Edge, No. 5. Here the eleventh is spaced in two note groups, one in the bass and the other in the soprano. Together they serve as a backdrop for a figure composed of parallel fourths.

Example 55

Vaughan-Williams, On Wenlock Edge, No. 5



Like sevenths and ninths, elevenths may be voiced to accentuate the movement of parallel fifths. For instance, in Example 56 Ives has voiced a series of fundamental eleventh chords so that the root and fifth, and seventh and eleventh move in parallel perfect fifths.

Example 56

Ives, "Paracelsus"

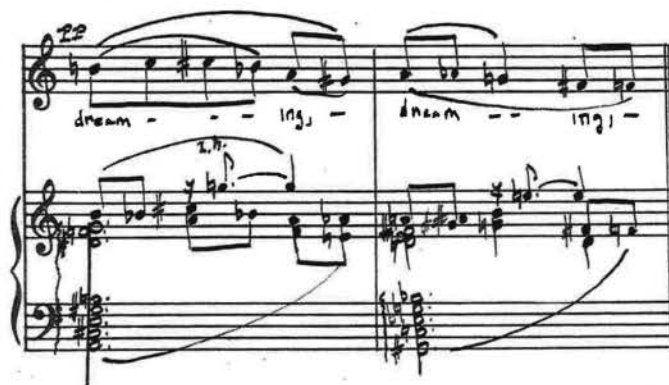


An unusual type of compound eleventh appears in Ives' song, "The Majority

(Ex. 57). It begins as a chord by thirds and, after reaching the augmented eleventh, continues as a chord by seconds. In portions of each measure as many as ten different tones appear simultaneously.

Example 57

Ives, "The Majority"



How these harmonies are combined with other types of chords can be illustrated by the following passage from Ives' "Paracelsus" (Ex. 58). The first chord is a compound harmony with a strong whole-tone flavor. The next chord is a simple triad in second inversion, followed by a similar passing chord. The next chord, an F# diminished ninth with the seventh in the bass, expands to a thirteenth chord. And the last chord is a compound harmony, also with a whole-tone flavor, which is held through a nine-tone cluster.

Example 58

Ives, "Paracelsus"



Until recent years the thirteenth chord was considered to be the largest practical chord by thirds, since the superposition of another third (the 15th) would be a two-octave duplication of the root. This type of thinking presupposes, or is governed by, the major-minor tonal system since it takes only seven tones into account.* The major-minor system, by its own limitations, places restrictions on the nature of the harmonic structures which may exist within that system. While much of the music in the twentieth century is tonally oriented, this orientation is not always governed by strict major-minor concepts. And as the tonal system expanded into one which accommodated more than seven different tones, it automatically became vested with the responsibility of explaining harmonies which might result from a superposition of all the tones in the system. These chords are called by a variety of names, according to their spacing and usage; however, when they are arranged in single units and predominately in thirds, they are called fifteenth chords, seventeenth chords, nineteenth chords, etc. Not every tone of the chord need be different; the chord's designation, however, will be governed by the distance of the largest new interval above the root, after the chord has been arranged in fundamental position.

The following serves to illustrate. The first chord in Example 59 is a fifteenth with the third and fifth duplicated above the fifteenth. The second chord is a true nineteenth chord, even though the seventeenth is a duplication of the third.

Example 59



* An unaltered thirteenth chord on any pitch contains all seven tones of the diatonic scale.

These types of chords can be found, in abundance, in the music of Charles Ives. Four characteristic illustrations appear below. The first (Ex. 60) is from his song, "Soliloquy", and consists of a three chord passage involving a D^b major triad, an A minor seventh, and a seventeenth chord built on D. The second (Ex. 61) is from "The Majority". In the first measure an altered thirteenth becomes a seventeenth on the second beat of the measure. The harmony in the next measure is a misspelled fifteenth chord on B. And the third and fourth illustrations (Exs. 62 & 63) are from his song, "December". The last chord in Example 62 is a D fifteenth; while in Example 63 a seventeen chord appropriately appears at the word weight.

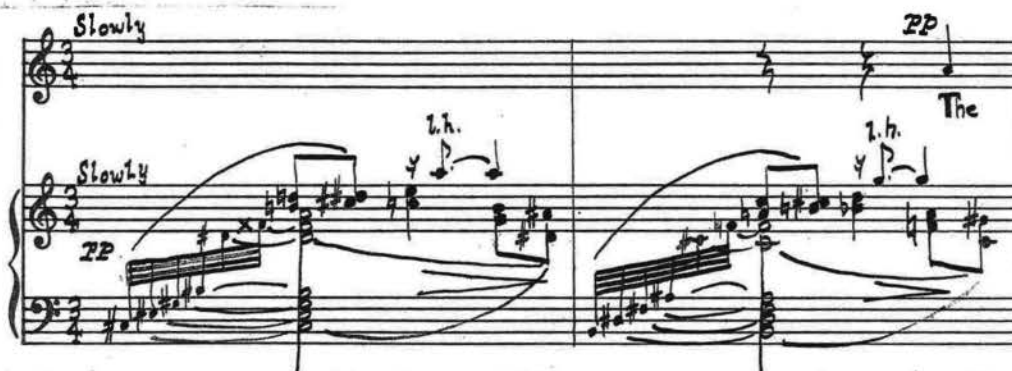
Example 60

Ives, "Soliloquy"



Example 61

Ives, "The Majority"



Example 62

Ives, "December"

ALLEGRO CON SPIRITO

You host - a drunk - and a cat - a - bar;

marcato

Example 63

Ives, "December"

You host - a drunk - and a cat - a - bar;

marcato

Chapter IV

CHORDS BY FOURTHS

The period from approximately 1450 to 1900 is sometimes referred to as the period of Tertian Harmony, or the period in which chords were built in thirds. Before this time, especially during the periods of Organum and Ars Antiqua, both the fourth and the fifth were the main structural units, and the third was treated as a dissonance or as an imperfect consonance. In the early part of the Tertian Period the third gradually assumed the structural significance previously held by the fourth and fifth; and the style, which was still primarily contrapuntal, gradually evolved into the homophonic one which has become characteristic of that period. This homophonic style provided enough potential variety and development to command the almost exclusive attention of composers until the beginning of the twentieth century. In this century various composers have fashioned a harmonic idiom in which tertian harmonies have been replaced by quartal* harmonies. Some of these composers have also combined these harmonies with a vigorous contrapuntal style having its roots in pre-tertion polyphony. The former will be discussed below, while the latter will be discussed at the end of this chapter.

Scriabin, in the early years of this century, made an attempt to expand the tonal system into one which could accommodate quartal harmonies. His reflections, like those of so many other twentieth century theoreticians, led him to a study of the structure of the overtone series, where he hoped to find an acoustical justification of his harmonic theories. He believed that the overtone series not only suggested and sanctioned tertian harmonies, but also suggested harmonies which are distinctively non-tertian. He also be-

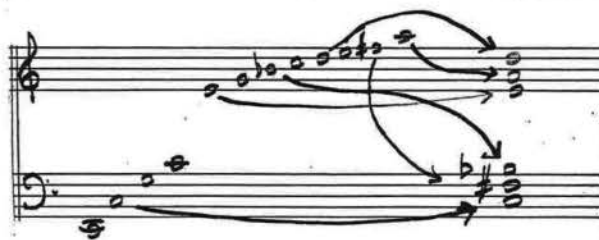
* Chords built in fourths

lieved that any harmony based on the overtone series is a legitimate chord and should be treated as a concord. The root of such a chord, or the entire chord itself, could be treated as the tonic of a piece and could also be transposed, used in inversion, or embellished with non-chord tones without destroying its tonic function. Scriabin used several types of these synthetic chords (two are quoted in Example 64); but they all had one structural characteristic in common: they were all built in fourths. The most often quoted synthetic chord, the one he used as the basis for his tone poem, Prometheus, and his Seventh Piano Sonata appears in Example 65.

Example 64



Example 65



The composer of mid-century is in debt to Scriabin for his attempt to expand tonal materials with some degree of organization; however, the current use of quartal harmonies is different in several respects: There is no longer any attempt to justify quartal harmonies through an analogy to

the overtone series. They are now constructed by the superposition of perfect, and sometimes augmented (Ex. 66), fourths. The diminished fourth is rarely used; however a third or sixth is sometimes added above or below a chord by fourths. This type of fourth chord will be discussed later in the chapter.

Example 66

Bergsma, Six Songs, No. 1



Quartal harmonies are either spaced entirely (Ex. 67) or predominately (Ex. 68) in fourths.

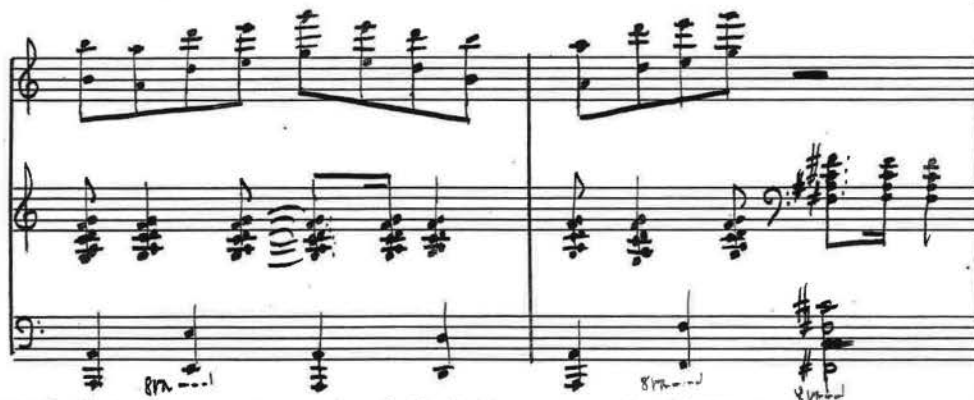
Example 67

Schoenberg, Kammersymphonie, Op. 9



Example 68

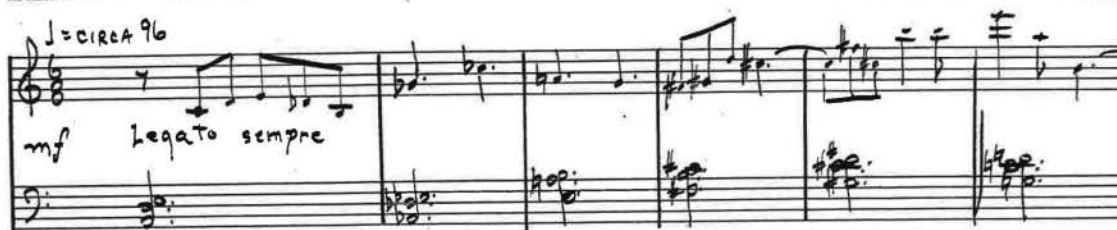
Malipiero, Pause del Silenzio



They sometimes appear in inversion (Ex. 69), or with one of the fourths omitted (Ex. 70). The melody in the illustration from Schuman's Three Score Set is accompanied by three-note chords by fourths in "first inversion". In the Bartok illustration five-note chords by fourths appear with the third tone in each chord omitted.

Example 69

Schuman, Three Score Set



Example 70

Bartok, "Autumn Tears", Op. 16, No. 1

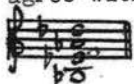


Alterations, inversions, and omitted chord factors have a tendency to weaken the unique character of chords by fourths. If the interval of a fourth does not predominate the chord tends to assume a compound character.

After analyzing each fourth in a major key, it may be observed that each is perfect except for the one involving the subdominant and leading-tone (which is augmented). In order to keep chords diatonic in a major key it is, therefore, necessary to have an augmented fourth in any chord which contains the fourth and seventh degrees. Passages built entirely in perfect fourths cannot exist in a major key since in order to maintain the scheme of perfect fourths there must be successive alterations of the leading-tone, mediant, submediant, etc., in the tonic chord. Quartal harmonies, therefore, generate free and fluctuating modes, rather than major scales. When the composer does use a chord containing an augmented fourth he usually treats it with special care, and very often "resolves" the upper member of the augmented fourth, conjunctly.

Chord relations are governed by the distance between the roots* of each chord according to the cycle of fourths. Chords built on roots separated by

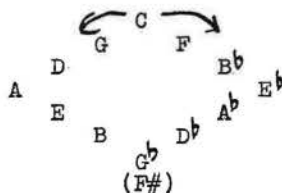
I consider the root of a fourth chord to be that tone which is the lowest when the chord is arranged in fourths. In certain instances Hindemith would not agree with me. For instance, Hindemith would say that the root of this chord is B \flat , since B \flat is the root of the most consonant interval (B \flat -F). I however, find it more logical to analyze this chord as a five-tone chord by fourths with F as the root, especially when it appears in a passage which is decidedly based on quartal harmonies.



a fourth (higher or lower) are the most closely related; chords built on roots separated by two fourths (or a major second or minor seventh) are the next most closely related, etc. Of course, radical changes in the size of the fourth chords involved will also modify these relationships. Closely related progressions are smooth, and are quite effective when the harmonic rhythm is fast. Distant progressions give a feeling of motion and are, therefore, quite effective in cadential passages.

It has often been said that quartal harmonies have a pentatonic flavor, and one can readily understand why if he examines the relationship in the following illustration. Any five adjacent tones in the circle form a complete pentatonic scale; any six adjacent tones form two pentatonic scales, etc.

Example 71



Quartal harmonies can be texturally divided into those with five tones or less, and those with six tones or more. Those chords with five or fewer perfect fourths contain no sharp dissonances, while those with six or more perfect fourths contain one or more sharp dissonances, according to their size. Because of textural considerations the mildly dissonant fourths chords are not freely intermingled with the sharply dissonant ones, however, the sharply and mildly dissonant quartal chords are used together in cadences, for dramatic purposes, or anytime tension is required.

Three-note chords by fourths are usually used in a three or four part texture. In a four part texture they usually appear undoubled, with the fourth voice containing a pedal or pedal-like figure, or a melody with contrasting or individual character. For instance, the three-note fourth chords

in the song by Arnold Bax (Ex. 72) support an obligato which is derived from the harmonies below. In the second measure of this illustration the harmonies are compounded with added-tones and end in tertian harmonies (A minor seventh, and a misspelled G# diminished seventh).

Example 72

Bax

It has already been mentioned that quartal harmonies, especially those proceeding in parallel motion, are effectively combined with various pedal-like devices.

Example 73

Honegger, Chant de Joie

The fourth chord, itself, is sometimes used as a pedal. In the illustration below, Hindemith uses an inverted ornamental pedal, based on quartal harmonies, over a sequential development in the bass.

Example 74

Hindemith, Suite For Piano, "Ragtime"



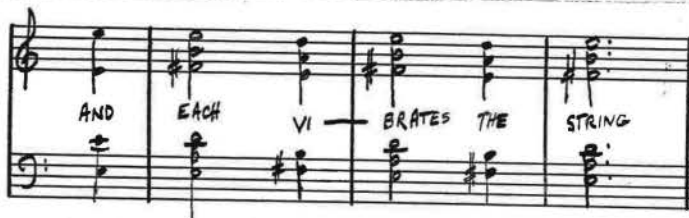
Quartal harmonies are effectively used in a slow harmonic rhythm, since a good deal of variety can be achieved through various changes in the chord's position. The entire passage quoted from Holst's Choral Symphony (Ex. 75) is based on one five-note fourth chord which appears alternately in inversion* and in its fundamental position. There is also a dramatic reason for this spacing. Notice that there is a reference to a string in the text. Holst achieves a fusion between the music and the text by spacing the chords according to old lute tuning.**

* Here again, Hindemith would not agree with my analysis: according to his system the root of the half-note chord is A, not F#.

** The device of having both the text and music suggest the same idea is centuries old, and can be traced back through Bach's choral technique to the madrigalism of the fifteenth century.

Example 75

Holst, Choral Symphony



Larger chords by fourths are usually used in orchestral music where they are widely spaced and rendered more sonorous through extensive doublings. Holst uses these large chords in his Evening Watch. The passage quoted below consists of from three- to seven-note chords by fourths.

Example 76

Holst, Evening Watch



Quartal harmonies are sometimes compounded with added-tones. One of the most common types of added-tone fourth chords is the one in which a third (or sixth) is added above or below the fourth chord proper. It lends a soft consonant quality to the chord and makes it effective as a pivot between tertian and quartal harmonies. The second theme in the first movement of Barber's Second Symphony begins with a four-note fourth chord with an added third in the bass. The same device is also used by Wallingford Riegger in his Twelve Pieces For Piano.

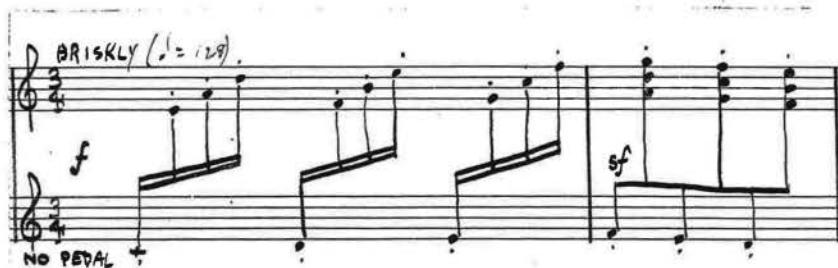
Example 77

Barber, Second Symphony



Example 78

Riegger, Twelve Pieces For Piano



An added-tone is also used to intensify the dissonant content of a fourth chord. For instance, the fourth chord motto in the finale of Vaughan-Williams' Symphony in F Minor ends on an open fifth with an added F in the bass.

Example 79

Vaughan-Williams, Symphony In F Minor



Benjamin Britten uses a combination of these two types of added-tones in his opera, Peter Grimes (Ex. 80). Above the fourth chord G, C#, F# is an added third in the form of an octave tremolo, while beneath it is an E-F trill which clashes with the texture above.

Example 80

Britten, Peter Grimes

Once a quartal texture has been established it is relatively simple to change the size of the chords.

Example 81

Holst, Choral Symphony



And, like so many other contemporary harmonies, quartal chords can be effectively entered through the unison. In fact it is idiomatic of Holst's style to approach quartal harmonies through the unison or through octaves (See Examples 75 & 76).

Quartal harmonies are also combined with various other harmonies, such as chords by thirds,* added-tone chords, polychords, etc. When fourth chords are used in conjunction with chords by thirds there is a tendency to prepare one of the tones (usually the highest) of the fourth chord. William Bergsma uses a combination of quartal and tertiary harmonies in the first of his Six Songs based on the poems of E. E. Cummings. A characteristic illustration appears below.

Example 82

Bergsma, Six Songs

* Illustrated in Chapter III

Example 82 (Cont.)

Example 82 (Cont.) is a musical score for voice and piano. The voice part is in the upper staff, and the piano accompaniment is in the lower staff. The key signature is one sharp (F#), and the time signature is 2/4. The score includes lyrics: "ROSE - - - - - shall he get the spring - - - - - what". The piano accompaniment features a series of chords in the right hand and a bass line in the left hand. The score is marked with measures 19, 20, and 21.

William Schuman also uses this procedure in his Piano Concerto. In the quotation from this work (Ex. 83) he combines compound harmonies with triads. It may be observed that these compound harmonies resemble three- and four-note chords by fourth in intervallic texture (open consonances and mild dissonances). The triads are also spaced in a manner which emphasizes their open consonant quality.

Example 83

Schuman, Piano Concerto

Example 83 is a musical score for piano, showing a quotation from Schuman's Piano Concerto. The score is in the key of B-flat major and 2/4 time. It features a series of chords in the right hand, including a six-note chord in fourths, followed by a chord in thirds, and then a B-flat major triad with an added sixth. The left hand provides a bass line. The score is marked with measures 120 and 121. The tempo is marked as 08. Fl. and the dynamics are marked as Cl. mf dolce.

Another interesting use of a fourth chord in conjunction with other types of harmonies appears in Honegger's King David. The quotation below begins with a six-note chord in fourths* followed by a chord in thirds. Then this chord in thirds, a B^b major triad with an added sixth, proceeds cadentially to a five-note chord by fifths built on E.

* The second fourth is an augmented fourth spelled as a diminished fifth.

Example 84

Honegger, King David



Chords by fourths are often used in parallel motion. A discussion of this device appears in the chapter on "Parallel, Reflective, and Oblique Harmonies".

While chords by fifths resemble chords by fourths in dissonant content, they have an entirely different textural effect. The stable, open consonant quality of these chords makes them effective in cadential formuli, or in conjunction with other types of harmony.

Chords by fifths are often used in conjunction with chords by fourths. In fact one might say that they are both different aspects of the same harmonic personality. Milhaud capitalizes on this relationship in the second movement of the first of his Cinq Symphonies (Ex. 85), where a six-note chord by fifths on A^b, is inverted* becoming a six-note chord by fourths on G.

Example 85

Milhaud, Cinq Symphonies, No. 1

* In the actual meaning of the word, i.e., turned upside down.

Chords by fifths are also easily combined with chords by thirds.

Example 86

Harris, Little Suite, No. 1

The musical score for Example 86 consists of three staves. The top staff is in treble clef and contains a series of chords, some marked with an accent (>) and a tempo marking of (♩ = 100). The middle staff is also in treble clef and contains a series of chords. The bottom staff is in bass clef and contains a series of chords. A 'SUSTAINING PEDAL' and 'UNA CORDA' marking is present at the bottom of the score.

Twentieth century contrapuntal practice can be divided into that which is tonally* oriented and that which is not; and, while fourths, fifths, and seconds are the basis of both types, the conception of their function is different in each: In strict atonal counterpoint only the texture and tension of an interval is considered, while in tonal counterpoint not only is the texture and tension considered but so are the harmonic implications which arise through the intervals relation to immediately implied harmonies and the prevailing tonal center.

The delineation between harmony and counterpoint is not always so clear in practice as it is in the classroom. Many composers have developed a style in which harmony is severely governed by contrapuntal considerations, and where counterpoint is firmly rooted in clear harmonic framework. It is inconceivable that a composer would consistently vary his textural palette each time he shifts his emphasis from the vertical to the horizontal. It, therefore, may be observed that the intervals emphasized in a contrapuntal fabric will usually be the same ones which are combined to form the characteristic harmonies of a work. For instance, both Paul Hindemith and Robert Palmer write in a polyphonic style in which fourths, fifths, and seconds are emphasized. Hindemith consistently favors the fourth while Robert Palmer seems to favor the fifth. The two illustrations below (Exs. 87 & 88)

* Not necessarily major or minor

indicate the harmonic consequent of such emphasis.

Example 87

Palmer, Woodwind Quintet (1951)

LENTO Esp.
FL. #d.
ob. mf
Bsn.
Hrn.
p
4/2
3/2
p
FL. #d.
Bsn.
4

Example 88

Hindemith, Organ Sonata, No. 3



Notice that Palmer avoids progressions involving strong root relations, and that traditional cadences have been replaced by those containing open octaves and fifths. The effect is one of strength and is achieved not through the urgent demand for stasis, but through the inherent strength of harmonies which are comprised, predominately, of the most consonant intervals. Hindemith, on the other hand, uses a more liberal intervallic palette in a decidedly more compact texture. He skillfully blends open and soft consonant intervals with sharp and mild dissonant intervals, and uses cadences involving harmonies with strong root relations (very often plagal).

Further observations on contemporary counterpoint appear in the chapter on "Harmony and the Twelve-Tone Technique".

Chapter V

CHORDS BY SECONDS

The name most associated with secundal harmonies (tone clusters) is that of Henry Cowell. While he was not the first to use this type of chordal construction; he, above all others, has made the greatest effort to describe to what extent these harmonies have been used and to suggest various devices which have been relatively unexploited.

Cowell realizes that many different types of chordal constructions can be naturally derived from various portions of the overtone series. He prudently avoids the error of theoretical oversimplification by suggesting that individual consideration be given to each. He sees the necessity for three* systems to cover

- 1) chords built by fourths and fifths (Partials 1 to 4)
- 2) chords built by thirds and sixths (Partials 4 to 7)
- 3) chords built by seconds and sevenths (Partials 7 to 16)

In defining tone clusters Cowell says that they ". . . are chords built from major and minor seconds, which may in turn be derived from the upper reaches of the overtone system, and have therefore a sound foundation. In building up clusters from seconds, it will be seen that both major and minor seconds are used, just as major and minor thirds are used in the familiar system of thirds. There is an exact resemblance between the two systems, and the same amount of potential variety in each."**

Chromatic and Diatonic Clusters

A chromatic cluster is one that consists entirely of half steps. Excellent examples of this type of cluster can be found in Riegger's Music

* It is interesting that Cowell makes no reference to overtones higher than the sixteenth partial. I believe that his opinion of the validity or practicality of a system to cover intervals smaller than a semitone is herein tacitly implied.

** Cowell, New Musical Resources, p. 117

For Brass Choir (1948-49). It is characteristic of Riegger's style to begin a piece with a short unison statement of a principle motive immediately followed by a harmonic passage which indicates the general textural characteristics of the piece. In this way both the harmonic and melodic aspects of the piece are made known from the outset. The harmonic fabric in Music For Brass Choir (Ex. 89) consists of a fixed* chromatic cluster which increases in size until it ultimately appears as a twenty-six note cluster in the final cadence (Ex. 90).

Example 89

Riegger, Music For Brass Choir

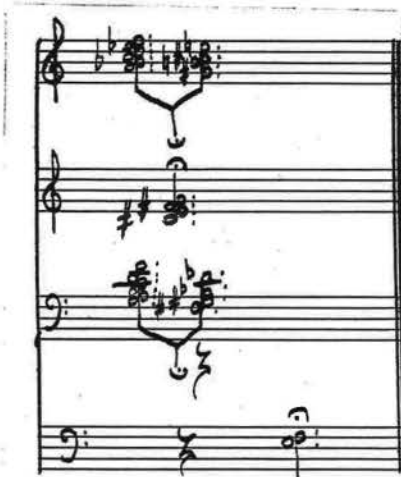
DANDANTE ♩ = 88-96

Handwritten musical score for Music For Brass Choir by Riegger. The score is for three parts: Tpts. (Trumpets), Hrn. (Horn), and Tbn. (Tuba). The tempo is marked **DANDANTE** with a quarter note equal to 88-96 beats. The key signature has one flat (B-flat). The time signature is 3/4. The score consists of two systems. The first system shows the Tpts. part with a "1. Solo" marking and a "dolce" marking. The Hrn. part has a "p" marking. The Tbn. part has a "Tbn. 1-6" marking and a "pp" marking. The second system shows the Tpts. part with "pp" and "f" markings. The Hrn. part has a "p" marking. The Tbn. part has a "Tbn. 7+10" marking and "pp" markings. The score ends with a final cadence.

* all tones sounded together

Example 90

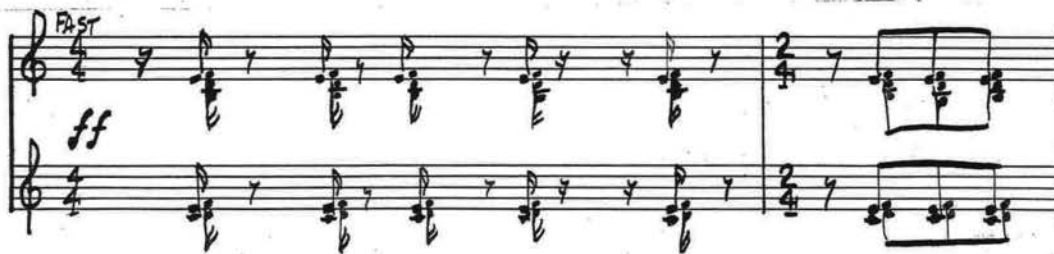
Riegger, Music For Brass Choir



A diatonic cluster is one which is composed of both major and minor seconds. As compared to a chromatic cluster of equal dimensions, it is less dissonant and more harmonically oriented.* Examples 91 and 92 are illustrations of typical diatonic clusters.

Example 91

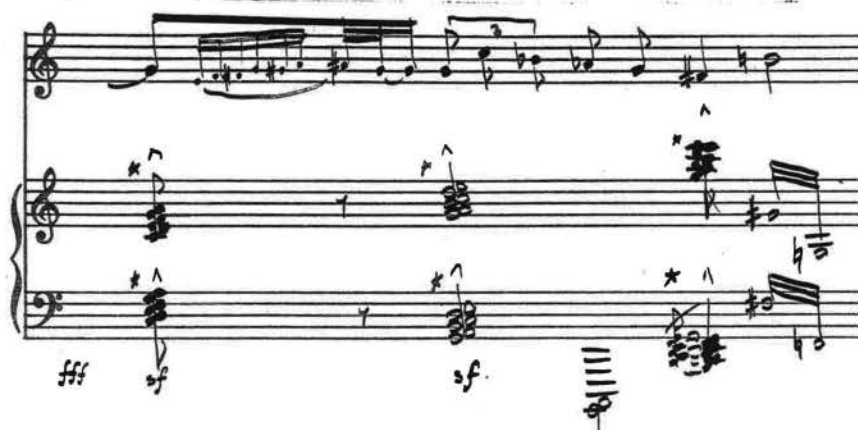
Ives, Three Places in New England, "Putnam's Camp"



* There is always some ambiguity in discerning the root of any chord built by the superposition of uquidistant intervals.

Example 92

Ives, "Lincoln The Great Commoner"



The order of whole and half steps above a given root are usually arrived at on one of three different ways: first, the accidentals of the cluster may be generated by the major scale of the root; second, the accidentals of the cluster may be derived from the prevailing tonality of the passage; and third, an order of major and minor seconds may be established which is maintained from cluster to cluster. When two or more clusters are used simultaneously the root of each cluster may generate its own accidentals, the root of one cluster may generate accidentals for all clusters, or the accidentals of each cluster may be derived from one or more prevailing tonalities.

Fixed and Moving Clusters

A cluster is fixed when all of its tones are sounded simultaneously. If the tones of the cluster are sounded consecutively and each is held until the last tone enters, the cluster is called a sustained arpeggio or moving cluster. The clusters in Example 93 are chromatic sustained arpeggios.

Example 93

Ives, "Soliloquy"



Cluster chords are quite frequently used in conjunction with other types of chordal formations. In the piano accompaniment of Ives' song, "Soliloquy" (Ex. 94) a passage appears in which chords are successively constructed by sevenths, fifths, fourths, thirds, major seconds, and finally minor seconds. Very often in piano music one also finds a cluster in one hand and some other type of harmonic or melodic figure in the other (Exs. 95 & 96).

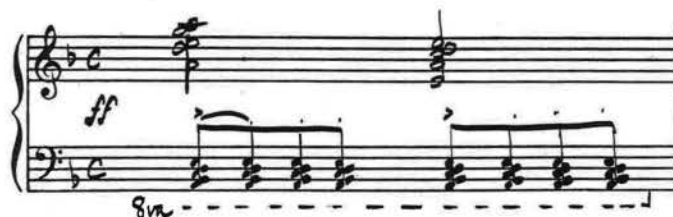
Example 94

Ives, "Soliloquy"



Example 95

Cowell, Amerind Suite



Example 96

Riegger, Twelve Pieces For Piano, "Tone Clusters"



Just as two or more voices may be contrapuntally set against each other, so may two or more series of fixed clusters. An interesting illustration of this device occurs in Ives' The Fourth Of July. The following observations may be made pertaining to the illustration from this work quoted below (Ex. 97):

- 1) each chord is a seven-note diatonic cluster
- 2) the accidentals in each line are derived from a prevailing tonality, not generated by the root of each specific cluster
 - a) the accidentals of the upper line are derived from B major
 - b) the accidentals of the middle line are derived from B^b major
 - c) the accidentals of the lower line are derived from A major

Example 97

Ives, The Fourth Of July



In the previous illustration Ives chose to keep the size of each cluster uniform. Had he altered the size of each cluster, making some larger or smaller than others, three or more contrapuntally related lines would have been created by the motion of the outer voices in each cluster. Though illustrations exploiting this particular polyphonic device can be found,* it would seem that the most accepted procedure is to keep the clusters uniform in size, such as those in the Bartok excerpt below.

Example 98

Bartok, The Wooden Princess



* See Cowell's Movement For String Quartet and Piano Concerto

In Example 99 an interesting clusteral effect is achieved by building a cluster through the superposition of major seconds. It must be noted, however, that these clusters are used only to satisfy dramatic needs. They are not typical of the harmonies generally used throughout the opera.

Example 99

Gottfried von Einem, Der Prozess

Josef K. (zu sich)

nun steht al - so auch Ei - ne

wa - che von dem Hau - se

While large clusters are more dramatic and powerful, small clusters have the advantage of being more agile. For this reason small clusters may be used in supple, flowing lines with great effectiveness. Very often one or more voices in a polyphonic passage is embroidered with added seconds, resulting in a quasi added-tone or clusteral texture. Such is the case in the

opening of Cowell's Maestoso for piano.

Example 100

Cowell, Maestoso

ALLEGRO NON TROPPO

R.H.

ACCIDENTALS APPLY TO SINGLE NOTES ONLY

mf maestoso

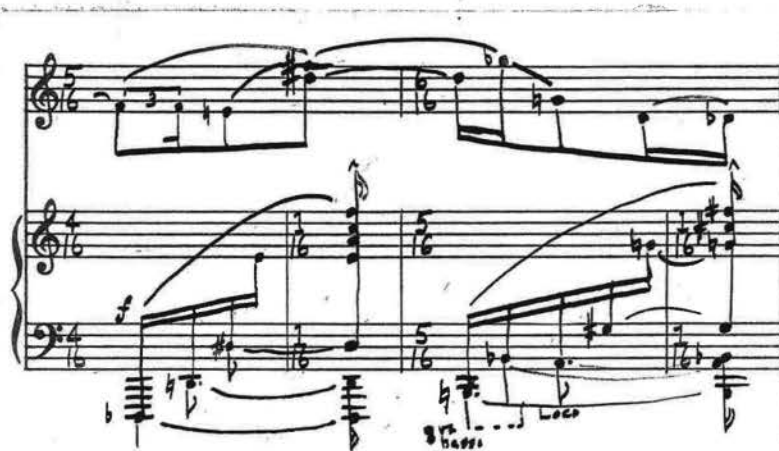
L.H.

In large works clusters are usually used in conjunction with, or contrasted by, other types of harmony. The greatest textural problems arise not so much through the relationship of these contrasting harmonies, as it does through the manipulation of the transitional materials which lead from one type of harmony to another. One of the most common transitional devices involving clusters is to gradually subtract various members of the cluster, leaving harmonies which suggest the kind of harmonies which are to follow. The reverse procedure is also possible.

While fixed clusters are usually set in their most compact position, sustained arpeggios are usually set in wide spacings, forming chords by sevenths or ninths. The arpeggio most often unfolds from the lowest tone to the highest (Ex. 101), or from the highest tone to the lowest (Ex. 102); however, illustrations may also be found in which the cluster unfolds laterally, i.e., from the center to the extremities, or from the extremities to the center.

Example 101

Ives, "Soliloquy"



Example 102

Ives, "Soliloquy"



The manner in which a moving cluster unfolds may become a formal characteristic of the piece, and is thus capable of creating a certain amount of thematic unity. By the same token different aspects of the cluster's character may be accentuated by controlling the order in which

its constituents make their entrance. The consonant portion of a cluster may be accentuated, for instance, by first introducing those tones which form consonant intervals.

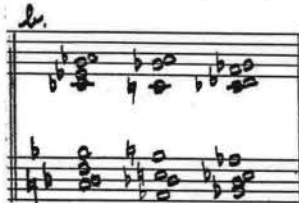
In the second and third decade of this century many composers capitalized on the novelty of certain cluster effects. Needless to say, the artistic results were less than negligible. It is in few arts that materials, themselves, are capable of generating any esthetic satisfaction; music, I am sure, is not one of them. Musical materials just furnish the means to an end, and when these materials become ends in themselves only the most inconsequential music can result. The tendency in recent years has been to use clusters in conjunction with other types of harmony, and usually evolve from those harmonies when a high degree of tension is required. In other words, they are a product of harmonic growth and therefore organically related to the entire harmonic structure of the work.

Chapter VI

ADDED-TONE CHORDS

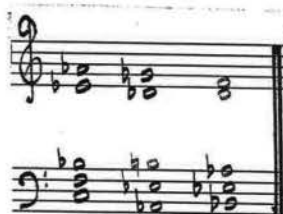
Added-tone chords are those harmonies which result from the imposition of extraneous tones upon various harmonic formations. The added tone is usually placed a second above or below a chord tone and serves to intensify the dissonant content of the chord. While added tones may be imposed upon virtually any kind of harmony, certain devices must be utilized in order for them to be perceived as such.* When added tones are imposed upon simple harmonies such as triads and seventh chords, they are fairly obvious; however, when they are added to more complex harmonies there is a need, proportionate to the complexity of these harmonies, to establish a definite harmonic language in which the added tones will be perceived as alien to the fundamental harmony. For instance, when one attempts to analyze the following harmonies he is confronted with a variety of interpretations:

Example 103



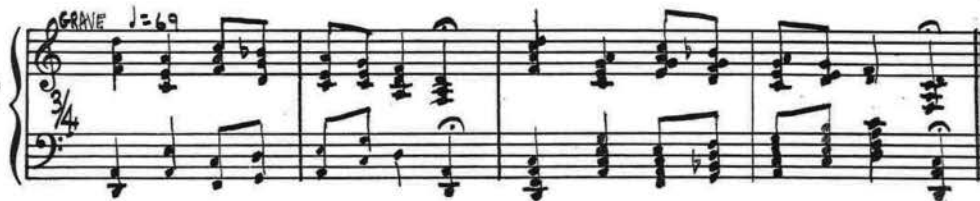
* I do not wish to suggest that composers use certain devices solely for the purpose of providing the listener with a more comfortable harmonic analysis. On the contrary, I believe that whether a construction is perceived to be an added-tone chord or some other harmonic formation is of little consequence to the composer so long as the esthetic purport of the work has been communicated. However, this in no way contradicts the fact that certain devices used to achieve formal ends, such as repetition and sequence, may also shed considerable light on the proper analysis of certain harmonic formations.

Example 104



Example 105

Bartok, Fourteen Bagatelles



72

The same device also appears in the tenth bagatelle. Here, an established bitonal texture (Ex. 106) is embroidered with added tones in the bass (Ex. 107).

Example 106

Bartok, Fourteen Bagatelles



Example 107

Bartok, Fourteen Bagatelles



It was once believed that the tonic triad was the only chord which could represent a strong tonic feeling; however, it is now possible to add tones to the tonic triad and still maintain a feeling of finality, so long as the fundamental is conspicuously evident. Added tones are also imposed upon cadential harmonies, or harmonies used in sequential passages.

The most often used added tones are the added sixth, second, and fourth.* There are also times when the added seventh functions as an added tone, es-

Some writers consider the major-minor chord to be a species of added-tone chords, one of the thirds being an added tone. The more accepted analysis, however, is that it is a polychord.

pecially when it consistently appears a second below the root rather than a seventh above it.

Example 108

Stravinsky, Firebird Suite



When the added tone is no closer to the nearest chord tone than a major second, the chord is mildly dissonant; and when the added tone is within a minor second of a chord tone, the chord is sharply dissonant. It may be observed that the greater the clash between the added tone and the basic harmony, the more one is apt to perceive it as an alien member of the chord.

Added-tone chords are spaced in a variety of ways, each having its own textural quality. It has already been pointed out that the most common spacing is a compact one in which a second is placed immediately above or below a chord tone, such as those in Examples 109 and 110.

Example 109

Messiaen*, La Nativite du Seigneur



* Messiaen often uses the added sixth and added augmented fourth, as well as the added second. He seems, however, more concerned with the coloristic aspects of these harmonies than with their ability to function as strong structural uni

Example 110

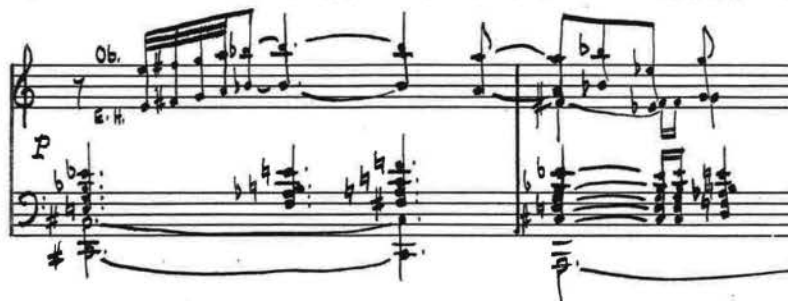
Copland, Billy The Kid



Another fairly common spacing is used by Paul Creston in his Third Symphony. In the illustration from this work below (Ex. 111), he places added tones above a series of diminished triads and seventh chords.

Example 111

Creston, Third Symphony



The added tone may also be completely isolated from the basic harmony. For instance, there is a passage (Ex. 112) in the second movement of Vincent Persichetti's Fourth Piano Sonata in which close position triads appear above added tones in the bass.

Example 112

Persichetti, Piano Sonata No. 4



Peter Mennin uses the same spacing in Moby Dick.

Example 113

Mennin, Moby Dick

A musical score for a scene from the film Moby Dick. It features three staves: Solo Flute, STRINGS, and a piano accompaniment. The Solo Flute part is marked *cantabile*. The piano accompaniment is marked *8m* and *pizz*. The music is in 3/4 time and has a key signature of one flat. The Solo Flute part has a melodic line with many accidentals. The STRINGS part has a harmonic accompaniment. The piano accompaniment has a complex rhythmic pattern with many accidentals.

The added tone is sometimes isolated above the basic harmony. Luigi Dallapiccola's opera, Il Prigioniero, opens with a repeated series of two diminished triads and one incomplete diminished seventh chord. Above each of these chords, at the interval of a diminished octave, is an added tone which produces a quasi polychordal feeling.

Example 114

Dallapiccola, Il Prigioniero



It may be observed that as long as the basic harmony is in a relatively compact position it does not matter whether the added tone is imbedded within it, added above or below it, or isolated from it. But when the basic harmony is widely spaced and the added tones are shifted from one voice to another, the added tones tend to lose their identity and become equal constituents in the resulting compound texture. For instance, there is a considerable textural difference between the harmonies in Examples 115a and 115b, though each consists of the same tones.

Example 115



Added tones are also imposed upon chords in the augmented-sixth family, which in themselves are a species of added-tone chords. The Italian augmented-sixth chord was the basic augmented-sixth chord of the nineteenth century. To this chord was added an augmented fourth forming the French augmented-sixth chord, or a perfect fifth forming the German augmented-sixth chord. In the twentieth century the dissonant content of these basic augmented-sixth chords has been further intensified by the addition of an augmented, doubly augmented, or diminished octave.

Example 116



Added tones are also used to embroider various melodic lines. Two illustrations, one from Riegger's Twelve Pieces For Piano and the other from Cowell's Maestoso, are quoted below.

Example 117

Riegger, Twelve Pieces For Piano



Example 118

Cowell, Maestoso

R.H.

mf

L.H.

Further illustrations of added-tone chords may be found in Chapters IV and VIII.

Chapter VII

COMPOUND CHORDS

The chords discussed thus far have been those which are constructed through the superposition of one specific interval, such as a second, third, fourth, or fifth. There is however, another classification in which harmonies are constructed through the superposition of various combinations of miscellaneous intervals. These chords are called compound chords, and they display both of the following characteristics: first, they are single homogeneous chordal units; and second, they cannot be analyzed as a species of any one of the other accepted classifications of contemporary harmonies. There will still be occasions when it will be difficult to say whether certain chords are compound chords or whether they are added-tone or altered chords (Ex. 119). In a case such as this the most satisfying analysis can only be arrived at through an examination of the context in which the harmonies are used.

Example 119

Varese, Octandre



Many interesting species of compound chords appear in Vincent Persichetti's Four Hand Piano Concerto. The work opens with an un-accompanied statement of a theme which provides the basic material for the entire work (Ex. 120).

Example 120

Persichetti, Four Hand Piano Concerto



It may be observed that sharp and mild dissonances, and soft consonances are emphasized, while open consonances are not. It has been stated that composers do not vary their textural palette each time he shifts his emphasis from the horizontal to the vertical and that the most conspicuous linear intervals very often are combined to form the characteristic harmonies of the work. What then could be more consistent with the implications of this opening theme than this passage of compound chords, which follows it.

Example 121

Persichetti, Four Hand Piano Concerto

Immediately following the entrance of the second voice in measure six, one is aware that a definite scheme of intervallic tension is functioning. The compound harmonies which begin on the last quarter-note of measure seven are texturally consistent, in that they each contain at least one mild or sharp dissonance, and one soft consonance (until the cadence on a chord by fifths in measure nine). This combination of soft consonances and sharp and mild dissonances becomes even more manifest in passages such as this:

Example 122

Persichetti, Four Hand Piano Concerto

or in passages such as this:

Example 123

Persichetti, Four Hand Piano Concerto

8

The compound harmonies in the previous example are composed, this time, of sharp dissonances over open consonances.

Another type of compound passage which grows out of the opening material appears in the following illustration.

Example 124

Persichetti, Four Hand Piano Concerto

1.º elegante

2.º tempo (relaxed)

P elegante

In the previous illustration the three upper parts suggest the opening harmonies while the two lower voices are designed to soften, although not to hide, some of the stringent harmonies in this hymn-tune section. The two lower voices also create an incipient polychordal feeling and supply dissonances when they are needed in order to maintain textural consistency.

There is probably no living composer who can manipulate his harmonies with such delicate precision, or who can fuse spacing, dissonance, and instrumental color into one inseparable and homogeneous sonority as can Igor Stravinsky. Stravinsky uses a variety of compound chords, which usually grow out of other harmonies, or which are formed by converging contrapuntal lines. Three typical illustrations, all from his Symphony In Three Movements, appear below. In the first illustration (Ex. 125) a sustained E-minor harmony serves as a mat for a G-major chord figure played by the 'celli and piano. Chord (y) is a compound chord, and chord (x) is an added-tone A^b major triad.

Example 125

Stravinsky, Symphony In Three Movements

The musical score for Example 125 is a four-staff excerpt from Stravinsky's *Symphony In Three Movements*. The top staff is for Violins (W.W.), the second for Brass, the third for Cello/Piano, and the bottom for Bass. The tempo is marked 'Allegro' with a quarter note equal to 160 beats per minute. The key signature has one flat (B-flat). The score features a complex harmonic texture with sustained chords and moving lines. Chords are labeled with circled 'y' and 'x' to indicate specific compound and added-tone chords discussed in the text. Dynamics include 'fff' and 'ff-mf-sub.'

While the majority of harmonies in the second illustration (Ex. 126) can be analyzed as incomplete triads over an added-tone bass, the chords at (a), (b), and (c) cannot. Chord (a) consists of the fourth F \sharp -C \sharp (doubled at the octave) above an E \flat . While the texture definitely suggests added-tone harmonies, I believe that this construction can safely be defined as a species of compound chords. Chords (b) and (c) are definitely compound harmonies.

Example 126

Stravinsky, Symphony In Three Movements

The third illustration from this work appears below, and contains a compound chord in which the interval of a fourth predominates.

Example 127

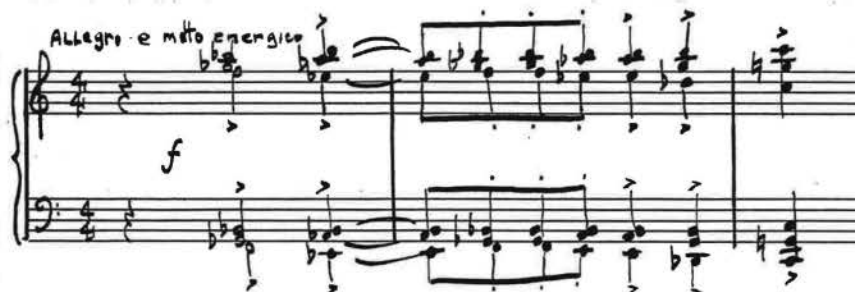
Stravinsky, Symphony In Three Movements



Robert Palmer is another composer who frequently uses compound structures. It has been pointed out that he writes in a harmonically oriented, linear style in which fourths, fifths, and seconds are emphasized. His Piano Quartet opens with the following compound harmonies:

Example 128

Palmer, Piano Quartet



The opening theme of the second movement is harmonized with chords by thirds mixed with various three-note compound harmonies, plus open fourths and fifths (Ex. 129).

Example 129

Palmer, Piano Quartet



In the third movement a compound passage appears in which the harmonies resemble either chords by fourths, major-minor polychords, or added-tone harmonies.

Example 130

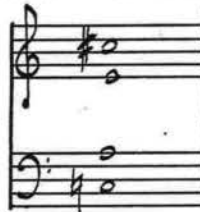
Palmer, Piano Quartet



Another illustration of simple compound chords can be found in the second movement of Persichetti's Fourth Piano Sonata. In the illustration below (Ex. 131) soft and open consonances are subtly blended with sharp and mild dissonances.

Probably the most often discussed class of compound harmonies are those which involve some symmetrical intervallic relationship. While the number of symmetrical patterns is infinite, all of these harmonies have one characteristic in common: their unique character tends to be destroyed as soon as the symmetrical pattern is altered; or in other words, they can exist in only one spacing, and cannot be inverted. The most often quoted symmetrical chord (which is actually a major-minor polychord, not a compound chord) is the one used so extensively by William Schuman. The chord consists of two major sixths, separated by a perfect fifth.

Example 133



It must be said, however, that the symmetrical relation which exists in this chord is only a casual result of Schuman's desire to refine and reduce a major-minor harmony to its most essential factors, and then to space the resultant harmony in one of its most resonant positions.

Another symmetrical chord, again with polychordal implications, is used by Bartok in his First Violin Sonata.

Example 134

Bartok, First Violin Sonata



Example 131

Persichetti, Fourth Piano Sonata



An interesting, but much thicker, compound texture appears in the second movement of Paul Bowles Sonata For Two Pianos. The harmonies in the first piano suggest various quartal chords, while the harmonies in the second piano are composed of a two-chord, polychordal ostinato.

Example 132

Bowles, Sonata For Two Pianos

In the previous illustration one finds a chord consisting of a perfect fifth and minor ninth over the root (C#) in the left hand, while a similar construction, built on F#, appears in the right hand. A similar procedure is again used by Bartok in his Second Violin Sonata, but involving different intervallic relationships.

Example 135

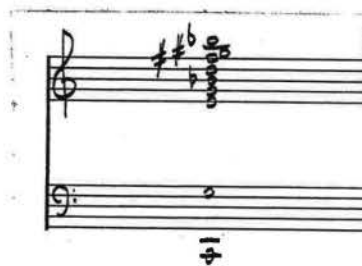
Bartok, Second Violin Sonata



There are some very large compound chords which manifest a more deliberate attempt to fashion harmonies with symmetrical interval relations. Many of these chords have been given names by the composers who have used them, or certain musicologists who have discussed them. The ones mentioned below are the Resonance Chord, the All-Interval Chord or Mother Chord, the Grandmother Chord, the Pyramid Chord, and the Chord Of The Minor 23rd.

The Resonance Chord was devised by Messiaen. It is constructed according to the overtone series and contains all of the tones of one of his favorite modes.

Example 136



The All-Interval Chord was first introduced by Fritz Klein in a composition called Die Machine (1921). He calls this chord, which contains eleven different intervals, the Mother Chord.

Example 137



A further elaboration of the Mother Chord has been suggested by Nicholas Slonimsky, which he calls the Grandmother Chord. He has said, ". . . it has all the intervallic properties of the mother chord plus an especial order of intervals so arranged that they are alternately odd-numbered and even-numbered when counted in semitones, with the row of odd numbered intervals forming a decreased arithmetical progression and the row of even-numbered intervals forming an increased arithmetical progression."

* Slonimsky, Thesaurus of Scale and Melodic Patterns, p. iii

Example 138



The last group of symmetrical chords has been mentioned, not because they have been exploited (in any sense of the word) by twentieth century composers, but because they do reflect a growing desire by many contemporary composers to space large, complex harmonies in a manner which would suggest that considerable reflection presupposes their construction and that they possess an inner logic above and beyond their contextual use. Without becoming entangled in a socio-psychological debate I should like to say that I believe this situation is caused, considerably, by the contemporary artist's attitude toward his art and its relation to society. Today undue emphasis is placed upon technique. A composer who has something to say, but who says it in an unassuming way, cannot be tolerated. He is, instead, pushed aside in favor of the composer who is able to manipulate the most banal and theatrical materials with great virtuosity. This situation, coupled with the fact that psychologists have been telling us, for the past fifty years, that one of most important indications of an individual's mental health is his ability to adjust to his environment, has made the artist overconscious of conformity. True: the artist as a human being is compelled to make certain personal concessions to the society in which he lives; however, when these concessions take the form of capitulation, when he finds he must offer systems to explain what he has done, when he is compelled to use anything other than that which he has created to justify his labor, then art will become just what many people believe it to be: not the manifestation of personal values, but a reflection of contemporary taste.

Chapter VIII

POLYCHORDS

A polychord is a multi-unit chord in which various single unit harmonies are combined into one composite chord. While both polychordal and polytonal passages result from the superposition of materials in different tonal spheres, they are different in this one respect: In a polytonal passage each strand of harmony generally suggests one specific tonality, while in a polychordal passage the tonal implications of each polychordal unit usually changes from chord to chord; or in other words, in a polychordal passage there is not attempt to keep each strand of harmony in a specific key. A comparison of Example 141 with Example will readily show the difference between these two procedures.

Example 141

W. Schuman, Piano Concerto



The use of polychords is another attempt to organize large harmonic formations. Henry Cowell has said, "If single harmonies are continually built up by using more and more tones, they may become unduly complex; but if the many tones are simplified by grouping the harmony into related units, it becomes possible to retain almost complete simplicity and clarity in the use of many different tones together."*

* Cowell, New Musical Resources, pp. 25-26

The term polychord suggests that three or more chordal units have been combined; however, through tradition, the term is also used to describe those chords in which only two chordal units have been combined.

Polychords tend to lose their multi-unit character as each of the chordal units are brought closer together, until it may become quite difficult to determine whether the harmony is a polychord or a single-unit chord. This proximity, or the lack of it, is governed both by the physical distance between each of the chordal units, plus the distance between the roots of each chordal unit according to a circle of fifths.

There are two basic ways of spacing polychords, and each has its own textural character. One way is to isolate each chordal unit and then to space them in a tight compact position (very often in closed position and in second inversion*). This type of spacing projects the individual character of each of the polychordal unit, and strongly suggests a biplanar texture.

Example 142

W. Schuman, Symphony For Strings



The other way is to space the polychord in one of its more resonant positions, which is governed by 1), the chord's spacing in relation to the

* Of the three possible closed positions, the second inversion most nearly resembles the intervallic distribution of the overtone series.

structure of the overtone series; 2), overtone reinforcement;* 3), the quality of the triads combined; 4), the interval formed by the outer voices; 5), the type of doublings used; and 6), the manner in which the polychord is orchestrated. For instance the polychord below displays most of the qualities which contribute to resonance.

Example 143



Considering all of the various types of constructions which may be polychordally combined, plus the different pitch relationships which may be involved, the number of possible polychordal combinations is infinite. For instance, there are approximately 176 different polychords which can be constructed through combining only two triads. Of these, the most often used are major over major, minor over major, major over minor, and then minor over minor. The diminished and augmented triads are seldom used. In the few examples which can be quoted containing an augmented or diminished triad, the augmented or diminished triad usually appears above a major or minor triad.

Several composers have attempted to arrange polychords, especially those composed of two triadal units, into a hierarchy according to their tension and inherent resonance. Roy Harris was one of the first to make such an attempt; however, since his system was so closely related to his theory of color-values his classifications indicate little more than his subjective impression of these harmonies. A more concrete attempt to organize these materials has been made by one of his students, Vincent

* Each chordal factor generates an overtone series. The series generated by the bass is the strongest, and the series of each successive tone becomes proportionately weaker. A more resonant chord is produced when the upper polychordal factors appear at points which coincide with overtones generated by the lower chordal factors.

Persichetti. Persichetti says that a series of triads moving through a cycle of fifths may be constructed over a given triad. And that each polychord tends to become more dissonant and less resonant as the roots of the respective chordal units become more remote according to the cycle of fifths.

Example 144



According to this principle number 6 in the series is the least resonant and the most dissonant; then come numbers 5 and 7, 4 and 8, 3 and 9, 2 and 10, and finally 1 and 11. To make a further distinction numbers 7, 8, 9, 10, and 11 are less resonant than numbers 5, 4, 3, 2, and 1, respectively because of a poorer overtone distribution. One of the obvious limitations of this system is that it only holds true for major-major polychords. The harmonies in polychordal passages such as the one which begins Messiaen's song, Action de Grâces, are still best classified through an examination of its composite intervallic structure.

Example 145

Messiaen, Action de Grâces



Each composer who uses polychords tends to favor certain ones. For instance, Roy Harris uses the following polychords* in the pastoral section of his Third Symphony.

Example 146



It may be observed that in the major-major group he uses all of the possible pitch relationships, except for the three most dissonant ones (Nos. 6, 7, and 5 in Ex. 144). In the minor over major group and the major over minor group he uses those combinations which produce chords which under other circumstances might be analyzed as either triads with added sixths, or seventh, ninth, or eleventh chords. It also may be observed that he does not use the minor-minor polychord.

While Harris tends to use polychords in which the roots of each chordal unit are closely related according to a circle of fifths, W. Schuman and Stravinsky both tend to use polychords in which the roots of each chordal unit ^{ARE} not only closely, but sometimes distantly, related. For instance, there is a polychordal passage in Schuman's Crendendum in which the root of each chordal unit is separated by a semitone. The upper triads are major while the implied lower triads are minor.

* Each polychord is constructed from C so that a comparison of their structures may more easily be made.

Example 147

Schuman, Crendendum

PRESTO

OB.

STRINGS

PIZZ.

The tritone relationship, which often creates an incipient polytonal texture, is often used by Stravinsky. A typical illustration occurs in his Symphony In Three Movements. In the passage quoted below a series of parallel major triads appear over an implied triadal bass, forming polychords whose chordal units are in tritone relationship.

Example 148

Stravinsky, Symphony In Three Movements

W.W.

STRINGS

PIZZ.

Another interesting polychordal passage from this work appears in Example 149. In this illustration staccato chords in the woodwinds and strings are polychordally combined with broken triadal figures in the brass.

Example 149

Stravinsky, Symphony In Three Movements



An excellent illustration of the polychordal combinations used by Bartok appear in the second of his Three Burlesques, Op. 8c. The following chart (Ex. 150) illustrates the various polychordal combinations used in this piece. The following observations may be made: 1), in the majority of cases each of the upper chordal units always is accompanied by the same lower chordal unit; 2), each polychord consists of six different tones; and 3), the roots of each chordal unit are either a semi-tone or tritone apart.

Example 150

The image shows three systems of musical notation, each with two staves. The notation is handwritten and represents complex polychordal structures. The first system has six measures, the second has four measures, and the third has four measures. The notation includes various accidentals (sharps, flats, naturals) and complex groupings of notes, often with slurs indicating connections between measures or systems. Some measures contain the word "AND" written in a stylized, handwritten font.

In the illustrations thus far, when major and minor chordal units were polychordally combined, each was constructed from a different root. However, there is a species of polychords in which major and minor triads are constructed from the same root. The resulting polychordal formation is usually called a major-minor polychord or, more briefly, a major-minor chord.* There is a difference, of course, between polychords which contain various polychordal units creating a fluctuating major-minor texture (Ex. 151) and the major-minor chord, itself (Ex. 152).

* Vincent Persichetti has suggested that these chords be called mijor or manor chords.

Example 151

Willem Pijper, Third Symphony



Example 152*

Copland, Vitebsk

LENTO MOLTO MARCATO (♩ = 52)

* In this illustration notes marked ♯ are played a quarter-tone sharp, while tones marked ♭ are played a quarter-tone flat.

Since both of these polychords (major-minor and implied major-minor) bear a close resemblance to each other, they are often used in the same passages.

Example 153

Pijper, Piano Concerto



Because the presence of only four tones (root, fifth, major third, and minor third) are necessary to define a major-minor chord many composers have made a textural refinement by omitting the superfluous chord factors. The resulting harmony is usually spaced in the following manner (after W. Schuman):

Example 154



Persichetti begins one of the responses (No. 24) in his Hymns And Responses with the previous chord (Ex. 155). He also uses a compound version of the same chord in his Four Hand Piano Concerto (Ex. 156).

Example 155

Persichetti, Hymns and Responses, No. 24

In UNISON, moderately slow

May the words of my mouth and the med-i-ta-tion of my

Example 156

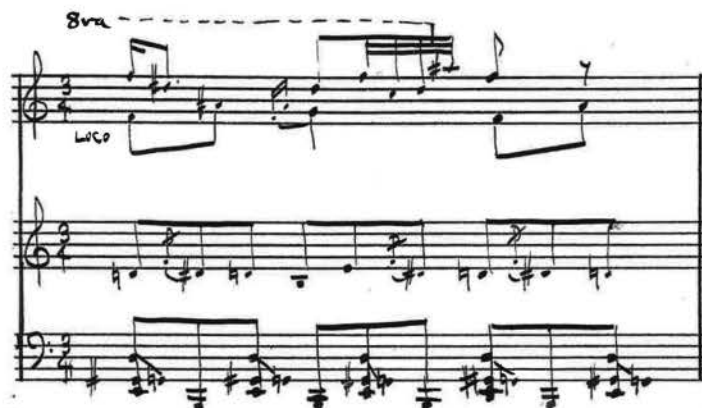
Persichetti, Four Hand Piano Concerto

f subito

Illustrations of major-minor seventh chords can be found in Stravinsky's The Rites of Spring. In the following quotation an E major-minor seventh appears below a melodic line suggesting B^b major, creating a quasi polychordal feeling. (Also see Ex. 206)

Example 157

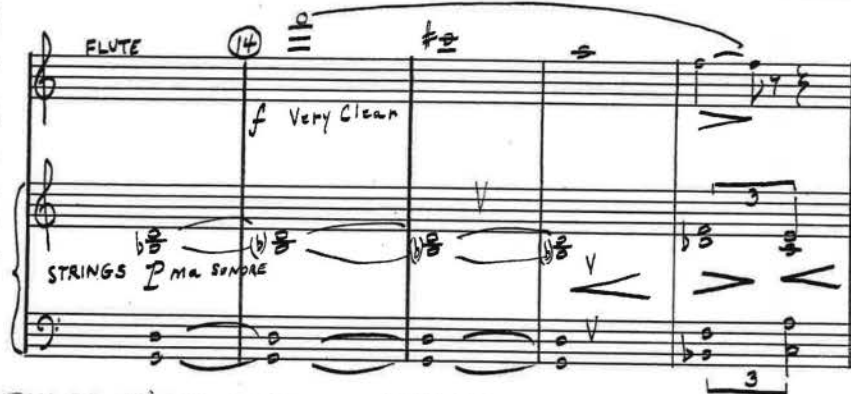
Stravinsky, The Rites of Spring



Even though polychords containing a diminished or augmented triadal unit are rare, a few examples can be found. The most well known of these polychords occurs in Harris' Third Symphony.

Example 158

Harris, Third Symphony



There has been a growing tendency to construct polychords which consist of three or more chordal units. Excellent examples of this type of polychord can be found in Persichetti's Four Hand Piano Concerto (Ex. 159) and Symphony For Strings (Ex. 160), and in Vaughan-Williams' Pastoral Symphony (Ex. 161).

Example 159

Persichetti, Four Hand Piano Concerto

The image shows a handwritten musical score for Example 159, Persichetti's Four Hand Piano Concerto. The score is written on four staves, organized into two grand staves (treble and bass clef on the left, and alto and bass clef on the right). The notation includes various musical symbols such as notes, rests, and chords. There are several handwritten annotations in the score: '8va' is written above the first staff, 'Loco' is written below the first staff, '8' is written above the second staff, 'Loco' is written below the second staff, and 'LUNGA' is written below the third staff. The score appears to be a study or a working draft, given the handwritten nature of the notation and the presence of these annotations.

Example 160

Persichetti, Symphony For Strings



Example 161

Vaughan-Williams, Pastoral Symphony

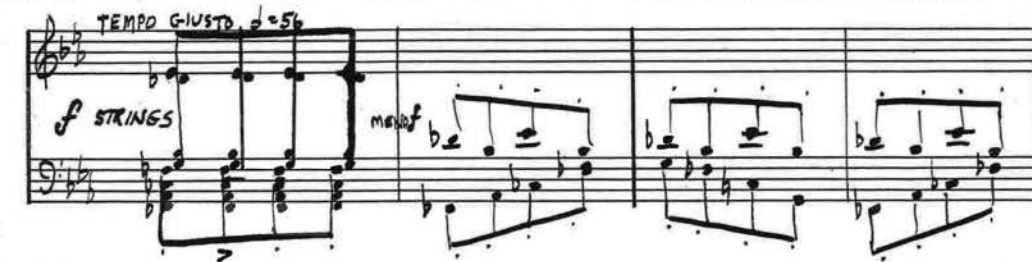


Triads are not the only constructions which are polychordally combined. (Any combination of chords by thirds, chords by fourths, added-tone chords, compound chords, or clusters is possible.) Other frequently used polychords consist of a triad and a seventh chord, or a triad and a chord by fourths. For instance, there is a passage in Stravinsky's The Rites of Spring which is based on a polychord consisting of a triad and

a seventh chord.

Example 162

Stravinsky, The Rites of Spring



One can also find illustrations of polychords composed of a triad and a fourth chord in Harris' Little Suite. In the illustration below polychords consisting of both two triadal units, and one triad and one fourth chord appear over a quadruple pedal.

Example 163

Harris, Little Suite



It may have already been observed that all of the previously mentioned polychords often appear over various pedals or pedal-like figures.

Example 164

Persichetti, Fourth Piano Sonata



While a considerable variety of polychordal structures may be found in the music of some composers, most composers tend to emphasize certain polychordal constructions, and use them in conjunction with the other materials which are idiomatic of their personal harmonic style. These composers maintain textural consistency, not through constructional uniformity but, through a careful control of dissonant content. Stravinsky is certainly one of these composers, and it is not uncommon to find passages in his music which manifest a completely individual approach to the manipulation of polychordal materials. A typical illustration of his polychordal style, from his Symphony In Three Movements, appears in Example 165. It may be observed that the entire passage is constructed over a pedal G. Chord (1) consists of an implied* F minor harmony over a G major-minor chord. In chord (2)

* One of the characteristics of Stravinsky's harmonic style is his frequent use of chords which consist of a root, third, and octave. It may be observed that unless the basic harmony is meant to be perceived as an augmented or diminished triad, the absence of the fifth has little harmonic significance. The perfect fifth will still be subtly present in the overtone series generated by the root. This construction is more supple than a complete triad because the two different tones may function as either the root and third, or third and fifth of an implied harmony.

the F minor harmony is resolved, in the manner of an appoggiatura chord, into the G major-minor chord. Chord (3) is an implied F minor-A minor polychord. Chord (4) is an E major-minor chord which proceeds, like an embellishing chord, into a polychord consisting of an implied F minor harmony over an implied C major bass (chord 5). Chord (6) is an added-tone C major triad, while chord (7) is a polychord consisting of an implied F minor harmony over an implied E major harmony. And chord (8) is an E major-F minor polychord. This entire passage also effects a modulation from D to G through the use of one of Stravinsky's most favorite devices: a modulation resulting through the introduction of a pedal which ultimately becomes the tonic or dominant of the new key.

Example 165

Stravinsky, Symphony In Three Movements

106 ① ② ③ ④ ⑤

LOW W.W. ANT. BRASS

Vc. pizz.

marcato

107 ⑥ ⑦ ⑧

Va.

Vc.

sfz

Another typical illustration of Stravinsky's polychordal style appears in Example 166. In this illustration an E^b harmony over an A minor bass serves as a mat for a staccato seventh chord figure played by the piano.

Example 166

Stravinsky, Symphony in Three Movements

An excellent illustration of a compound polychordal texture can be found in W. Pijper's Piano Concerto (Ex. 167). In this illustration the piano plays two sets of parallel intervals (perfect fifths and minor thirds) moving chromatically in contrary motion. The resultant chords do not function as actual harmonies; they are only two strands of intervals which are propelled by a melodic force and finally resolve into an actual structural harmony (the A^b major triad). While the piano plays this passage the orchestra plays a series of harmonies of which the first is a chord with a whole-tone flavor and the subsequent harmonies are either triads, seventh chords, or ninth chords. Together, these various harmonies form a series

of chords with a decided polychordal flavor.

Example 167

Pijper, Piano Concerto



Passages involving mixed polychords are abundant in the music of Harris, Copland, Schuman, and Persichetti; a typical illustration, from Copland's Short Symphony, is quoted in Example 168. This passage consists of an A^b major seventh chord followed by a C major triad with an added C[#] in the tenor. The chord on the dotted quarter-note is a polychord consisting of an A major triad above a B minor bass. The last chord in the measure is a B^b major seventh chord, which evolves into a D major over B^b minor polychord through the introduction of an F[#]. The chord on the next quarter-note is an A seventh, spaced to resemble an A major-C[#] minor polychord. The last two chords in this measure are B^b seventh chords, which proceed to an A major-D major polychord. And the last chord is a B minor seventh chord in a quasi polychordal spacing.

Example 168

Copland, Short Symphony



Two typical illustrations of the compound polychordal textures used by Persichetti appear in Examples 168 and 170. In Example 169 an octave passage is periodically punctuated with various compound polychords. For instance, the first polychord consists of a G minor seventh chord above a four-note chord by fifths. It may be observed that this chord is spaced so that certain tones serve dual functions: the tones F and G, respectively, may be considered as the thirds of the implied D^b and E^b triads in the bass. The G minor seventh chord is also spaced in a manner which suggests two interlocked triadal units (B^b and G). The principle of having various tones serve dual functions is carried throughout the entire passage. The next chord is a D major triad sandwiched between an inverted five-note chord by fifths. The first chord in the next measure is an E major-C# minor polychord above a four-note chord by fifths. The next chord is a polychord consisting of a G# minor triad beneath an F# major triad. This chord is followed by a B major-G# major polychord. In the next measure the following polychords occur: C major-E minor above a C major bass; E major-C# minor over a G bass; the next chord is a repetition of the first; E major over D major; E major over C# minor (interlocked); C# minor-A major (interlocked) over an F major bass; E^b major with an added sixth, arranged polychordally, under a B major triad; and an A major triad over an F major bass. (The B^b and E^b in the bass are added-tones.)

Example 169

Persichetti, Four Hand Piano Concerto

In Example 170 various intervals, polychords, and chords by fourth and fifths are combined into one uniform texture.

Example 170

Persichetti, Fourth Piano Sonata

Example 170 (Cont.)



And one last illustration of a compound polychordal texture is quoted from Ives' song, "Walt Whitman". The passage begins with a polychord consisting of two minor triads (F and D#) in first inversion, followed by a compound chord. In the second measure a polychord consisting of C minor over B minor is followed by a compound chord which suggests the polychordal combination of a C minor triad with an added sixth beneath an added-tone A^b major-minor chord. The next chord consists of two seventh chords polychordally combined, followed by a polychord consisting of B^b major-D diminished (interlocked over an E seventh chord. This harmony proceeds to a polychordal arrangement of augmented triads on F and G. The next to last chord is a B^b minor-A^b augmented polychord with added tones in the soprano. And the final chord is a polychordal arrangement of augmented triads on F and G.

Example 171

Ives, "Walt Whitman"

Fast and in a challenging way

Who goes there? HAW-KER-ing, grows, mys-ti-cal and

Chapter IX

PARALLEL, REFLECTIVE, AND OBLIQUE HARMONIES

Parallel Harmony

Through a confusion in terminology the term parallel harmony has come to indicate two, and sometimes different, musical phenomena: Sometimes the term is used to indicate the manner in which harmonies are connected, while at other times it is used to signify that all the harmonies in a given passage possess the same construction. This point of confusion may be accounted for by the fact that chords connected in parallel motion very often possess the same construction. But, since there are occasions when similarly constructed harmonies are not connected in parallel motion, I shall try to avoid any ambiguity by indicating, when using the term, whether it refers to construction or connection.

Passages involving considerable parallel motion have a tendency to become boring in a relatively short period of time; and when the harmonies involved possess the same construction, this tendency is considerably increased. Composers who use parallelism must, therefore, do so with great discretion.

Ever since the period of Organum the perfect fifth has, in one way or another, played a considerable role in the music of the Western Civilization. Even though parallel perfect fifths were frowned upon from the fourteenth century until quite recently the fifth, through this entire period, still guided chordal progressions and thematic relations.

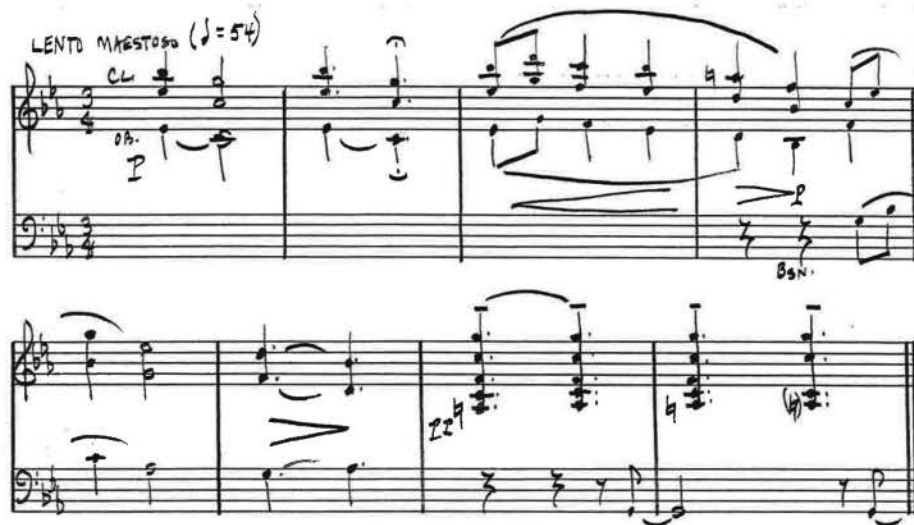
Although one can find isolated illustrations of parallel perfect fifths in such masters as Mozart and Beethoven, it is not until the period of the French Impressionists that the strong disdain for parallel perfect fifths is significantly removed.

Today parallel perfect fifths are used without hesitation. When they are used alone they have a tendency to become boring quite rapidly. Composers

therefore tend to use them only in short, isolated passages. For instance Copland's ballet, Billy The Kid, opens with a quiet theme in parallel fifths; but before they have a chance to become dull they proceed into a passage of parallel compound harmonies which, in turn, proceeds to a ninth chord spaced in a manner which emphasizes the interval of a perfect fifth.

Example 172

Copland, Billy The Kid



Sometimes the monotony of parallel fifths is avoided by the insertion of intervals, other than fifths, in the passage.

Example 173

Persichetti, The Hollow Men



Fifths are often used in the bass, under a voice (or voices) which moves in oblique or contrary motion (Ex. 174), or which is cast in an individual rhythmic pattern (Ex. 175).

Example 174

Bartok, Fourteen Bagatelles, Op. 6, No. 6



Example 175

Riegger, Twelve Pieces for Piano, "Tone Clusters"



Of course, fifths are also used in passages which suggest organum couplé

Example 176

Harris, Third Symphony



Chromatic fifths are more flexible than diatonic fifths, and are used a little more freely. However, even chromatic fifths will usually be accompanied by contrary motion in another voice.

Example 177

Harris, Soliloquy And Dance



When fifths result from voice leadings in chordal passages they are not as obvious as when they appear alone, since the character of the harmonies involved tend to attract one's primary attention. However, if these fifths continue for any length of time, they too will require special consideration. Such fifths in the soprano are extremely obvious, while those in the bass are a little less obvious. Fifths in the inner voices are the least obvious.

Many contemporary tone structures are voiced so that fifths appear in the bass. For instance, the series of seventh chords in the following illustration is spaced so that fifths appear in the bass. To help counterbalance this weighty bass the two upper voices move in contrary motion. (A similar illustration, but with more parallel motion, appears in Example 50.)

Example 178

Harris, Soliloquy And Dance



The same type of contrary motion against parallel fifths can also be found in the illustrations from Copland's Our Town (Ex. 52), and the fourth of Bartok's Fourteen Bagatelles (Ex. 105). In the following illustration from Harris' Fifth Symphony a greater interest in voice leading is achieved through the use of periodic inversions.

Example 179

Harris, Fifth Symphony



There will often be times when no effort is made to introduce contrary motion; however, such passages are usually very short. One might, in the nature of a refutation, quote this passage from Harris' Soliloquy And Dance, which is completely parallel.

Example 180

Harris, Soliloquy And Dance



However, the voicings in the previous passage have been designed more for pianistic expediency than to project fifths, per se. When the tempo and probable pedaling are taken into account, one is more apt to hear these fifths melting together to form a texture with a seventh and ninth chord flavor.

At one time or another almost every conceivable harmonic construction has been used as the basis for a passage of parallel harmonies. Sometimes the composer will find it necessary to make a slight change in the intervallic structure of one of the chords (such as changing a major third to a minor third, or a perfect fourth to an augmented fourth), but in the majority of harmonies the structure remains the same.

Of all the chordal structures used in parallel harmony, the triad has probably been the most significantly exploited. Countless illustrations of parallel triads can be found in the music of Vaughan-Williams. Two typical illustrations, both involving major triads, appear below.

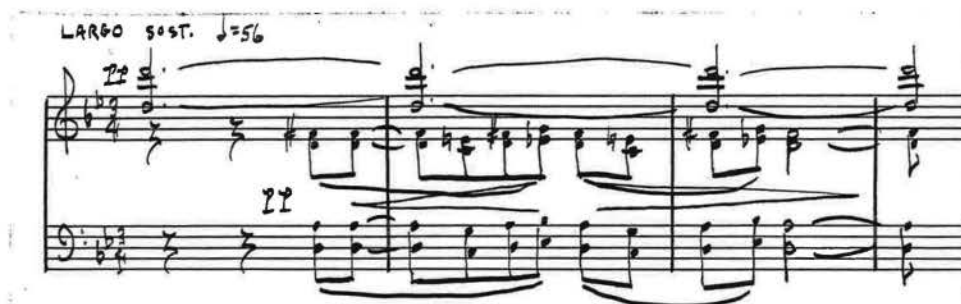
Example 181

Vaughan-Williams, Symphony In F Minor



Example 182

Vaughan-Williams, Fantasia On A Theme By Thomas Tallis



Another passage involving parallel major triads can be found in Bartok's opera, Bluebeard's Castle. This passage (Ex. 183) is even more significant since Bartok does not usually use triads in this manner.

Example 183

Bartok, Bluebeard's Castle



Gottfried von Einem also uses parallel major triads in his Acht Hafis-Lieder, Op. 5. In the illustration below parallel major triads appear over a staccato added-tone bass.

Example 184

v. Einem, Acht Hafis-Lieder, Op. 5



In the following passage, from Vaughan-Williams' London Symphony, a melody in the minor mode is harmonized with parallel minor triads.

Example 185

Vaughan-Williams, London Symphony



A fresh use of parallel minor triads can also be found in the ballet, Ancient Inscriptions, by the contemporary Italian composer Ludovico Rocca. In the first measure of the passage below, parallel minor triads in third

relationship progressions appear above a pedal point on C, and a scale passage in the Dorian mode. In the next measure the minor triads continue over the pedal point and an added-tone bass.

Example 186

Rocca, Ancient Inscriptions

The musical score for 'Ancient Inscriptions' by Rocca is written for a large ensemble. It includes parts for 4 Horns, 3 Trumpets, Basses, and Wagner Horns (W.W.). The score is in 3/4 time and features a complex harmonic structure. A pedal point on C is present, and a scale passage in the Dorian mode is shown. The score is marked with 'fff' (fortissimo) and 'ff' (fortissimo).

An interesting combination of major and minor triads appears in a sequential passage in Schuman's A Free Song.

Example 187

Schuman, A Free Song

The musical score for 'A Free Song' by Schuman is written for strings. It is in 3/2 time and features a sequential passage with a combination of major and minor triads. The score is marked with 'ff' (fortissimo) and 'mf' (mezzo-forte).

Chords by fourths are also frequently used in parallel motion. In the following illustration from Bartok's Fourteen Bagatelles, Op. 6, No. 11 a passage in parallel fourth chords cadences on a triad and then proceeds, through a unison figure, to a contrasting texture.

Example 188

Bartok, Fourteen Bagatelles, Op. 6, No. 11



Other illustrations of parallel fourth chords appear in the Buch der Hangenden Garten, No. 3 of Schoenberg. In the illustration below parallel, chromatically descending, chords by fourths appear below a voice in contrary motion.

Example 189

Schoenberg, Buch der Hangenden Garten, No. 3



Quite frequently even more complex harmonies (polychords, clusters, compound chords, etc.) are used in parallel motion. In the following passage, again from Schuman's A Free Song, a polychord is used as the basis for a series of parallel harmonies. In the last measure of the illustration the polychordal segments split and continue in oblique and contrary motion.

Example 190

Schuman, A Free Song



Two other unique polychords used in parallel motion appear in third movement of Persichetti's Fourth Piano Sonata, and in the song by Ives called "Indian". The polychord in the Persichetti illustration consists of a triad beneath a three-note chord by fourths, while the polychord in the Ives illustration consists of a minor triad above an incomplete seventh chord.

Example 191

Persichetti, Fourth Piano Sonata



Example 192

Ives, "The Indian"

Stravinsky often uses parallel harmonies in a polytonal setting. In the illustration below parallel major triads are imposed upon a G major mat.

Example 193

Stravinsky, Symphony In Three Movements

A very interesting illustration of parallel compound chords appears in the seventh of Bartok's Fourteen Bagatelles (Ex. 194). Here, the compound harmonies, resembling clusters, move in parallel motion above a broken chordal figure in the bass.

Example 194

Bartok, Fourteen Bagatelles



It is also quite common to find two strands of parallel harmonies moving in oblique or contrary motion. Sometimes the chords in both strands are similarly constructed (Ex. 195), while other times they are not (Ex. 196).

Example 195

Ives, "December"



Example 196

Schoenberg, Five Pieces For Orchestra



Parallel harmony gains an added interest when one or more parts are set against it. In the following illustration from Bartok's Sonatina parallel triads accompany an agile theme in the bass.

Example 197

Bartok, Sonatina



Another type of parallel accompaniment can be found in Schuman's Violin Concerto. Here the parallel harmonies are minor triads.

Example 198

Schuman, Violin Concerto

Other illustrations of parallel triads set against a voice in contrary motion can be found in Barber's Second Essay For Orchestra, Persichetti's Fourth Piano Sonata, and Ives' song, "The Seer". In the Barber illustration (Ex. 199) a series of major triads in first inversion appears over an added-tone bass and cadences on a chord by fourths. In the Persichetti illustration (Ex. 200) two lines, each with its own momentum, are pitted against each other. And in the Ives song (Ex. 201) a series of parallel augmented triads appears above chromatically descending minor sevenths.

Example 199

Barber, Second Essay For Orchestra



Example 200

Persichetti, Fourth Piano Sonata



Example 201

Ives, "The Seer"



I wish to quote also the passage from Bartok's Second Violin Sonata in which two lines of parallel thirds and sixths* are set against each other in contrary motion and finally lead to a passage involving major-minor harmonies.

Example 202

Bartok, Second Violin Sonata



* One is sometimes tempted to analyze thirds or sixth as incomplete triads. However in such passages those which appear in Examples 200 and 202, I believe the composer is not thinking in terms of incomplete chords, but simply of intervals with their own inherent textural quality.

There are also times when composers use similarly constructed harmonies throughout an entire passage without connecting them in parallel motion. Such passages possess an added interest, and do not become tedious as quickly as they would had the same harmonies been connected in parallel motion. For instance, the song "Lullaby For A Reluctant Sleeper" by Henry Leland Clark is based on major triads; however, they are not connected in parallel motion.

Example 203

Clark, "Lullaby For A Reluctant Sleeper"

LARGO (♩ = 48)

I WILL SLEEP NOW. I'VE

LOVED THIS DAY E-NUUGH. I'VE DRAINED ITS BEAU-TY DRY ITS DREDS ARE SWEET

Another interesting use of similarly constructed triads appears in Ives' song, "The Majority" (Ex. 204). It may be observed that while all the parts ascend, the harmonies actually descend in whole steps. (The roots of the respective chords are B \flat , A \flat , G \flat , E, and D.)

Example 204

Ives, "The Majority"



Another illustration of this device appears in Schuman's Undertow. Here again, the parallel major triads are not connected in parallel motion.

Example 205

Schuman, Undertow



And one final illustration comes from Rolf Liebermann's opera, Penelope. Here (Ex. 206) a twelve-tone melody is harmonized, for the most part, with major-minor seventh chords.

ANDANTE SOSTENUTO
dolce e tranquillo

DURCH den DICH-TUNG Wen den Kraft

Kehn-te Ich zu-rück zu dir.

Reflective Harmonies

I do not believe that there has been more discussion about a procedure which is so infrequently used as there has been concerning reflective harmony. And it is the wide-spread interest in the potential of these harmonies that causes them to be mentioned, not their preponderance in the contemporary literature. Reflective harmonies are, again, an attempt to bring logic to large harmonic structures. George F. McKay says, ". . . since all harmonic meaning is to be found through some form of mathematical coordination, an examination of the possibilities included in

a mathematical exact simultaneous inversion of chordal structures would reveal undiscovered harmonic interest or coordination."*

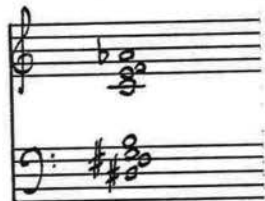
The essential difference between **reflective** harmonies and all other harmonies is the manner in which they are constructed: Most harmonies are constructed through a placement of tones at certain intervals above a given root; however, reflective harmonies are constructed through a simultaneous placement of tones both above and below a given tone of departure. I hesitate to call this tone a root since even though it is the tone from which all intervallic distances are calculated, it will seldom be the root of the resulting harmony. A simple illustration will clarify this point. Starting from middle C if one adds a major second (above and below), a perfect fourth (above and below), and a major sixth (above and below) the following harmony results:

Example 207



However the root of this chord is E not C. The reflective harmony in the previous illustration was conjunctly constructed. It is also possible to construct reflective harmonies disjunctly, i.e., from two different tones of departure. In the following illustration the construction is the same ascending from C as it is descending from B.

Example 208



* George F. McKay, The Technique Of Modern Harmony, p.82

The distance between the tones of departure may even be larger. In the following illustration the construction from treble clef C is mirrored from bass clef G.

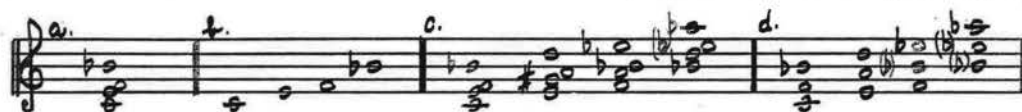
Example 209



Conjunctly constructed reflective harmonies are quite difficult to detect because of their resemblance to other types of chordal constructions (elevenths, thirteenth, polychords, compound chords, etc.). Disjunctly connected reflective harmonies, on the other hand, are more detectable, especially when the tones of departure are spaced widely apart.

Oblique Harmony

The term oblique harmony has been used to describe two different procedures: It is sometimes used synonymously with reflective harmony; but more often it is used to describe a species of harmony which results from the construction of a series of parallel harmonies upon an arpeggiated version of a chord. For instance, the compound chord in Example 210a can be separated into a broken chord (b). Then upon this chord can be built a series of harmonies with parallel construction. These parallel may (Ex. 210c) or may not (Ex. 210d) resemble the construction of the original chord.



Willem Pijper uses a modification of this device in his Third Piano Sonatina. In the illustration below parallel triads are built upon successive tones of a broken dominant seventh chord. (The ostinato in the bass lends a polytonal flavor.)

Example 211

Pijper, Third Piano Sonatina



Chapter X

POLYTONALITY, POLYMODALITY, AND POLYHARMONY

Polytonality

Polytonality is a procedure in which one simultaneously combines materials existing in, or normally associated with, two or more different tonal spheres. In the actual sense of the word polytonality suggests at least three different tonalities; however, through tradition, passages involving only two tonal spheres (bitonal) are still called polytonal. Some writers on the contemporary scene believe that with a fairly sensitive ear one can perceive each tonality in a polytonal passage, while others believe that polytonality is essentially perceived analytically, not orally; and a third group insists that in any so-called polytonal passage there can be only one tonal center, to which all other implied tonal centers must be subjugated. For instance, Hindemith says, "The game of letting two or more tonalities run along side by side and so achieving new harmonic effects is, to be sure, very entertaining for the composer, but the listener cannot follow the separate tonalities, for he relates every simultaneous combination of sounds to a root -- and thus we see the futility of the game. Every simultaneous combination of sounds must have one root, and only one; one cannot conceive of additional roots somewhere above, belonging to other tonal spheres. Even the craziest harmonic combinations can result in only one degree-progression.^[*] The ear judges the total sound, and does not ask with what intentions it was produced."^{**}

[*] In Hindemith's system the roots of large harmonic groupings are called degrees, and the pattern formed by their succession is called its degree-progression.

** Hindemith, The Craft Of Musical Composition, Vol. 1, p. 156

The principle of superposed tonalities is not actually a product of the twentieth century. One can find many passages in Bach where an accidental bitonality occurs through real canonic imitation. One can also find horizontally independent tonalities in Haydn and Mozart which result from passing harmonies, resolved and unresolved appoggiaturas, and retarded resolutions of various other ornamental tones. One can also find many illustrations of the simultaneous superposition of the tonic and dominant harmonies in Beethoven.

In the nineteenth century further indications of a growing interest in polytonality manifested itself through the frequent use of various pedal devices, ground motives, and appoggiatura chords. Typical illustrations of nineteenth century polytonality can be found in the hero's theme from R. Strauss' Ein Heldenleben (E^b major and C minor), and in Mahler's Lieder eines Fahrenden Gesellen. For instance, the Lieder (1-4) display the following superimposed tonalities:

- No. 1 D minor and G minor
- No. 2 D major and F# major
- No. 3 D minor and E^b minor
- No. 4 E minor and F major-minor

Many illustrations of early twentieth century polytonality can be found in the music of Charles Ives; however, when one thinks of the advent of twentieth century polytonality one instinctively recalls Stravinsky's Petrouchka. In this work the keys of C major and F# major are placed side by side (Ex. 212a), then combined in a tremolo (Ex. 212b), and then uttered simultaneously in seconds (Ex. 212c). This bitonalism has become one of the characteristics of his harmonic style; and there is hardly a score of his which does not contain it.

Example 212

Stravinsky, Petrouchka

a)



b)



c)



Another composer whose name is immediately associated with polytonality is that of Darius Milhaud. His music is characterized by a clearer, and sometimes ludicrous, type of polytonality. Two illustrations of his polytonal technique appear below. In the first illustration (Ex. 213) harmonies in B \flat major appear over an alternating tonic-dominant bass in G. In the second illustration (Ex. 214) a series of parallel 6-3 chords appears over a bass passage in F \sharp major.

Example 213

Milhaud, Poems juifs, "Chant du Laboureur"

Example 214

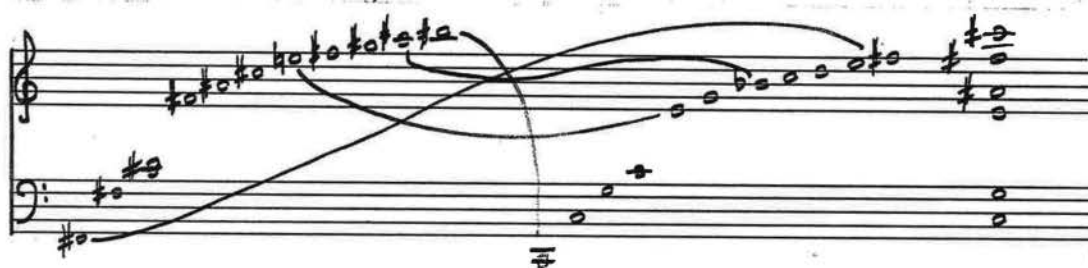
Milhaud, Christophe Colomb

Composers seem to consistently favor certain key relationships in polytonal passages. The ones most frequently used are those keys in second and tritone relationship. Or in other words, keys which are not closely related according to the circle of fifths. George McKay says, " . . . the first and most natural polytonal combination, and that which may be considered the first point of approach to the problem of polytonality, exists in the relationship of keys which are an augmented fourth apart."* And he goes on to say, "The closeness of relationship of these two keys

* George F. McKay, The Technique Of Modern Harmony, p. 73

may be thoroughly understood from an examination of the extended overtone series of each of them. . . . Thus the basic theory of polytonal relationships could depend upon such inter-relationships."* (The illustration to which he alludes is quoted below.)

Example 215



There are three basic types of polytonality: the chordal type, the pedal type, and the horizontal type. The chordal type consists of the superposition of harmonies which revolve about two or more different tonal spheres. Very often, passages composed of polychords tend to assume a polytonal flavor (Ex. 216). It is also possible for only one polychord to generate a polytonal passage. This procedure is clearly illustrated in the final cadence of Bartok's Studies, Op. 18, No. 1 (Ex. 217).

Example 216

Copland, Piano Concerto



* op. cit.

Example 217

Bartok, Studies, Op. 18, No. 1



Also in this category are those polytonal passages which are based on some single-unit, resonant harmony (such as chords by thirds). In the following illustration the oboe and flute sing a melody in the Lydian mode, while the harpsichord plays two lines of sixths, one in A minor and the other in a G mode, which together form resonant added-tone seventh chords.

Example 218

De Falla, Concerto For Harpsichord And Various Instruments

Polytonal passages arising through the use of various harmonies in conjunction with pedal devices are quite common. If one examines the passage in Example 219, it may be observed that a melody in F# Mixolydian is combined with a double pedal point suggesting G major.

Example 219

Bartok, Ten Easy Pieces, "Dedication"



A similar passage occurs in the first of Bartok's Three Burlesques, Op. 8c. In the following illustration from this piece a melody in F# major appears above an ornamented pedal point.

Example 220

Bartok, Three Burlesques, Op. 8c



Also in this category are those polytonal passages which result from the combination of various harmonies over a ground motive. For instance, the melody from Schuman's Undertow, which was first harmonized with parallel major triads (Ex. 205), later returns in the following manner:

Example 221

Schuman, Undertow



It may be observed that the melody, in E^b major, is accompanied by a voice containing appoggiaturas, both of which appear over a tonic-dominant ground in E.

Another illustration of this type of polytonality appears in Example 222. One of the characteristics of Revueltas' harmonic style is his propensity to establish an ostinato or a ground motive which is clearly in a given key, and then to have bursts of short declamatory motives appear in other keys. This device is significantly exploited in his music for the film The Wave, and also in his Janitzio, and Caminos.

Example 222

Silvestre Revueltas, Quauhnahuac

The horizontal type of polytonality results from the combination of various melodic lines which are normally associated with two or more different tonal centers. This type of polytonality is very often the result of real canonic writing.

In the following illustration from the Bartok Esquisses (Ex. 223) two lines, one suggesting E minor and the other A^b major, are combined.

Example 223

Bartok, Esquisses

A more complex illustration, from Berg's opera, Wozzeck, appears in Example 224. In this illustration the upper parts revolve around E^b major, while the lower parts strongly suggest G minor.

Example 224

Berg, Wozzeck



Illustrations of polytonal passages which result from real canonic writing appear in Alan Hovhaness' Saint Vartan. In this work polytonal canons appear in nine of the twenty-four movements. Another illustration is the polytonal fugue in Barber's Second Essay For Orchestra, while others can be found in Ives' Song Of The Harvest Season. Here the voice, cornet, trombone, and organ are each written in a different key.

Polymodality

The essential difference between polymodality and polytonality is that polytonality indicates that two or more different tonal centers are involved with no reference to whether the modes built on these tonal centers are identical or not. Polymodality, on the other hand, indicates that two or

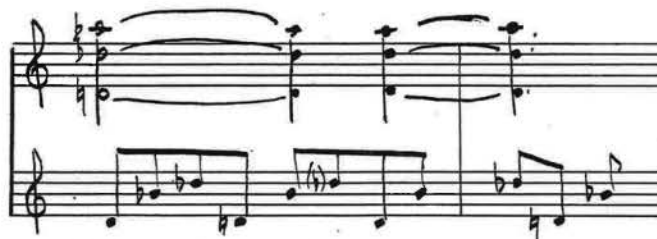
more different modes are involved, but with no reference to whether each is constructed on the same or different tonal centers.* Polymodality also suggests that one of the modes involved is not the major mode. The possible polymodal combinations are as follows:

- Same tonic - Different modes
- Different tonics - Same modes (but not major)
- Different tonics - Different modes

The most common type of polymodality in which two different modes are constructed on the same tonic is the major-minor type. Many illustrations of this type of polymodality appear in the chapter on polychords (Chapter VIII), and two more are quoted below. In the illustration from Stravinsky (Ex. 225) the modes involved are B^b major-minor, and the modes in the Bartok illustration (Ex. 226) are D# major-minor. In both illustrations the polymodality results from the use of major-minor polychords.

Example 225

Stravinsky, Symphony In Three Movements



* To be technically correct, passages involving two modes are bimodal, not polymodal. However, the term polymodal is often used to describe bimodal passages, just as the term polytonal is often used to describe bitonal passages.

Example 226

Bartok, Ten Easy Pieces, No. 7



Illustrations of different modes constructed on different tonics are fairly common. Three illustrations appear below. The first (Ex. 227) involves the Mixolydian on G over the Ionian on E \flat ; the second (Ex. 228) involves the Aeolian on C \sharp over the Phrygian on C; and the third (Ex. 229) involves a suggested Aeolian on A over a free mode on F.

Example 227

Vaughan-Williams, Pastoral Symphony



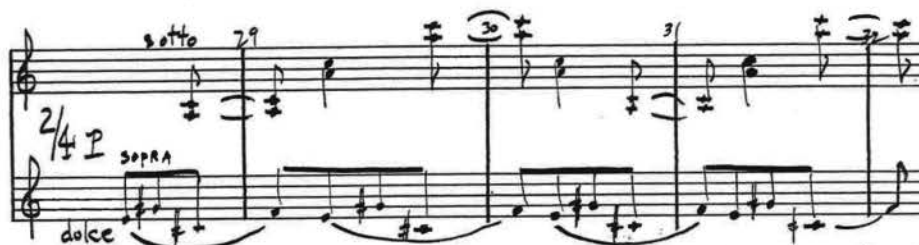
Example 228

Bartok, Fourteen Bagatelles, Op. 6, No. 1



Example 229

Bartok, Ten Easy Pieces, No. 4



It goes without saying that all of the devices applicable in polytonal passages are also applicable in polymodal passages.

Polyharmony

The term polyharmony is another term which is used to describe two different harmonic devices. Most often it is used to describe a polychordal passage in which all of the harmonic units exist in the same mode, usually the major mode (Ex. 230); however, the term is also used to describe the combining of chords in the same or different keys in such manner that each moves as if it were sounding alone (Ex. 231).

Example 230



Example 231

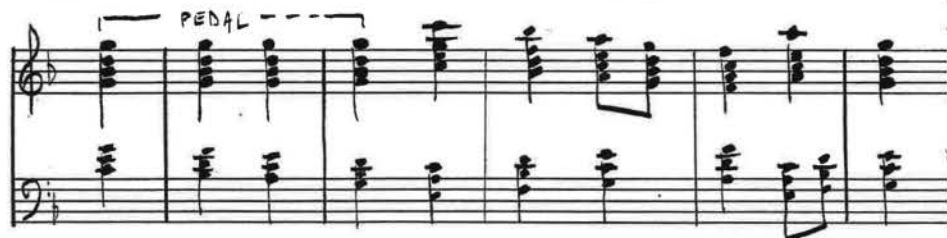


A typical illustration of polyharmony appears in this quotation from

Petrouchka.*

Example 232

Stravinsky, Petrouchka



* Humphrey Searle, in his Twentieth Century Counterpoint, p. 23, says that this passage consists of two part contrapuntal writing with each part thickened-out to common chords.

Chapter XI

HARMONY AND THE TWELVE-TONE TECHNIQUE*

The twelve-tone technique of composition is neither tonal nor atonal in itself, since even in a strict manipulation of the series both tonal and atonal music may be produced. The two essential factors which govern the degree to which a work is tonal are the tonal implications contained in the series, and the manner in which the series is treated by the composer. It must be understood that strict serial writing does not insure atonality anymore than the use of simple triads guarantees logical and well organized harmonic progressions.

The essential difference between tonal and atonal music is the function which harmony plays in each. In tonal music the function of harmony is architectural organization. The immediate functions of harmony, such as supporting thematic material or connecting one musical idea with another, are small components in a large pattern of relationships; each harmonic unit, from the smallest to the largest, is an essential portion of the entire architectural shape of the work. In atonal music, on the other hand, harmony serves only immediate functions, not formal ones.** Here the function of harmony is to subdivide musical space, to emphasize a climax, or to make the texture more sonorous.

At this point the following question is usually raised: Since the harmonic relations which control the architectural shape of a work are absent, or are at least non-functioning, in an atonal work what besides

* In discussing the harmonic manifestations of the twelve-tone technique and its influence upon twentieth century harmonic practice, this writer assumes that the reader is familiar with the basic principles of the technique; since it is inconceivable that any serious musician, whether he be teacher, student, performer, or composer has not investigated a procedure which will probably go down in history as the greatest single achievement, or deficiency, in the music of the twentieth century.

** Unless there is a deliberate attempt to the contrary

thematic unity is used to achieve architectural organization? The answer is, of course, the perpetual revolution of the series; the unity derived from one system of organization has been replaced by the unity derived from another. The tonality which exists in strict serial music is, therefore, inconsequential unless it serves an architectural function. This leads to a more direct and clearer definition of atonality. Atonality is not the negation of tonality in that there exists no harmonic subservency of one tone to another, or that there exists no harmonic relationship between adjacent constructional units; atonality means that these relationships serve no architectural function.

In the twelve-tone technique any combination of three or more different tones is considered a legitimate chord. And since these chords have no harmonic (tonal) obligations, only their texture and tension need be considered.* The majority of harmonic structures used in strict twelve-tone writing can usually be classified as either compound chords or chords by fourths, fifths, or seconds. Chords built in thirds are usually avoided because of their affinity to the major-minor tonal system. A typical illustration of atonal harmonic structure appears below.

Example 233

Schoenberg, Fourth String Quartet

The musical score for Example 233, Schoenberg's Fourth String Quartet, is presented in four staves. The notation is complex, featuring various intervals and chords. The score is divided into measures, with some measures containing multiple notes and others containing rests. The overall texture is dense and complex, characteristic of Schoenberg's twelve-tone technique. The notation includes notes, rests, and dynamic markings. The score is divided into measures, with some measures containing multiple notes and others containing rests. The overall texture is dense and complex, characteristic of Schoenberg's twelve-tone technique.

* A discussion of the texture and tension of chords appears in Chapter 1.

Various twelve-note chords have been discussed in the chapter entitled "Compound Chords", however there has been little effort to exploit these harmonies in tonal music. The use of these chords in atonal music, on the other hand, has been more significant since they possess an added meaning by containing, in one chord, all twelve notes of the series. Illustrations of twelve-tone chords can be found in Berg's Five Orchestral Songs, No. 3 and in Humphrey Searle's Poem, for twenty-two strings.*

The chords in atonal music arise through contrapuntal part writing or directly from the series itself. The harmonies which result from contrapuntal part writing resemble first species counterpoint in that all voices essentially have the same rhythm. The following serves to illustrate:

Example 234

Schoenberg, Wind Quintet, Op. 26



* The final chord of Searle's Poem is a twenty-four note chord, comprised of all of the tones in the Original and Inverted forms of the series.

The process of deriving chords directly from the series is called telescoping, and is based on the principle that consecutive tones of the series may appear in both the horizontal and vertical dimensions. A typical illustration of the series functioning in both the horizontal and vertical dimensions appears below. It is taken from Rudolf Wagner-Régeny's* Mythologische Figurinen, which are three dances for orchestra.

Example 235

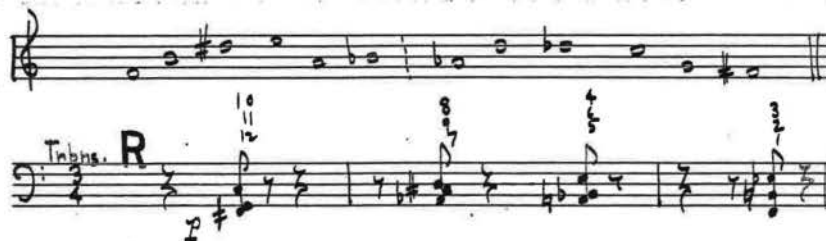
Wagner-Régeny, Mythologische Figurinen



Other clear illustrations of telescoped chords can be found in Riegger's Third Symphony (Ex. 236) and in Schoenberg's Serenade, Op. 24 (Ex. 237). In both of these illustrations the series is used entirely in a harmonic fashion.

Example 236

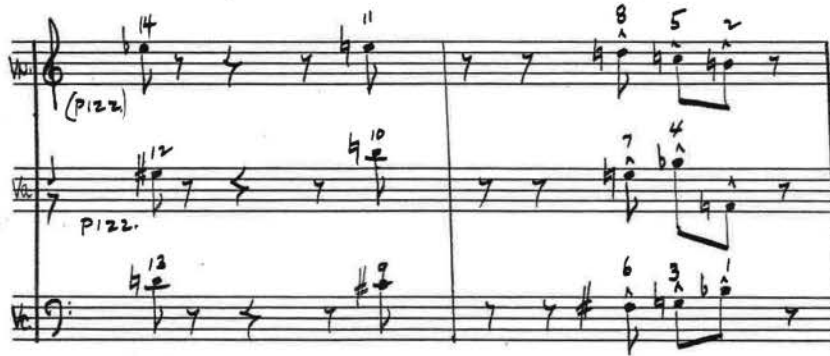
Riegger, Third Symphony



* Rudolf Wagner-Régeny is a contemporary German composer, born in Transylvania, now living in Berlin.

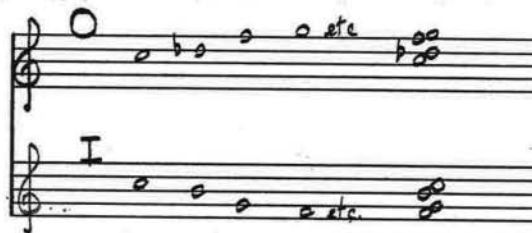
Example 237

Schoenberg, Serenade, Op. 24



Harmonies can only be derived from two forms of the series (O and I, or R and RI),* since O and R, and I and RI produce identical harmonies, except in reverse order. While the harmonies derived from O or I (or R and RI) will have different constructions, it is evident that a mirror relation exists between them.

Example 238



It is possible through the use of telescoped chords to have one series evolve into another. Thus these telescoped chords become a pivot between each series, and serves to bind the two together. This device has been

O represents original, I represents inversion, R represents retrograde, and RI represents retrograde-inversion

used by Berg in his opera, Lulu. The series upon which the opera is based (Ex. 239a) is telescoped into four chords (Ex. 239b). Then another series (Ex. 239c) is derived from these chords by using the uppermost tone in each successive chord to begin the series and continuing in like manner until the full twelve-note series is reached.

Example 239



Further structural variety in harmonies directly derived from the series is usually achieved through changes of octave position of chordal factors, rearrangement of note-groups, exchange of tones between primary and accompanying parts, combining two or more forms of the series, combining two or more series, or through extracting certain tones from the series and using them as a pedal chord. In the following illustration from the last movement of Schoenberg's Fourth String Quartet harmonic variety is achieved through octave changes in the position of chord factors. This procedure resembles the use of inversions in the tonal system.

Example 240

Schoenberg, Fourth String Quartet



One of the techniques used by Schoenberg was to divide the series into two, three, or four note-groups. These groups then function as small independent series, and were used interchangeably with each other. The harmonic variety inherent in such a device is clearly evident in the following example.

Example 241

Schoenberg, Wind Quintet, Op. 25

A passage from the Serenade, Op. 24 illustrates the harmonic variety derived from the simultaneous use of two or more forms of the series.

Example 242

Schoenberg, Serenade, Op. 24

And the use of a pedal chord appears in the first movement of the Quintet.

Example 243

Schoenberg, Wind Quintet, Op. 26

The implications offered by the twelve-tone technique for the exploration and development of various musical materials are so large that many of the atonal composers who have followed Schoenberg, Berg, and Webern have taken a special interest in one or two specific areas of exploration. For instance Luigi Dallapiccola is extremely interested in melody, while Boris Blacher is primarily concerned with rhythm. Searle and Krenek are interested in a manipulation of various note-groups within the series, and George Rochberg has made a significant contribution with his book on the construction of the hexachordal series.* However, the name most pertinent to this study is that of Hanns Jelinek who, along with investigation of melody, has done the most to formulate and conceptualize a theory of atonal harmony. In his recent book on atonal harmony** he makes the following distinctions:

- Horizontal dodecaphony - where the series appears in one or more voices successively (the melodic dimension)
- Vertical dodecaphony - where the series is simultaneously divided between all voices
- Broken dodecaphony - where the series is divided into segments (note-groups) and used simultaneously in various voices

Jelinek has attempted to achieve added architectural unity by combining the unity presented by the constant repetition of the series with the unity achieved through the use of tonally oriented, telescoped chords. Kurt Blaukopf has said that, "Vertical dodecaphonism in conjunction with tone-repetitions create a feeling of familiarity in the listener that can hardly be attained by a rigid and purely horizontal application of the twelve-tone technique. The composer of the Symphony brevis seems in fact to be eager to bridge the gulf that separates the public from the advanced technical resources by building clear formal structures without impairing the dodecaphonic principle. . . .*** A typical illustration of Jelinek's

* George Rochberg, The Hexachord And Its Relation To The Twelve Tone Row

** Hanns Jelinek, Anleitung Zur Zwölftonkomposition, (Universal Ed.)

*** Music Quarterly, Vol. 37, No. 3, p. 415

Example 244

Handwritten musical score for "Allegro Moderato" in 2/4 time. The score is written on ten staves, with the first two staves for piano (p.) and the remaining eight staves for violin (v.). The tempo is marked "ALLEGRO MODERATO" with a quarter note equal to 66 beats per minute. The key signature is one flat (B-flat major or D minor). The score includes extensive fingerings, slurs, and performance markings such as "Imp. xyloph." and "STR. V. PAN.".

Example 244 (Cont.)



There are almost as many variations in twelve-tone writing as there are twelve-tone composers. Even a superficial comparison of Schoenberg with his two most famous pupils, Berg and Webern, will readily indicate that the twelve-tone technique is compatible with a variety of musical styles.

Most of the present day variations, expansions, or refinements in the technique can be directly traced to devices used by either Schoenberg, Berg, or Webern. When these three composers are taken as a group, Schoenberg appears to be the master of classical atonality. He is the trunk from which all branches grew. Webern, on the other hand, has even further refined the technique so that each note is an indispensable unit in the overall shape of the piece. Webern's pointilistic style has had a profound influence on many of the young German, Italian, and French atonalists. In fact, many of them believe that while Schoenberg is the point of departure, it is not until Webern that the real fruits of the technique are realized. Unlike his fellow pupil, Berg did not make an effort to rarefy any superfluity which might have existed in Schoenberg. Berg's position is that he is the link, or common denominator, between tonality and atonality; and it is his music which has had the greatest influence upon composers who use the technique in a tonal manner.

Berg did not try to avoid tonal implications in series construction. And the tonal implications in a series must make themselves manifest in a piece of any length. For instance the series in his Violin Concerto (Ex. 245a) begins with eight successive thirds, and ends with a whole-tone

scale fragment. The thirds can be divided into four overlapping triads, or various other tertiary harmonies. Tonal implications such as these cannot and were not meant to be hidden. One can see by examining the passage in Example 245b that the composer has made no effort to disguise or hide the tonal implications inherent in this series.

Example 245

Berg, Violin Concerto

a)



b)



Another series with strong harmonic implications can be found in Rolf Liebermann's Symphony No. 1. This series can be divided into four triads, or three seventh chords.

Example 246

Liebermann, Symphony No. 1



Another illustration of the series used in a tonal manner can be found in the fourth movement of Matyas Seiber's cantata. The movement is constructed around a two chord quotation from Schoenberg.** To these two chords Seiber has added two complementary chords; and together, these four chords contain all twelve notes of the series.

The musical notation shows the first four chords of the exercise on a single staff. Chord I is a D major triad (D, F#, A). Chord II is a D minor triad (D, F, A). Chord III is a D major triad (D, F#, A). Chord IV is a D major triad (D, F#, A). The notes are written as whole notes.

Example 248

Handwritten musical score for "The Amen". The score is written on two staves. The top staff is for Tenor, and the bottom staff is for the Orchestral part. The Tenor part begins with a treble clef and a key signature of one sharp (F#). The lyrics "to - men - - - - - sion" are written below the notes. The Orchestral part is written for piano (P) and includes a bass line with a key signature of one flat (Bb). The score is marked with various musical notations, including notes, rests, and dynamic markings like "P" and "pp".

* Josef Rufer, Composition With Twelve Notes, pp. 192-193
** Piano Pieces, Op. 19, No. 6

harmonies play a larger role in their music than they normally would in a contrapuntal system. One such device, introduced and developed by Wolfgang Fortner, is called modal derivation. The justification for this device lies in the fact that in Schoenberg one can find many series which begin melodically but end in a telescoped chord. According to this principle Fortner extracts a certain number of tones from the series and uses them as an ostinato, or "fixed harmonic field" as he calls it. The remaining tones are then rearranged into a mode which no longer follows the order of the original series. A clear illustration of this device appears in Die Weisse Rose (Ex. ²⁴⁹284). In this illustration the tones A^b, C, G, and D^b constitute the fixed harmonic field. The eight remaining tones are arranged in a mode which appears in a variety of ways (O, I, R, RI, altered, dismembered, etc.). The harmonic implications of such a device are obvious.

Example 249

Fortner, Die Weisse Rose



The contemporary German composer Hermann Heiss also uses a device which creates a strong feeling of tonality. The series in his Simfonia atematica (Ex. 250a) is arranged to form a pattern of intervals, tones, and chords (Ex. 250b). This pattern is then used as the series (Ex. 250c). Heiss calls this device a "Klangliches Kontinuum"*.

* Sound continuum

Example 250

Heiss, Simfonia atematica



Winfred Zillig is another contemporary German composer whose atonal style is strongly rooted in harmony. He has said, "Many of my series produce, from the harmonic point of view, possibilities of building chords in thirds, triads, sevenths or ninths, and also piled-up triads; I am coming more and more towards the mysterious and compulsive connection with tonality, so that tonality might prove to be a special case of twelve-note music, just as the church modes were a special case of tonality."* In his opera, Das Opfer, he telescopes the series into four triads, of which two are major and two are minor.

Example 251

Zillig, Das Opfer

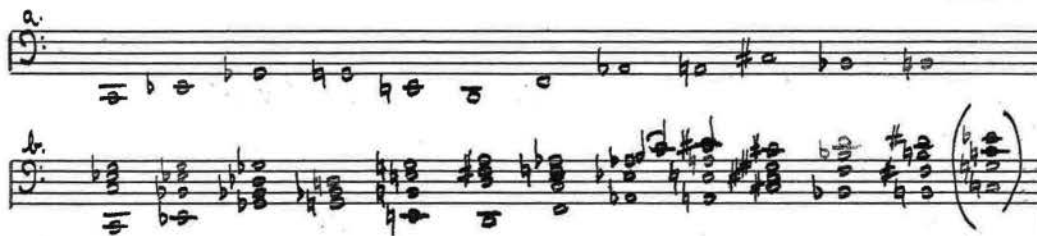


* Josef Rufer, Composition With Twelve Notes, p. 201

Because the twelve-tone technique is a linear system, it has had a considerable influence on the melodic writing of many composers, even those who are not essentially atonal composers. Such devices as melodic inversion, retrogression, or the casting of the same sequence of tones in various rhythmic guises has become a standard contemporary procedure. The use of complete twelve-tone series can even be found in works which are entirely tonal. Virgil Thomson, for instance, states a series in A Solemn Music (Ex. 252a) which is then harmonized with major and minor triads (Ex. 252b). Henry Cowell says that "From the standpoint of tonality the triads in A Solemn Music are haphazard, as they do not define any key or series of keys, and they suggest no tonic, no dominant. Their existence depends on the fact that their basses form a row and it is this row that really gives them unity."^{*}

Example 252

Thomson, A Solemn Music



Another illustration of tonally oriented twelve-tone music can be found in the third movement of Walter Piston's Partita For Violin, Viola, And Organ. The movement is based on triads in second and third relationship, which also display considerable chromatic movement.

^{*} Music Quarterly, Vol 35, No. 4, p. 622

In all probability the present division of twelve-tone composers into those who stem from Webern and those who stem from Berg will continue; and to what extent the latter group will combine the twelve-tone technique with the various harmonic structures exploited in the first half of the twentieth century remains yet to be seen. However, many scholars believe that the second half of this century will be characterized by a colossal amalgamation of techniques and materials, and that the rewards of a considerable period of experimentation are immediately before us.