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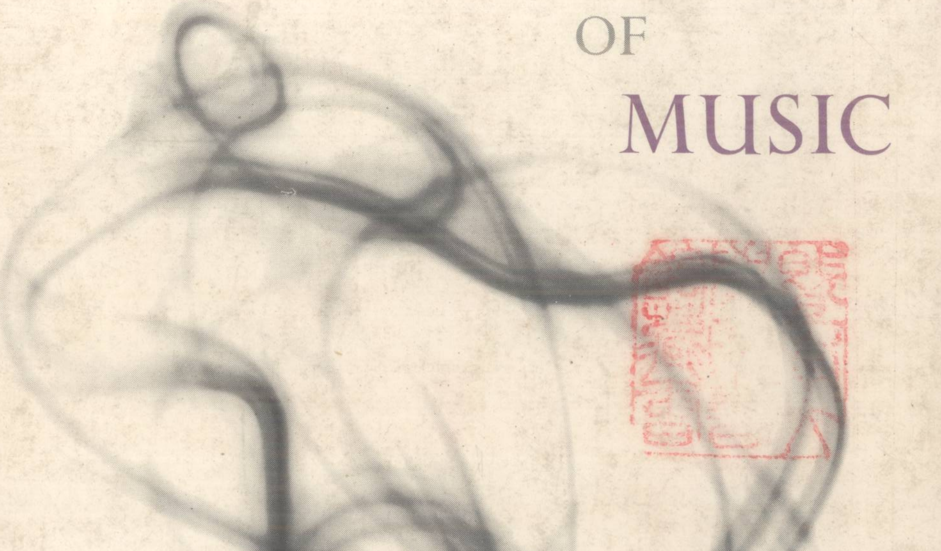
THE RHYTHMIC STRUCTURE OF MUSIC



BY
GROSVENOR COOPER
AND
LEONARD B. MEYER

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THE RHYTHMIC STRUCTURE OF MUSIC

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黄振耀先生惠赠

Grosvenor W. Cooper and Leonard B. Meyer

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PREFACE

Every musician, whether composer, performer, or theorist will agree that "In the beginning was rhythm." For the shaping power of rhythm and, more broadly speaking, of the temporal organization of music, is a *sine qua non* of the art. An understanding of rhythm is important for performer as well as composer, for historian as well as music theorist. Yet the study of this aspect of music has been almost totally neglected in the formal training of musicians since the Renaissance. There are many textbooks on harmony and counterpoint but none on rhythm. Although theorists have frequently written about the temporal organization of music, their concern has generally been with meter and phrase structure rather than with rhythm. Every music school requires students to take courses in harmony and counterpoint, but few give more than passing notice to the rhythmic structure of music.

A book dealing with rhythm must therefore perform two functions at once. It must, on the one hand, organize and develop a conceptual framework—a theory of rhythmic structure. And it must, on the other hand, present through discussion, example, and precept, analytical methods and compositional procedures.

This book does not presume to answer all questions in the field of rhythm. Nor does it pretend to cover all possible rhythmic problems. It is a first book on the subject, a text intended for students not too advanced in theoretical studies but already familiar with harmony and counterpoint. It is also a beginning in the sense that it will, we hope, lead to further study of rhythm and better, more comprehensive texts.

Since there are at present very few courses in rhythm, this book is designed to be used in conjunction with courses in harmony or counterpoint, courses in interpretation, and courses in analysis. It has been successfully used in these ways at the University of Chicago. We hope that, as a result of its existence, courses dealing with rhythm will begin to be offered as part of the music curriculum.

We are well aware of the fact that some readers will take exception either to the general conceptual framework advanced here or to particular analyses. With regard to the former, we can but hope that dissenting voices will provoke a fruitful discussion on a subject which has, by seemingly common consent, been neglected by music theorists. With regard to the latter, we can but plead fallibility and emphasize that what is crucial in the present undertaking is the method and general viewpoint rather than their exemplifications in any particular analysis.

This book is the result of many fruitful, and some fruitless, discussions—and sometimes arguments—which we have had both with our colleagues and with our students. The debt which we owe to them is freely acknowledged. In particular we wish to thank Mrs. Jeanne Bamberger, whose many helpful suggestions and cogent criticism have found their way into this book.

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I

DEFINITIONS AND PRINCIPLES

To study rhythm is to study all of music. Rhythm both organizes, and is itself organized by, all the elements which create and shape musical processes.

Just as a melody is more than simply a series of pitches, so rhythm is more than a mere sequence of durational proportions. To experience rhythm is to group separate sounds into structured patterns. Such grouping is the result of the interaction among the various aspects of the materials of music: pitch, intensity, timbre, texture, and harmony—as well as duration.

It is the intimate and intricate interaction of temporal organization with all the other shaping forces of music which makes the study of rhythm both a rewarding task and, at times, a difficult and perplexing one. The task is rewarding not only because the subject is itself intrinsically interesting but also because, by adding a new dimension to our understanding of related fields such as melody, harmony, counterpoint, and orchestration, it makes possible a more precise and penetrating analysis of those processes.

The study of rhythm is rewarding in a practical way as well. An understanding of rhythm is as important to the performer as it is to the composer and to the theorist. Indeed, as will be apparent throughout this book, a considerable part of what is usually called "interpretation" depends upon the performer's sensitivity to and awareness of rhythmic structure.

Because the complex and delicate interaction among the elements of music precludes the use of easy "rules of thumb" and pat, simplistic answers, the analysis of rhythm tends to be complicated and, at times, uncertain. These difficulties are in part responsible for the neglect which the field of rhythm has suffered in recent writings on music theory.

In part, however, the development of a fruitful approach to the study of rhythm has been hampered by a failure to distinguish clearly among the several aspects of temporal organization itself. The resulting confusion has created a correlative ambiguity of terminology. Since clear distinctions and unequivocal terminology are necessary if the analysis of the rhythmic structure of music is to move beyond its present moribund state, our first task must be one of definition.

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Some of the distinctions and definitions presented in what follows may seem unusual or contrary to current use. We ask the reader to bear with us, trusting that he will find that the insights which the distinctions ultimately yield will justify the inconvenience of novelty.

ARCHITECTONIC LEVELS

Most of the music with which we shall be concerned is architectonic in its organization. That is, just as letters are combined into words, words into sentences, sentences into paragraphs, and so on, so in music individual tones become grouped into motives, motives into phrases, phrases into periods, etc. This is a familiar concept in the analysis of harmonic and melodic structure. It is equally important in the analysis of rhythm and meter.

As a piece of music unfolds, its rhythmic structure is perceived not as a series of discrete independent units strung together in a mechanical, additive way like beads, but as an organic process in which smaller rhythmic motives, while possessing a shape and structure of their own, also function as integral parts of a larger rhythmic organization. In Example 53*a* (p. 42), for instance, the motive of the first measure forms a small, separate rhythmic group. When this motive is repeated in the second measure, the motive and its repetition are perceived as constituting a more extended rhythmic pattern. They form a rhythm on a higher architectonic level.

The lowest level on which a complete rhythmic group is realized—upon which a strong beat and one or more weak beats are grouped together—will be called the *primary rhythmic level*. As is often the case, the rhythm of the primary level in Example 53*a* is itself made up of smaller note values which form a subsidiary, partial rhythmic motive. Such partial patterns create what will be called *inferior rhythmic levels* or, where there is only one such level, the *subprimary level*. When groups on the primary rhythmic level are themselves organized into longer, compound patterns, *superior rhythmic levels* are created.

In the analyses given in this book the schematization of the primary level will be indicated by an arabic "1." Superior levels, in order of increasing length, will be labeled "2," "3," etc. Inferior rhythmic levels, in order of decreasing length, will be indicated by small roman numerals: "i," "ii," etc. (see Examples 23 and 50, pp. 23, 40).

Metric structure is similarly architectonic. For instance, a $\frac{3}{4}$ meter differs from a $\frac{6}{8}$ meter in that the former is made up of three units of a lower level $\frac{2}{8}$ meter, while the latter is made up of two units of a lower level $\frac{3}{8}$ meter. And either a $\frac{3}{4}$ or a $\frac{6}{8}$ meter may itself be combined with metric units on the same level to form more extensive, higher-level meters. Thus in Example 53*a* the meter of the primary level—the level on which beats are felt and counted—is in threes. The inferior metric level is organized in twos ($\frac{2}{8}$) and the superior metric level is also duple—that is, $2 \times \frac{3}{4}$.

Three basic modes of temporal organization can be differentiated. They are pulse, meter, and rhythm. Tempo, though it qualifies and modifies these, is not itself a mode of organization. Thus a rhythm or theme will be recognizably the same whether played faster or slower. And while changes in tempo will alter the character of the music and perhaps influence our impression of what the basic beat is (since the beat tends to be perceived as being moderate in speed), tempo is not a relationship. It is not an organizing force.[1]

PULSE

A pulse is one of a series of regularly recurring, precisely equivalent stimuli. Like the ticks of a metronome or a watch, pulses mark off equal units in the temporal continuum. Though generally established and supported by objective stimuli (sounds), the sense of pulse may exist subjectively. A sense of regular pulses, once established, tends to be continued in the mind and musculature of the listener, even though the sound has stopped. For instance, objective pulses may cease or may fail for a time to coincide with the previously established pulse series. When this occurs, the human need for the security of an actual stimulus or for simplicity of response generally makes such passages seem to point toward the re-establishment of objective pulses or to a return to pulse coincidence.

All pulses in a series are by definition exactly alike. However, preferring clear and definite patterns to such an unorganized and potentially infinite series, the human mind tends to impose some sort of organization upon such equal pulses.[2] As we listen to the ticks of a clock or the clicks of a railroad car passing over the tracks, we tend to arrange the equal pulses into intelligible units of finite duration or into even more obviously structured groups. Thus, although pulse can theoretically exist without either meter or rhythm, the nature of the human mind is such that this is a rare occurrence in music.

While pulse is seldom heard in a pure state (as a series of undifferentiated stimuli), this does not mean that it is not an important aspect of musical ex-

[1] It is important to recognize that tempo is a psychological fact as well as a physical one. Thus eighth-notes in two pieces of music may move at the same absolute speed, but one of the pieces may seem faster than the other. This is possible because the psychological tempo, which we shall call "pace," depends upon how time is filled—upon how many patterns arise in a given span of time. See, for instance, the increase in pace which takes place at measure 48 in the second movement of Mozart's Piano Concerto in D Minor (K. 466).

[2] That the mind tends to impose patterns upon even a random series of stimuli has been clearly demonstrated by experiments. See John Cohen, "Subjective Probability," *Scientific American*, XCCVII, No. 5 (November, 1957), 136.

perience. Not only is pulse necessary for the existence of meter, but it generally, though not always, underlies and reinforces rhythmic experience.

METER

Meter is the measurement of the number of pulses between more or less regularly recurring accents.[3] Therefore, in order for meter to exist, some of the pulses in a series must be accented—marked for consciousness—relative to others.[4] When pulses are thus counted within a metric context, they are referred to as *beats.* Beats which are accented are called "strong"; those which are unaccented are called "weak."

While there can be no meter without an underlying pulse to establish the units of measurement, there can, as we shall see, be meter without any clearly definable rhythm (see pp. 7–8). Conversely, there can be rhythm without meter—as in the "free" rhythm of some Oriental and folk music and in what has been called the "measured rhythm" of Gregorian chant.[5]

Although meter tends to be regular, irregularities may occur without destroying the sense of metric organization.[6] Usually this is because such irregularities are temporary. Often too, what is irregular on one architectonic level becomes regular on a higher (or lower) one. Thus if a unit of three quarter-notes is followed by a unit of two and the tempo is quite fast, the mind, tending to perceive a pattern in the simplest, most regular way possible, will organize the pattern into a composite group of five quarter-notes, as in Act III, scene 2 (measures 31 ff.) of Wagner's *Tristan und Isolde.* This is also the case with the hemiole rhythm in which the opposition of three groups of two played against two groups of three $\left(\begin{smallmatrix}2+2+2\\3+3\end{smallmatrix}\right)$ is resolved after six beats. Indeed, one might state as a general law that the dominant or primary meter will tend to organize itself—be perceived—on the lowest architectonic level on which it exhibits regularity.

As noted above, meter, like other aspects of musical organization, is architectonic in nature. That is, since the beats which measure the meter designated in the time signature may themselves be divided into equal units or compounded into larger metric units, some of which will be accented relative to others, it follows that most compositions present a hierarchy of metric organizations. For instance, the units of a $\frac{2}{4}$ meter might be divided or compounded as in Example 1. Needless to say, other combinations are possible on all architectonic levels.

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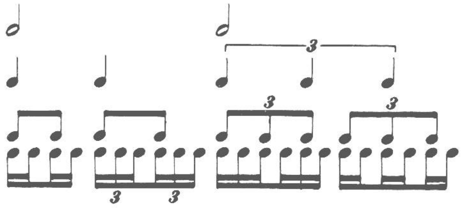
[3] Although theorists, both Renaissance and modern, have referred to the measurement of regularly recurring accents as "rhythm," it is not so by our definition. And it would seem that only confusion has resulted from calling those aspects of temporal organization which measure, "rhythmic." They are metric.

[4] For further discussion of "accent," see pp. 11 ff.

[5] See Willi Apel, *Harvard Dictionary of Music* (Cambridge, Mass.: Harvard University Press, 1945), p. 640.

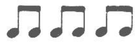
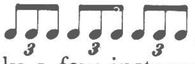
[6] Often such irregularities are not apparent in the time signature of the music. This is the case with the hemiole "rhythm," for instance. Conversely, meter may at times be more regular than its notation would lead us to expect. For such an example, see Leonard B. Meyer, *Emotion and Meaning in Music* (Chicago: University of Chicago Press, 1956), pp. 119–21.



EXAMPLE 1

We are inclined to think of there being only one metric organization, the one designated in the time signature and measured by the bar lines. This is because tonal harmony and homophony, with their emphasis upon vertical coincidence, and dance music, with its basic motor patterns, have for the past two hundred years made for the dominance of what we have called the "primary metric level." Until recently this primary level has dominated metric experience. Changes on other metric levels which can be and are referred to the regularity of the primary level are treated with an almost casual freedom.

But this has not always been the case. In the polyphonic music of the later Middle Ages and the Renaissance the relationships of the several metric levels both within each voice and between voices was a very important facet of style. The organization of these metric levels was recognized by the theorists of the time and was specified by the time signatures of the period. Such terms as "tempus," "prolatio," "perfectus," and so forth indicated the organization on particular metric levels.

Of course some time signatures do indicate the organization of inferior metric levels. Thus $\frac{3}{4}$ implies—but only implies—that the subsidiary metric organization is to be in twos. One can easily move from this organization in twos,  , to the one in threes,  , as Schubert, for instance, was so fond of doing. There are only a few instances in the literature of music since 1600 in which the composer has specified what the metric organization of higher architectonic levels is to be. The example which comes to mind most readily occurs in the Scherzo (measures 180–240) of Beethoven's Symphony No. 9, where the composer indicates that the higher rhythmic organization is to be in threes or in fours by writing "ritmo di tre battute" or "ritmo di quattro battute" (see Example 95, p. 80).

RHYTHM

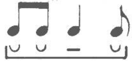
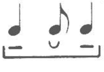
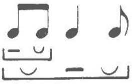
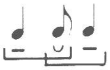
Rhythm may be defined as the way in which one or more unaccented beats are grouped in relation to an accented one. The five basic rhythmic groupings may be differentiated by terms traditionally associated with prosody:

a. iamb ∪ –
b. anapest ∪ ∪ –
c. trochee – ∪
d. dactyl – ∪ ∪
e. amphibrach ∪ – ∪

Since, as noted above, rhythmic organization is architectonic, more extensive rhythmic structures—phrases, periods, etc.—as well as shorter, more obviously rhythmic motives exhibit these basic patterns.

Rhythm is independent of meter in two separate senses. First, rhythm can exist without there being a regular meter, as it does in the case of Gregorian chant or recitativo secco. That is, unaccented notes may be grouped in relation to an accented one without there being regularly recurring accents measuring metric units of equal duration. Indeed, rhythm is at least theoretically independent of pulse. Second, and more important for our purposes, rhythm is independent of meter in the sense that any one of the rhythmic groupings given above can occur in any type of metric organization. For instance, an iambic grouping can occur in duple or triple meter. In other words, rhythm can vary within a given metric organization, as the examples in the following chapters amply illustrate.

Though rhythm may vary independently of meter, this does not mean that rhythm is not influenced by the metric organization and, conversely, that meter is not in a very important sense dependent upon rhythm. As we shall see, some rhythmic groupings are more difficult to realize in a given meter than others. On the other hand, precisely because rhythmic accents generally coincide with metric ones, it should be emphasized that the bar lines, which serve to mark off metric units, do not indicate what the rhythmic organization is. Rhythmic groups are not respecters of bar lines. They cross them more often than not; and one of the first things that the reader must learn is that the bar line will tell him little about rhythmic grouping.

Since a rhythmic group can be apprehended only when its elements are distinguished from one another, rhythm, as defined above, always involves an interrelationship between a single, accented (strong) beat and either one or two unaccented (weak) beats. Hence neither a series of undifferentiated strong beats (– –, etc.), the so-called spondee foot, nor a series of undifferentiated weak beats (∪∪, etc.), the pyrrhic foot, can be true rhythms. They are incomplete rhythms (see pp. 85 ff.). Other possible combinations of strong and weak beats, such as  or , will be analyzed as combinations of the basic groups given above,  and , rather than as separate, independent patterns. In addition to limiting the number of classifiable patterns, this procedure has the advantage of employing a single method for analyzing group formation on all architectonic levels.

The use of poetic feet to analyze rhythmic patterns is somewhat unusual.[7] Rhythmic groupings have generally been treated as if they were metric units. However, since these groups can be found in various different meters they are not themselves the same as meters. An account of the theoretical basis for the viewpoint advanced here is beyond the scope of this book.[8] We can but ask the reader, at least provisionally, to accept this viewpoint and hope that he will find it justified by the understanding which it yields.

ACCENT

Though the concept of accent is obviously of central importance in the theory and analysis of rhythm, an ultimate definition in terms of psychological causes does not seem possible with our present knowledge. That is, one cannot at present state unequivocally what makes one tone seem accented and another not. For while such factors as duration, intensity, melodic contour, regularity, and so forth obviously play a part in creating an impression of accent, none of them appears to be an invariable and necessary concomitant of accent.[9] Accents may occur on short notes as well as long, on soft notes as well as loud, on lower notes as well as higher ones, and irregularly as well as regularly. In short, since accent appears to be a product of a number of variables whose interaction is not precisely known, it must for our purposes remain a basic, axiomatic concept which is understandable as an experience but undefined in terms of causes.

However, while we cannot stipulate precisely what makes a tone seem accented, we can define accent in terms of its operation within the musical context and point out many of its characteristics. In order for a tone to appear accented it must be set off from other tones of the series in some way. If all notes are alike, there will be no accents. At the same time, however, the accented tone must be similar and near enough to other tones of the series that it can be related to these—that it does not become an isolated sound. In other words, accent is a

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[7] As Apel (*op. cit.*, p. 639) points out, "It would be a hopeless task to search for a definition of rhythm which would prove acceptable even to a small minority of musicians and writers on music."

[8] See Meyer, *op. cit.*, pp. 83–93 and 102 ff.; and James I. Mursell, *The Psychology of Music* (New York: W. W. Norton, 1937), chaps. iv and v.

[9] While accents may be distinguished according to whether they are produced by stress (dynamic), duration (agogic), or melodic change (tonic), their function in organizing rhythmic groups does not depend upon their origin and we have therefore decided to treat them as a single aspect of rhythmic experience. See Apel, *op. cit.*, p. 6.

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