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Melodic doubling is a special effect used sparingly by composers to color and reinforce lines. The foregoing examples show typical applications of the device in isolated passages from larger works where it is appropriate and useful.

### Suggested Assignments

1. Illustrate each distinctive twentieth-century melodic practice cited in the text with a melody copied from a contemporary composition. Other themes from the sources of the examples in the chapter may be used.
2. Write idiomatic melodies for various instruments exploiting some of the possibilities suggested in the section on nonvocal melodic lines.
3. Make a table of Messiaen's modes of limited transpositions showing each of the seven modes starting on C and on ascending semitones until the pitch content of the first transposition is repeated.
4. Analyze a passage from a Messiaen work to determine whether or not its pitches are derived from one of the modes of limited transpositions. Identify by number any modes that are detected.
5. Write melodies using scale patterns from the examples. Invent additional scales and compose melodies using them.
6. Write melodies exploiting the principles of free tonality. In these melodies pay particular attention to contour, organization, and to the element of unity which otherwise may be lacking.
7. Write melodic lines influenced by contemporary harmonic structures.
8. Listen to a recording of the second movement (*Giuoco delle coppie*) from Bartok's *Concerto for Orchestra*. Analyze the intervals between parts involved in melodic doublings by ear or from the score.
9. Devise effective doublings for original or borrowed melodies. Original melodies may be drawn from previous assignments.
10. Read "Sketch of a New Esthetic of Music" by Ferruccio Busoni in *Three Classics in the Aesthetic of Music* (Dover Publications, 1962) or in *Contemporary Composers on Contemporary Music* edited by Elliott Schwartz and Barney Childs (Holt, Rinehart and Winston, 1967).

## Rhythm and Meter

THROUGHOUT this century rhythm has been less restricted and more varied than in any prior period or style since time signatures and bar lines came into general use. These conventions of notation and the constant metric accent patterns associated with them severely inhibited rhythmic flexibility in the past. On a larger dimension the four-measure phrases which became standard were also an inhibiting factor. Though time signatures, bar lines, metric accents, and four-measure phrases are still used, their tyranny over rhythmic organization was broken early in the century by composers revolting against arbitrary restrictions and seeking means to express innovative rhythmic ideas. They devised many ways of circumventing the limitations implicit in our notational system and explored many fresh approaches to the organization of time and durations in music. Complete rhythmic freedom is now taken for granted. Cataloging all of the new devices is not feasible, but a survey of the more fruitful trends will suffice as an introduction to twentieth-century rhythm.

### Nonmetric Rhythms

*Proportional notation*

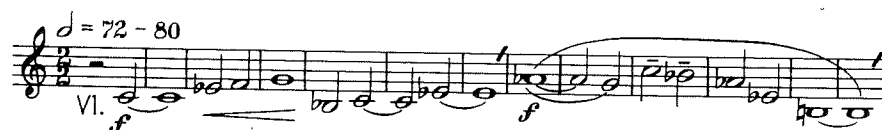
Traditionally, music is written in a constant meter specified by a time signature. Bar lines define metric units, and beats immediately following bar lines are accented. Music theory also establishes a hierarchy of secondary accents and unaccented beats. Generations of composers wrote music applying these principles; performers are still taught to observe them; and listeners are expected to perceive them. A wealth of music has been composed embodying these rhythmic concepts, but their limitations are obvious.

*Pyramidal Song  
Radio Head*

One way to circumvent such limitations is to preserve bar lines solely as a convenience of notation, disregarding in composition and performance any metric or accentual implications they formerly had. The effect is to create music without audible bar lines which is essentially nonmetric. This idea is not new. It existed in plain chant and in the vocal music of the sixteenth century. Renewed interest in sixteenth-century vocal polyphony has done much to revive it. In the absence of metric accents, notes which are approached by leap, prolonged, or embellished become functionally equivalent to the notes on metric accents, but being independent of the meter they may come any place in the measure.

The metric divisions indicated by the time signature and bar lines in Example 69 cannot be detected in performance. Ties across bar lines obliterate the metric accents and produce a subtle, free-flowing rhythm in which the phrases of seven measures and six measures sound neither irregular nor extended. The phrase divisions, which otherwise might be ambiguous, were marked by the composer as shown.

Ex. 69 HARRIS: *Symphony No. 3* (1938) p3



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Example 70 illustrates the same type of rhythmic feeling, though the stresses start to coincide with the bar lines at the end. Often, as in this example, nonmetric rhythms are integrated with metrically oriented patterns. Internal repetitions create the impression of extensions, but phrase divisions are not clearly defined.

Ex. 70 SCHUMAN: *Symphony No. 3* (1941) p46



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In the interpretation of nonmetric music, phrasing and articulation marks assume added importance, because the performers' instinctive responses to rhythm and those associated with metric music are not valid. Eliminating or camouflaging the effect of bar lines by ties is only one of the ways rhythmic flexibility is achieved in modern music.

## Shifting Accents *not side story*

Rhythmic flexibility can also be achieved by shifting accents from their normal location in the metric pattern to some other beat or fraction of a beat by means of articulation and phrasing marks that do not coincide with the metric divisions. Shifting accents can be, and frequently are, reinforced in the texture and scoring.

In the Walton example, accent marks on certain second and third beats and slurs joining pairs of quarter notes serve to shift the stresses from their normal location in the measure and to create a temporary, 2/4 meter effect.

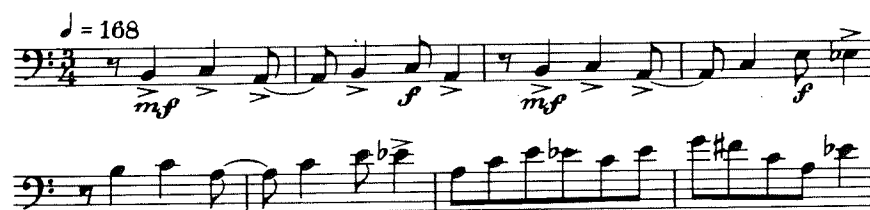
Ex. 71 WALTON: *Symphony No. 1* (1935) p106



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Accents can be displaced a fraction of a beat in conjunction with synopated rhythms, a possibility illustrated in Example 72.

Ex. 72 STRAVINSKY: *Firebird Suite* (1910) p24



Sometimes an accent shift is associated with a rhythmic or melodic pattern that does not conform to the meter. The accents in Example 73 coincide with the repeated high points in the line but shift in relation to the beat.

Ex. 73 STRAVINSKY: *The Rite of Spring* (1913) p30



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The accented beginning of the descending figure in Example 74 comes a sixteenth later in each measure.

Ex. 74 COPLAND: *Symphony No. 3* (1946) p131



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Note groupings foreign to the meter are not always marked by accents. Unaccented groupings of this sort are indicated by phrasing marks or by beams joining notes within a group. Since phrasing marks also indicate bowing in string music, Schoenberg uses beams in his *String Quartet No. 4* to delineate groups of notes that extend over beats and bar lines.

Ex. 75 SCHOENBERG: *String Quartet No. 4* (1936) p59



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Bowing is not a factor in the following example from a Bartok piano piece, but he beams together groups of sixteenth notes which shift position in relation to the beat. Other interpretations are possible, but the notation suggests that each group is to be played in the same way. This in effect shifts the location of any accents, real or implied, in reference to the notated beats and bar lines, which would not be perceived by listeners.

Ex. 76 BARTOK: *Mikrokosmos, No. 146—Ostinato* (1926–37)



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Walton makes extensive and imaginative use of rhythmic shifts in *Belshazzar's Feast* from which Example 77 is taken. The accents do not agree with the meter or comply with any consistent pattern. On the contrary, they occur on every beat and half beat of the measure in the course of this brief excerpt.

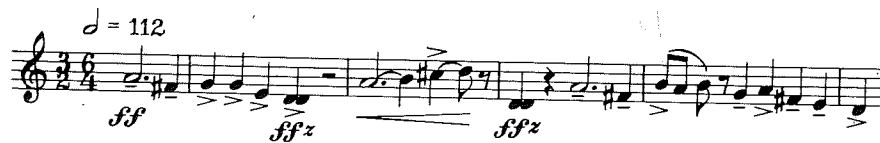
Ex. 77 WALTON: *Belshazzar's Feast* (1931) p70



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Roy Harris capitalizes on the fact that 3/2 and 6/4 measures have the same number of quarter notes but different secondary accents to write a theme with an unusual rhythm. Each measure of Example 78 fits into one pattern or the other, but mixing them adds a unique touch. The irregularly spaced accents cannot be anticipated or the location of the bar lines perceived aurally in this five-measure phrase.

Ex. 78 HARRIS: *Symphony No. 3* (1938) p56



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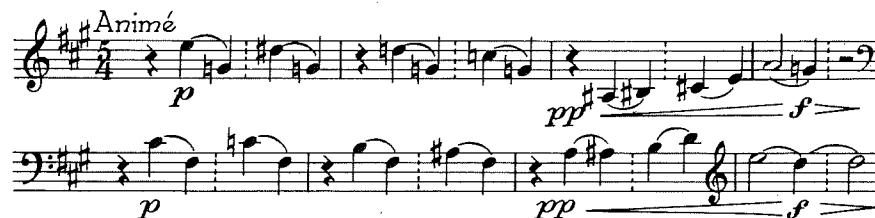
Momentarily displaced accents producing rhythmic units of unequal duration have been illustrated in the preceding examples. When a pattern of unequal durations within a measure is used consistently, an asymmetric meter results.

Asymmetric Meters *Brubeck*  
*Blue Rondo Alla Turca*

One of the first asymmetric meters to be used was 5/4. Measures in 5/4 meter can divide either 3-2 or 2-3. Though it is not usually neces-

sary, divisions within measures can be indicated by dotted bar lines, as Ravel does in *Daphnis and Chloe*.

Ex. 79 RAVEL: *Daphnis and Chloe, Suite No. 2* (1911) p87



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Piston places the accent marks in his *Divertimento* to suggest a 2-3-2 division of the 7/8 measures.

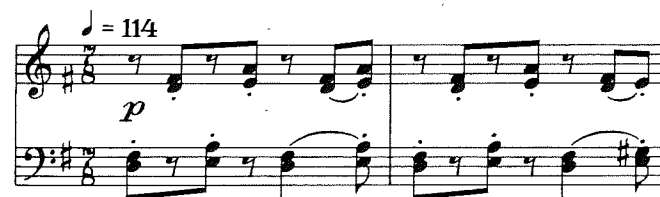
Ex. 80 PISTON: *Divertimento* (1946) p1



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The beams and slurs in the following 7/8 example imply 2-2-3 or 4-3 divisions.

Ex. 81 BARTOK: *Mikrokosmos, No. 82—Scherzo* (1926-37)



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Stravinsky divides 9/8 measures asymmetrically 4-5 and then 5-4. The time signatures are shown in the example as they appear in the score.

Ex. 82 STRAVINSKY: *The Rite of Spring* (1913) p31



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The measures of Example 83 contain eight eighth notes, the same number as in 4/4 meter, but the time signature explicitly groups them in an asymmetric pattern that is maintained throughout the piece.

Ex. 83 BARTOK: *Mikrokosmos, No. 153—Dance in Bulgarian Rhythm* (1926-37)



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The number of eighth values in the measures of Example 84 is nine, the same as in 9/8 meter, but again Bartok specifies an asymmetric division which is constant for the entire first part of the movement from which the example is taken.

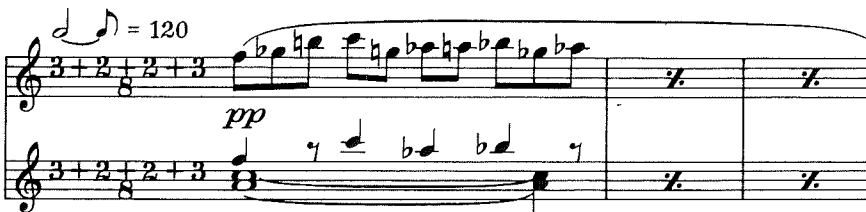
Ex. 84 BARTOK: *String Quartet No. 5* (1934) p31



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In the trio of the same movement Bartok adds an eighth value to the measures for a total of ten, which he also divides asymmetrically.

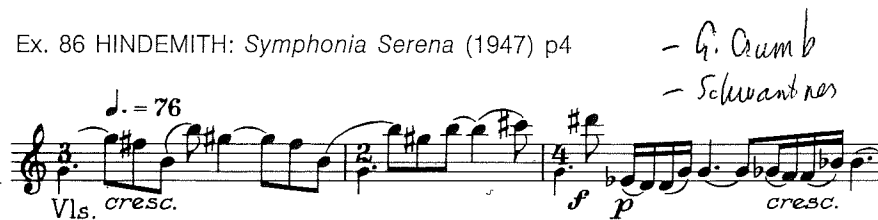
Ex. 85 BARTOK: *String Quartet No. 5* (1934) p35



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Many unusual time signatures are encountered in contemporary music. Several have already been illustrated. Other possibilities include the use of a small unit such as a sixteenth or a thirty-second for the beat and the use of meters which involve unusual numbers or fractions of beats. Such time signatures ordinarily have the same logical basis as conventional time signatures, and interpreting them poses no special problems. Jaques-Dalcroze conceived the idea of substituting a note symbol for the lower number in time signatures. This system is practical for any meter but is particularly advantageous when the true beat is a dotted value. Carl Orff adopted it for his *Catulli Carmina*. He writes the time signature above the staff with a line between the number and the note symbol. Hindemith uses the system intermittently in the first movement of his *Symphonia Serena*. He places the symbols on the staff like a conventional time signature, as shown.

Ex. 86 HINDEMITH: *Symphonia Serena* (1947) p4



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The preceding example introduces not only a new type of time signature but also another source of rhythmic variety—changing time signatures.

## Changing Time Signatures

Some of the less inspired music of the past creates the impression with its regular metric accents and evenly spaced cadences that it was written to fit into measures and phrases of standard dimensions. Not so the music of the present. Its accents are often independent of the meter, and there is no longer a viable norm for phrase lengths. Composers who elect to retain the traditional functions of time signatures and bar lines are not committed to a constant rhythmic pattern. They have the option of changing the time signature as often as necessary to reflect the metric implications of the music. Bar lines then come between beat patterns and before metric accents as in conventional music, but their placement is determined measure by measure, not in advance for an entire composition. Changing time signatures are a trademark of modern music, and virtually every score provides examples. They are an added hazard for players and conductors, but many contemporary musical ideas cannot be notated precisely within the framework of a single meter.

Frequent time signature changes may be but are not necessarily associated with complexity. Example 87 is from a simple piano piece for children.

Ex. 87 BARTOK: *For Children, Vol. 1 No. 28—Choral* (1908)



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The epic *Rite of Spring* was a revolutionary work when it was written, and after more than six decades its rhythms, which involve many time changes, still sound exciting and even daring. The rhythm of Example 88 is subtle and imaginative, but not complicated.

Ex. 88 STRAVINSKY: *The Rite of Spring* (1913) p101



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The *Sacrificial Dance* with which *The Rite of Spring* ends contains its most powerful and provocative rhythms. Few consecutive measures have the same time signature. The changes shown in Example 89 are representative.

Ex. 89 STRAVINSKY: *The Rite of Spring* (1913) p112



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Almost any modern work will yield additional examples of variable measure lengths and metric patterns. Copland makes effective use of these devices, along with shifting accents and asymmetric meters and divisions, in *El Salón México*.



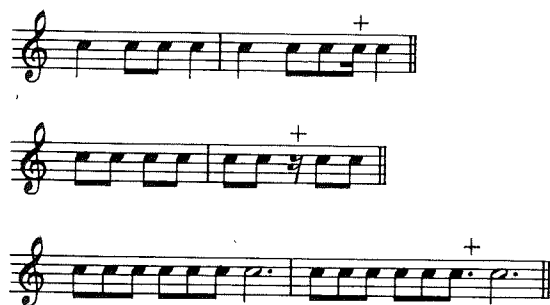
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## New Rhythmic Concepts

The unique rhythmic concepts of Olivier Messiaen are explained in his book *The Techniques of My Musical Language*. In place of the traditional rhythmic units, beats and measures, he uses a short fractional unit such as an eighth or a sixteenth as the only constant value. Free multiplications of this fractional unit lead to a type of rhythmic organization which is essentially *ametrical*. The notation is precise but unmeasured. Bar lines do not delineate metric units but serve to mark phrase divisions and to cancel the effect of accidentals. The impression created is that of a very free rhythm, but the processes are not entirely instinctive. Some have a rational basis.

One procedure is to transform a simple rhythmic pattern by inserting a short *added value*, which can be represented by a note, a rest, or a dot. Each of these possibilities is illustrated, with the added values marked by crosses, in the following example from Messiaen's book.

Ex. 91 MESSIAEN: *Rhythms with Added Values*



Extract from *The Technique of My Musical Language* by Olivier Messiaen. Copyright by Alphonse Leduc & Cie, Paris, Owners and Publishers.

Augmentation and diminution are other systematic rhythmic modifications employed extensively by Messiaen. He includes more complex multiples and fractions than the doubling and halving of the values in conventional augmentation and diminution. The following table is adapted from his book. The values on the right are the augmentations of those on the left; the values on the left are the diminutions of those on the right. The amount the durations are increased or decreased is shown beside the notation expressed as a multiple or a fraction of the original values.

Ex. 92 MESSIAEN: *Table of Augmented and Diminished Rhythms*

## DIMINUTION AUGMENTATION

Amount of Reduction

Amount of Addition

One-fifth One-fourth

One-fourth One-third

One-third  
(removal  
of a dot) One-half  
(addition  
of a dot)

One-half  
(classic  
diminution) Whole  
(classic  
augmentation)

Two-thirds Double

Three-fourths Triple

Four-fifths Quadruple

Extract from *The Technique of My Musical Language* by Olivier Messiaen. Copyright by Alphonse Leduc & Cie, Paris, Owners and Publishers.

In the next example typical Messiaen rhythmic procedures are illustrated in an ametrical context. It contains added values, marked by crosses, and repetitions of a short motive augmented and diminished in turn by the addition and removal of dots.

Ex. 93 MESSIAEN: *La Nativité du Seigneur*—9. *Dieu parmi nous* (1935)



Extract from *La Nativité du Seigneur* by Olivier Messiaen. Copyright by Alphonse Leduc & Cie, Paris, Owners and Publishers.

Elliot Carter is another composer with a highly individual approach to rhythm. His music is characterized by a device known as *metric modulation*. In metric modulation a proportional change of tempo is accomplished by a change from one meter to another with the two meters linked by a common value. The idea is not new, but Carter has applied it to infinitely more complex relationships than his predecessors. Those in the following passage are typical. The sixteenth-note value is constant when the time changes from 2/4 to 14/16. In the next change the beat is constant, the double-dotted-quarter note equaling the quarter note. The effect of the two changes is to reduce the tempo of the quarter-note beats from 126 to 72. After eleven measures in this tempo, the quintuplet sixteenth value becomes the sixteenth value in 10/16 meter. When the meter returns to 2/4 with the sixteenth value constant, the tempo quickens to 90 for the quarter-note beats. In Carter's equations the first note always represents the preceding tempo and the second note the following tempo. He writes a double bar line before a time signature change only when the symbol for the constant value between the two meters is different.

Ex. 94 CARTER: *Eight Etudes and a Fantasy*—*Fantasy* (1950)



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To summarize, the expanded rhythmic resources of contemporary music include nonmetric and ametric rhythms, accents which shift in relation to the beats and bar lines, asymmetric meters, changing time signatures, added values, augmentation and diminution by unconventional ratios, and metric modulation. In addition, some twelve-tone composers have extended serial control to durations, a step in the direction of total organization. At the other end of the spectrum is aleatoric music in which durations are not specified by the composer but are determined by the performers or by chance. Electronic synthesizers and computers are capable of both ultimate precision and random selection in rhythmic matters, but the notation (if any) is usually no more than a graphic, second-by-second schedule of sound events. These newest styles are considered further under their respective headings.

Practical young composers, unless working with electronic media, are well advised to use rhythmic devices which will intrigue but not discourage the players who are available to perform their music. Excessively difficult rhythms are an insurmountable barrier to group performance by any but the most expert and experienced players. Besides, some of the most effective rhythms are those which make only minor but striking departures from convention.

### *Suggested Assignments*

1. Locate and copy examples illustrating the categories of contemporary rhythm discussed in this chapter. Analyze the phrase structures of the longer examples.
2. Write a paper describing and categorizing the rhythmic procedures in a contemporary work you have played or sung. Illustrate your comments with appropriate examples.
3. Write a melody with nonmetric rhythm similar in style to Examples 69 and 70.
4. Write an exercise in which accents shift in relation to the bar lines and/or beats.
5. Write an exercise in an asymmetric meter.
6. Write an exercise in which time changes are exploited as a characteristic feature.
7. Write an exercise featuring added values in an ametrical context.
8. Compose a piece for a percussion instrument or ensemble in which frequent tempo changes are accomplished by means of metric modulation.
9. Compose a short piece exploring a variety of contemporary rhythmic devices.
10. For additional reading on rhythm see Paul Creston's book *Principles of Rhythm* (Franco Colombo, 1964).

## Chord Structure

CHORD structure is the vertical arrangement of notes sounding simultaneously. Harmonic sounds rarely occur in isolation, but a thorough understanding of chord structure is necessary before considering the more complicated problem of harmonic progression. Knowledge of conventional chord structures, including all of the triads and seventh chords with their inversions and alterations, is presumed. This chapter is concerned with the more complex sonorities required to express most contemporary musical ideas. This need, and not the search for novelty which is sometimes suspected, has caused the tremendous expansion in the harmonic vocabulary of our time.

When first hearing music in advanced twentieth-century harmonic idioms, one sometimes gets the impression that modern composers have severed all ties with tradition and the traditional music which makes up the bulk of concert programs, broadcasts, and recordings. This break is more apparent than real. The development of harmonic resources has followed a consistent course of exploiting higher and higher elements of the overtone series. In this respect contemporary composers are merely continuing a process that started with organum and *magadizing* and led successively to triads and chords of the seventh, ninth, eleventh, thirteenth, and beyond. The enrichment of harmonic resources through the successive inclusion of higher members of the overtone series is shown in the following example.

Though more complex chords were used sporadically before the turn of the century, the most active chord fully accepted was the dominant seventh, which is produced by the first seven-tones of the overtone series. Within two decades sonorities comprising the most remote relationships were an integral part of every composer's harmonic language. The speed with which new sounds were introduced obscured the fact that they were the inevitable result of the evolutionary process. It is worth noting that