THE 3:2 RELATIONSHIP AS THE FOUNDATION OF TIMELINES IN WEST AFRICAN MUSICS

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RESEARCH PROJECT

Submitted in partial fulfillment of the requirements for the degree of Doctor of Musical Arts in the Graduate College of the University of Illinois at Urbana-Champaign, 1998

Urbana, Illinois

Eugene Novotney, Arcata, CA (2003)

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Almost all research agrees upon the fundamental importance of rhythm in African musics, but the explanations of its foundation are as varied as the continent itself. Scholars and nonscholars alike have been seduced by the mystery of rhythm in African musics, and many theories have been advanced to detail its structure and organization. Rhythm seems to be simultaneously the most studied aspect of African music as well as the most confused.

Much discussion has been devoted to the debate over the validity of generality and specificity in analyzing African musics. The very size and scope of Africa leads to its musics being complex and diverse phenomena. The views expressed in my analysis will not be meant to constitute a universal axiom for all African musics. Instead, they will be offered as insights into basic rhythmic principles upon which many West African musics have been built.
My study will be based on the premise that the 3:2 relationship is the foundation of rhythmic structure in West African music. I will first establish a terminology for often misused terms—such as polyrhythm, cross-rhythm, syncopation, beat, and pulse—and I will examine the use of these terms by scholars and performers. In fact, this analysis of terminology will be extensive and thorough, and will comprise a major portion of my study.

Second, I will detail the foundation and the construction of timelines and rhythmic structures in West African musics, based on aspects of the 3:2 relationship. I will propose a system for analyzing West African rhythmic structures and demonstrate how the elements of this system function together to create dense and complex textures based in cross-rhythmic relationships.

Next, I will present a thorough examination of the phenomena of the 3:2 relationship as manifested in nature and as as a model of structure in mathematics, architecture, and music. I will relate the 3:2 foundation of West African musics to the structural significance of the 3:2 relationship in other models. I will examine the 3:2 harmonic foundation in the theory of common practice tonal music. And I will examine the 3:2 relationship as the foundation of musics of the African diaspora: namely, as it manifests itself through the concept of "clave."
I will use the conventional Western notational system to represent all of my musical examples. In all cases, I will stress the importance of understanding this complex rhythmic system as an integration of its components, not merely as groupings of its elements. Above all, I will draw conclusions based on thorough analysis and practice, approaching my topic through the eyes of a performer.
To C.K. Ladzekpo,

whose patience, guidance, wisdom, and spirit

are a continuous inspiration.
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CHAPTER 1
INTRODUCTION

Almost all research agrees upon the fundamental importance of rhythm in African musics, but the explanations of its foundation are as varied as the continent itself. Scholars and nonscholars alike have been seduced by the mystery of rhythm in African musics, and many theories have been advanced to detail its structure and organization. Rhythm seems to be simultaneously the most studied aspect of African music as well as the most confused.

Much discussion has been devoted to the debate over the validity of generality and specificity in analyzing African musics. The very size and scope of Africa leads to its musics being complex and diverse phenomena. So the views expressed in this document are not meant to constitute a universal axiom for all African musics. Instead, they are offered as insights into basic rhythmic principles.
Please note that my own performance experience has primarily been focused on the musics of the Anlo-Ewe people of Ghana and the Yoruba people of Nigeria. I have, however, observed the rhythmic structures and timelines characteristic to Ewe and Yoruba musics displayed in numerous other West African musical contexts. Specifically, I will argue that the timelines and rhythmic structures common to these West African musics are based on the foundation of the 3:2 relationship. It may be the case that these timelines and rhythmic principles function in other musics of Africa as well, but that particular claim beyond the scope of this document.

I will first establish a terminology for often misused terms—such as polyrhythm, cross-rhythm, syncopation, beat, and pulse,—and I will examine the use of these terms by scholars and performers. In fact, this analysis of terminology will be extensive and thorough, and will comprise a major portion of this study. For ease of reference, a glossary of the terms discussed will be included as Appendix B.

Second, I will detail the foundation and the construction of timelines and rhythmic structures in West African musics, based on aspects of the 3:2 relationship. I will propose a system for analyzing West African rhythmic structures and demonstrate how the elements of this system function together to create dense and complex textures based in cross-rhythmic relationships.
Next, I will present a thorough examination of the phenomena of the 3:2 relationship as manifested in nature and as a model of structure in mathematics, architecture, and music. I will relate the 3:2 foundation of West African musics to the structural significance of the 3:2 relationship in other models. I will examine the 3:2 harmonic foundation in the theory of common practice tonal music. And I will examine the 3:2 relationship as the foundation of musics of the African diaspora: namely, as it manifests itself through the concept of "clave."

I will use the conventional Western notational system to represent all of my musical examples. In all cases, I will stress the importance of understanding this complex rhythmic system as an integration of its components, not merely as groupings of its elements. Above all, I will draw conclusions based on thorough analysis and practice, approaching my topic through the eyes of a performer.

Indeed, my initial introduction to this topic came not as a scholar, but rather as a percussionist, and my interest has always been in prescriptive (how to play the best) rather than descriptive (general characteristics) methodology. Fascinated by West African rhythmic structures, I eventually committed myself to learn to perform them. At that time, I could not imagine what a
profound effect that decision would have on my life. Certainly, I would not be the musician or person I am today had I not chosen to make that commitment.

I have never been to Africa. All of my ideas were formulated through studying the literature and working with African musicians in the United States. To this end, I must especially thank my teacher, Anlo-Ewe master drummer C.K. Ladzekpo, for his energy and patience in opening the door to this very special music for me. Most of my ideas are rooted in C.K.'s teaching. For his guidance and inspiration, I will be forever grateful.
CHAPTER 2

POLYRHYTHM AND CROSS-RHYTHM

As I begin my analysis, I must define several terms which have been the basis of severe ambiguity and argument in the past. As my intent is to employ the most universally accepted definitions of the terms in question, I feel it is most proper, when at all possible, to reference the most standard bodies of research available in the field at large. To that end, I will begin my studies by referencing the Harvard Dictionary of Music, the Grove’s Encyclopedia of Music and Musicians, and the Webster’s Dictionary of the English Language. By doing so, a basis for common and universal usage should be revealed. When necessary, I will select substitutions for, or additions to, the above-referenced texts. I will pursue other references when a specific term cannot be found in the primary sources or when the definitions provided by the primary sources require augmentation due to continued ambiguity.
Most often, African musics are referred to in scholarship as being polyrhythmic. Some authors choose instead to describe African musics as cross-rhythmic. Regularly, in reference to African rhythmic schemes, discussions of both polyrhythm and cross-rhythm lead to the use of the term hemiola. Almost universally, there is significant contradiction in the use of these terms from author to author. In a comparison of scholarship, quite often, authors use conflicting terminology to represent the same concept. Even more confusing is the inverse of the situation, when authors use identical terminology to represent related, but fundamentally nonequivalent, concepts. Because the ambiguous usage of the terms polyrhythm, cross-rhythm, and hemiola, has been continuous in the scholarship of African musics, many feel that the original and proper meanings of these terms have been weakened. For this reason, I will spend a significant amount of time in the early stages of this document thoroughly investigating the proper usage of this critical terminology.

The *Harvard Dictionary of Music* (Randel 1986:646) defines polyrhythm as the “simultaneous use of two or more rhythms that are not readily perceived as deriving from one another or as simple manifestations of the same meter; sometimes also cross-rhythm.” It goes on to state that “familiar examples in tonal music are the simultaneous use of triple and duple subdivisions of the beat, and the simultaneous use of 3/4 and 6/8 ... termed hemiola.” Finally, it ends by stating that “traditional African
music abounds in polyrhythm, and it is evident in African derived musics of the New World." Grove's (19--:72) offers a more general statement by defining polyrhythm as "the superposition of different rhythms or metres." Grove's continues, "the term is closely related to (and sometimes used simultaneously with) CROSS-RHYTHM, though the latter is properly restricted to rhythm that contradicts a given metric pulse or beat." Webster's Dictionary (19--:1760) predictably presents the most generic description of polyrhythm by defining it as "the simultaneous combination of contrasting rhythms in a musical composition." It is interesting to note that Webster's Dictionary avoids the use of the term cross-rhythm in its definition. In contrast, the Harvard Dictionary and Groves choose not only to reference the term, but also to state that, in some cases, the terms polyrhythm and cross-rhythm are used synonymously.

Cross-rhythm is defined by The Harvard Dictionary of Music as "a rhythm in which the regular pattern of accents of the prevailing meter is contradicted by a conflicting pattern and not merely by a momentary displacement that leaves the prevailing meter fundamentally unchallenged. See also Syncopation, Polyrhythm" (Randel 1986:216). Grove's defines cross-rhythm as "the regular shift of some of the beats in a metric pattern to points ahead of or behind their normal positions in that pattern, for instance the division of 4/4 into 3+3+2 quavers, or 9/8 into 2+2+2+3 quavers; if every beat is shifted by the same amount, this is called
syncopation.” (Sadie 1980:64) The most generic definition of cross-rhythm - in Webster's Dictionary once again - is almost identical to its earlier definition of polyrhythm. It simply states that cross-rhythm is "the simultaneous use of contrasting rhythmic patterns." (19)--:543)

Clearly, individual identities for the terms polyrhythm and cross-rhythm cannot be assigned solely upon the definitions presented by Webster. Although one may draw significance from minor differences, such as "simultaneous use of," rather than "simultaneous combination of," both definitions generalize the terms until they have basically the same meaning. At the most primary level, both terms describe the simultaneous occurrence of contrasting rhythms. Although this statement can be accepted as true, I feel it is both incomplete and imprecise. I strongly believe that the terms polyrhythm and cross-rhythm, although closely related, can be assigned individual identities.

When one examines the definitions presented by Harvard and Grove's, individual identities for the two terms begin to emerge. Harvard states that polyrhythm is "sometimes also cross-rhythm" (Randel 1986:646), while Grove's describes the term polyrhythm as "sometimes used synonymously with CROSS-RHYTHM," emphasizing that the use of the term cross-rhythm should be "properly restricted to rhythm that contradicts a given metric pulse or beat" (Sadie 1980:72). In this case, the definition from Harvard does not
provide us with significant insight other than the implication, through the use of the words “sometimes also,” that the concept of polyrhythm somehow encompasses the concept of cross-rhythm. The definition from Grove’s reinforces this implication by stating that polyrhythm is “sometimes used” as a synonym for cross-rhythm. Perhaps more importantly, Grove’s classifies cross-rhythm as having the characteristic of contradicting the given meter. Grove’s, in this instance, seems to offer us a better clue into the unique criteria which allow us to properly label specific rhythmic phenomena as cross-rhythm rather than polyrhythm. Still, more information is needed to distinguish the identity of these two terms.

When defining cross-rhythm, both Harvard and Grove’s stress that the regular pattern of accents or beats is shifted or contradicted in a systematic and regular manner. Grove’s stresses that cross-rhythm contains a “regular shift of some of the beats.” The Harvard Dictionary speaks of the “regular pattern of accents” being “contradicted by a conflicting pattern,” implying, through the use of the word “pattern,” that the rhythmic contradiction is of a systematic nature. The Harvard Dictionary continues to state that this contradiction is not “momentary” but in a fixed state, again implying a significant and continuing systematic rhythmic conflict. In this case, it is the definition from the Harvard Dictionary that proves to be the more useful, instructing us that the conflict must be more than “momentary” to qualify as cross-
rhythm. This confirms that, to be properly considered cross-
rhythm, the rhythmic contradiction must be of a significant enough
nature as to disrupt the prevailing metric accent.

As we are almost able to assign distinguishing descriptions to the
terms polyrhythm and cross-rhythm, there is one more issue I must
raise. If we refer back to the basic definitions presented by
Webster's Dictionary, it is obvious that both polyrhythm and
cross-rhythm, are described as the simultaneous occurrence of
conflicting rhythms. Clearly and directly, Webster's Dictionary
shows that both terms represent, in essence, the vertical
phenomenon of two rhythms interacting simultaneously.

With this observation in mind, I will again reference these terms
as they appeared in the Harvard Dictionary and Grove's
Encyclopedia. If we first examine the listings for polyrhythm, we
find both the Harvard Dictionary and Grove's Encyclopedia
confirming that polyrhythm represents a vertical interaction of
rhythms. The Harvard Dictionary begins its definition with "The
simultaneous use of two or more rhythms," denoting, through the
use of the word "simultaneous," that a vertical relationship
between at least two rhythms is in place (Randel 1986:646). In
comparison, the Grove's Encyclopedia begins its listing by
stating that polyrhythm is "the superposition of different
rhythms," likewise denoting, through the use of the word
"superposition," that a vertical relationship is in place between "different rhythms" (Sadie 1980:72).

With both sources confirming that polyrhythm represents the "vertical phenomenon of two rhythms interacting simultaneously," I will now, again, reference our other listings for the term cross-rhythm. As previously discussed, the definition of cross-rhythm in the Harvard Dictionary refers to "the regular pattern of accents of the prevailing meter" being "contradicted by a conflicting pattern" (Randel 1986:216). The Harvard Dictionary has thus confirmed a vertical relationship. In essence, this definition speaks of one rhythm ("the regular pattern of accents of the prevailing meter") simultaneously and vertically interacting with a second rhythm ("being contradicted by a conflicting pattern").

The definition presented by Grove's Encyclopedia, likewise, refers to the "regular shift of some of the beats in a metric pattern" to points different than "their normal positions in that pattern" (Sadie 1980:64). Again, one rhythm (the points of the normal positions of beats in a given metric pattern) is depicted as simultaneously and vertically interacting with a second rhythm (the shifted points of some of the beats).

It can now be confirmed that the terms polyrhythm and cross-rhythm are both properly used as descriptions of vertical events. However, one clarification is in order.
All the definitions of polyrhythm described the phenomenon as the simultaneous play of two or more contrasting rhythms. All emphasized the vertical interaction of different rhythms, though not necessarily the vertical interaction of a rhythm against a metric scheme. Of course, in many notable examples of the phenomenon of polyrhythm, rhythms that reinforce the metric accents interact with rhythms that are in contrast to the metric accents. In essence, these examples represent what scholars have come to delineae a "commetric" rhythm vertically interacting with a "contrametric" rhythm (Kolinski 1973:497). This particular type of rhythm-against-meter relationship, however is neither stipulated nor mandated. What is emphasized in the description of this terminology is the phenomenon of rhythm-against-rhythm.

When examining cross-rhythm, we concluded that the term, like polyrhythm, represented one rhythm vertically and simultaneously interacting with another rhythm. Examples provided by both the Harvard Dictionary and the Grove's Encyclopedia consistently described the phenomenon as the vertical interaction of the primary rhythm of the metric accent interacting with a second rhythm that represents a conflict to, or shift from, the metric accents. Unlike the previous examples for polyrhythm, however, was the vertical interaction of a rhythm against a metric accent. The emphasis in the description of this term is the phenomenon of rhythm-against-meter.
At this point, we have confirmed that *polyrhythm* and *crossrhythm* are both properly used as descriptions of vertical events. It has also been revealed that, while significant overlap in these concepts exist, each has a specific context. The term *polyrhythm* generally speaks to the vertical interaction of two conflicting rhythms. The term *cross-rhythm* more specifically speaks to the vertical play of a rhythm acting in conflict with the metric accents themselves.

To again summarize, from the combined study of these definitions one must conclude that *polyrhythm* is a general and non-specific term for the simultaneous occurrence of two or more conflicting rhythms, of which, the term *cross-rhythm* is a specific and definable subset. While all examples of cross-rhythm would also be examples of polyrhythm, all examples of polyrhythm would not necessarily be examples of cross-rhythm. One must also conclude that *cross-rhythm* should be properly reserved to define rhythmic/metric contradiction which is regular and systematic and which occurs in the longer span: that is, systematic rhythmic/metric contradiction that significantly disrupts the prevailing meter or accent pattern of the music. As the *Harvard Dictionary* reinforces, cross-rhythm should not be used to describe a situation that is “merely...a momentary displacement that leaves the prevailing meter fundamentally unchallenged.”
With this view, the following example could correctly be labelled polyrhythm, but could not be considered an example of cross-rhythm:

In figure 1, part (B) presents a strong and regular four-beat accent pattern in 12/8 meter for both bars. Part (A) presents a strong and regular four-beat accent pattern in bar one, but it blurs beats one and two of the second bar by presenting a quintuplet figure before redefining the regular four-beat accent pattern again on beats three and four. This momentary contradiction leaves the prevailing meter fundamentally unchallenged; thus, it is an example of polyrhythm but not cross-rhythm.

Likewise, the following example, based on our previous conclusions, would be correctly labelled an example of cross-rhythm, in turn making it automatically an example of polyrhythm.
In figure 2, part (B) again presents a strong and regular four-beat accent pattern in 12/8 meter for both bars. Part (A), however, presents a continuous contradiction of the four-beat accent pattern by emphasizing a strong and regular six-beat accent pattern within the same time span. This proportional, continuous, and systematic contradiction challenges the prevailing meter in the long term, thus making figure 2 an excellent example of typical cross-rhythm.

It is necessary at this point to anticipate further ambiguities that may be raised concerning these issues. The basic nature of the examples above allows for clarity in distinguishing the features that determine the specific phenomenon of cross-rhythm. Both examples are classified as polyrhythmic because they both contain simultaneous occurrence of two or more conflicting rhythms. Example 0.1 is classified as cross-rhythmic because the rhythmic contradiction is systematic, occurs in the long span, and
acts to significantly disrupt the prevailing metric accents.

Upon further analysis of these two examples, another difference becomes apparent. In figure 2, our cross-rhythm example, the accent pattern of both parts A and B are easily divisible into a common denominator (i.e. 6:4; 3:2). In essence, the rhythmic contradiction can easily be perceived as deriving from simple and even divisions of the same meter. They are, in fact, in a simple ratio to the main beats. In figure 1, however, the rhythmic contradiction that occurs between parts A and B at the beginning of measure two cannot be easily perceived as simple and even divisions of the same meter, and the resultant contradiction is not easily divisible into a common denominator. As in figure 2, the rhythmic contradiction represented in figure 1 is proportional, but instead of representing the simple ratio of 3:2 (as in figure 2), figure 1 represents a more complex 5:2 (or 5:6) ratio.

Could it then hold true that all examples of the subset, cross-rhythm, represent simple proportions which can be easily divisible into a common denominator and are, likewise, derived from simple and even divisions of the same meter? Could it also hold true that rhythmic phenomenoa which represent complex proportions, are not easily divisible, and are not derived from simple and even divisions of the same meter will be polyrhythmic but not properly cross-rhythmic? Although this doctrine appears sound, and would
allow us to easily categorize rhythmic phenomenon based on simple mathematic principles, it is my opinion, based on our working definitions, that it cannot hold true.

As was previously stated, it is the perceived level to which the rhythmic conflict systematically contradicts the prevailing meter, not the complexity of the mathematical relationship that determines the phenomenon of cross-rhythm or polyrhythm. Using this logic as the basis for analysis, the following example, figure 3, must be labelled as polyrhythmic (but not cross-rhythmic) even though the rhythmic contradiction is easily divisible into a common denominator (i.e., 3:2) and can easily be derived from simple and even divisions of the same meter.

![Fig. 3](image)

Part (A) presents a strong and regular four-beat accent pattern in bar one, but it blurs beats one and two of the second bar by presenting a conflicting 3:2 rhythm before redefining the regular four-beat accent pattern again on beats three and four. As was the case when examining figure 1, this momentary contradiction leaves
the prevailing meter fundamentally unchallenged. Thus, it is an example of polyrhythm but not cross-rhythm. One may even choose to label the single occurrence of the conflicting 3:2 rhythm in figure 3 as a polyrhythmic fragment of the sequential 3:2 (6:4) cross-rhythm displayed in figure 2. In itself, however, figure 3 cannot be labelled as an example of cross-rhythm. Although figure 3 displays the same regular and systematic derivation found in figure 2, the rhythmic conflict produced between the parts is too brief to fundamentally challenge the prevailing meter.

Following this logic again, the following figure must be labelled as cross-rhythmic, even though the proportional relationship between parts A and B is highly complex, is not easily divisible, and, in fact, cannot be easily perceived as simple and even divisions of the same meter.

Example 4 must be classified as cross-rhythmic because the rhythmic contradiction is regular and systematic, occurs in the long span, and acts to significantly disrupt the prevailing metric
accents. Again, this contradiction is not "momentary" but in a fixed pattern, creating a significant and continuing rhythmic conflict.

With these examples understood, our working definitions seem to provide adequate means to categorize even the most complex rhythmic examples as either polyrhythmic or cross-rhythmic, based entirely on the level of systematic, temporal disruption. In turn, we have also proved that the complexity of a given proportional relationship has no significance in determining whether a phenomenon is to be considered an example of cross-rhythm or polyrhythm. At this point, perhaps, it is also important to establish that even though all of our prior examples of polyrhythm and cross-rhythm displayed proportional relationships, there is nothing in our working understanding of the terms to stipulate that proportional relationships must exist.

To review, we have confirmed that polyrhythm is simply the simultaneous occurrence of conflicting rhythm. Accordingly, we have confirmed that cross-rhythm is regular and systematic rhythmic contradiction which disrupts the metric accent. At no time has the element of proportional relationships been mentioned or implied in either definition. Even though cross-rhythm requires a regular and systematic contradiction, it could as easily be a
regular and systematic contradiction based on the addition of asymmetrical note values rather than one based on a divisible ratio.

Even within the definition of cross-rhythm presented by *Grove's Encyclopedia*, there was a very clear example of non-proportional cross-rhythm based on asymmetrical addition of note values rather than on division of ratio. As an example of cross-rhythm, *Grove's Encyclopedia* offers, "for instance, the division of 4/4 into 3+3+2 quavers, or 9/8 into 2+2+2+3 quavers." (Sadie 1980:64)

Please refer to figure 5 for a visual reference.

Both example (A) and example (B) of figure 5 represent regular and systematic rhythmic contradiction which disrupts the metric accent. They are both, by definition, examples of cross-rhythm and, thus, also examples of polyrhythm. Neither example, however, is proportional, and neither example is based on a divisive ratio. Both are, instead, linear sequences, based on the addition of asymmetrical groupings of subdivisions. They are not random events, but instead, regular and systematic rhythmic
contradictions. By emphasizing asymmetrical attacks that contradict the normal meters, they also serve to disrupt the flow of the metric accent significantly.

As we have previously observed and noted, many examples of polyrhythm and cross-rhythm exist in structures that represent proportional relationships with both simple and complex ratios. We have now further confirmed that these divisive structures, though common, are not the only examples of cross-rhythm that satisfy our working definition. With this in mind, I will turn to some common problem areas that must not be overlooked.

One potential point of confusion still to be addressed is: How do we find a common interpretation for a level of rhythmic conflict which creates a significant enough disruption of the prevailing meter to warrant the label of cross-rhythm?

Earlier we confirmed that cross-rhythm should be properly reserved to define rhythmic/metric contradiction which is regular and systematic and which occurs in the longer span. We stressed that the sequential rhythmic/metric contradiction must be significant enough to significantly disrupt the prevailing meter or accent pattern of the music. Can we confirm a systematic approach for determining the minimum duration required of a given sequential rhythmic disruption of the prevailing meter in order for that disruption to be considered cross-rhythm?
We have repeatedly stated that a true example of cross-rhythm cannot be a mere momentary rhythmic displacement. It must disrupt and challenge the prevailing metric scheme. Metric schemes are traditionally marked as a sequence of linear durations divided into measures or bars according to the given length of the scheme. It follows that a metric scheme cannot be disrupted in a durational span less than the durational span required to reveal the identity of the metric scheme itself. In other words, if it cannot be determined that a metric scheme exists in 12/8 meter until at least one entire measure of 12/8 meter is revealed, it follows that the prevailing metric scheme of 12/8 cannot be disrupted by any rhythmic activity of a duration less than one measure of 12/8 time. In essence, we have confirmed that a systematic rhythmic/metric contradiction that significantly disrupts the accent pattern of the music for less than at least one musical measure cannot be considered an example of cross-rhythm. Again, we can refer to figures 1 and 3 as visual examples.

In turn, can we now confirm that all sequential rhythmic/metric contradiction significantly disrupting the accent pattern of the music for at least one musical measure may be properly identified as cross-rhythmic? To affirm this statement as an absolute truth would be to create of a universal doctrine based on rationale that some would debate. Rather than propose this axiom as a universal truth, we could assert that sequential rhythmic/metric
contradiction that significantly disrupts the prevailing accent pattern of the music for at least one musical measure is usually considered to be cross-rhythmic. This statement allows for a limited interpretation of what actually constitutes a contradiction and challenge to the prevailing metric scheme. It seems to me, however, that to argue that such a contradiction not be considered cross-rhythmic, substantial and extraordinary rationale would have to be provided to make the case that the prevailing meter was not fundamentally challenged or displaced. In short, the fundamental question appears to be: Is one measure of systematic disruption of the prevailing meter enough to consider the prevailing meter fundamentally challenged? Or, to restate, can we consider the following figure to be an example of crossrhythm, even though it is only one measure in length?

Based on the previous argument, logic would appear to lead to the answer yes. Can it now be stated that sequential rhythmic/metric contradiction that significantly disrupts the established and prevailing accent pattern of the music for at least one measure
should properly be considered an example of cross-rhythm? Logic leads to a positive response, but is a delineation based on one measure broad enough to encompass all examples of cross-rhythm we may encounter? Before reaching a conclusion, let us consider another, slightly different, musical example of cross-rhythm that may reveal additional information. Please refer to figure 7 for a visual reference.

In figure 7, part (B) presents a strong and regular two-beat accent pattern reinforcing the 2/4 time signature of the meter for three bars. Part (A), however, presents a continuous contradiction of the quarter-note accent pattern by emphasizing a regular and systematic attack scheme based on a three eighth-note (or dotted quarter-note) duration. Over the time span of a three measure phrase, an easily recognizable 4:6 cross-rhythm is created between part (A) and part (B). In essence, figure 7 would be considered to be a classic example of an evenly divisible cross-rhythm (4:6) as it exists in a simple, duple metric structure. How does this new example affect our previous question?
Obviously, figure 7 has a drastic effect on the assertion that one measure of systematic rhythmic/metric contradiction would signal and define all occurrence of cross-rhythm. In fact, in figure 7, the evidence that a true cross-rhythm exists does not become apparent and confirmable until the end of the third measure. How does this compare to our previous statements concerning systematic rhythmic/metric contradiction that takes place within a given measure?

In essence, a clear relationship can be defined. When the statement was proposed that all sequential rhythmic/metric contradiction that significantly disrupts the accent pattern of the music for more than one measure be identified as cross-rhythm, its basis was an example in which both the cross-rhythm and the metric structure were revealed within one measure of 12/8 meter (figure 6). It has already been observed in figure 7, that while the metric structure is revealed in part (B) every measure, the cross-rhythmic relationship of part (A) is revealed over a three measure span.

If we only look at measure one of figure 7, we cannot identify that measure as an example of cross-rhythm. Likewise, if we look at measure two only, or even measures one and two together, no cross-rhythmic relationships can be established. Under the most general definition, one could refer to these simultaneous rhythmic
conflicts as examples of polyrhythm. They do not, however, significantly and systematically disrupt the metric accent; therefore, they cannot be referred to as examples of cross-rhythm. It appears now that our original proposal must be modified to account for cross-rhythmic relationships requiring two or more measures to reveal themselves. 

Taking into account information from these examples, we can now confirm a systematic approach to determining the minimum duration required of a given sequential rhythmic disruption of the prevailing meter in order for that disruption to be considered cross-rhythm. We previously asked whether or not one measure of systematic disruption was enough. We now know that the answer to this question is sometimes. Specifically, when both the metric structure and the entire cross-rhythmic relationship are revealed within one measure, that one measure of systematic metric challenge will satisfy the durational requirement for definition as cross-rhythmic. In situations where the metric structure is revealed in one measure but the metric challenge (i.e., cross rhythm) requires two or more measures to reveal itself in its entirety, we will consider that minimum number of measures (required for one cycle of the relationship to reveal itself in its entirety) as the minimum satisfactory duration required for it to be defined as an example of cross-rhythm.
Another important point of confusion and debate comes in finding a common interpretation of the perception of different rhythms as being derived from, or manifestations of, the same meter. As we have detailed, performance practice and analytical logic reveal that many, but not all, of the musical settings we cite as examples of cross-rhythm are also rhythmic combinations easily divisible into a common denominator (i.e., 6:4; 3:2) and easily perceived as being derived from simple and even divisions of the same meter. Perhaps the most common example of this phenomenon is the simultaneous occurrence of a 3/4 metric accent and a 6/8 metric accent. This phenomenon was displayed in figure 2 as a 6:4 cross-rhythm. We have, of course, demonstrated that examples of cross-rhythm need not be easily divisible or perceivable (figure 4) and that examples of cross-rhythm may not even be based on proportional structures at all (figure 5).

Confusion occurs, however, when we review the previously documented definition of polyrhythm from the *Harvard Dictionary of Music*. We find that it describes polyrhythm as the "simultaneous use of two or more rhythms that are not readily perceived as deriving from one another or as simple manifestations of the same meter." When the *Harvard Dictionary* states that polyrhythm is characterized by simultaneous rhythms that would not be "readily perceived ... as simple manifestations of the same meter," I am led to speculate that they must be referring to highly complex and unrelated divisions of the meter which, under normal
circumstances, would be extremely difficult to perceive. They would either produce very sophisticated ratios to the main beats or be asymmetrically based. This would be in contrast to relatively simple, evenly divisible, and easily recognizable divisions of the meter, such as the previously mentioned relationship between the 3/4 metric accent and the 6/8 metric accent.

When I read further, and find "the simultaneous use of 3/4 and 6/8" cited as a "familiar" example of polyrhythm, I begin to understand an interpretational problem that has been the root of much of the ambiguity surrounding polyrhythm that I have encountered, both in print and through my experiences and discussions with other musicians. My interpretation holds that the simultaneous occurrence of a 3/4 metric accent and a 6/8 metric accent is easily divisible into a common denominator and can readily be perceived as being derived from simple and even divisions of the same metric scheme. In essence, I view them as simple manifestations of the same meter, existing in a simple ratio to the main beats. In this case, I understand the term manifestation to mean "one of the forms in which someone or something ... is revealed" (Morris:794).

The Harvard Dictionary, however, does not consider "the simultaneous use of triple and duple subdivisions of the beat, and the simultaneous use of 3/4 and 6/8 or similarly related pairs of
meters" to be "readily perceived" as "simple manifestations of the same meter" (Randel 1986:646). To be completely objective, the Harvard Dictionary definition does not actually state that the simultaneous occurrence of duple and triple subdivisions, or duple and triple metric schemes, are not simple manifestations of the same meter; it merely states that they are not "readily perceived" as such. This allows one to speculate that the Harvard Dictionary works from the premise that only rhythms emphasizing the dominant beat scheme of a given meter are readily perceivable as manifestations of that given meter. I strongly believe, however, that most musicians do readily perceive the simultaneous occurrence of a 3/4 metric accent and a 6/8 metric accent as being derived from simple and even divisions of the same metric scheme, or, in the words of the Harvard Dictionary, as "simple manifestations of the same meter."

Again, I feel compelled to reaffirm that many polyrhythmic examples exist where two simultaneous rhythms occur that cannot, under any circumstances, be considered derivative of one another or remotely related as manifestations of the same meter. Earlier, we also cautioned against jumping to the false conclusion that all divisive examples of cross-rhythm represent proportions easily divisible into a common denominator, and, likewise, derived from simple and even divisions of the same meter. I feel it is crucial, however, to recognize that many examples of cross-rhythm do exist in a proportional relationship to one another, containing rhythmic
combinations which are easily divisible into common denominators (i.e., 6:4, 3:2, etc.). Most importantly, these combinations can be perceived, readily or not, as being derived from different simple and even divisions of the same meter.

In this sense, I propose that although it is correct to refer to African rhythmic phenomena as polyrhythmic in the general sense, the use of the term cross-rhythm is often more specific and more appropriate. The body of this paper will present numerous examples of African rhythmic models to support this statement in detail. It is sufficient at this point to accept the description of African rhythmic phenomena as both polyrhythmic and cross-rhythmic in nature, with emphasis on rhythmic combinations which exist in a divisive relationship to one another, which represent proportions easily divisible into common denominators (i.e., 6:4, 3:2, etc.), and which provide systematic rhythmic contradiction of the prevailing meter in the long term (rather than momentary rhythmic and metric displacements).

Although much more discussion concerning terminology is in order, it seems appropriate, before we leave the topic of polyrhythm and cross-rhythm, to interject a working definition for cross-rhythm that has been advanced by one of the most distinguished scholars of African music and African rhythmic phenomenon.
In his outstanding book, *The Music of Africa*, Kwabena Nketia offers the following definition of cross-rhythm:

This interplay arises where rhythms based on different schemes of pulse structures are juxtaposed. The simplest type of cross rhythm is that based on the ratio of two against three, or their multiples - that is, *vertical* interplay of duple and triple rhythms (as opposed to hemiola, where the interplay is linear). More complex cross rhythms result when divisive and additive rhythms are juxtaposed. (Nketia 1974:134-135)

Nketia offers us much to consider in his concise description of the phenomenon of cross-rhythm. He implies a proportional, regular, and systematic approach to the "interplay" through his use of the language, "different schemes of pulse structures," and he clearly recognizes that some cross rhythms may be of a simple ratio and easily divisible (such as his example of two against three), and that some cross rhythms may be asymmetrical and result in more complex relationships. To this point, Nketia is in complete accordance with the working definition of cross rhythm proposed earlier in this document, although he presents his case in a slightly different manner.

One ambiguous point, however, is that Nketia does not directly comment on the need for the "interplay" to occur in the long span and significantly disrupt the prevailing meter. Some would say that Nketia, through his use of language such as "schemes of pulse
structures" and "juxtaposed," has implied that the rhythmic phenomenon that he is describing is one of continuation and temporal significance. I accept that logic, but I also feel it necessary to note that, although he may imply it, Nketia does not directly comment on the issue of metric disruption.

Perhaps the most interesting aspect of Nketia's statement concerning cross-rhythm is his description of cross-rhythm being the vertical interplay of duple and triple rhythms, while hemiola is the linear interplay of duple and triple rhythms. In essence, because Nketia has recognized that cross-rhythm can occur in both simple and complex ratios and also asymmetrically, we can accept his text as basically stating that the phenomenon of cross-rhythm occurs as a vertical interplay and not a linear one. Nketia, again, is in complete accord with the working definition of cross-rhythm proposed earlier in this document. The language "systematic rhythmic/metric contradiction that significantly disrupts the prevailing meter" conveys the concept that a vertical relationship exists between the "systematic rhythmic/metric contradiction" and the "prevailing meter." In fact, up to this point, our entire process of analysis in defining cross-rhythm has been founded on the point that simultaneous rhythmic activity exists, thus establishing the fact that at least one vertical relationship is in place.
As we have now confirmed the accuracy of Nketia’s description of cross-rhythm as being based solely on vertical interplay, can we also accept his statement that hemiola is based solely on linear interplay and, even more specifically, the linear interplay of the ratio 3:2? Before investigating the term hemiola, let us confirm that we have an accurate understanding of Nketia’s description of the phenomenon.
Nketia has devoted an entire chapter of his book, *The Music of Africa*, to "Rhythm in Instrumental Music," and in doing so, has offered a good outline for the use of terminology describing the phenomenon of rhythm. After a discussion of duple and triple rhythm, Nketia states that "the regular divisions of the time span do not always occur in duple or triple forms," but that they "are also conceived in alternating sections of duple and triple; that is, a linear realization of the ratio 2:3, as shown below" (Nketia 1974:127). Nketia's example appears below as our figure 8.

![Diagram](image)

Fig. 8

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Nketia continues by stating that "this pulse structure is referred to as hemiola." He concludes that "it is a combination of two equal sections of duple and triple" and that "each section may have further divisions" (Nketia 1974:128). He then provides another visual example, represented as our figure 9.

Without question, Nketia's text and examples unanimously confirm that he uses the term hemiola exclusively to describe the linear realization of the ratio 2:3. It is also extremely interesting to note that Nketia, in his visual examples, represents the linear realization of the 2:3 ratio in two distinct forms.

Although he offers no time signature, upon examining part (A) of figure 9, one can conclude that Nketia has presented an example representing a 2/4 meter with duple subdivisions, where three equal note values have been substituted for two equal note values. In essence, a new subdivision has been created using note values that are considered to be outside the normal parameters of subdivision for the given metric structure. Theorists have come to
refer to these as "borrowed divisions," a term commonly used to
describe not only triplets in a duple structure but, for instance,
also quintuplets in a duple or triple structure or even, perhaps,
duplets in a triple structure (Cooper 1973:32).

Again, without offering any time signature, part (B) of figure 9
clearly represents a 6/8 meter with triple sub-divisions, where
two groups of three subdivisions each, have been regrouped into
three groups of two subdivisions each. In this example, no new or
borrowed division is required, because the process occurs through
note regrouping rather than note substitution.

It is interesting to observe that Nketia, although giving clear
visual examples of two distinct metric realizations of the linear
2:3, never refers in his examples to the conceptual difference
between the substitution or the regrouping of note values. He also
does not mention the implied vertical 3:2 relationship that occurs
when a triplet rhythm is introduced into a structure with duple
subdivisions. One could postulate that since Nketia does not offer
a time signature for his examples, he is merely using the triplet
(part A of figure 9) to represent the linear ratio of 2:3, and no
more. It does, however, remain an unanswered question. As stated
earlier, what we can absolutely confirm is that Nketia, under all
circumstances, uses the term hemiola exclusively to describe the
linear realization of the ratio 2:3.
With Nketia's description as a basis for comparison, we have enough information to begin an examination of hemiola as it is defined in our standard references. The Harvard Dictionary defines hemiola specifically as "the ratio 3:2," and notes the word's Greek origins. Hemiola is defined in terms of rhythm as "the use of three notes of equal value in the time normally occupied by two notes of equal value." Further, "the resulting rhythm can be expressed in modern terms as a substitution of 3/2 for 6/4 or a two measures of 3/4 in which quarter notes are tied across the bar, as shown in the (following) example." (Randel 1986: 376)

The definition found in Grove's Encyclopedia echoes the content found in Harvard's Dictionary. Grove's begins by noting the word's Greek origin, and stating that the exact meaning would translate to "the whole and a half." Grove's continues by deliniating hemiola as the "substitution of three imperfect notes for two perfect ones" in the 15th century and, in the modern metrical system, presents the example of denotating "the articulation of two bars in triple meter as if they were notated as three bars in duple meter" (Sadie 1980:472-473).
Since no definition of hemiola is available in either the Webster's or the American Heritage Dictionaries, a definition from the fifth edition of Schirmer Books Manual of Musical Terms will serve as our third source of reference. The Schirmer Manual confirms the information previously presented by both the Harvard Dictionary and Grove's Encyclopedia by defining hemiola as "the use of three notes of equal duration in a bar alternating with two notes of equal value, in the same bar length, so that the longer notes equal 1 1/2 shorter ones." The definition concludes by saying that "in modern notation, the hemiola is represented by a succession of bars alternating between 6/8 and 3/4 time."

Before we begin our comparison of these definitions with Nketia's, I feel it necessary to explain that hemiola has been used to describe proportional relationships both as they relate to the phenomenon of rhythm, and, as they relate to the phenomena of intervals and pitch. Hemiola in terms of pitch is used to define the 3:2 relationship as it manifests itself as the interval of the perfect fifth. Ancient proofs of this statement were often displayed through the use of vibrating strings. That is, when dealing with vibrations of strings that vibrate frequently enough to form what we would refer to as discernable pitch, the ratio 3:2 "is the ratio of the lengths of two strings that together sound a perfect fifth" (Randel 1986:376). Likewise, in early music theory, it was proven that "when the string of the monochord was divided in this ratio (3:2), the two lengths sounded the interval of the
perfect fifth” (Sadie 1980:472). Although pitch, as it relates to proportional relationships, is an extremely interesting topic (and one that will be investigated later), it is sufficient to say that, for the purpose of our current investigation, we will concern ourselves only with the definition of hemiola as it relates to the phenomena of rhythm.

Taking the information concerning rhythm found in these three definitions of hemiola and comparing it with the statement by Nketia, it is clear that they all are in basic agreement. Each source details hemiola as being founded in the 3:2 relationship, and each source presents an example of hemiola as being the substitution of three equal note values in the time of two. Although neither Harvard, Grove’s, nor Schirmer’s specifically speak of hemiola as being only a linear phenomenon, as Nketia does, all three sources present examples detailing only linear activity, and all stress that this linear activity involves the alternation of duple and triple time values. At no time do any of the sources refer specifically to simultaneous activity.

An argument could be made, however, that in examples of hemiola, the alternation of triple and duple divisions of the established metric accent create a situation where the hemiola rhythm is alternatingly in unison with or opposed to the rhythm of the metric accent, thus creating a vertical 3:2 relationship between the hemiola rhythm and the established metric accent during that
time in which they exist in opposition to each other. In other words, the linear alternation of the duple and triple divisions of the meter creates a vertical 3:2 cross-rhythmic relationship between the hemiola rhythm and the rhythm of the meter at every other alternation. Please refer to figures 11 and 12 as a visual reference:
In both of the previous examples, part (A) represents the hemiola rhythm, and part (B) represents the established metric accent. In figure 11, the hemiola rhythm in measure 1 serves to establish the triple metric accent of the 6/4 meter. In measure 2, a vertical cross-rhythm in the ratio of 3:2 is established between the altered duple hemiola rhythm and the established triple metric accent. Likewise, in figure 12, the hemiola rhythm in measures 1 and 2 serves to establish the triple metric accent of the 3/4 meter. In measures 3 and 4, a vertical cross-rhythm in the ratio of 3:2 is established between the altered duple hemiola rhythm and the established triple metric accent.

At first impression, this argument for the existence of vertical relationships as a component of hemiola appears quite sound, especially in reference to the musical examples first presented by the Harvard Dictionary and reinforced by the Grove's Encyclopedia. It begins to break down, however, when applied to the slightly different description of hemiola presented by the Schirmer Manual. After presenting an almost identical definition to those found in Harvard and Grove's, the Schirmer Manual states that, as an example in modern notation, "the hemiola is represented by a succession of bars alternating between 6/8 and 3/4 time" (Baker 1995:115). If we are to view hemiola in this way, the vertical 3:2 relationship no longer exists as a component of hemiola. Please refer to figure 13 as a visual reference:
As in examples 11 and 12, part (A) represents the hemiola rhythm, and part (B) represents the metric accent. As can be seen in example 13, because the time signature changes every other bar, the metric accent changes in unison with the hemiola rhythm. Because of this phenomenon, the vertical 3:2 relationship is never established between the hemiola rhythm and the metric accent. They are, instead, always in unison.

What conclusions can now be drawn from our investigation of hemiola? First, all sources emphasize hemiola as being founded in the 3:2 relationship. Second, each source presents an example of hemiola as being the substitution of three equal note values in the time of two in a linear alternation. Finally, if we take into consideration the information from all of our sources, we must accept that the term hemiola can be used to describe both settings where the hemiola rhythm changes while the meter is fixed and settings where the meter changes in unison with the hemiola.
rhythm. In cases where the meter remains fixed, a vertical 3:2 relationship between the hemiola rhythm and the metric accent is created as a function of the linear alternation.

It is precisely the above mentioned phenomenon (the linear alternation of the 3:2 ratio creating an alternating and reoccurring vertical 3:2 relationship in fixed metric structures) that forms the basis for much of the confusion in the proper usage of the term hemiola. Clearly, however, out of all of the points made above, it is the linear alternation of three equal note values in the time of two that provides us with our distinguishing description of the phenomenon of hemiola.

In a further examination of an earlier reference to hemiola in a definition of polyrhythm (from the Harvard Dictionary), we see the linear/vertical controversy just described. In defining polyrhythm, the Harvard Dictionary refers to the “familiar example” of “the simultaneous use of 3/4 and 6/8 or similarly related meters ... termed hemiola.” Obviously, this statement has implications in direct conflict with not only our working definition but also Nketia’s. As mentioned above, the question which arises in this instance is at the root of much of the ambiguity in the use of the term hemiola by performers and scholars alike. Is hemiola a term which should be reserved exclusively for description of the linear (successive) interplay of duple and triple rhythms, or may hemiola, as a specific subset
of the larger phenomenon of cross-rhythm, be properly used in describing the vertical (simultaneous) interplay of the 3:2 relationship?

So far, all of our evidence, with the exception of the reference in the *Harvard Dictionary of Music*, points to the term *hemiola* being used to specifically describe the linear interplay of the 3:2 relationship. To further our investigation, we will now examine the use of term hemiola by another important scholar of African music, Rose Brandel. Although most of Brandel's famous article, "The African Hemiola Style," deals with her adaptation of a newly defined "African Hemiola Style," much useful information on the classic definition of the term *hemiola* is presented as a forward to her own thoughts:

As used in European musical tradition from the Renaissance onward, the term 'hemiola' refers, of course, to the interplay of two groups of three notes with three groups of two notes. This is accomplished without any durational change in the basic pulse unit, so that two groups of 3/4, for example, may become three groups of 2/4 without any metronome change in the quarter note. The important overall effect here is the quantitative alternation of two 'conductors' durations, one of which is longer or shorter than the other. This exchange of 'long' and 'short' is always in the ratio of 2:3, or 3:2, i.e., the longer duration is always one and one-half times the length of the shorter duration. (Brandel 1959:106)
Brandel continues by stating that sometimes the term *hemiola* is confused with the term *sesquialtera*. Brandel then details the evolution of these two terms, including the initial use of notation featuring note-coloration to convey rhythmic relationships. She states that, in reality, the derivations of the two terms came from very different rhythmic concepts because "the hemiola derives from an unequal, asymmetric rhythmic approach, and the sesquialtera from an equal, symmetrical rhythmic approach" (Brandel 1959:106). Quite interestingly, Brandel references the theories of Curt Sachs, who notes that the ancient Greek hemiola, taken literally as, "by one and one half," was actually realized in succession as a five-beat meter, such as "quarter plus dotted quarter (5/8), or half plus a dotted-half (5/4) (Sachs 1943:261). Especially interesting is the discussion of the asymmetrical rhythms of ancient Greece, India, and the Middle East, referred to, in Sachs view, as additive rhythms, while the symmetrical rhythms of Western music were divisive by nature.

Of course Brandel, by virtue of her initial definition, concedes that hemiola is no longer thought of as an asymmetrical, five-beat meter today in Western theory, as it was in the times of ancient Greece. She states that "in Europe, the hemiola already existed in the fourteenth century, being designated by means of note-coloration" (Brandel 1959:106). It is in this following description that her conception of the proper use of the terms *hemiola* and *sesquialtra* is revealed:
Note-coloration within an imperfect tempus (i.e., binary) gave rise to triplets (the imperfect breve - or two quarters - became a triplet) -- this was sesquialtera; Note-coloration within a perfect tempus (i.e., ternary) gave rise to regrouping rather than substitution (two perfect breves - or two groups of three quarters, became three groups of two quarters) -- the true hemiola. (Brandel 1959:106)

With this statement, Brandel makes a very strong delineation between those distinct rhythmic events which are to be properly considered examples of sesquialtera and those distinct rhythmic events which are to be properly considered examples of hemiola. To clarify the statement made by Brandel, sesquialtera occurs as a phenomenon in binary structures when two even note values are substituted by a three-note triplet figure (i.e., in 2/4 time, two quarter-notes become a quarter-note triplet), and hemiola occurs as a phenomenon in ternary structures when two groups of three are regrouped into three groups of two (i.e., when two bars of 3/4 meter become three bars of 2/4 meter). Please refer to figure 14 for a visual reference of sesquialtera and figure 15 for a visual reference of hemiola:
Certainly, the distinguishing descriptions of *sesquialtera* and *hemiola* are based, first, on the concept of *binary* or *ternary* structure, and second, on the corresponding *substitution* or *regrouping* of the rhythm. *Sesquialtera*, in a *binary* structure, requires the *substitution* of three in the time of two (triplet). *Hemiola*, in a *ternary* structure, requires the *regrouping* of two groups of three into three groups of two. As we have now begun to understanding the relationship between hemiola and *sesquialtera*, can we now use this information to assist us in answering our original question? Is *hemiola* a term which should be reserved exclusively for the description of the linear (successive) interplay of duple and triple rhythms, or may hemiola, as a specific subset of the larger phenomenon of cross-rhythm, be
properly used in describing the vertical (simultaneous) interplay of the 3:2 relationship?

At first impression, it appears possible that Brandel has offered us an answer. By defining *sesquialtera* as a triplet substitution in a binary structure (figure 14), a vertical 3:2 relationship is created between the triplet rhythm, and the metric accent of the binary structure. Likewise, by defining hemiola as a proportional duple regrouping in a ternary structure (figure 15), a linear 3:2 relationship is established. Could our answer be that the term *hemiola* does, in fact, properly represent a linear 3:2 relationship, while *sesquialtera*, in turn, is the term best used to represent a vertical 3:2 relationship? Certainly, this clear delineation appears to eliminate a great deal of potential ambiguity and offer us precise and specific terms for the linear and vertical representation of the 3:2 relationship. Upon closer examination, however, one question reveals itself which could force us to reconsider our use of the term *sesquialtera* to represent all vertical 3:2 relationships.

Earlier, we stated our original interpretation of Brandel's definition of *sesquialtera* as "a phenomenon in binary structures when two even note values are substituted by a three-note triplet figure (i.e., in 2/4 time, two quarter-notes become a quarter-note triplet)." A review of that interpretation confirms that the triplet substitution acts to create a vertical 3:2 relationship in
a binary structure. But what about a vertical 3:2 relationship in a ternary structure and, specifically, one that is created through regrouping rather than substitution? Brandel defined hemiola as a phenomenon existing in ternary structures when two groups of three are regrouped into three groups of two in succession. A vertical 3:2 relationship in a ternary structure would then be created when two groups of three were regrouped into three groups of two and combined simultaneously, rather than in succession. Please refer to figure 16 for a visual representation of the vertical 3:2 relationship in a binary structure (substitution). Refer to figure 17 for the vertical 3:2 relationship in a ternary structure (regrouping):

Clearly, both of the examples above represent vertical 3:2 relationships, but are they both examples of sesquialtera? Our working definitions allow us to delineate only figure 16 as true sesquialtera, due to the characteristic substitution of the
triplet value in a binary structure. Because figure 17 creates a 3:2 relationship in a ternary structure through regrouping that is "accomplished without any durational change in the basic pulse unit" (as in Brandel's initial description of hemiola), figure 17 cannot qualify as an example of sesquialtera, even though the 3:2 relationship created is a vertical one. (Brandel 1959:106) We would, more properly, refer to figure 17 as an example of an easily divisible cross-rhythm representing the vertical 3:2 relationship. We must now confirm that we cannot properly use the term sesquialtera to represent all vertical 3:2 relationships. Sesquialtera must be reserved only for those specific instances where a duple division is transformed into a triplet, thus making the triplet what we have previously defined as a borrowed division.

The question still remains as to whether we can properly refer to hemiola as being a specifically linear phenomenon. Still, we have been able to establish a distinguishing description for the term sesquialtera. Before accepting our description of sesquialtera, however, it seems appropriate to confirm our working definition with that of the standard references.

The most recent edition of the Harvard Dictionary of Music, disappointingly, does not have a specific entry for sesquialtera, although it is briefly referenced under the heading "Sesqui-" as relating to the ratio 3:2 and "in some contexts, being equivalent
to hemiola" (Randel 1986:744). As a side point, it is interesting to note that the Harvard Dictionary defines 'sesqui-' as a Latin prefix which denotes a fraction "whose numerator is larger by one than its denominator, e.g., sesquialtera (3/2)..., sesquitertia (4/3), sesquiquarta (5/4), sesquioctava (9/8)." An older edition of the Harvard Dictionary provides more information, stating that in "treatises dealing with proportions it (sesquialtera) means temporal values corresponding to modern triplet notes (three triplet notes equal two normal notes)." Echoing the confusing statement (also noted in the more recent edition of the dictionary), the definition concludes by stating, with absolutely no rationale, that "another term for sesquialtera is hemiola" (Apel 1977:772).

Interestingly, the Grove’s Dictionary begins its listing of sesquialtera by confirming that the word itself is of Latin origin and has the meaning of “the whole and a half,” quite similar in denotation to all of our previous translations of the Greek term hemiola. Grove’s continues by detailing that in "the Middle Ages and Renaissance, the proportio sesquialtera indicated a diminution of the relative value of each note shape in the ratio 3:2" (Sadie 1980:192-193). Perhaps most informative is a brief musical example of sesquialtera composed by Dufay. In this example, the tenor is set in 2/2 meter with rhythms consisting of simple divisions of the
beat scheme. The discantus is set in a 3/2 meter over the identical durational period, creating a constant 3:2 sesquialtera relationship between the parts.

Although no definitions were listed in either Webster's Dictionary or the Schirmer Manual of Musical Terms, a comparison of the definition of sesquialtera presented by the Harvard Dictionary (Apel 1977) and Grove's Encyclopedia with that presented earlier by Rose Brandel should offer us some standard of insight into the term's accepted usage. As when we began our comparison of the definitions of hemiola, it is important to note that the term sesquialtera is used to describe proportional 3:2 relationships, both as they relate to the phenomena of rhythm and as they relate to the phenomena of pitch and the interval of the perfect fifth. Again, we will concern ourselves only with the definition sesquialtera as it relates to rhythm.

Comparing our reference definitions to Brandel's, we find that all sources agree in principal, if not in exact language, on the meaning of the term sesquialtera. All three sources point to the substitution of three notes in the time of two, and all refer to the "borrowed division" of the three-note triplet against a binary setting. Still troubling, however, is the vague statement presented in the revised edition of the Harvard Dictionary of Music concerning sesquialtera as being equivalent to hemiola "in some contexts" (Randel 1986: 744). Also troubling is the even more
vague statement in the 1977 Harvard Dictionary simply interjecting that "another term for *sesquialtera* is hemiola." Of course, the obvious question that remains unanswered by these statements is: In what contexts, or under what circumstances, is the term *sesquialtera* equivalent to the term *hemiola*?

The statement presented in the revised Harvard Dictionary promoting the equivalence of *sesquialtera* and hemiola "in some contexts" (Randel 1986:744) could lead us in many confusing directions speculating as to what those contexts could be. Some could say the Harvard Dictionary was implying that the term *hemiola* could be properly used to distinguish vertical 3:2 relationships that were not classic examples of *sesquialtera*, due to the fact that their note values were regrouped rather than substituted. Others could claim that, because both terms imply the 3:2 relationship, we could properly refer to a repeating linear sequence of two quarter-notes followed by a quarter-note triplet (figure 0.8) as both *sesquialtera* and hemiola, since even though a substitution rather than a regrouping takes place, the linear alternation of three equal note values in the time of two allows us to use the terms interchangeably. Of course, even more elaborate speculation could ensue, taking us even further away from confirming the distinguishing descriptions of either *sesquialtera* or hemiola. I do not feel, however, that a solid and convincing rationale could be provided for any of these potential speculations. It seems more appropriate, instead, to re-examine
our process of defining the terms *sesquialtera* and *hemiola* in an attempt to reveal any links, or universally accepted points of overlap.

When we began to review the term *sesquialtera* we did so in reference to our study of *hemiola*, through information and comparisons provided in Rose Brandel’s article, “The African Hemiola Style.” At that point of our investigation, we had previously noted that *hemiola* is used to describe the 3:2 relationship, both as it relates to the phenomena of rhythm and as it relates to the phenomena of intervals and pitch. We had also noted that, in terms of pitch, *hemiola* is widely used to define the 3:2 relationship and the interval of the perfect fifth. Likewise, when we began our investigation of *sesquialtera*, we noted that, in standard definitions, the same reference to the 3:2 relationship and the interval of the perfect fifth existed. Because our investigation of these two terms was concerned with rhythmic relationships rather than pitch relationships, we chose to concern ourselves only with the definition of these terms as they relate to the phenomena of rhythm. If we now compare the standard reference definitions of these two terms as they relate to pitch, we find some very interesting results.

All sources confirm that, as they relate to pitch, both *hemiola* and *sesquialtera* represent the ratio of 3:2 and the interval of the perfect fifth. In reference to pitch relationships, it appears...
that hemiola and sesquialtera are, respectively, terms from Greek and Latin origins that essentially have the identical meaning. When we review the statement in the revised Harvard Dictionary of Music concerning sesquialtera as being equivalent to hemiola "in some contexts," we find that the information is presented in reference to both "discussions of proportions and intervals" (Randel 1986: 744). This allows for the conclusion that when the Harvard Dictionary states that sesquialtera is equivalent to hemiola "in some contexts," the "contexts" they are referring to are "contexts" of pitch.

Likewise, when we review the statement from the 1977 Harvard Dictionary of Music stating that "another term for sesquialtera is hemiola," we find that statement following a detailed discussion of intervals and "ratios of vibrations" (Apel 1977:772). This allows for the conclusion that the Harvard Dictionary's reference to the interchangeability of sesquialtera and hemiola is in relation to the phenomena of pitch rather than rhythm, as was previously assumed.

Based on strong and defendable rationale, we now can produced a logical answer to the question: "In what contexts or under what circumstances is the term sesquialtera equivalent to the term hemiola?" Our investigation has produced the conclusion that, in
relation to pitch, *sesquialtera* is equivalent in meaning to *hemiola*, while in relation to rhythm, *sesquialtera* and *hemiola* represent specific and unique phenomena.

As our general understanding of *sesquialtera* appears to offer us a satisfactory working definition, let us now turn our attention back to our description of *hemiola*. Specifically, should the term *hemiola* properly be used only to describe the linear interplay of the 3:2 relationship, as promoted by Nketia?

Before doing so, however, it seems appropriate to state here that Nketia himself does not reference the term *sesquialtera* at all in his book, *The Music of Africa*. Nketia also never refers to the conceptual difference between the substitution or the regrouping of note values, and he does not describe the vertical 3:2 relationship as being a component of a triplet rhythm in a structure with duple subdivisions. As previously noted, however, he does present musical examples of *hemiola* which involve the use of substituted triplet figures. This, in essence, would contradict the structural models for the term *hemiola* as presented by Brandel and Sachs. The logical conclusion can only be that Nketia, as stated earlier, is merely using the triplet divisions to represent the linear ratio of 2:3 visually, with no other meanings attached.
It remains curious as to why Nketia, himself, does not reference the term *sesquialtera* at all in his comprehensive text. Many would argue that Nketia's rationale stems from the fact that true *sesquialtera* is not emphasized in most African rhythmic structures. Numerous examples could display how most African rhythmic structures, whether they be linear or vertical, are based on the concept of regrouping rather than on substitution and borrowed divisions, like the triplet. However logical this rationale is, it remains entirely speculation. Whether Nketia believes that *sesquialtera* is common or rare to African rhythmic structures, the point remains that he has not referenced the term in his text. Perhaps it is this fact in itself that is revealing.

Again let us turn our attention to Nketia's description of *hemiola*, and specifically the question of whether the term *hemiola* should properly be used exclusively to describe the linear interplay of the 3:2 relationship. As an additional point of reference, let us consider the definition of *hemiola* presented by Paul Cooper in his comprehensive historical and analytical text, *Perspectives in Music Theory*.

Cooper states that "when referring to time values," the term *hemiola* "denotes the relationship of 3:2." He continues by detailing that "it is the play of twice three units against thrice two units, either simultaneously or successively" (Cooper 1973:36). Cooper follows his statement by offering two common
examples of successive hemiola, his examples being nearly identical to those offered by the Harvard Dictionary earlier, as our figure 10. Cooper’s examples are represented below as figure 18.

Cooper continues his definition by stating that hemiola “is also used, less accurately, to describe a vertical (simultaneous) combination of three against two” (Cooper 1973:36). Cooper then gives a visual example, his Example 57, which is represented here as figure 19. A footnote below the figure tells us that, in actuality, the “preferred term for a vertical two against three (Example 57) is sesquialtera.”
What conclusions can we draw from Cooper’s descriptions and examples? First of all, let us examine his text. Cooper promptly addresses the question at the focus of our investigation by defining *hemiola* as representing the play of 3:2 “either simultaneously or successively” (Cooper 1973:36). This initial statement appears very firm and clear. But later, he seems to contradict himself by stating that “the term is also used, less accurately, to describe a vertical (simultaneous) combination of 3:2” (Cooper 1973:36). To further clarify, or perhaps confuse, this new statement, Cooper offers (in a footnote) that “the preferred term for a vertical two against three is *sesquialtera*” (Cooper 1973: 36).

In summary, Cooper has told us that *hemiola* is a term used for all representations of the 3:2 relationship, but that we should more properly use the term *sesquialtera* to represent vertical (simultaneous) occurrences. One could speculate that to Cooper the term *hemiola* is more properly used to represent linear occurrences of the 3:2 relationship. Cooper might also be hinting that the term *hemiola* has become accepted, through improper usage over time, to represent both vertical and linear representations of the 3:2 relationship, but that, most accurately, *hemiola* should be used to describe only linear representations, and *sesquialtera* should be used to represent only vertical representations.
If this logic is accepted, the question again arises concerning the use of the term *sesquialtera* to describe all vertical representations of the 3:2 relationship. In his text, Cooper does not differentiate between the formation of the vertical 3:2 relationship being based on substitution (triplets) or the regrouping of metric stress. He also does not specifically address, in text, the necessary existence of binary or ternary structures as a component of either phenomenon. Perhaps a review of his visual examples will offer new information.

We earlier confirmed that Cooper’s examples of linear (successive) hemiola (figure 18) were in agreement with the classic examples of hemiola previously presented (figure 10). They both represent a proportional duple regrouping in a ternary structure, clearly defining the linear play of the 3:2 relationship. Upon re-examination of Cooper’s example of vertical hemiola, however, some new perspectives can be revealed.

Cooper’s text stated that “the preferred term for a vertical two against three” is *sesquialtera*, but did not define *sesquialtera* as being based on substitution or regrouping. When we examine Cooper’s vertical example (figure 19), we find that he has, indeed, provided an example of what was previously defined in this document as *sesquialtera*. In the most classic sense, his example represents a binary structure with the substitution of three equal
note values in the time of two, in turn requiring the use of the borrowed division of the triplet.

Although he has not stated his position as such, Cooper, through his visual examples, has represented linear hemiola as a phenomenon of duple regrouping in a ternary structure, and he has represented sesquialtera as a vertical phenomenon of triplet substitution in a binary structure. Clearly, his visual examples confirm the working definitions of these terms that have been established earlier in this document. However, we are still faced with ambiguity.

Cooper has stated that the term hemiola is used both to describe a linear and, “less accurately, to describe a vertical three against two” (Cooper 1973:36). He has also said that sesquialtera “is the preferred term for a vertical two against three” (Cooper 1973:36). As a visual reference for his vertical example, Cooper presents a classic example of sesquialtera, displaying triplet substitution in a binary structure. Neither in his text nor in examples, however, does Cooper account for a vertical 3:2 relationship in a ternary structure created, specifically, through regrouping rather than substitution. In essence, Cooper has not yet sufficiently addressed the one vertical example that could provide insight into the proper distinguishing description for the term hemiola.
We can discover, however, an interesting example if we further into Cooper's text and reference his definition of the term polyrhythm. Cooper denotes polyrhythm as "the simultaneous use of two or more different (and contrasting) rhythmic schemes." This definition is, in all practical terms, identical to the working definition of polyrhythm proposed earlier. Cooper then presents the following visual representation of polyrhythm, notated below as figure 20.

![Figure 20](image)

If we analyze this visual example of polyrhythm provided by Cooper, it becomes apparent that he has notated a vertical (simultaneous) 3:2 relationship created through regrouping of metric accents rather than the substitution of triplet values. Although the example is written in a 2/4 time signature, it requires the displayed three-measure (ternary) structure for its proper realization. In essence, Cooper has finally provided the
vertical 3:2 example that we assumed he overlooked. It appears, however, as an example of polyrhythm instead of hemiola.

Although some of his statements have added to previous ambiguities, Cooper has, through the main body of his text and examples, confirmed our working definitions of sesquialtera and hemiola. He has not, however, provided us with new or absolute evidence to confirm Nketia's original statement that hemiola should properly be used to describe specifically only the linear interplay of triple and duple rhythms (although he has implied it). He has, though, presented us with a visual representation of the vertical 3:2 relationship created through regrouping, but as an example of polyrhythm and not as an example of hemiola. Through his visual examples, then has Cooper confirmed Nketia's basic premise that the vertical play of duple and triple rhythm is polyrhythm (since, by our previous definition, all examples of cross-rhythm are also polyrhythm) and that only the linear play of duple and triple rhythms is properly hemiola?

Because so much of what has been established from Cooper's visual examples is not clearly stated in his text, many would say that severe ambiguity still exists, and that more rationale is still required before formulating a final conclusion. Our examination of Cooper has possibly provided us with a strategy for consideration. By stating that hemiola, in addition to its linear usage, is "also used, less accurately, to describe a vertical 3:2 relationship,"
Cooper has implied that improper use of the term *hemiola* has, over time, caused the term to mutate from its original and proper definition to a more ambiguous one (Cooper 1973:36). Would it then be wise to examine again our most historic and original definition of *hemiola*? Perhaps one final review of Brandel's interpretation of Sach's classic definition of *hemiola* will reveal a perspective previously overlooked or underestimated.

When Brandel's definition of *hemiola* is re-examined, one immediately notices that she begins with the words, "As used in European musical tradition from the Renaissance onward" (Brandel 1959:106). Prior to that time, it has been understood that *hemiola* existed in music of Greek origin. But unlike its European descendent, it was set in an asymmetrical structure instead of a symmetrical one. The evolution of the European symmetrical definition of *hemiola* from the earlier, five-beat, asymmetrical Greek version of the concept was pointed out previously as being of interest. Perhaps this evolution holds the key to a defendable rationale for Nketia's distinguishing description of *hemiola*.

As Brandel has noted, Sachs confirmed that the Greek *hemiola* was taken absolutely literally as "by one and one-half" and manifested itself as the "paeonic or five-beat meter, which was realized in practice as a dotted-quarter plus a quarter (5/8), or a half plus a dotted-half (5/4) (Sachs 1943:261). Sachs, in a reference ten years later, comments on asymmetrical rhythmic approaches being...
considered "additive styles" because of the "succession or addition of assorted durations" (Sachs 1953:24-25).

The most significant aspect of this description of the asymmetric Greek hemiola is the use of the word succession. Clearly, the ancient Greek hemiola, from which the European concept is derived, was a successive, or linear, phenomenon. If the earlier description of the Greek concept of hemiola is taken literally, there would be no circumstance under which the Greek hemiola could produce a vertical event.

Now, after an extensive investigation into several basic and implied definitions of the term hemiola, we can conclude that Nketia's definition of hemiola is the best definition after all. Certainly there is substantial rationale, based on the historic Greek usage, that the term hemiola should properly be used to describe a linear 3:2 relationship.

To summarize, we now have formulated distinguishing descriptions for several terms that have consistently been the basis of severe ambiguity. For the purpose of this document, the following working definitions will be used to define the terms polyrhythm, cross-rhythm, hemiola, and sesquialtera.
Polyrhythm will be defined as a general and nonspecific term for the simultaneous occurrence of two or more conflicting rhythms, of which cross-rhythm is a specific and definable subset.

Cross-rhythm will be a more specific term reserved to define examples of polyrhythm consisting of rhythmic/metric contradiction which are regular and systematic and which occurs in the longer span - that is, systematic rhythmic/metric contradiction that significantly disrupts the prevailing meter or accent pattern of the music. Again, while all examples of cross-rhythm would also be examples of polyrhythm, all examples of polyrhythm would not necessarily be examples of cross-rhythm.

Hemiola will be defined, rhythmically, as a linear phenomenon in ternary structures where two groups of three are alternatingly regrouped into three groups of two. In essence, hemiola represents a linear realization of the ratio 3:2, formed by the regrouping of note values. Two classic examples are the regrouping of two bars of 3/4 meter into three bars of 2/4 meter and a sequential succession of bars alternating between a 6/8 and 3/4 metric accent.

Under a strict interpretation of this given definition, it must be noted that hemiola cannot be considered an example of polyrhythm. The rationale for this statement is that hemiola does not represent the simultaneous occurrence of two conflicting rhythms.
but, instead, a successive and alternating linear phenomenon. As we saw near the beginning of this investigation, the alternation of duple and triple accents does produce a situation where the hemiola rhythm is alternatingly in unison with or opposed to the metric accent in examples where the metric accent does not change with the rhythm. This serves to create a vertical 3:2 relationship (polyrhythm) during the time in which they exist in opposition to each other. This vertical relationship is a function of the hemiola process, however, and should not be thought of as the hemiola itself. The hemiola is the linear process of the regrouping and alternation of duple and triple metric accents in a ternary structure and, by itself, is not a polyrhythm.

Sesquialtera will be defined, rhythmically, as a vertical phenomenon in binary structures where two even note values are substituted by a three-note triplet figure, thus making the triplet a borrowed division. In essence, sesquialtera represents those specific examples of the vertical realization of the 3:2 relationship that are formed by the substitution of borrowed divisions. As confirmed earlier, vertical realizations of the 3:2 ratio that are formed through the regrouping of note values, rather than the use of borrowed divisions, cannot be considered examples of sesquialtera. The classic example of this phenomenon occurs in 2/4 time when two quarter-notes become a quarter-note triplet. Under a strict interpretation of this given definition, it must be stated that sesquialtera is always considered an
example of polyrhythm, and if it occurs as a regular and systematic occurrence in the long term, it also may be considered an example of cross-rhythm.
In addition to distinguishing between concepts of polyrhythm, cross-rhythm, hemiola, and sesquialtera, there are several other terms for which proper definitions must be confirmed. During the course of our investigation, the concepts of additive rhythm, divisive rhythm, and syncopation were referenced in relation to various descriptions of the above terminology. These deserve further explanation. Perhaps even more important is the confirmation of proper definitions for the terms beat and pulse, often used in the standard literature as if they meant the same thing. Because a distinguishing description of these two terms is so crucial to the understanding of several related concepts, I will begin with them.

The terms beat and pulse are often used interchangelably. Even more notable is the wide usage of the word beat to represent phenomena better described as rhythm, tempo, or style. Many would argue
that, since the variable usage of these terms has become so accepted, the terms have expanded to a broader meaning than they once had. I cannot accept this argument. If we are to maintain the consistency, structure, and integrity of our language over time, we cannot allow terminology to mutate into an ambiguous state due to uninformed usage. On this point, there must be no variance.

Fortunately, all standard sources confirm that the term *beat* properly represents the basic temporal referent of a composition, and that this basic temporal referent may be divided into smaller pulsations, often referred to as subdivisions. Most sources also refer to the history of the term as being related to the marking of time in music by "movements of the hand" (Randel 1986: 85). Again, to emphasize this essential concept, the term *beat* properly represents the primary temporal marker of the music: that is, what one would conduct or tap a foot to. The term *pulse* properly represents the smaller, equal subdivisions between the given beats. The beats, in fact, generate the smaller pulsations. They are not merely to be considered a mathematically derived result of them. When using the terminology correctly, there would be no circumstance where the pulses could generate the beats.

Music can be divided into segments, or measures, based on the number of beats that represent the desired temporal scheme. In turn, the desired number of pulses, or subdivisions, between these beats is also described. It is both the number of beats per
measure and the defined subdivisions of the beat that create the metric scheme. This concept dates back, at least, to the mensural notation of the Middle Ages, where the beat, or tactus, was referenced in terms of "time (tempus) and subdivision (prolatio)" (Cooper 1973:32).

In general, metric schemes can be divided into two categories depending on the number of pulses per beat: A. Binary, consisting of two or four pulses per beat, and B. Ternary, consisting of three or six pulses per beat. Often, binary subdivision is also referred to as simple division, while ternary subdivision is generally referred to as compound division (Locke 1982: 221; Cooper 1973: 31). In addition to their usage as descriptions of pulses, these terms, binary and ternary, also describe beat schemes. In these cases, the term binary is often replaced with the term duple, and the term ternary is often replaced with the term triple.

In mensural notation, the terms for subdivision were imperfect for binary division and perfect for ternary division. The idea of the number three being referred to as "perfect" has been traced "theologically to the Holy Trinity" (Sadie 1980:813).

Historically, the terms perfect and imperfect were also applied to the tempus (time) or beat scheme, designating, for example, the meter 2/4 as "Imperfect - Imperfect" and the meter, 6/8, as "Imperfect - Perfect" (Cooper 1973:33; Randel 1986:485-486). When
using the modern terminology described in the previous paragraph, the 2/4 meter is referred to as a 'simple duple' meter (a binary beat scheme with binary subdivisions), while the meter 6/8 would be referred to as a 'compound duple' meter (a binary beat scheme with ternary subdivisions).

Most examples of African musics, especially musics associated with dance, can be transcribed into metric schemes in Western notation in 4/4 meter (for music with binary subdivisions) or 12/8 meter (for musics with ternary subdivisions). Please refer to figure 21 for a visual examples of 4/4 and 12/8 metric schemes with their basic subdivisions.

In standard musical terminology, each example represents a metric scheme that consists of four beats per measure, the first example with binary subdivision, and the second with ternary subdivision. The binary scheme produces 16 pulsations per measure, measured in 16th notes, and the ternary example produces 12 pulsations, measured in 8th notes. Also, the commonly accepted designations
that have come to represent locations of specific pulsations have been included in figure 21. Using these specific designations, we can now refer to the beats in a 4/4 metric scheme as "beat one," "beat two," "beat three," or "beat four." We can refer to a given subdivision of the beat as being the "e," the "and," or the "a." Likewise, in a 12/8 metric scheme, we refer to the beats in the same fashion (using the designations one, two, three, or four), and we refer to the subdivisions of those beats as being either the "and," or the "a."
CHAPTER 5

DOWNBEAT, UPBEAT, AND OFFBEAT

Often the terms downbeat, upbeat, and offbeat are used without proper understanding of their origins or specified meanings. Commonly, upbeat and offbeat are used interchangeably and incorrectly. Many musicians feel that the severe confusion in the usage of these terms has rendered them almost meaningless. Again, I cannot accept this argument.

All standard sources are in agreement concerning the definition of downbeat, with some references going into much more detail than others. The Harvard Dictionary presents a very concise definition, stating that the downbeat is "the first and thus metrically strongest beat of a measure, usually signalled in conducting with a downward motion" (Randel 1986:242).

Described in the Grove's Encyclopedia under the heading "rhythm," downbeat is again defined as the first beat of the measure.
Especially interesting is the rationale based on a presentation of the theories of Riemann. Riemann classified beats as "on-stressed," "off-stressed," or "interior stressed," depending on whether they fell at the beginning, the end, or the middle of the measure. According to Reimann, the downbeat is on-stressed, or at the beginning of the measure, and the upbeat is off-stressed, or at the end of the measure. Beats within the interior of the measure are referred to, then, as interior-stressed (Sadie 1980:808).

In a similar manner, Webster’s Dictionary offers a very direct and concise definition. In Webster’s the term downbeat is described as “the downward hand movement made by a conductor to indicate the first beat of a musical measure” (1984:212).

To take this investigation one step further, I would like to confirm that Schirmer’s Manual echoes the previous definitions by stating that downbeat is defined as “the downward stroke of the hand in beating time, making the primary or first accent in each measure.” (Baker 1995:78)

With no confusion, all sources agree that the term downbeat is properly used to describe the first beat of a measure, regardless of metric scheme, and that this first beat is often represented by the downward stroke of the hand when marking time. As this definition is accepted and clear, I would like to point out that
occasionally the term downbeat is accepted as an expression to
describe only the first beat of a musical composition. In fact, a
description of this alternative usage of the term is provided by
the Harvard Dictionary, which states that downbeat, as a secondary
definition, can also be "the first beat of a piece and thus also
the conductor's signal to begin a piece" (Randel 1986:242).

While recognizing the legitimacy of this alternative usage, for
the purposes of this document the term downbeat will be used as it
was originally defined: "the first beat" of every measure of a
musical composition.

Upbeat is defined by the Harvard Dictionary of Music as follows:

One or several notes that occur before the first bar line
and thus before the first metrically accented beat (downbeat)
of a work or phrase; anacrusis, pickup. (Randel 1986:900)

This definition appears clear except for the opening phrase
describing upbeat as "one or several notes" (Randel 1986:900). As
downbeat was described as having only one possible attack point
(the first beat of the measure), could it be that upbeat is a term
used to describe, potentially, several attack points (or notes)
that would occur near the end of a given measure leading to the
next downbeat? Perhaps other sources will clarify the confusing
question of whether the term upbeat properly represents one
specific attack point in the measure.
As was the case with the term *downbeat* there is no specific entry in the *Grove's Encyclopedia* for the term *upbeat*. As previously, *upbeat* is referenced under the heading of "rhythm," and is designated, by Reimann, as an off-stressed beat, occurring at the end of the measure (Sadie 1980:808). This definition appears to imply that the term *upbeat* represents one attack point, occurring, specifically, at the end of the measure and before the next *downbeat*.

*Webster's Dictionary* defines *upbeat* as "an unaccented and especially the final beat of the measure." (1984:754) This definition appears ambiguous toward the issue of *upbeat* designating one or several attack points in the measure. Further investigation appears to be in order.

The *Schirmer Manual*, in turn, defines the term *upbeat* as follows:


As *Schirmer's Manual* is the first source to directly reference a conductor's hand motion, a distinguishing description is becoming more clear. To augment the definition presented by *Schirmer's*, let us look to one more source for clarification.
The *American Heritage Dictionary* defines the term *upbeat* as "an unaccented beat, upon which the conductor's hand is raised; especially, the last beat of a measure" (Morris 1976:1406). Confirming the information presented by *Schirmer's Manual*, the *American Heritage Dictionary* again references the conductor's hand motion. It also confirms previous definitions by identifying the upbeat as "especially, the last beat of a measure" (AM HERITAGE).

At this point, a satisfactory working definition for the term *upbeat* can be formulated. All sources agree that upbeat represents a designation for the final beat of a given measure. Sources also have related the term (as was the case with *downbeat*) to the motions made by the hand when marking time.

As a further reference, let us consider the examples of standard conducting patterns presented by Paul Cooper in his text, *Perspectives in Music Theory*. Please refer to figure 22 on the following page for a visual diagram.

It can be easily seen in figure 22 that, in every case, the conductor's hand is raised at the final beat of each individual conducting pattern, no matter what the time signature. This provides us with a stunning confirmation that, in fact, there is a direct and historic relationship between the terms *downbeat* and *upbeat* and the physical motion of the hand when marking time.
Fig. 22
This also provides additional confirmation to the accepted description of the term *upbeat* as a designation for the final beat of a given metric scheme.

The one question that remains unanswered, however, is whether or not the term, *upbeat*, properly represents only one note (the final beat of the measure) or whether it can properly represent "one or several notes," as proposed by the *Harvard Dictionary*. Using our present working definition of the term as a foundation, a logical application of the phrase "one or several notes" results in the term *upbeat* representing not only the final beat of the measure but also any grouping of notes (or rhythmic motive) that occurs in anticipation of the next downbeat. In essence, the *Harvard Dictionary* has used, in describing *upbeat*, the classic definition of what most musicians would refer to as a "pickup."

In referencing the *Harvard Dictionary*’s definition of the term *pickup*, it becomes obvious that the above assertion is true. The *Harvard Dictionary* defines *pickup* as follows:

One or more notes preceding the first metrically strong beat (usually the first beat of the first complete measure) of a phrase or section of a composition; anacrusis, upbeat. (Randel 1986:637)
Of course, this definition is almost an identical restatement of the definition provided for the term *upbeat*. In fact, as can be easily observed, each term references the other as a synonym.

As was the case with the term *downbeat*, it must be accepted that the *Harvard Dictionary* has provided us with alternative and, in this case, broader definition of the term *upbeat* which also encompasses the concept of *pickup*. As before, while recognizing the legitimacy of this alternative usage, for the purposes of this document, the term *upbeat* will not be used as a synonym for *pickup*, but instead will be used as it was initially defined. Specifically, in this document the term *upbeat* will be understood to describe the last beat of every measure of a musical composition, usually marked by the upward motion of the conductor's hand. To clarify this point even further, the term *upbeat* will be used to delineate a specific location in the musical measure (the last beat), while the term *pickup* will be used to describe a rhythmic phenomenon of one or more notes that lead into a downbeat. This rhythmic phenomenon, the pickup, could have the duration of an entire beat, only a fraction of a beat, or perhaps even more than one beat.

With satisfactory working definition of the terms *downbeat* and *upbeat* established, I will now turn my investigation to the final component in this comparison: the term, *offbeat*. Quite interestingly, no definitions of *offbeat* exist in either the
Harvard Dictionary, Grove's Encyclopedia, Schirmer's Manual, or Cooper's theory text. Perhaps because of its literary denotations, offbeat does appear in both Webster's Dictionary and the American Heritage Dictionary. In both cases, the term offbeat is simply defined as "an unaccented beat" (Webster's 1984:488; Morris 1976:911).

One can only conclude that the omission of the term offbeat in all of the common music references was not accidental. Perhaps they consider this term to be so self-describing that it is not in need of a specific entry. If the term offbeat is taken at face value, it simply means "off of the beat." It then follows that the term should be used to describe any attack point that is not located on the beat or, perhaps, not located onbeat. As a point of reference, the term onbeat is also not found in any of the standard music references. Once an understanding of the opposition of the terms onbeat and offbeat has been confirmed, one can properly speak of both the downbeat and the upbeat as onbeat moments (or onbeats), while the pulsations (or subdivisions) that are generated by, and in between, the beats would all be referred to as offbeat moments (or offbeats).

Let us compare our working definition of the term offbeat with that of a distinguished scholar of African rhythmic principles who has used the term widely in publication. In his often referenced article, "Principles of Offbeat Timing and Cross-rhythm in
Southern Ewe Dance Drumming," David Locke confirms our working
definition by referring to the subdivisions as "offbeat positions
within each main beat" (Locke 1982: 227). In reference to Ewe
rhythmic patterns, Locke states that instead of emphasizing all of
the possible subdivisions and offbeat moments, only "three offbeat
positions are used frequently: the second and third 8th notes and
the second dotted 8th note" (Locke 1982: 227). He continues by
stating that "there are twelve important offbeat moments within
each cycle of the standard bell pattern," and then he offers a
visual example, that is represented by figure 23 below.

Clearly through his text and his musical example, Locke has
confirmed our working definition of the term offbeat. By referring
to the subdivisions as offbeat positions and relating them to the
four beats of the metric scheme and, later, to other rhythms that
have onbeat positions, Locke has also confirmed our concept of the
term onbeat.
To summarize this portion of our investigation, we now have established distinguishing descriptions for the terms *downbeat*, *upbeat*, *offbeat*, and *onbeat*. For the purpose of this document, the following working definitions will be used to describe these terms.

The term *downbeat* will be understood to describe the first beat of every measure of a musical composition, usually marked by the downward motion of the conductor's hand. The term *upbeat* will be understood to describe the last beat of every measure of a musical composition, usually marked by the upward motion of the conductor's hand. With this said, it must also be understood that accepted secondary definitions exist for each term. In the case of *downbeat*, we recognize that it is sometimes used to signify only the first beat of the entire composition. And in the case of *upbeat*, we recognize that it is sometimes used synonymously with the term *pickup*.

It is also necessary at this time to comment on the notion of a conductor's hand marking music in reference to the term *downbeat* and *upbeat*. For the purpose of this document, it will be understood that beat one of a given measure will always be considered the downbeat, whether a conductor is marking the metric scheme or not. Likewise, the term *upbeat* will be used to represent the final beat of a given metric scheme, whether it happens to be
conducted or not. In essence, metric schemes exist in performance settings that may or may not be using a conductor as a visual, temporal reference.

To continue our summary, the term *offbeat* will be used in this document to describe any attack point, or subdivision, that does not coincide with a beat. The term *onbeat*, in turn, will be used to describe any attack point that does coincide with a beat. In essence, this delineation allows us to refer to every beat, downbeat, and upbeat position also as an onbeat position, or as an onbeat. Our definitions also clearly instruct us to refer to every subdivision or pulsation, whether it be in a binary or a ternary division, as an offbeat position, or as an offbeat.

Earlier, I stated that most African musics can be transcribed into metric schemes which would normally be represented in Western notation as 4/4 meter (for music with binary subdivisions) or 12/8 meter (for musics with ternary subdivisions). As our definitions for the terms *downbeat*, *upbeat*, *offbeat*, and *onbeat* are now in place, I will now reconsider the earlier 4/4 and 12/8 models as they relate to this newly confirmed terminology. In my example, the onbeats will be labelled with the letter (D) if they specifically represent a downbeat, the letter (U) if they specifically represent an upbeat, and the letter (B) if they specifically represent a beat that is neither a downbeat nor an upbeat (or what was previously defined by Reimann as an *interior*
beat: a beat which is neither at the beginning nor at the end of a measure). Please refer to figure 24 for a visual representation of these metric schemes and their labels.

As can easily be seen, all of the pulses, or subdivisions, which exist in between the beats are properly labelled as offbeats. Likewise, if further and smaller subdivision of the beats were to occur, all smaller subdivisions that existed between the beats would be properly labelled as offbeats as well. Because both the 4/4 and the 12/8 examples share a quadruple beat scheme, they also share the designation of beats one (downbeat), two (interior beat), three (interior beat), and four (upbeat).

Often, the various beats of a four-beat scheme carry with them an implied level of substructure. Often the first beat, or downbeat, is considered the strongest beat in the measure, with all of the other beats, to various degrees, being thought of as weaker. The *Harvard Dictionary of Music* describes the sub-structure as follows:
Thus, in 4/4, the first beat is the strong beat, and the third beat is the next strongest, and beats two and four are weak beats. To the extent that the strong beat is thought of as bearing an accent, it is a metrical accent and not one to be necessarily reinforced by increased loudness or sharper attack. (Randel 1986:489)

With this concept of the substructure understood, a very important point must now be made. It must be noted that, when speaking in terms of all musics, this substructure of hierarchical strengths does not always exist.

Historically, much Western music has been composed in a four-beat scheme that does exhibit the above-stated hierarchy. Much of the music composed in the Twentieth Century, however, does not employ this hierarchy at all. In much contemporary music, all beats of a given measure are considered to be equal in strength to each other. In fact, the proper performance of a composition may depend on the performer(s) not applying hierarchical values to the beats. This is also the case with most African musics. Although, as stated earlier, most African musics can be transcribed into metric schemes that would normally be represented in Western notation as 4/4 or 12/8 meter, the beats carry with them no implication of hierarchical value. This understanding will become crucially important when I begin my analysis of African rhythmic structures.
It is interesting to note that musicians sometimes attempt to take the onbeat/offbeat structure inherent in metric schemes and use it as a designation for subdivisions. This has been an error that I have observed repeatedly in my own experience as a music educator. Often teachers, in an effort to give a specific name to each subdivision (and without using the common labels "e," "and," and "a") take the terminology used to describe points in the beat scheme and instead describe the subdivisions. Some attempt to recreate the scheme of pulsations as a miniature model of the proper beat designations for 4/4 or 3/4 beat schemes. Please refer to figure 25 as a visual reference.

In a normal 4/4 or 12/8 metric scheme, beat one would represent the downbeat and beat four would represent the upbeat. In figure 25 each beat is, instead, referred to as a downbeat, and the final subdivision of each beat is referred to as an upbeat. Especially troubling about this incorrect representation is that a pulsation
that does not coincide with a beat and is, instead, between the beats, and thus an offbeat, is being referred to as an upbeat, a term which should refer to an onbeat.

Another example of this attempt to take the terminology used to describe the beat scheme and apply it, instead, to subdivisions occurs in figure 26, where the 2/4 beat scheme is used as model for the duple pulsations in a 4/4 metric scheme.

![Fig. 26](image)

In a normal 2/4 metric scheme, beat one would represent the downbeat, beat two would represent the upbeat, and the "ands" of the beats would be referred to as offbeats. As in the previous example, in figure 26, each beat is referred to as a downbeat. Different, in this case, is that the "and" of each beat is referred to as an upbeat, and the "e" and "a" of each beat are referred to as offbeats. Sometimes this concept of the "and" being referred to as the upbeat, and the "a" being referred to as the offbeat is further transposed onto the 12/8 metric scheme, as in figure 27.
Troubling in both examples 26 and 27 is that a pulsation that does not coincide with a beat, and is in essence an offbeat, is being referred to as an upbeat, a term that should refer to an onbeat. Even more confusing than the descriptions of these twisted phenomena is the rationale that is advanced in defense of them. In no case can I accept figures 26 and 27 as representations of the proper usage of the terms downbeat, upbeat, or offbeat. Further, to promote their usage reveals, not only a lack of knowledge of their historical foundation and link to the marking of time, but also a disregard for the distinguishing descriptions of the terms beat and pulse.

I have often speculated that as musicians develop a higher skill level and gain more practical experience, they also become less demanding in distinguishing descriptions of musical phenomenon. It almost seems that as one’s musical understanding and intuition become more and more finely developed, there is less of a need to verbally describe the concepts that are understood innately. Regardless, I still hold that when the time is at hand to describe
these phenomenons verbally, one must refer to the musical terminology as accurately and as consistently as possible. Otherwise, the integrity of our terminology will be severely compromised.
CHAPTER 6

ADDITIVE RHYTHM, DIVISIVE RHYTHM, AND SYNCOPATION

We must now turn our attention to three additional terms that were referenced by our standard sources in earlier definitions of polyrhythm and cross-rhythm. Specifically, I am referring to the terms additive (asymmetrical) rhythm, divisive (symmetrical) rhythm, and syncopation. It has been my experience that, because these terms represent highly conceptual musical ideas, they are even more universally misunderstood and misused than the previous terms we have investigated.

I will begin this investigation with the terms additive rhythm and divisive rhythm. As these two terms are used often in the classic literature describing African musics, as well as in our standard references, I will also refer to descriptions of these two terms by four important scholars of African musics. Finally, as these
two terms are almost always referred to in relation to one another, I will approach these terms as a set rather than individually.

The *Harvard Dictionary of Music* does not have individual listings for the terms *additive rhythm* and *divisive rhythm*, but instead references them under the general heading of "rhythm." The *Harvard Dictionary* presents its description in the following context:

> The distinction of durational rhythms and meters from accentual meters and rhythms has often been described with other pairs of terms: Quantitive (durations) versus Qualitative (accents), borrowed from poetic metrics, is one such pair. Particularly suggestive is the designation *additive* for quantitative meters and rhythms of the Indian type versus *divisive* for accentual meters like those of Western music ... All meters and rhythms are ultimately construed in terms of durational values of two and three. But where the larger rhythmic-metric numbers in the Near East are consequences of the addition of twos and threes and their sums, in Western traditional art music they arise as products of twos and threes and their multiples." (Randel 1986:702-703)

The *Harvard Dictionary* continues by offering two musical examples, both of the equal duration of nine eighth-note pulsations, often referred to in Western music as the metric scheme 9/8. The first musical example is said to be of Turco-Arabic origin and sequences the nine eighth-note pulsations in a grouping of a "four count
segment added to a five note segment” (Randel 1986:702). Please refer to figure 28 as a visual reference.

![Figure 28](image)

The second musical example offered by the *Harvard Dictionary* is said to be typical of Western musics, and has “three beats of equal duration, each in turn divided into three pulses.” Please refer to figure 29 as a visual reference.

![Figure 29](image)

The *Harvard Dictionary* completes its discussion on additive and divisive rhythms by emphasizing that the non-Western additive example used the asymmetrical structure of 9=4+5, while the Western divisive example used the symmetrical structure of 9=3x3. It is obvious that the *Harvard Dictionary* has emphasized, among other things, that divisive rhythm is based on equally and regularly divided beats, while additive rhythm, to the contrary, is not.
With the Harvard Dictionary's description of these terms complete, I will now reference their entries in Grove's Encyclopedia. Like the Harvard Dictionary, Grove's Encyclopedia references the terms additive rhythm and divisive rhythm under their general heading of "rhythm." Grove's states that additive rhythm "uses one and only one unit of time to measure durations and to measure phrase lengths," and continues by noting that this is true for "even the lengths of asymmetrical phrases." (Sadie 1980:807) Divisive rhythm, on the other hand, creates a "rational, measurable structure, usually based on division by two or three, and, implicitly, a beat that organizes the music metrically by establishing an even, regular pulse." (Sadie 1980:807)

Although the Grove's Encyclopedia offers no visual references, the text serves to restate the basic concepts inherent in the descriptions of these terms by the Harvard Dictionary. As there are no definitions of these highly specific terms available in Webster's Dictionary, the American Heritage Dictionary, or the Schirmer Manual of Musical Terms, I will now turn to working definitions proposed by four noted scholars of African music.

Before doing so, however, I would like to confirm that the descriptions of additive rhythm and divisive rhythm in the Harvard Dictionary and in Grove's Encyclopedia provide us with a good working definition for each term. At this point, it should be understood that additive rhythms are rhythms which, first, do not
exist as divisions within our normal concept of a regular beat scheme, and second, are consequences of the addition of groupings of twos and threes and their sums. They are, by nature, asymmetrical. Musics of Indian and Turco-Arabic origin are cited as familiar examples. Divisive rhythms are rhythms which, first, are based on divisions within our normal concept of a regular beat scheme, and second, arise as products of twos and threes and their multiples. They are, by nature, symmetrical. Traditional Western art music is cited as the primary example for divisive structure.

Now, I will investigate the usage of these terms by four scholars who have made significant contributions in the research of African rhythmic systems. Two of the scholars, Rose Brandel and Kwabena Nketia, have already been fundamental to previous studies in this document. The remaining two scholars are Mieczyslaw Kolinski, whose well founded concepts of metro-rhythmic structures are often studied and referenced, and Rose Brandel, who is quite famous among scholars for her theory of "Mosaic Time." As a means of structure, I will reference these four authors in the chronological order in which they published their ideas on these terms.

As was well noted in an earlier discussion, Rose Brandel’s landmark article of 1959, "The African Hemiola Style," spends a significant amount of time discussing the rhythmic theories of Curt Sachs. Vital to her discussion of these theories are the
terms, **additive** and **divisive rhythm**. After noting that the rhythms of ancient Greece, India, and the Middle East are often asymmetrical, Brandel states that Sachs "calls the asymmetric style an additive style -- by virtue of the emphasis within this style on the succession or addition of assorted durations" (Brandel 1959:106). Brandel then describes most Western rhythms as being of the symmetric style and continues by explaining that Sachs "calls the symmetric style a divisive style -- by virtue of the emphasis...on equally divided measures, i.e., measures divided into regular durations" (Brandel 1959:106). Clearly, Brandel's interpretation of the terms additive and divisive rhythm is in firm agreement with our working definitions.

Written in 1973, Mieczyslaw Kolinski's article, "A Cross Cultural Approach to Metro-Rhythmic Patterns," has been referenced often in scholarship. It offers a concise, yet thorough, overview of systems used to describe rhythmic principles. Kolinski does not actually define the terms additive and divisive rhythm, in his presentation, but his usage of them in context appears consistent with our established working definitions. It is worthy to note, however, that Kolinski offers us alternative terms to replace additive and divisive. While referencing the work of the esteemed scholar of African musics, A.M. Jones, Kolinski offers the following statement before he begins his analysis:
Before discussing this thesis, let me redefine the unfortunate terms “additive” and “divisive” rhythm as isometric and heterometric organizations; I assume the author (Jones) would have agreed with these definitions. (Kolinski 1974:497)

By defining additive rhythm as isometric, Kolinski has emphasized that the additive rhythms are always equal and identical (iso-) to the metric scheme. Because of this, additive rhythms are not viewed as relating to the subdivisions of a meter. Alternately, by defining divisive rhythm as heterometric, Kolinski has emphasized that the divisive rhythms are often in opposition to and different (hetero-) in accent than the metric scheme. Divisive rhythms are always viewed as relating to the subdivisions of a meter. They are always in a simultaneous vertical relationship with the beat scheme. Kolinski’s interpretation of additive and divisive rhythm is conceptually in agreement with our working definitions of the terms. His alternative terminology, though in my opinion less clear than additive and divisive, also serves to confirm conceptual agreement.

In The Music of Africa, Kwabena Nketia offers definitions of both additive and divisive rhythm, but does so in the context of African rhythmical structures only. He refers to additive rhythms as rhythms that do not “follow the internal divisions of the time span,” and he refers to divisive rhythms as rhythms which do “articulate the regular divisions of the time span … and follow
the scheme of pulse structure in the grouping of notes" (Nketia 1974:128-129). Using a scheme with twelve eighth-note pulsations, Nketia provides examples of additive rhythm as resulting in the asymmetrical groupings of 7+5 and 5+7. Please refer to figure 30 as a visual reference.

Nketia does not present a parallel example of divisive rhythm in a scheme based on twelve eighth-note pulsations, but instead offers several basic examples of divisive subdivision in 2/4, 3/4, and 6/8 time signatures. All of his examples clearly demonstrate the articulation of the regular divisions of the time span, and they follow the pulse structure exactly in all of their various groupings.

Nketia’s interpretation of additive and divisive rhythm is, like Brandel’s and Kolinski’s, conceptually in agreement with our working definitions of the terms. Although he refers to additive rhythms as existing only in schemes that, mathematically, also could be viewed as divisive, his use of the term additive is otherwise consistent with our previous descriptions.
As our final and most current reference, the contemporary scholar Ruth Stone presents another version of the additive/divisive relationship in her 1985 article, "In Search of Time in African Music." In a reference to another distinguished scholar, Alan P. Merriam, Stone refers to divisive rhythms as being "rooted in a unilinear basis of time reckoning." She states that these concepts are in contrast to mosaic time, a term coined by yet another scholar of African musics, Paul Berliner. Stone considers mosaic time to be represented by additive rhythms, and uses, as Brandel did, Sachs' idea that additive rhythm is "composed of beats that are not necessarily equal in length" (Stone 1985:140). Although I feel that the term mosaic time implies multiple and simultaneous phenomena, it is clear through her use of language that Stone's conception of additive and divisive rhythm is, like all previous scholars, in agreement with our working definitions.

To summarize, all sources have confirmed our working definitions of additive and divisive rhythm, both through text and visual examples. In review, additive rhythm is not based on an equal and regular beat scheme with equal and regular subdivisions. Instead, it is realized as the addition of groupings of twos and threes and their sums. It is, by nature, asymmetrical. Divisive rhythm is, in contrast, based on an equal and regular beat scheme with equal and regular subdivisions. It is realized as products of twos and threes and their multiples. It is, by nature, symmetrical.
Earlier in this document, we stated that "beats generate pulses" and that there would be no circumstance where the pulses would, inversely, generate beats. Now, with our understanding of additive and divisive rhythm, this statement must be qualified. It will hold true that in examples of divisive rhythm, the symmetrical beats will generate either a binary or ternary pulse structure, and there would be no case where the pulses could generate the beats. In examples of additive rhythm, however, the pulses are the primary metric marker and, in essence, an asymmetrical beat scheme is generated by groupings of twos and threes and their sums.

With these definitions accepted and clear, I feel that it is wise at this time to address one issue concerning the relationship between additive and divisive rhythm that has been implied but not properly addressed. The musical examples in figures 28 and 29 proved that both additive and divisive rhythms can exist within the same metric scheme. That is, within a scheme of nine eighth-note pulsations, one can choose to divide the scheme in an asymmetrical manner, such as 4+5, and imply an irregular beat scheme, or one can choose to divide the scheme in a symmetrical manner, such as 3x3, and imply three equal beats to the measure. Based on other models, it is also obvious that within a scheme consisting of twelve eighth-note pulsations, one can symmetrically divide the scheme into 4x3, and imply four equal
beats of three pulsations, or one can asymmetrically divide the scheme into 5+7 or 7+5, and imply an irregular and linear relationship.

In essence, many schemes that can exist as symmetrical divisions can also be represented as irregular and asymmetrical linear sequences. There are several schemes that can, however, only exist in one identity. Take, for instance, the meters 5/8, 7/8, 11/8, 13/8, 15/8, etc. These meters cannot be considered to be divisive, because there is no possibility of these meters being generated by equal and regular beats or divided by equal and regular subdivisions. Properly, these meters can only be thought of as additive.

On the other hand, there are a limited number of schemes that can only exist as divisive, according to our working definitions. Consider the meters 3/8 and 2/4. Our working definition of an additive structure stressed the asymmetrical nature based on the addition of groupings of twos and threes. In the meter 3/8 the addition of twos and threes is not possible, and an asymmetrical division cannot be created. Likewise, in 2/4 meter, the only possible addition is 2+2, thus creating a symmetrical division that implies two equal and regular beats. Again, an asymmetrical division cannot be created.
With the terms additive rhythm and divisive rhythm clearly delineated, I will turn my attention to the last term that I have targeted for investigation, syncopation. Again, the term presents a specific dilemma. It is often overgeneralized, resulting in the improper usage of the term, syncopation, to describe phenomena that would better be delineated by other terminology. With this understood, I will begin my investigation with our usual references.

The *Harvard Dictionary of Music* defines *syncopation* as follows:

> A momentary contradiction of the prevailing meter or pulse. This may take the form of a temporary transformation of the fundamental character of the meter, e.g., from duple to triple or from 3/4 to 3/2 (see Hemiola), or it may be simply the contradiction of the regular succession of strong and weak beats within a measure or group of measures whose metrical context nevertheless remains clearly defined by some part of the musical texture that does not itself participate in the *syncopation*....The former type may have the effect of "shifting the bar line," e.g., of causing one of the weak beats to function as a strong beat...The latter type may entail attacks between beats rather than on them... (Randel 1986:827)

The following definition of *syncopation*, presented by the *Grove’s Encyclopedia*, offers both similar and different information than that of the listing found in the *Harvard Dictionary*:
The regular shifting of each beat in a measured pattern by the same amount ahead of or behind its normal position in that pattern... This may occur in some or all of the parts. Syncopation, as it is most widely understood, is restricted to situations in which the strong beats receive no articulation. This means either that they are silent, or that each note is articulated on a weak beat and tied over to the next beat. Because any syncopated musical line can be perceived as contrary to the pulse established by the organization of the music into bars, syncopation is related to, and sometimes used as a term for...cross-rhythm. (Sadie 1980:469)

Webster’s Dictionary describes the term syncopation quite concisely by stating that it represents the “shift of a musical accent to a beat that is normally weak” (Webster's 1984:698). Likewise, the American Heritage Dictionary echoes Webster’s Dictionary by describing syncopation as “a shift of accent in a passage... that occurs when a normally weak beat is stressed.” (MORRIS 1976:1304) The definition found in Schirmer’s Manual of Musical Terms falls between those definitions provided by the Grove’s Encyclopedia and the Harvard Dictionary of Music. It states that syncopation is “the regular shift of every beat in a measure by the same amount ahead of or beyond its usual position, creating both rhythmic tension and repeated unaccented strong beats” (Baker 1995:230).

When comparing all of the above definitions, it becomes obvious that the descriptions presented are crucially related (especially
in the cases of the Harvard Dictionary and the Grove's Encyclopedia) to those presented for the term cross-rhythm. Where the Harvard Dictionary described cross-rhythm as rhythmic/metric contradiction that is "not merely...a momentary displacement" of the meter but a significant disruption of it," it presents syncopation, instead, as just that - "a momentary contradiction of the prevailing meter or pulse" (Randel 1986:216;827). Also notable is the statement that, in examples of syncopation, the "metrical context nevertheless remains clearly defined" (Randel 1986:827). By the usage of the very specific and similar wording of these two definitions, the Harvard Dictionary has both established a relationship between the two terms and established at least one distinguishing difference between them.

In a very similar manner, Grove's Encyclopedia establishes, both a relationship between the two terms and a distinguishing difference as well. To review, Grove's Encyclopedia described syncopation as "the regular shifting of each beat in a measured pattern by the same amount ahead of or behind its normal position in that pattern." The term cross-rhythm, on the other hand, was defined as "the regular shift of some of the beats in a metric pattern to points ahead of or behind their normal positions in that pattern." It adds that "if every beat is shifted by the same amount, this is called syncopation." In the same method as the Harvard Dictionary, the Grove's Encyclopedia, by using the very
specific and similar wording of these two definitions, has both established a relationship between the two terms and established another distinguishing difference between them.

At this point, both terms, *syncopation* and *cross-rhythm*, properly represent rhythmic phenomena which contradict the prevailing meter. According to the *Harvard Dictionary*, *syncopation*, represents a momentary contradiction where the meter is not significantly disrupted, and *cross-rhythm* represents a significant contradiction that truly disrupts the meter. Both terms represent the shifting of rhythms away from their normal metric accents, but *syncopation* requires that this shift be of each beat by the same (symmetrical) amount, where *cross-rhythm* allows for the shift to be of some of the beats, and of various (asymmetrical) degrees.

To follow this distinction would mean that asymmetrical constructions, such as those presented earlier as examples of *cross-rhythm* in figure 5, could not be considered examples of *syncopation*. The rationale for this would be that each beat is not shifted in the same amount, and thus cannot be *syncopation*.

With these delineations accepted, how do they relate to Grove's assertion that "syncopation, as it is most widely understood, is restricted to situations in which the strong beat receives no articulation" (Sadie 1980:469)? It appears that our working
definition could support this assertion. When we reexamine the
definition presented by the Harvard Dictionary, however, a
significant contradiction becomes apparent.

The Harvard Dictionary presents, as one of two possible examples
of syncopation, the “temporary transformation of the fundamental
character of the meter ... from duple to triple or from 3/4 to 3/2
(see Hemiola).” Obviously, the example stated above, aside from
broadening the meaning of syncopation to encompass the concept of
hemiola, creates a context where some of the strong beats are
articulated (1 out of every 3), while most of the attacks (2 out
of every 3) are contrary to the strong beats.

How does this relate to the assertion previously made by the
Grove’s Encyclopedia stipulating that “syncopation ... is
restricted to situations in which the strong beat receives no
articulation” (Sadie 1980:469)? In fact, while all of the other
sources describe syncopation as a phenomenon characterized by a
regular and even shift away from the strong beats to the weak, the
Harvard Dictionary is the only source that, in effect, delineates
two different characteristic realizations: one that reinforces the
descriptions of all of the other sources, and a second that
describes the phenomenon of hemiola also as an example of
syncopation.
To resolve this conflict, I will refer, first, to an earlier version of the *Harvard Dictionary* (Apel 1977), and compare the previous listing for the term *syncopation* with the current one. Perhaps a variation in the two descriptions will offer useful insights. In the 1977 edition of the *Harvard Dictionary*, *syncopation* is described as follows:

Syncopation is, generally speaking, any deliberate disturbance of the normal pulse of the meter, accent, and rhythm. The principal system of rhythm in Western music is based on the groupings of equal beats into two's and three's with a regularly recurrent accent on the first beat of each group. Any deviation from this scheme is perceived as a disturbance or contradiction between the underlying (normal) pulse and the actual (abnormal) rhythm ... Example 1 shows the three most common methods of shifting the accent to the normally weak beats of the measure, by (a) holding on over the strong beat; (b) having rests on the strong beats; (c) placing a stress on the weak beat. (Apel 1977: 827-828)

The following example is then presented as a visual reference:
It is extremely clear, after review of both the text and musical examples, that the 1977 definition does not refer to the phenomenon of hemiola as in any way related to the term syncopation. Instead, the 1977 definition confirms the one specific description of syncopation provided by all of our other references. The musical examples, and the descriptions of them, especially help to clarify that the concept of syncopation is deeply rooted in even and regular shifts of rhythm away from the strong accents of the beat scheme.

According to above description, the concept of syncopation is rooted in the existence of what was much earlier described as offbeat moments, or offbeats. In fact, in relation to African musics, the scholar Ruth Stone states that "the idea of 'offbeat'... is also known as syncopation." She continues by describing how "a part is conceived in relation" to the beat and that part "is playing 'off' the beat" (Stone 1985:140).

We are still left with the fact that the revised edition of the Harvard Dictionary presents examples of two different phenomenon that represent syncopation, while all other sources provide only one. Further, the use of an example of hemiola in representing the concept of syncopation raises the question of the inclusion of more sophisticated proportional rhythmic conflict under the identity of syncopation. And what about the component of rhythmic alternation that is characteristic of the phenomenon of hemiola?
Further, what about the phenomenon of even and regular shifting away from the beat, said to be characteristic of *syncopation*? At this point, the terms *polyrhythm*, *cross-rhythm*, *hemiola*, and *syncopation* begin to get severely blurred.

In the revised edition of the *Harvard Dictionary*, the definition of the term *syncopation* has been expanded beyond its previous and historic usage. To take this examination to its proper conclusion, it appears that further research into the historic usage of the term is in order.

An excellent historic overview of the term *syncopation* is presented by the contemporary scholar, Simha Arom, in his book, *African Polyphony and Polyrhythm*. Arom traces the proper meaning of syncopation by referencing Rousseau’s 1768 Dictionary of musical terminology. Rousseau defines syncopation as having the characteristic of extending onto strong beats sounds begun on weak beats. Arom also references the *Encyclopedie de la Musique*, written by Amy in 1961, showing how it also defines syncopation as accenting weak beats and extending them onto strong beats.

Arom then introduces the concept of the offbeat, documenting Rousseau’s stipulation that every note that can be identified as syncopated is also offbeat. Arom then makes reference to syncopated sequences as offbeat progressions. Of course, this is quite consistent with the statements of Ruth Stone presented
earlier. In an interesting point, Arom describes offbeat as "any note which is attacked so as not to coincide with the attack of the beat," confirming the working definition of the term presented earlier in this document. He then summarizes his findings quite concisely by affirming: "Syncopation requires that an offbeat note extend on to part of the following beat, specifically the strong beat" (Arom 1991:207). Through his presentation of the definitions proposed by Rousseau and Amy, Arom has provided us with useful information concerning the historic and proper usage of the term syncopation.

As a final strategy to further delineate the description of syncopation, I will now examine the roots of the word itself. The root syn is of Greek origin and denotes the concept of "with, together, or same." The form syncop, also Greek, describes "cutting short" or "cutting up." These roots very directly relate to the musical idea of shifting even accents to the weak beats and extending them onto the strong ones.

After a thorough examination of word roots, historic usage, and perceived meanings of the term syncopation, a distinguishing description can now be properly assigned, based on logic and defendable rationale. While fully recognizing that the Harvard Dictionary of Music, in its most recent revision, has chosen to expand the meaning of the term, for the purposes of this document, syncopation will not have two related meanings but will, instead,
only be used in one specific and distinguishing context. The term *syncopation* will denote the regular and even shift of rhythmic accent from the strong beats of the metric accent to the weak. Thus, *syncopation* will take the form of continuous and even offbeat accent in relation to the metric accent. The metric accent, although challenged by the *syncopation*, is never disturbed to the level of what could be identified as a "significant disruption of the prevailing meter," as is the case with cross-rhythm. In the most general sense, *syncopation* could be thought of as similar to cross-rhythm in that both phenomena act to contradict the prevailing meter to some degree and are, in essence, phenomena of "rhythm-against-meter." Syncopation should be thought of as different than cross-rhythm in the most general sense that, where cross-rhythm implies a rhythmic activity that primarily crosses the metric accent, *syncopation* implies a rhythmic activity that is primarily off of the metric accent, or offbeat.
CHAPTER 7
THE FOUNDATION OF TIMELINES IN WEST AFRICAN MUSICS

The first and most essential step in the analysis of African rhythmic systems is to recognize that, primarily, the music is based on symmetrical and regularly occurring beats. Using the term as it was explained earlier, African rhythmic systems exist in a divisive structure (with symmetrical beats that generate pulses) and not an additive one (with pulses that generate asymmetrical beats). The concept of the existence of the symmetrical beat in African musics has eluded many scholars over the years and has consistently been a topic of heated and colorful debate.

As has been noted by the ethnomusicologist, Shannon Dudley, "eventually, through instruction from African musicians, observation of performances, and the insights of African consultants, it became apparent to these scholars that the Western concept of a meter—a commonly perceived, fixed number of equidistant 'main-beats' with a first and last beat, that
correspond to a musical period—is not foreign to African music” (Dudley 1996:272). Dudley continues his discussion by confirming that the concept of the beat in African music was confirmed by Ewe physician S. Cudjoe in the academic publication, Phylon, as early as 1953. Even so, as we will discuss later, many scholars still did not accept its existence.

Throughout all of my various study and performance experience with West African musics, the existence of a symmetrical beat structure has been unquestionably confirmed by every teacher in every context. My own study has included the repertoires of Takada (Ewe people of Ghana), Agahu (Ewe people of Ghana), Kpanlogo (Ga people of Ghana), Yevevu (Ewe people of Ghana), Fofuï (Ewe people of Ghana), Agbeko (Ewe people of Ghana), Adzohu (Fon–Ewe people of Ghana), Sovu (Ewe people of Ghana), Sikyi (Ashanti people of Ghana), Adowa (Ashanti people of Ghana), Akom (Ashanti people of Ghana), Obatala (Yoruba people of Nigeria), Ogun (Yoruba people of Nigeria), Osun (Yoruba people of Nigeria), Sanponna (Yoruba people of Nigeria), and Mo Sa Keke (Yoruba people of Nigeria). In addition, I have observed numerous rehearsals and performances of other various repertoires of West African musics, and can again confirm that in each case, a symmetrical beat structure was unquestionably the structural foundation upon which all else was built.
With a foundation of regular and symmetrical beats in place, these beats are then subdivided by pulses, forming either ternary or binary subdivisions. In most West African musics, these beats are grouped in a four-beat scheme. These recurrent groupings of beat schemes create musical periods, or measures. The subdivision of these beat schemes, in turn, generate either 12 pulsations or 16 pulsations, respectively, for ternary or binary structures. In the Western notational format, these systems are best transcribed as occurring in 12/8 time for a ternary subdivision and 4/4 time for a binary subdivision.

This paper will primarily concern itself with musics and ideas presented in structures consisting of a four-beat scheme with ternary subdivision (12/8) and will display, through these structures, the basis of African cross-rhythmic constructions. This does not mean in any way to imply that the 12/8 metric structure is always dominant over the 4/4 metric structure in West African musics. It is, however, the most useful and the most common model for the interplay of the phenomenon of cross-rhythm as it manifests itself in many West African musics.

Given that we will use a 12/8 time signature and that this time signature is not meant to imply in any sense that one beat is more significant than any other beat, we can represent the skeleton of this structure quite simply as follows:
Although fundamental to this structure, the beats are quite often inaudible in performance, and are rarely emphasized aurally by musicians. This, in fact, is at the root of much of the confusion and misunderstanding in the debate by many scholars over the existence of the regular and symmetrical beat in African music. Again, through my extensive research, study, and performance of West African musics, I can confidently confirm that the beat does, in fact, exist, and that often it is not easily perceived by listeners.

With this model in mind, the next step in understanding West African rhythmic structures is to recognize the importance and significance of the 3:2 relationship. This document will argue that the 3:2 relationship is unquestionably the foundation of rhythmic structure in West African music. As well as being at the root of more complex cross-rhythmic relationships, it also serves as the generator of the basic timeline found in most West African and West African-derived musics. The timeline of which I
speaking, labeled by many scholars as the "standard pattern" (see King 1960, Locke 1982, etc.), can be constructed through an application of the following procedures.

The most basic representation of the 3:2 cross-rhythm is formed by grouping the pulses in our standard 12/8 model in duple subdivisions while maintaining our unchanged four-beat scheme. This is represented as follows:

If we then only attack the first pulse of each duple subdivision, our transformation is complete:
For every two main beats that are felt, three equally spaced pulses are sounded. Over the course of a full 12/8 measure (four beats), six equally spaced pulses are sounded, in essence creating a 6:4 cross-rhythm, acting as the first extension of our basic 3:2 relationship.

It is appropriate, at this point, to refer in verbal terms to different moments during the phenomenon of cross-rhythm. With reference to figure 34, beats one and three represent moments where the four-beat scheme and the cross-rhythm coincide in unison, thus causing a moment of static motion, or resolution. Beats two and four, on the other hand, represent moments where the four-beat scheme contradicts the cross-rhythm, thus causing a moment of dynamic motion, or conflict.

Based on my understanding of this phenomenon, as explained to me by my teacher, C.K. Ladzekpo, these moments of static and dynamic motion can be explained in a philosophical context by many Africans. As stated by C.K. Ladzekpo:

In aesthetic expression, a moment of resolution or peace occurs when the beat schemes coincide and a moment of conflict occurs when the beat schemes are in alternate motion. These moments are customarily conceived and expressed as physical phenomena familiar to a human being. A moment of resolution is expressed as a human being standing firm or exerting force by reason of weight alone without motion,
while a moment of conflict is expressed as a human being travelling forward, alternating the legs. (Ladzekpo 1995)

To summarize, with this reasoning in place, we can refer to moments of unison during a cross-rhythmic phenomenon as being static moments of resolution, and we can refer to moments of contradiction during a cross-rhythmic phenomenon as being dynamic moments of conflict.

To continue with the formation of our 12/8 model structures, we now choose to attack only the second pulse of each previously identified duple subdivision, creating the following structure:

This we will label as our offbeat 6:4 cross-rhythm, because rather than beginning our sequence with our first beat, we instead start the pattern at a delay of one pulse or, in essence, off the beat. This pattern can be thought of as a simple variation of our basic 6:4 cross-rhythm, in that it replaces what was a sounded pulse with a silent pulse, and visa versa. Using our previous rationale,
in this example of the off-beat 6:4 cross-rhythm, beats one and three become dynamic moments, while beats two and four are transformed into static moments.

An excellent performance exercise to become familiar with these cross-rhythms is to sound one measure of the basic 6:4 cross-rhythm followed immediately by one measure of the offbeat 6:4 cross-rhythm, as notated as follows:

When we reduce this simple exercise into a single measure of 12/8, the following pattern emerges:
If we then add one additional attack on our previously silent pulse six to aid in our transition from the onbeat feel to the offbeat feel, our pattern becomes complete:

Thus through a systematic application of the onbeat and offbeat 3:2 cross-rhythm, we have revealed the foundation of one of the most important and significant timelines found in West African musics, the “standard pattern.” One of the most distinguishing characteristics of this very exciting timeline is its transformation from a static moment of resolution at beat one to dynamic moments of conflict on beats two and three, then to a static moment of resolution once again on beat four.

The foundation of this crucially important timeline lies in the realization of the 3:2 relationship as it manifests itself in the symmetrical and divisive 12/8 African rhythmic structure.
CHAPTER 8
SPECIALIST STUDIES: TIMELINES IN AFRICAN MUSICS

It is at this point that I must refer to the work done by previous scholars in regard to the 'standard pattern.' Although the pattern itself has been referred to countless times by scholars of African musics and has appeared in various formats and transcriptions in the standard literature, no one has recognized its construction in relation to the 3:2 cross-rhythm in his or her analysis. It is this specific lack of attention to its cross-rhythmic construction that has caused so much confusion and inaccuracy in previous analysis and transcription.

Among the scholars who have focused much of their attention in this area, A.M. Jones seems to be the first and most significant author on the standard pattern. Certainly, A.M. Jones must be recognized and commended for his contributions as a scholar of African musics. He is responsible for a number of monumental and classic studies in the field, conducted with passion and integrity.
and repeatedly referenced since their time of publication. He was the first scholar to recognize the significance of timelines in African musics, and he consistently promoted the use of the Western notational system as a viable means for transcription. In short, Jones' work continues to have a tremendous impact on the study of African musics. In retrospect, however, Jones' studies, especially those concerning the standard pattern, are severely and fundamentally flawed.

Jones, noting the widespread use of the standard pattern in various African musics as a key to its significance, notated his transcription as follows:

Fig. 39

If we superimpose the 12/8 metric scheme over Jones' transcription and compare it to 12/8 standard pattern constructs, we find that Jones' has accurately transcribed the time spans between attack points as they relate to the onbeat and offbeat 3:2 sequence:
Yet he did not understand the significance of regular and symmetrical beats subdivided into a ternary pulse structure as a basis for the rhythmic model. Thus, without the understanding of this fundamental structural concept, it was impossible for him to recognize the 3:2 construct of the standard pattern for which he is so famous. Jones, using the term *clap* where I use the term *attack*, reveals in his own words his misinterpretation of the rhythmic structure of the standard pattern:

> It is here that we see one of the significant characteristics of African music as distinct from the West. There is, of course, no reason why music should be governed by a steady, equally spaced beat as in 3/4, 4/4, 6/8 time, or any other of the conventional time forms. (Jones 1954:32)
In direct reference to the standard pattern, Jones states that,

We find that the claps fall in the most unlikely and apparently impossible places, but this is only because Europeans find it difficult to conceive of clapping accompaniment to a song which carries no thought of stress. (1954: 33)

The claps (attacks) do not, however, fall in "impossible places" at all. Instead, using the 12/8 metric scheme and the 3:2 construct as our model, they fall exactly where we would expect them to be. One point that Jones is correct on is the concept of composite rhythm, which is so important to the interlocking structures found in many African musics. In Jones' own words, "when Africans do combined clapping, what they are aiming at is the pattern which emerges from the combination. (Jones 1954: 35)

Jones however, continuously denies the existence of symmetrical beats and a consistent metric structure throughout the parts of an ensemble. Jones boldly asserts that, "In drumming, to state the case in its simplest and most direct form, the main beats never coincide" (Jones 1954: 39). To further emphasize his misconception, we see Jones declaring that this point is "so important that no adjective can be strong enough to overemphasize it."
Turning his attention to the use of standard Western notational concepts, Jones then asserts the following concerning African rhythmic technique:

We shall never understand it, let alone master it, if we approach it from the point of view of our own musical system. For this reason, any attempt to write African music in the European manner, with bar lines running right down the score and applying to all the contributing instruments simultaneously, is bound to lead to confusion. It gives the impression that all but one of the contributors is highly syncopated, and the multitude of tied notes and off-beat accents makes the mind reel ... African music is not syncopated nor is it complicated except for the master drum rhythms. The business of transcription is to produce a readable score which reflects faithfully what is being played. To use European methods is to produce a score which is nothing short of a travesty of what the African is doing even though it accurately presents the incidence of each note played. (Jones 1954: 44)

Jones follows with an example of one of his transcriptions, the full score to the song, the "Icilili Dance" from the Lala people, complete with drum and clap accompaniment.

In this transcription, Jones notates some parts in 2/4 meter, some parts in 3/4 meter, some parts in 3/8 meter, and some parts in durational values only, with no meter identified. This transcription should, instead, be represented accurately as a unified score in a 12/8 meter. Jones claims that to represent the
song in 12/8 meter would be to create an artificial illusion of syncopation. In fact, according to definitions confirmed earlier in this document, African music is highly syncopated and contains many offbeat accents and cross-rhythms. In essence, Jones has displayed what he earlier claimed was a flaw in the usage of Western notation. He has notated the incidence of each note without reflecting faithfully what is being played. Certainly, with no disrespect for the integrity and intent of his work, I can not support A.M. Jones' transcription of the "Icilili Dance" as an accurate representation of performance practice.

Jones' misinterpretation was followed by many others, perhaps the most famous being Anthony King. In his 1960 article entitled, "The Employment of the "Standard Pattern" in Yoruba Music," King coined the terminology standard pattern to represent the timeline discovered by Jones. He presented further examples of its form and application. Expanding on the implications of Jones' notation, King's transcription appeared as follows:
Although I have found King's term *standard pattern* useful, his addition of the 7/8 + 5/8 time signature to the pattern further adds to the confusion and misrepresentation of the rhythm. In essence, he has analyzed this divisive pattern (that is actually based on symmetrical beats interacting with the onbeat and offbeat 3:2 cross-rhythm) as an additive pattern based on 7/8 + 5/8 with an asymmetrical beat structure. He goes on to transcribe what he calls "one of the many possible variants of the pattern" (King 1960: 52) as follows:

![Fig. 42](image)

King has here transcribed the full "onbeat 3:2/offbeat 3:2" pattern with the transition note included, but he has begun the pattern in the wrong place. The following diagram displays the relationship of King's transcription to the actual metric structure:
In essence, King has used pulse number eight of the 12/8 metric scheme as the starting point of his variant of the standard pattern. This creates several severe distortions. First, King's incorrect notation of the variant of the standard pattern serves to distort the actual foundation of this very important timeline. Second, King has incorrectly related the starting point (first attack) of his variant to the starting point (first attack) of A.M. Jones' original pattern and applied the same 7/8 + 5/8 notational scheme to both. In short, King has perceived his downbeat and Jones' downbeat as starting in the same place, and assigned these two different attack points as beat one of his 7/8 model. In doing so, King has perceived the relationship of the original standard pattern to its variant as follows in figure 44.
In actuality, the starting point of the variant to which King refers begins on the eighth pulsation of the 12/8 metric scheme. It relates to the starting point of the original standard pattern as represented in figure 45.

In his transcription, King allowed himself to be misled as to the functional starting point of his variant. Of course, with the knowledge that this rhythm exists divisively in a 12/8 metric scheme, we have observed this variant actually to be the onbeat 3:2/offbeat 3:2 pattern in an incorrect form.
One reason for this error may be that King was forcing himself to hear his variant in the $7/8 + 5/8$ metric structure that he imposed on Jones' transcription. For instance, when the correct onbeat 3:2/offbeat 3:2 pattern is notated without meter and realized in a linear fashion with quarter-note and eighth-note values, it appears as transcribed in figure 46.

If one were to impose an additive metric structure on the above transcription, the normal inclination, based on long and short note values determining the metric accent, would be to group the pattern as $5/8 + 7/8$, rather than King's $7/8 + 5/8$. This is due to the fact that the most logical and natural breakdown of the combination of twos and threes in this pattern results in the addition of \{(2 + 3) + (2 + 2 + 3)\}. Please refer to figure 47 as a visual reference.
Transcribing the pattern by using the actual eighth pulsation of the correct 12/8 scheme as the starting point, allows King to rationalize the application of the artificial and incorrect 7/8 + 5/8 metric scheme to the resultant structure. Please refer to figure 48 for a visual representation of King's variant notated with artificial metric schemes.

Fig 48

One might think, looking at this previous example, that the additive structure defined by the most logical and natural breakdown of the combination of twos and threes in this pattern would result in the addition of \((2 + 3 + 2) + (3 + 2)\). Clearly, by comparing King's variant to the model first presented by Jones, it can easily be confirmed that the above-stated combination of groupings of twos and threes is not what King was attempting to display at all. Jones' standard pattern is clearly defined as \((2 + 2 + 3) + (2 + 3)\). King, because he must match the artificial structure he imposed on Jones' example, forces the metric scheme of figure 48 to define the structure of \((2 + 2 + 3) + (2 + 3)\). He offers no rationale for the metric accents he has artificially and arbitrarily imposed.
With regard to King's perception of the starting point of his variant, perhaps even more significant to note is the fact that sometimes, when the standard pattern is sounded in the Yoruba ensemble contexts King describes, it is done so in performance as beginning with what has been described earlier in this document as pick-up notes. That is, even though all of the members of the ensemble know exactly where the downbeat actually is, they do not always start their patterns, or start the beginning of a performance, with the downbeat. Instead, they often start marking the audible pattern as it begins as an offbeat of beat three of the 12/8 scheme. This fact is well documented by the Yoruba master drummer, Muraina Oyelami, in his text, *Yoruba Dundun Music* (Oyelami 1989:5,8,16–17). Of course, since beat three is a silent beat in the execution of the standard pattern, the first actual note that is heard falls on pulsation number eight, exactly where King begins his incorrect transcription. This example of beginning a transcription with the first audible sound labelled as the downbeat has been a common and costly error in the notation of many African musics (Ladzekpo 1997).

In his transcription of the standard pattern, King includes, below his Western notation, what he refers to as "nonsense syllables, whose sole function is to serve as a mnemonic to the ... Drummer" (King 1960:52). He applies these syllables to his notation as represented in figure 49 which follows:
These syllables, "KON - KON - KO LO - KON - KO LO - ," are not actually "nonsense syllables," in that they serve as more than merely a mnemonic, or "device used to assist the memory" (Morris 1976: 842). In fact, these syllables have two directional and descriptive functions. First, these syllables serve to express the melodic tonality of the desired pattern, with the mouth functioning as a surrogate for the desired tones, and second, these syllables direct the dexterity of the hands, in essence telling a performer how to reproduce the desired pattern (Ladzekpo 1997).

The proper application of these syllables to the correct standard pattern is notated as figure 50 below.
Based on figure 50, one can easily observe that the correct sequence for the syllabic pronunciation of the standard pattern is "LO - KON - KO LO - KON - KON - KO." It is also quite obvious that if one begins the verbal sequence displayed in figure 50 on pulsation number eight of the 12/8 scheme, the verbal sequence promoted by King, "KON - KON - KO LO - KON - KO LO - ," is artificially created.

To offer a word in defense of King's study, it must be accepted that, at times, it can be extremely difficult to hear the proper starting point of the 'standard pattern,' especially in relation to the highly complex textures of many African musics. To make matters even more confusing, in Yoruba contexts the standard pattern is often expressed in succession as the following verbal sequence:

"KON - KON - KO LO - KON - KON - KO;
LO - KON - KO LO - KON - KON - KO;
LO - KON - KO LO - KON - KON - KO;
LO - KON - KO LO - KON - KON - KO;
LO - KON - KO LO - KON - KON - KO;

etc..." (Ladzekpo 1997)

This sequence shows that, as a performance practice, when describing the standard pattern as starting from the actual downbeat, a Yoruba will often express the first sequence of the standard pattern with slightly different syllables than the rest.
of the repeated sequences, even though the rhythm is identical throughout. Specifically, the very first attack of the standard pattern is often expressed with the syllable KON rather than the syllable LO. In every other repetition of the sequence, however, the downbeat is expressed consistently with the expected syllable LO (Ladzekpo 1997).

The variation in the expression of the first syllable of the verbal sequence detailed above makes it very easy to confuse the first and second halves of the standard pattern, especially during the initial sequence. This unusual phenomenon could also have contributed to King's erroneous transcription of his stated variant. Complicated by the fact that the pattern is sometimes initiated as an offbeat of the third beat in 12/8 meter, it can easily be seen why King had so much difficulty with his interpretation.

Performances of African musics do not always begin on the downbeat, but instead often begin on a pick-up note or even a series of pick-up notes. Experienced musicians are always expected to know where they are in the pattern, and to enter accordingly, always being in-synch with the proper downbeat and in correct relation to the 12/8 metric scheme as a whole.
This phenomenon in traditional African musics is very similar to performance practices of contemporary jazz musicians. Often in jazz settings, a member of the rhythm section, such as the piano or bass player, will begin playing the chord changes of a standard jazz composition from somewhere in the middle of the progression, perhaps as an introduction to a song. It is characteristic of mature jazz performers to know exactly where the chord changes were begun in the structure, and to have the ability to join in at the correct place in the music, while always knowing exactly where the downbeats are and what chords are being played.

To refer back to Anthony King’s 1960 article, King’s transcription of the standard pattern is further showcased in its incorrect state when he includes it as part of several mixed-meter transcriptions of African drumming and songs. As with the mixed-meter transcriptions of A.M. Jones, King’s ensemble scores display severe misconceptions of African rhythmic structures. Instead of asymmetrical mixed meters with noncoordinated and staggered bar lines, King’s examples should be notated in a symmetrical 12/8 meter with all of the downbeats coinciding in unison between all of the parts.

In discussing King’s transcription of his variant of the standard pattern with my teacher, C.K. Ladzekpo, I found myself repeatedly asking him if this variant timeline identified by King was a pattern familiar to him. After confirming, of course, that King
had identified the onbeat 3:2/offbeat 3:2 standard pattern starting on the wrong beat, I asked Mr. Ladzekpo again if King's transcription, taken at face value as it appears in figure 8, was a pattern known to him. After repeated answers of "No" from Mr. Ladzekpo, he finally responded as follows, leaving no doubt as to his conviction: "I have never heard that rhythm used as a primary timeline in my travels on the whole continent of Africa!" (Ladzekpo 1997).

The next article that I will consider is a 1972 publication by Gerhard Kubik entitled, "Oral Notation of Some West and Central African Timeline Patterns." In this concise and informative article, Kubik reviews essentially the same subject matter as King did twelve years before him. Kubik does not, however, present identical information or identical terminology.

In a discussion of oral syllabic notation, Kubik offers the following observation:

Investigators have often erroneously referred to the symbols as "nonsense syllables." Apart from the fact that such "nonsense syllables" are often onomatopoeic or ideophonic in nature, it can also be shown in examples that they are basically a vehicle for musical notation. They have a specific communication value" (Kubik 1972:169).
Kubik, then, has defended the rationale presented earlier in this document concerning the relationship of syllabic sequences to directional and descriptive functions.

Kubik goes on, however, to reconstruct the identical variant of the standard pattern promoted by King and represented in figure 11. Kubik, like King, has recognized the onbeat 3:2/offbeat 3:2 pattern, but he has notated it as beginning on what actually is pulse number eight of a 12/8 metric scheme. Rather than calling his variant the standard pattern however, Kubik refers to his example as "the West African twelve-pulse 'timeline' pattern" (Kubik 1972: 169).

Kubik introduces the use of Nketia's term, timeline (Nketia 1963), as a response to the terms, guide (Jones 1959) and timekeeper (King 1960), used earlier in the literature. I endorse the use of this terminology. I find the term, timeline useful in describing cyclic African rhythmic patterns that serve organizational functions, such as the onbeat 3:2/offbeat 3:2 standard pattern earlier described.

Kubik also makes an interesting point concerning rhythmic structure:

In contrast to what has been widely accepted, there is no evidence that the musicians themselves think of it (rhythm)
as "additive." This is what it looks like in staff notation because of the purely durational symbols. Staff notation distinguishes only long and short notes. This is an idea alien to West African percussion rhythm, where it is important for the performer to understand when (i.e., at which points in a steady flowing series of smaller units, or elementary pulses) he actually strikes. The strokes cannot be explained in terms of long and short notes, but in terms of varying distances between the strokes of action units. (Kubik 1972: 170)

Kubik has, in essence, stated that African rhythm is not conceived in terms of the additive duration of specific notes, but rather on the given attack points in a specific sequence. On this point I agree. I cannot, however, accept that these attack points cannot be represented accurately on staff notation. As previously confirmed, I believe that these patterns can be successfully transcribed into Western notation.

In discussing with my teacher, C.K. Ladzekpo, the dilemma of attack-points being misrepresented as durational values, he reminded me that the instruments often responsible for sounding timelines in Anlo-Ewe music are the gankogui and atoke. Both of these instruments are small iron bells characterized as having sharp attack qualities with very little sustain. While it is possible to further shorten the decay of these instruments through muting techniques, it is not possible to extend or sustain their sound beyond their natural envelopes.
Additionally, considerable variance is often exhibited between the inherent sound envelopes of different bells, some having even a shorter sustain quality than others. In essence, the same holds true for membranophones. Drums are attack oriented rather than sustain oriented instruments. As Kubik has noted, to think of these instruments as producing note values of various extended durations is highly problematic.

In his article of 1975, Laz E.N. Ekwueme presented further analysis of the standard pattern, based on the incorrect divisions of Jones and King. Ekwueme states that the construction is based on the grouping of $2 + 2 + 3 + 2 + 3$, and that the pattern is constructed by the addition of combinations of duple and triple time units (Ekwueme 1975:30). It is interesting to note that Ekwueme broke the pattern down into twos and threes in a linear sequence when, inversely, the linear sequence is a result of the vertical $2:3$ relationships. He goes on to comment on a duple pulse dividing the pattern (it is triple) and presents a chart of variations of the basic sequence, again linear in conception, with no illumination of the $3:2$ cross-rhythm that lies at its foundation.
What is most confusing about Ekwueme's analysis is his lack of a specific and accurate starting point to the pattern. Although Ekwueme later talks about dividing the pattern into four pulses or beats (he uses the terms pulses and beats to mean the same thing), makes it appear as though the beats may be applied "later" to produce different relationships. He seems much more interested in demonstrating variations than in illuminating the basic structure of the pattern itself.

Ekwueme's comments on the fact that, when the standard pattern is divided into a four-beat structure, the timeline coincides with the beat scheme on beat one and beat four. Again, not having the proper insight to recognize the symmetrical and divisive structure which generated this phenomenon, Ekwueme cannot call this anything more than "an interesting discovery" (Ekwueme 1975:31). Ekwueme offers some extremely interesting ideas on the concept of form in
the long span; however, these comments are not immediately pertinent to our current discussion.

Robert Kauffman's comprehensive article of 1980, "African Rhythm: A Reassessment," acts as an excellent and thought provoking survey of ideas from different authors on the concept of rhythm in African musics. Still, Kauffman, as late as 1980, presents Jones' and King's inaccurate transcription of the standard pattern. Although Kauffman details many theories from many points of view, he never questions the accuracy of King's transcriptions or looks beyond the pattern to the basis of its construction. Not knowing where the pattern actually begins, he simply re-creates King's previous transcription. Please refer to figure 52 as a visual reference of Kauffman's example.
tapped out constantly on a gourd" (Kauffman 1980: 397). I have repeatedly listened to this selection from *Musiques Dahomeennes*, and I can absolutely confirm, with no question or hesitation, that the pattern supposedly "dramatically displayed in the first item on the record" is not the pattern that Kauffman cites as figure 52, but instead, the onbeat 3:2/offbeat 3:2 pattern constructed as figure 38. This pattern, in fact, is the first sound heard on the entire recording, and the pattern actually begins on the correct downbeat (as in figure 38), and not as Kauffman has transcribed it. This reveals that Kauffman, like King before him, cannot define the true starting point of the pattern and mistakenly hears pulse eight of the actual pattern as pulse one of his incorrect transcription.

In his article of 1982, David Locke is perhaps the first scholar to accurately represent the standard pattern, both in terms of starting it in the correct place and relating it to the 12/8 metric scheme of four beats to the measure with ternary subdivisions of the beat. In fact, Locke offers an enlightening and profound analysis of African rhythmic structures that is well worth a thorough examination.

Locke details the existence of timelines as fundamental to African rhythmic structures, but he never actually uses Nketia's
terminology in his discussions. Instead, he describes the standard pattern as a "time referent" and states that the "pattern creates cycles of time," therefore causing the music to have "a circular or spiral, not linear, rhythmic character" (Locke 1982: 218). Perhaps Locke is opposed to the usage of Nketia's term, timeline, because he feels it has a linear connotation. At any rate, Locke does not reference Nketia's terminology in this instance, though he does reference Nketia's work at several points elsewhere.

Locke then briefly offers his views on the usage of specific terminology to describe African musics, much in the spirit of the examination of terminology found earlier in this document. Locke starts by defining the terms beat and pulse. He does so in a manner consistent with our working definitions. He calls regular beats the "indispensable foundation upon which ... cross-rhythm and offbeat timing are built," and emphasizes that, in fact, "whether or not they are sounded, beats are felt by performers and, together with the bell pattern, steady their actions" (Locke 1982:221)

Locke discusses subdivision and meter in African musics. He confirms that "meter is unchanging throughout a piece" and that each player in an ensemble relates their "pattern both to the bell pattern and the primary metric accents, that is, beats, which are shared by all players." Although Locke does not refer to the Jones
and King transcriptions specifically, it almost seems he is relating his discussion of proper transcription to their previously published examples.

Locke describes the multiple layers of cross-rhythms often present in Ewe rhythmic structures, offering the term main beats for beats that emphasize the primary metric accent and the term counterbeats for the cross-rhythmic beats. Although I understand his logic and accept these terms as useful, I prefer to think of the cross-rhythm as generating a "secondary beat scheme," rather than "counterbeats."

Locke continues his presentation with a discussion of the standard pattern in detail. Locke states that the standard pattern—he calls it the "standard bell pattern"—consists of seven notes "arranged asymmetrically so that groups of two and three long strokes are separated from each other by single short strokes" (Locke 1982: 224). Up to this point, I have agreed with Locke's analysis, but I cannot follow his point with regard to long and short strokes. As Kubik has pointed out, no stroke is any longer or shorter than any other; they simply represent the attack points of the pulses. I would argue that this very illusion of long and short notes may, in fact, have contributed to the original mis-interpretations of this pattern. To continue to transcribe this pattern with these improper note values serves to further this misrepresentation.
The following chart displays Locke's transcription of the standard pattern, followed by a transcription of the pattern that emphasizes the 3:2 construction, followed by a notation that I find most easily read by musicians because of its notational link to the concept of the main beats:

Fig. 53

After his description of the "standard bell pattern," Locke enters into a discussion of the terms additive and divisive, but in the context of rhythmic motives only. He calls only equal rhythmic attacks divisive, and he provides visual examples of both additive and divisive rhythmic motives. Locke, however, never comments on the fact that the entire African rhythmic structure that he is examining is divisive in nature. Also, many of the examples of additive motives provided by Locke in his article could be interpreted as actually divisive in foundation but containing
rests at some of the attack points. I must say that this is another point in Locke's otherwise excellent article that I cannot follow.

Locke continues his discussion with a description of offbeats and offbeat timing. Locke's usage of the term offbeat is extremely consistent and, in fact, was one of the models for the working definition of the term, as detailed earlier in this document. Locke follows his description of the term offbeat by detailing and outlining the common cross-rhythms found in many African musics. Locke defines cross-rhythm in the following excerpt:

In other rhythm patterns, offbeat strokes are equidistant and regular, thus establishing the feeling of a contrasting stream of accents that pulls against the main beats. When the length of these accents is a simple ratio of the main beats then cross-rhythm ... results. (Locke 1982: 227)

Locke's description of cross-rhythm does not address the significance of the temporal disruption, and it does not take into account asymmetrical constructions. It is, however, a universal definition for the purpose of Locke's study. Locke continues by referencing the phenomenon of "consistent offbeat accent," which he defines as "temporary accents (that) have the same duration as the main beats, but are located in shifted positions within the bell cycle." In essence, Locke has described what has earlier been characteristically defined by the term syncopation.
The remainder of Locke’s article deals with an extended presentation of the concept of cross-rhythm as it applies both to specific musical examples and to African rhythmic structures at large. In addition to the 3:2 relationship, Locke gives examples of 3:4, 3:8, 4:3, and other proportional relationships that can be easily analyzed in African musics.

Locke makes the observation that a cross-rhythm “can be both vertical, that is, between two simultaneous rhythm patterns, or horizontal, that is, between successive motives in one rhythm pattern” (Locke 1982: 233). In fact, earlier in his article, Locke provided the following example of a typical hand-clap rhythm, represented as figure 54.

Although this represents a textbook example of the phenomenon of hemiola, as was previously detailed, Locke never mentions or refers to this term. Perhaps he did not want to limit himself only to the description of the 3:2 ratio with the introduction of the term hemiola. Or perhaps he did not want to introduce the ambiguity that the term sometimes generates.
As he concludes his article, he emphasize the importance of beat schemes and cross-rhythmic relationships in African rhythmic structures. I find most of his descriptions and examples to be excellent. He does not, however, develop his point in relation to the standard pattern, nor make any attempt to analyze the pattern in terms of cross-rhythm or structural significance. Of all the studies I have read on West African rhythm, however, I find David Locke’s work to be the most accurate, the most profound, and the most true to the African concept of time.

After Locke’s monumental work of 1982, the next significant study that provides new or different information concerning the standard pattern again comes from Kubik. In his article of 1972, we noted that Kubik offered two new and insightful ideas concerning the standard pattern. First, Kubik confirmed that the mnemonic syllables used to transmit the standard pattern verbally had directional value and were not merely nonsense syllables. Second, and possibly more importantly, Kubik asserted that African rhythm is based on attack points rather than on durational values, as previous (and later) scholars incorrectly promoted. Kubik, however, in an otherwise useful and well written article, did not provide an accurate representation of the standard pattern. Instead, he presented the old transcription of King.

Kubik developed the ideas presented in his article, combining them with much further study and analysis, and published his landmark
book, *Theory of African Music*. As a part of a comprehensive introduction, Kubik reviewed his current philosophy on rhythmic structures in Africa. In this book, he claims that the concept of rhythm is built from four to five principles that are common among musics.

First, he confirms the definitions for *beat* and *pulse* presented as the working definitions for this document. Kubik, in essence, transforms the terminology *elementary pulses* and *gross pulses* into the terms *pulses* and *beats*, respectively (Kubik 1994: 42). Second, in reference to these pulses and beats, Kubik states that these pulses are usually arranged into the common numbers, 8, 12, 16, and 24. He refers to these divisions as cycles. In essence, Kubik is outlining the metric accents for 4/4 and 12/8 in eighth-notes and sixteenth-notes, respectively.

Third, commenting on the specific number 12, Kubik notes that "it is the most important form number in African music," and that it can be divided by 2, 3, 4, and 6. Next, Kubik provides his description of cross-rhythm and defines the term as "patterns inside the same form number" that are "shifted against each other in combinations so that the main accents cross" (Kubik 1994: 42). Obviously, Kubik, like Locke, does not account for the possibility of an asymmetrical structure, nor does he comment on the significance of the temporal disruption. It is clear, however,
that Kubik is using the term as it manifests itself in African musics, and in this sense, he is also similar to Locke.

Finally, Kubik presents his analysis of timeline patterns in African musics. Interestingly, he has modified his analysis drastically from his earlier presentation. Kubik has obviously spent a considerable amount of time since 1972 in the research and study of timelines. He offers the following background information:

They are single-note patterns struck on a musical instrument of penetrating sound quality, such as a bell, a high-pitched drum, the rim of a drum, the wooden body of a drum, a bottle, calabash or percussion beam, concussion sticks (such as the Cuban claves) or a high-pitched key of a xylophone. They are a regulative element in many kinds of African music, especially along the West African coast, in western central Africa and in a broad belt along the Zambezi valley into Mozambique. (Kubik 1994: 44)

Kubik presents an excellent summary of the varied and widespread nature of timelines, as well as the instruments on which they are normally sounded. He goes on, however, to comment that the timelines are "characterized by an asymmetrical inner structure, such as 5 + 7" (Kubik 1994: 44).
Next, Kubik presents three realizations of what he refers to as “the most important timeline patterns” found in African musics. He refers to the first timeline as “the 12-pulse seven stroke pattern, version ‘a’ (mainly West African)” (Kubik 1994: 44). Unlike the other scholars, Kubik does not use Western notation for his transcriptions. He instead uses the symbols “X” and “.” to signify an attack point and a rest, respectively. He represents the pattern as it appears below:

\[ X \cdot X \cdot X X \cdot X X \cdot X X \]

In traditional Western notation, Kubik has correctly identified the onbeat 3:2/offbeat 3:2 pattern as notated in figure 55.

He next refers to “the 12-pulse seven stroke pattern, version ‘b’ (mainly Central African)” (Kubik 1994: 44), and represents it as follows:

\[ X \cdot X \cdot X \cdot X X \cdot X X \cdot X X \]

In Western notation, this rhythm appears as figure 56.
Although it has not yet been discussed in this document, I recognize this pattern presented by Kubik as another very prominent timeline in African musics, although certainly secondary to the pattern Kubik represented as version "a."

Kubik here has identified another common timeline that is founded on the onbeat/offbeat 3:2 relationship. The only specific difference between the two patterns is that the transition attack from the onbeat 3:2 rhythm to the offbeat 3:2 rhythm occurs on pulse six in pattern "a," and occurs directly on the third beat (pulse seven) of pattern "b." This, in essence, this gives pattern "b" decidedly more of an onbeat character than pattern "a."

If we refer to the timelines in the verbal terms of resolution (static) or conflict (dynamic), timeline "a" is static on beats one and four (the downbeat and upbeat) and dynamic on beats two and three (the interior beats), while timeline "b" is static on beats one, three, and four, and static only on beat two. In function, this makes pattern "a" more offbeat, and pattern "b" more onbeat.
Note that even though pattern "a" is more offbeat, it would not be correct, in the classic sense of the word, to refer to pattern "a" as syncopated. This is due to the fact that pattern "a" does not represent a continuous and even offbeat accent in relation to the metric accent. Instead, it crosses the metric accent, and is an example of cross-rhythm, not syncopation.

Finally Kubik presents, as his third timeline, "the 12-pulse five-stroke pattern," which is represented as follows:

\[
[\text{X . X . X . . X . X . .}]
\]

In Western notation, this final pattern appears as figure 57.

As his third timeline, Kubik has presented the five-attack pattern that Jones originally identified, and King labelled, as the standard pattern.

Although Kubik never comments on the foundations of, the construction of, or the relationship between these three timelines, he has accurately presented all the patterns in
relation to their downbeats and their attack points in the 12/8 metric scheme. Most notably, Kubik offers interesting names for these timelines, and in an effort to be more specific in describing these patterns, I endorse the direction that Kubik has taken the terminology. In all, I find Kubik’s presentation highly useful and descriptive and much developed from his earlier efforts.

I would like to note, before leaving Kubik, that an entire chapter (chapter VIII) of the yet unpublished Volume Two of Kubik’s, Theory of African Music, will be devoted to “The Cognitive Study of African Musical Rhythm.” In a proposed table of contents to the new volume, Kubik lists sections on timing systems, timeline patterns, motor accents, beats, etc., with the intention that this second volume provide detailed coverage in areas not fully covered in volume one. At the time of publication of this document, the second volume of Kubik’s book has not been printed in any form.

The final article on the standard pattern I would like to reference is a recent article by David Schmalenberger entitled, “African Rhythm: Perceptions of a Westerner.” In a discussion of additive and divisive rhythm, Schmalenberger gives examples of different ways the standard pattern can be realized in Western notation. One example mimics the long and short note durations seen in earlier examples, but he sets it in a 12/8 meter. Please refer to figure 58 for a visual reference.
He then offers an example of the pattern notated over two measures of 6/8 meter (still 12 eighth-note pulsations) as in figure 59 below.

To quote Schmalenberger, figure 59 "is easy to read, but the tied notes (which are necessary in order to maintain six eighth notes per measure and to follow the 'split bar' axiom) weaken our visual perception of the additive phrase" (Schmalenberger 1998: 37). He continues by asserting that the example above "visually implies a 6 + 6 regular division rather than a 7 + 5 irregular (additive) division" (Schmalenberger 1998: 37).

Finally, Schmalenberger presents an example that he claims is "easier for those of us trained in the Western European tradition to read," as represented in figure 60.
He asserts, however, that figure 60 also distorts the actual additive nature of the timeline, and that there is always a "temptation to view the African additiveness in relationship to the Western divisiveness" (Schmalenberger 1998: 38). As detailed earlier in this document, Schmalenberger makes reference to Eastern European rhythms that "can only be derived through addition (e.g., 5, 7, 11 or 13 counts)" (Schmalenberger 1998: 38).

He describes African rhythmic structures as being based not on their easily divisible length but on their additive internal structures.

Though Schmalenberger appears to offer a solid argument for his notational preference of the standard pattern, his rationale is fundamentally and crucially flawed. First, as has been demonstrated, the African rhythmic structure which generates the standard pattern is a divisive structure and not an additive one. Second, the standard pattern represents a series of attack points that outline the onbeat 3:2/offbeat 3:2 sequence, not a series of durational values. In fact, in different versions of the standard
pattern presented by Schmalenberger, he represents the same attack points as having different durational values—compare figures 15.5 and 15.7)—but he never notes the difference in note value as being a positive or negative aspect of either transcription. Schmalenberger seems not to have considered the issue of attack points as opposed to durational values in either of his notations.

Schmalenberger does recognize a steady flow of regular beats, but he seems to think the timeline exists as an additive rhythm within a highly divisive structure. Of course, without the understanding that the 3:2 relationship is the foundation of the standard pattern, Schmalenberger cannot see its divisive nature. As the most recent published analysis of the standard pattern that I know of, Schmalenberger's article does confirm the timeline's existence in relation to the four-beat scheme, and that is a significant advancement over the analyses of Jones and King. Schmalenberger does not, however, advance the scholarship with regard to his perception of the standard pattern existing as an additive phenomenon, even though he places it in a divisive framework. In this sense, he is still promoting the ideas of his predecessors.
With my review of the pertinent scholarship concerning the standard pattern completed, I feel that at this time I should comment on the use of the term standard pattern as it relates to the variety of transcriptions it is said to represent. As previously stated, I support the direction Kubik has taken in labeling timelines based on their attack points, but I do not like the designations “a” and “b” used to differentiate the similar 12-pulse seven-stroke patterns. Before commenting further on Kubik’s descriptions, however, I will review usage of the term standard pattern as it has been presented and used in the previously documented scholarship.

Clearly, the pattern that King (via Jones) has labeled the standard pattern in his original presentation consisted of five attack points. What I have earlier called the full onbeat 3:2/offbeat 3:2 pattern with the transition note included (see
figure 7) consists of seven attack points. This figure, called by King one of the "possible variants" of the standard pattern, was later referred to by Kauffman and Locke as the standard pattern itself. Kubik later assigned the designations "12-pulse five-stroke pattern" and "12-pulse seven-stroke pattern," to differentiate the two timelines, but he never commented directly on the usage of the term standard pattern. Also, Kubik introduces another common timeline in his discussion, one not previously referenced by other scholars. He refers to it as an alternate version of his transcription of the seven-stroke pattern. Unfortunately, he offers no rationale as to its origin or its relationship to the other patterns he displays. Perhaps even more important is the fact that he does not comment on either the origin or the structure of any of the patterns he has labeled, nor does he establish any functional relationship between them. Obviously, some ambiguity in applying the term standard pattern exists in the literature.

Figure 61 presents the following patterns for review and comparison:

A. The original standard pattern as observed by Jones and labeled by King. Later referred to as the "12-pulse five-stroke pattern" by Kubik.
B. The variant of the standard pattern as labeled by King. Later referred to as the standard pattern itself by Locke and Kauffman. Even later referred to by Kubik as the "12-pulse seven-stroke pattern, version "a.""

C. The '12-pulse seven-stroke pattern, version b," as presented by Kubik.

D. The 12/8 (four-beat with ternary subdivision) metric scheme.
It is clear that all of these patterns are manifestations of the same fundamental idea, that being one cycle of an onbeat 3:2 cross-rhythm followed immediately by one cycle of an offbeat 3:2 cross-rhythm. To say that one of the above patterns is a variant of another implies that one pattern is historically older than the others, an axiom which I doubt could be proved with satisfaction. I prefer to look at all three patterns as different statements of the same idea, absolutely based in the 3:2 relationship as it manifests itself in the 6:4 cross-rhythm of the 12/8 metric scheme. As an extremely general observation, I have noticed that the seven-stroke patterns are most often used at slow to medium-fast tempos, while the five-stroke pattern is most often used at fast to very fast tempos, but this is not always the case. It is logical to speculate that at fast tempos, the seven-stroke patterns may become too difficult to activate precisely, and that the omission of the attacks on pulse six-or-seven and on pulse twelve facilitate accurate performance. This rationale may, however, imply that the five-stroke pattern is a subset, or derivative, of the seven-stroke pattern, a point which cannot be proved. In the formation of traditional musics, the choice of when to use the seven-stroke patterns and when to use the five-stroke patterns may have been a strictly emotional decision based, possibly, on the need to create more or less rhythmic open space within specific textures. I must again stress, however, that the
foundation and the purpose of all three patterns is identical: they all clearly outline the 3:2 cross-rhythm with an onbeat and offbeat realization.

At this point, I would like to propose an outline for the most descriptive usage of terminology regarding the standard pattern as it relates to the three patterns outlined above. First, the patterns above would be considered three primary examples of timelines found in African musics. The term timeline, as introduced by Nketia, will be defined as a pattern serving as the rhythmic guideline of the music while also defining the duration and character of the time span or measure (Nketia 1974: 131). This concept was also referred to as a "cycle of time" by Locke (Locke 1982), a "guide" by Jones (Jones 1959), and a "time-keeper" by King (King 1960). I find Nketia's term timeline to be the preferred one, and the one that I will use in this document. Under this broad and consistent definition, the Afro-Cuban "clave" pattern, among others, would be viewed as a classic example of a timeline.

The concept of clave as it relates to the phenomenon of rhythm in Afro-Cuban musics will be detailed later in this document, but for now, it is safe to state that the foundations of clave in Cuban musics and the standard pattern in African musics are related, if not identical, in concept. As the term clave has come to be used to describe timeline phenomena in traditional Cuban musics,
Anthony King proposed the term standard pattern to describe timeline phenomena in traditional African musics. To take this discussion one step further, since it has been suggested through analysis that the 3:2 cross-rhythm is the key to understanding the foundation of these patterns, I propose that the term key pattern replace the term standard pattern in my discussion.

I feel that this terminology better reflects the structural significance of the pattern, and it also reflects upon the parallel term, clave, that has been in use for generations as a description of Cuban timelines. As noted by the Afro-Cuban scholar John Santos, in Spanish, "the word clave literally means key, keystone, or code" (Santos 1986:32). As the clave is literally the key to understanding Afro-Cuban musics, so also is the African key pattern the key to understanding African rhythmic structures. In turn, using the language brought forward by Kubik, I propose that the original pattern observed by Jones and labeled by King as the standard pattern be now referred to as the "five-stroke key pattern."

To define terminology for the seven-stroke pattern notated by Kubik in two versions as his "seven-stroke pattern, version a" and "seven-stroke pattern, version b," I would like to review the earlier observations made in this document in reference to static and dynamic moments in their structures. As previously detailed, the only specific difference between the two patterns is that the
transition attack from the onbeat 3:2 rhythm to the offbeat 3:2 rhythm occurs on pulse six in Kubik's pattern "a," and directly on the third downbeat (pulse seven) of Kubik's pattern "b." In terms of resolution (static) or conflict (dynamic), timeline "a" is static on beats one and four (the downbeat and upbeat) and dynamic on beats two and three (the interior beats), timeline "b" is static on beats one, three, and four, and static only on beat two. In function, this gives pattern "a" decidedly more of an offbeat character and pattern "b" decidedly more of an onbeat character.

For this reason, I propose that Kubik's "seven-stroke pattern, version a" be referred to as the "offbeat seven-stroke key pattern," and that Kubik's "seven-stroke pattern, version b" be referred to as the "onbeat seven-stroke key pattern." When the need for further specificity is present, I will follow Kubik's model and include the additional "12-pulse" designation, thus making their full and most distinguishing designations the "12-pulse five-stroke key pattern," the "12-pulse offbeat seven-stroke key pattern," and the "12-pulse onbeat seven-stroke key pattern."

Although I am hesitant to clutter this topic area with new terminology, I feel that, with consistent usage over time, these additions and clarifications may serve to reduce the confusing ambiguity often present when describing these timelines. Above all, I feel that the logical constructs of these titles will allow
for the standard classification of timelines based on their organizational principles, their attack points, and the metric contexts in which they exist.

Note, however, that these terms may not always need to be represented by their full and most specific descriptions. For instance, in a very general description of African rhythm, the term timeline in itself may be descriptive enough to serve the needs of the discussion. At other times, the 12/8 metric context could be understood, and the only timeline represented could be the "offbeat seven-stroke key pattern." In that case, it would be specific and descriptive enough simply to refer to the timeline as the "key pattern," and then, possibly, the "seven-stroke key pattern" in other contexts where the "five-stroke key pattern" existed as well. In very specific situations, the complete "12-pulse offbeat seven-stroke key pattern" designation might be required to allow comparison to the "12-pulse onbeat seven-stroke key pattern" or perhaps a seven-stroke pattern based on a "16-pulse" scheme.

In short, this terminology should be applied as specifically as required to best describe the given phenomenon in the given context, while remaining absolutely consistent in all of its various manifestations. I directly relate the proper usage of this terminology to the scientific principles of taxonomic classification. For example, in the family felidae (cats), the
genus designation *panthera* describes the lion, tiger, leopard, and jaguar, but the species designation *panthera tigris* defines only the tiger. If more specificity were required, one could refer to the subspecies *panthera tigris longipilis* (the Siberian tiger) (Morris 1976:1319-1320). A similar model of hierarchy in classification should hold true when properly describing timelines in African musics.

Before leaving the topic of classification, I would like to address the fact that the African timelines that have been detailed throughout this discussion are known in common usage by a wide variety of names. Because there has not been an absolute codification of the terminology used by scholars and performers of this music, many people have invented their own terms to describe various timelines. Perhaps the most common timeline encountered in the performance of West African music is the 12-pulse offbeat seven-stroke key pattern. I have heard this pattern referred to by the names "African bell," "African 12/8 bell," "African 6/8 bell," "12/8 bell," "6/8 bell," "12 bell," "Ewe bell," and, "standard bell." I have heard the 12-pulse five-stroke key pattern referred to by the descriptions "African clave," "African 12/8 clave," "African 6/8 clave," "12/8 clave," and, "6/8 clave." Finally, I have heard the 12-pulse onbeat seven-stroke key pattern referred to by the titles "Ibo pattern," "Nigerian bell," "Haitian bell," and even, "the other 12/8 African bell."
There are probably countless other terms, promoted by those who have adopted the invented terminology of a teacher or who have themselves created terms to describe the various phenomenon. Although some may argue that it is acceptable for a closed environment to adopt a unique terminology (with the stipulation that the terms are understood among the users), I hold that eventually this leads to confusion and misinformation. In time, the users of the closed system will interact with others who cannot function within their terminology, and extended interpretation will be required. Usually, terms from both systems get blurred, and confusion and misinterpretation often result. The most efficient and effective means would be to adopt a standard system of delineation that is comprehensive, logical, and flexible, such as the previously described taxonomic classification.

With the above rationale accepted, I feel it necessary to point out some interesting, and at times confusing, details concerning the relationship between the 12-pulse offbeat seven-stroke key pattern and the 12-pulse onbeat seven-stroke key pattern. The first is that the patterns are, in fact, retrogrades of one another; that is, the offbeat seven-stroke key pattern is, in essence, the onbeat seven-stroke key pattern, only backwards. Please refer to figure 62 for a visual reference.
Second, and perhaps more important in terms of the aural perception of the patterns, is the fact that if one turns pulse number six of the 'offbeat seven-stroke key pattern' into an artificial downbeat and begins a metric cycle maintaining the original attack points, the resulting rhythm created is the 'onbeat seven-stroke key pattern.' Please refer to figure 63 for a visual reference.
Likewise, if one turns pulse number eight of the onbeat seven-stroke key pattern into an artificial downbeat and begins a metric cycle maintaining the original attack points, the resulting rhythm created is the offbeat seven-stroke key pattern. Please refer to figure 64 for a visual reference.

The phenomena displayed by the last two musical examples can present extreme confusion to a listener if s/he is not firmly grounded in the four-beat scheme of the proper metric structure. Often, the true identity of the actual pattern being played can only be revealed through context, and even then (especially at extremely fast tempos) it can remain elusive to an inexperienced ear. Sometimes, using a two-tone bell, the actual downbeat of the key pattern is played on the low-pitched bell, while all other notes of the timeline are played on the high-pitched bell. This serves as an excellent guide to the proper aural interpretation of the specific key pattern being realized.
Of course, the timeline is often represented on one-tone instruments, where pitch differentiation cannot serve as the guide for clarification between the patterns. In these cases, one must relate the pattern to the four-beat scheme through context to find the proper downbeat. Most helpful is the fact that both the onbeat seven-stroke key pattern and the offbeat seven-stroke key pattern have static moments on both the downbeat and the upbeat of every measure. Of course, the onbeat seven-stroke key pattern also has a third static moment on beat three.

When one hears the onbeat seven-stroke key pattern while in actuality the offbeat seven-stroke key pattern is being played, none of the perceived downbeats will coordinate with the actual downbeats. The same holds true with the inverse of the situation, when one hears the offbeat seven-stroke key pattern while in actuality the onbeat seven-stroke key pattern is being sounded. In the end, it is one's ability to be firmly rooted in the four-beat 12/8 scheme that determines the proper understanding of one's relationship to a given timeline.

Always remember that these two patterns clearly outline the identical structure. They both represent all of the attack points of the onbeat 3:2/offbeat 3:2' construct. Despite this, the two patterns do actually feel slightly different, based, on the minor variance in the static and dynamic moments of each. As stated earlier, the attack that occurs on either pulse number six or
seven of the respective patterns functions as a transition note from the onbeat 3:2 relationship to the offbeat 3:2 relationship. It is, in fact, the placement of this very note that determines the offbeat or onbeat feel of the seven-stroke patterns.

When realized in settings outside of traditional West African musics, the offbeat seven-stroke key pattern is often interpreted by composers and performers alike as being generated in 6/4 meter with duple subdivisions. Please refer to figure 65 for a visual reference.

![Figure 65](image)

Early in my career, when I first encountered the offbeat seven-stroke key pattern notated in a jazz setting, I found that it was written in 6/4 meter. My inclination as a drummer, however, was to feel it in 12/8 meter instead. Though having no idea of its traditional foundation, I felt the proper four-beat scheme as a 4:6 cross-rhythm to the artificial metric accent of the 6/4 meter.

In fact, many composers have used this timeline as a rhythmic "groove" for a composition without having any knowledge of its traditional foundation or setting. When written in 6/4 meter, the
key pattern does not reveal the 3:2 cross-rhythm that is at its root. In essence, it transforms from a two-dimensional pattern (with both static and dynamic behavior) to a one-dimensional pattern (of strictly static behavior). Less commonly, I have encountered musicians who think of the key pattern in additive terms, somewhat along the lines of King, or perhaps Ekwueme. In these cases, I have observed it described as a 12-pulse, 5/8 + 7/8 phrase (rather than Anthony King's 7/8 + 5/8 division), again defining the natural metric accent caused by the falsely perceived "long" and "short" notes of the pattern, as detailed earlier. As in the 6/4 realization, when it is defined in additive terms, the key pattern does not reveal the 3:2 cross-rhythm at its root, and, it is transformed from an interactive two-dimensional pattern into a one-dimensional pattern with no conflict of metric accent.

To summarize, these altered schemes certainly represent ways in which the key pattern may be divided, but they do not represent the structure that is undeniably at its foundation. It is much more rewarding to "feel" and "generate" the pattern from four beats in 12/8 time, and then to juxtapose the 6:4 cross-rhythm with the established four-beat scheme. The static moments of resolution and the dynamic moments of conflict, inherent in this juxtaposition of cross-rhythm and beat, give the timeline its character. To actually "feel" and "generate" the pattern from any other model except the 12/8, four-beat scheme is to deny the challenge and the pleasure of the 3:2 relationship.
CHAPTER 10
THE 3:2 RELATIONSHIP AS A NATURAL PHENOMENON

The final area I would like to explore in relation to the foundation of the key pattern is the parallel that can be drawn between the 12-pulse offbeat seven-stroke key pattern and the semitone count of the widely used diatonic major scale. The major scale is often represented by the following formula, where "whole" designates one whole step and "half" designates one half step:

\[
\text{whole - whole - half - whole - whole - whole - half}
\]

The relationship of this formula to the 12-pulse offbeat seven-stroke key pattern is represented in figure 66.
The interval content in whole steps and half steps of the diatonic major scale is an exact parallel to the attack points of the 12-pulse offbeat seven-stroke key pattern. This very relationship was noted by Koetting in a 1986 article (published after his death, ed. Roderick Knight) regarding observations made in a presentation by Jeff Pressing (1983). Koetting dismisses the relationship by stating that "as fascinating and seductive as these explanations may be, they do not provide an answer to how Africans perceive rhythm. They are not operating principles—they do not actually account for what happens in the music" (Koetting 1986: 61).

In a 1992 article on the Agbadza Drums, John Collins takes a more positive approach to the relationship:

Of interest here is that the octave scale is thought to have been developed by the Greek mathematician and musician Pythagoras, whose name comes from the sacred python and priestess (pythia) of the Delphic oracle; a snake cult of which he was a member, imported into pre-Achaen Greece from North Africa. Indeed Pythagoras actually studied in Egypt, from where many of his geometrical theorems came. If his musical theories also came from Egypt, then an intriguing fact is that Africa has provided the same musical structure twice over: once in melodic and once in rhythmic form. (Collins 1992: 61)

Although Collins seems to endorse this parallel relationship, he offers no rationale as to why it exists. Koetting is convinced
that the relationship is not based in any "operating principle." Although I certainly cannot endorse the notion that the 12-pulse offbeat seven-stroke key pattern and the diatonic major scale are the rhythmic and melodic parallel of each other, I do feel that both structures are founded on the observation of the same operating principle.

As displayed earlier, the 3:2 cross-rhythm and its inversion are the foundation of the key pattern in West African music. It is also widely documented that the diatonic major scale (in Pythagorean tuning) is entirely based on the internal ratio of 3/2 (the perfect fifth). Easley Blackwood details the construction of the Pythagorean scale as follows:

"Let us begin with any pitch whatever, and find another pitch higher than the first by the second basic interval—the interval whose ratio is 3/2. We now continue the process until we have a total of seven pitches, each higher than the one immediately preceding by the interval whose ratio is 3/2. If these seven notes are now rearranged in ascending order within a compass of one octave, they form a diatonic scale. (Blackwood 1935: 23)

Using the formula above, if we begin a series of perfect fifths from the note F and extend it until seven notes are produced, the following series is created:

\[
F - C - G - D - A - E - B
\]
If we now collapse all of these seven pitches into one octave, we have created the diatonic major scale which begins on the pitch C. As was confirmed in figure 17, the interval content of this major scale in whole steps and half steps is an exact parallel to the attack points of the 12-pulse offbeat seven-stroke key pattern. Note that instead of producing a diatonic major scale from the beginning note of the sequence F, the series produces the C major diatonic scale instead. Of course, the relationship between the note C and the note F is a perfect fifth, or the 3:2 ratio.

If we continue our sequence of perfect fifths until infinity or until the sequence repeats itself, we eventually produce the full chromatic scale in Pythagorean tuning, represented as follows:

\[ F - C - G - D - A - E - B - F\# - C\# - G\# - D\# - A\# - (E\#) \]

Note that a total of twelve pitches are defined before, in essence, the system repeats itself with E\# (for our purposes, equivalent to the beginning F). It is interesting that this sequence produces the finite number of twelve pitches, which also happens to be the identical number of total pulses in the structure which generates the key pattern.

For some other interesting similarities, let us reconsider the first seven-note sequence we created. If we collapse all of
these pitches once more, but start our scale from the first note of our actual sequence, F, the following scale is produced:

\[ \text{F - G - A - B - C - D - E} \]

We have now created the Lydian mode, which is basically a major scale with the fourth scale degree raised by a half step. The semitone count of this scale is represented by the following formula, where "whole" designates one whole step and "half" designates one half step:

\[ \text{whole - whole - whole - half whole - whole - half} \]

The relationship of this formula to the 12-pulse onbeat seven-stroke key pattern is represented in figure 67.

The interval content in whole steps and half steps of the Lydian is an exact parallel to the attack points of the 12-pulse onbeat
seven-stroke key pattern. Now let us consider only the first five notes of this sequence, as represented below:

\[ F - C - G - D - A \]

If we collapse all of these pitches once more, and start our scale from the first note of our actual sequence, F, the following scale is produced:

\[ F - G - A - C - D \]

Finally, we have created the major Pentatonic scale, which is basically a major scale without the fourth and seventh scale degrees. Since it is not practical to describe this five-note scale in terms of whole steps and half steps, let us, instead, transpose these notes to the 12-pulse metric scheme as an analog to the 12 chromatic pitches generated by the finite sequence of perfect fifths. This is represented in figure 68 below.

If we now represent only the attack points of the notes, F, G, A, C, and D, the rhythm represented in figure 69 emerges.
This process has produced the five-stroke key pattern originally observed by A.M. Jones and labeled the standard pattern by Anthony King.

Again, I certainly cannot endorse the notion that these patterns and scales are the rhythmic and melodic parallels of each other, but I have noted that both structures are founded on the same operating principle: the 3:2 relationship. The key patterns represent various manifestations of the 3:2 relationship as a perceivable rhythm that represents a vertical relationship to the symmetrical structure which generates it. The scales above represent various manifestations of the 3:2 relationship as vertical ratios of two vibrating bodies. Of course, the vertical vibrations represented by the 3:2 relationship in this case are occurring at frequencies too fast to be perceived as rhythm, so instead they are perceived as pitch. It is this rate of speed of the vibrations (or tempo, perhaps) that, in fact, determines if the human ear hears a given event as rhythm or pitch.
In the first chapter of his monumental text, *On the Sensations of Tone*, Hermann Helmholtz describes this phenomenon. While detailing the range available on the grand piano, he describes the musical character of all notes below the lowest E as "imperfect, because we are here near the limit of the power of the ear to combine vibrations into musical tones" (Helmholtz 1885: 18). Helmholtz defines "distinguishable pitch" as having "between 40 and 4000 vibrations in a second" (Helmholtz 1885: 18). To translate this into more meaningful terms, consider the following example. A metronome marking of 120 to the quarter-note would produce eight 16th-notes per second, sixteen 32nd-notes per second, and thirty-two 64th-notes per second. Obviously, thirty-two 64-the notes per second is extremely fast for a rhythm, but it is not yet approaching the 40 vibrations per second required by Helmholtz to begin to be recognized as pitch. Even at 40 vibrations per second, the average ear barely recognizes the event as pitch, though the frequency of 40 vibrations per second is also far too fast to be accurately recognized as rhythm.

This relationship between rhythm and pitch is quite easy to display. The most accurate tests are done in hearing labs using sophisticated tone generators under controlled conditions, but a simple demonstration can be produced easily. Consider the following example of the relationship between frequency, rhythm, and pitch, as described by Harvey White in his useful text, *Physics and Music: The Science of Musical Sound*:
Every boy or girl who has owned a bicycle has at one time or another fastened a piece of cardboard to the forks of the front wheel so that one end projects between the spokes. When the wheel turns, the spokes strike the card and make it vibrate. The faster one rides, the faster the card vibrates, and the higher is the pitch of the sound. (White 1980: 168)

This excellent and simple example demonstrates exactly what one would hear from a tone generator when turned from its lowest possible frequency upward toward frequencies that are recognized as pitch. At first, the sound produced by the tone generator is represented aurally as a slow series of clicks from the loudspeaker. Then, as the frequency is raised, the series of clicks becomes more and more rapid, until finally, they are combined together by the ear into one cohesive and continuous sound, or pitch. This is similar to the phenomenon produced by the bicycle. As one begins the ride, the slow turning of the wheel allows the ear to define each individual vibration from the cardboard on the spokes, but as the ride becomes faster, the individual vibrations are combined into one cohesive and continuous sound, or pitch.

To relate this phenomenon to the 3:2 relationship and the perfect fifth, consider this example. In standard pitch nomenclature, when referencing the Pythagorean scale, A4 = 440 Hz, while E5 = 660 Hz (exactly a perfect fifth higher). The ratio of the frequency of
the perfect fifth (E5) to the reference pitch (A4) is 660:440, which easily reduces to 3:2. If we consider this same relationship one octave lower, A3 = 220Hz and E4 = 330Hz; at two octaves lower, A2 = 110Hz and E3 = 165Hz; and at three octaves lower, A1 = 55Hz and E2 = 82.5Hz (White 1980: 173). If we were to extend this relationship (theoretically) four additional octaves, at four octaves lower than the beginning pitches, A = 27.5Hz and E1 = 41.3Hz; at five octaves lower, a = 13.75Hz and E = 20.65Hz; at six octaves lowered, aa = 6.875Hz and e = 10.325Hz; and finally at seven octaves lower, aaa = 3.4375Hz and ee = 5.1625Hz.

When one hears the interval of the perfect fifth as represented by the frequencies 660Hz/440Hz, the specific pitches produced by the individual 660 and 440 vibrations blend into one harmonious interval. When we lower the frequency range below the level of perceivable pitch, however, the individual vibrations of each pitch are heard as rhythm. The interaction of the two individual rhythms create a composite 3:2 cross-rhythm. If it were possible to precisely set two identically calibrated tone generators to the assigned frequencies of 3.4375Hz and 5.1625Hz respectively (aaa and ee from above), the composite rhythm produced by these proportional vibrations would be equivalent to the 6:4 cross-rhythm set in the 12/8 metric scheme at an exact metronome marking of 68.75 to the dotted quarter-note. Please refer to figure 70 as a visual reference.
This clearly displays the analog between pitch and rhythm and the consistency of this relationship when applied to proportional pitch and rhythmic relationships.

This proportional relationship between pitch and rhythm has fascinated musicians, physicists, and mathematicians for generations. As well as being the root of the founding principles of our modern system of Western notation and nomenclature, this relationship has been explored by composers as a means of structural foundation in composition. Writing in the now famous journal, die Reihe (the Row) in 1959, the German composer and philosopher, Karlheinz Stockhausen presents the following in his article, "... How time Passes ..."

Our sense perception divides acoustically-perceptible phrases into two groups; we speak of durations and pitches. This becomes clear if we steadily shorten the length of a phrase (e.g., that between two impulses) from 1" to 1/2", to
1/4", 1/8", 1/16", 1/32", 1/64", etc. Until a phase-duration of approx. 1/16", we can still just hear the impulses separately; until then, we speak of duration ... Shorten the phase-duration gradually to 1/32", and the impulses are no longer separately perceptible; one can no longer speak of the 'duration' of a phase. The latter process becomes perceptible, rather, in a different way: one perceives the phase-duration as the "pitch" of the sound. (Stockhausen 1959: 10)

Stockhausen has, in very precise terms, detailed the information presented previously concerning the relationship of frequency to rhythm and pitch. Where Helmholtz has asserted that 40 vibrations per second are necessary for the ear to discern pitch, Stockhausen has stated that trained musicians begin to hear pitch at 32 vibrations per second. As stated by Stockhausen, "1/32 phase-duration makes us say a 'low' note. If a musician has learned to hear 'absolute' pitches in the scale system as we know it up to now, he will say that he hears approximately double-bass B" (Stockhausen 1959: 10). Stockhausen continues by offering the following observation:

Thus one differentiates phase durations up to approx. 1/16" as durations, and, in music up to the present time, so called "meter and rhythm" (the time ordering of durations) took place in the area between approx. 6" and 1/16". The time area in which phase proportions were defined as pitch-relations—harmonic and melodic—extends from approx. 1/16" to 1/3200" phase duration." (Stockhausen 1959: 10)
Applying his ideas to musical analysis, Stockhausen notes how, in the history of tonal music, modulations usually occurred to the dominant (the perfect fifth) and the subdominant (the perfect fourth, i.e., the inversion of the perfect fifth). He relates these tonal modulations to modulations in rhythm that often accompanied them.

Subtleties of cadence were used as details, just as on a larger scale there was modulation from one metrical field to the next, and finally, from one movement to the next, etc. Modulations were made to the “dominant” (3:2 - triplets), or to the “subdominant” (2:3 - dotted values). (Stockhausen 1959: 20)

Stockhausen argues in favor of developing a “scale of durations,” based on the proportions of perceptible phase relationships as a means of advancing the state of twelve-tone composition. He notes that “rhythm ... developed in such a way that no-one thought at first of doing anything that would correspond, in the sphere of macro-phases (durations) to twelve-tone composition” (Stockhausen 1959: 20). Stockhausen details and analyzes a proposed system for composition using serialized techniques to produce rhythms based on proportions.

What is most significant in reviewing the work of Stockhausen is that he is very aware of the profound and direct relationship between rhythm and pitch. In fact, he is so convinced of the
structural integrity of this relationship, that he proposes a new and radical means of composition based entirely on its principles.

One of Stockhausen’s most important contemporaries, Iannis Xenakis, was also intrigued by ratios and relationships, though he approached his art much differently than his colleague. Xenakis, being of Greek origin, looked back to the theories of Pythagoras for inspiration. His own words on the matter follow:

Pythagorism was born of music. Pythagoras built arithmetic, the cult of numbers, on musical foundations. In Orphism music fulfills the function of the redeemer of souls in the escape from the infernal cycle of reincarnations ... It is for religious reasons that Pythagoras discovers the process whereby music is made, and the relation between length of sounds and numbers; moreover, as geometry was being born at that same period, Pythagoras interested himself in it. By adding arithmetic to it, he laid the foundations of modern mathematics. (Xenakis 1967: 14)

In essence, Xenakis has commented on the direct relationship between the founding principles of music, arithmetic, geometry, and mathematics. Most importantly, Xenakis presents the following assertion for the application of his ideas:

It is urgent now to forge new ways of thinking, so that the ancient structures (Greek and Byzantine) as well as the actual ones of the music of Western countries, and also the musical traditions of other countries, such as Asia and
Africa, should be included into an overall theoretic vision essentially based on extra-temporal structures. (Xenakis 1969: 15)

Xenakis has now echoed that assertion put forward at the beginning of our discussion concerning the relationship between the diatonic major scale and the offbeat seven-stroke key pattern. In essence, Xenakis has confirmed that various structures have been founded on the same basic operating principle of proportional relationships. Further, he asserts that a comprehensive theoretic vision would account for phenomena generated by these relationships in all musics, from the ancient musics of the Greeks to the modern musics of the West, and, most importantly for the purposes of this document, for the traditional musics of Africa as well.

It is interesting to note here that Stockhausen and Xenakis both interacted with the revolutionary composer, Olivier Messian, in the early stages of their careers. In his respected text, The Technique of my Musical Language, Messian describes various musical phenomena generated by the fundamental relationship between pitch and rhythm. He, in fact, refers to this relationship as the "charm of impossibilities." He explains that "this charm, at once voluptuous and contemplative, resides particularly in certain mathematical impossibilities of the modal and rhythmic domains" (Messian 1944:122). Perhaps Stockhausen and Xenakis learned much from Messian's philosophies.
To return to the original premise of this current investigation, I still cannot endorse the notion that the 12-pulse offbeat seven-stroke key pattern and the diatonic major scale are the rhythmic and melodic parallel of each other. It cannot be denied, however, that both structures are founded on the same operating principle: the 3:2 relationship as it manifests itself as either rhythm or pitch.

It is appropriate again to state that the significance of the 3:2 relationship as it relates to the perfect fifth (and other phenomena) has been well documented throughout time. Of all ratios, the 3:2 relationship is by far the most studied, and perhaps the most profound, of all proportions. Consider the opening lines of Llewelyn Lloyd's classic text, *Intervals, Scales, and Temperaments*.

The perfect fifth is at once the perfect concord and the perfect enigma of musical theory ... Yet the fifth, or the fourth as an interval approached downwards, is perhaps the one interval, other than the octave, which we may count on finding in widely different musical scales, evolved by different peoples, in different countries, and in different times. (Lloyd 1963: 9)

Lloyd has insightfully noted the universal significance of the 3:2 relationship as integral to many musical structures, not only in the West, but throughout the world.
This brings me to a very critical point. The 3:2 relationship exists as a natural phenomenon that is not exclusive to any race, culture, or geographic region. Although many people look to ancient Greece as the birthplace of proportional theory, the phenomenon of proportional interaction was not invented in ancient Greece, merely observed. The first to have described this phenomenon was Pythagoras, but the phenomenon itself has been well documented as an occurrence of nature.

It is, in fact, this very connection between proportion and nature that Pythagoras, and others, found to be most interesting and most useful to their work. Consider the following passage presented by the author, György Doczi, in the first chapter of, The Power of Limits: Proportional Harmonies in Nature, Art, and Architecture. Commenting on Buddha's famous silent Flower Sermon, Doczi offers the following insights:

If we look closely at a flower, and likewise at other natural and man-made creations, we find a unity and an order common to all of them. This order can be seen in certain proportions which appear over and over again, and also in the similarly dynamic way all things grow or are made—by a union of complimentary opposites. The discipline inherent in the proportions and patterns of natural phenomena, and manifest in the most ageless and harmonious works of man, are evidence of the relatedness of all things. (Doczi 1994: 1)
Doczi offers much to consider in his concise, yet powerful, statement. Extremely interesting is Doczi's use of the phrase "a union of complementary opposites" when referring to proportions which have been observed to recur, both in natural and in man-made structures.

As others have before him, Doczi looks to the theories of Pythagoras for insight into the function and structure of proportional relationships. Commenting on the concept of harmony (from the Greek harmos: to join), Doczi notes the legendary story of Pythagoras listening to the different sounds of proportionally weighted anvils in a smith's shop, and then transferring his observations into experiments with vibrating strings. Other versions of the legend claim that Pythagoras actually listened not to anvils but to proportionally weighted hammers struck in pairs which produced musical intervals (Randel 1986:672). Modern scholars consider the tale to be unsound acoustically, and have labelled it more myth than fact. It is true, however, that Pythagoras observed that two vibrating strings sound the "most pleasant together ... when the length of the plucked strings relate in proportions expressible in the smallest whole numbers" (Doczi 1994:8).

Commenting specifically on the 3:2 relationship, Doczi states that, to the Greeks, "the pleasant sound of the 3:2 proportion was called diapente (penta = five), today called the fifth. The Greeks
considered the diapente to be a close approximation of the ratio of the "golden section" (Doczi 1994: 8). The golden section, in turn, can be identified both as a linear proportion and as the reduction of a series of proportions created by an interesting numerical sequence.

To consider the golden section as a linear proportion, I will use the description put forwarded by the theorist Erno Lendavi in an analysis of the work of Bartok. Lendavi states that the golden section is represented by "the division of a distance in such a way that the proportion of the whole length to the larger part corresponds geometrically to the proportion of the larger part to the smaller part, i.e., the larger part is the geometric mean of the whole length and the smaller part" (Lendavi 1971:17). When we now turn this geometric relationship into a proportion, we find that the golden section can be represented by the ratio, 0.618....

To now consider the golden section as a result of a sequence of proportions, we must first introduce that numerical series which generates the proportions: the Fibonacci series. Fibonacci was actually the nickname of Leonardo of Pisa (1170-1250), "hailed as the greatest European mathematician of the Middle Ages" (Vajda 1989:9). Like Pythagoras, Fibonacci "became acquainted with the advanced mathematical knowledge of Arabic scholars" while in North Africa (Vajda 1989:9). In fact, he proposed the use of the Arabic numerals in his text of 1202, Liber Abaci.
In that same text, Fibonacci proposed a problem which generated one of the most significant sequences of our time. Simply stated, the problem is as follows:

A pair of newly born rabbits is brought into a confined place. This pair, and every later pair, begets one new pair every other month, starting in their second month of age. How many pairs will there be after one, two, ... months, assuming that no deaths occur? (Vajda 1989:9)

The answer to the preceding question is represented by the following formula:

\[ F_{n+2} = F_{n+1} + F_n \] (Vajda 1989:9)

If we let \( n=0 \), the following series is created:

\[
\begin{array}{cccccccccc}
  n: & 0 & -1 & -2 & -3 & -4 & -5 & -6 & -7 & -8 & -9 & -10 & \ldots \\
  F_n: & 0 & -1 & 1 & 2 & 3 & 5 & 8 & 13 & 21 & 34 & 55 & \ldots \\
\end{array}
\]

One notable feature of this series is that, "any number in this series divided by the following one approximates 0.618 and any number divided by the previous one approximates 1.618, these being the characteristic proportional rates between the minor and major parts of the golden section," often referred to with the Greek letter \( \phi \) (Doczi 1994:5).
This series produces an analog to what is commonly referred to as the overtone series or the harmonic series. This is a series of pitches formed from a fundamental tone generating specific intervalic relationships. It has been observed as a natural phenomenon, such as the series of pitches produced by the passage of air through tubes. The first three pitches of the harmonic series are: first, the fundamental pitch itself; second, a pitch one octave above the fundamental pitch; and third, a pitch a perfect fifth higher than the octave.

If one considers the harmonic series in the key of C major, the first pitch would be C (fundamental); the second, C (octave); and the third, G (perfect fifth). In the standard proportions, codified by Pythagoras, these intervals would be represented by the ratios 1:1 for the fundamental pitch, 2:1 for the octave, and 3:2 for the perfect fifth. To review the series generated by Fibonacci's rabbit problem, it begins with the following numbers:

\[ 0 - 1 - 1 - 2 - 3 \ldots \]

If we now collapse this sequence into adjacent proportions, the following series is created:

\[ 1/1 - 2/1 - 3/2 \ldots \]
If we now compare the first three ratios formed from the series generated by Fibonacci's rabbit problem with the intervalic ratios of the first three pitches of the natural harmonic series, we find that they are, in fact, identical. From that point on, of course, the series generated by Fibonacci begins to approximate the proportion 0.618, and all of the ratios created by adjacent numbers in the series begin to be almost the same. As this series continues into infinity, all of the ratios function as further approximations of the 3:2 relationship.

Fibonacci's rabbit problem produces a series that represents an analog to pitch and reduces to the same proportion as the linear golden section. It is fascinating to note the consistency of this series as it occurs time and again in nature. Also referred to as the divine proportion, the universal nature of the golden section is described by Edward Rothstein in Emblems of Mind:

It is found throughout the natural world where growth is regular over time. The divine proportion governs the shape of snail shells, which grow organically, retaining a similar shape while increasing in size; it governs the turns of leaves on stems, the arrays of seeds in sunflowers, even the proportions of the human face. It is recurrent in organic forms. (Rothstein 1995:162)

Rothstein's assertions concerning the recurrence of the divine proportion in nature were confirmed by Doczi, who spends a
considerable portion of his previously referenced text, The Power of Limits, outlining the relationship of the proportion of the golden section to occurrences of the Fibonacci series and the divine proportion in natural phenomena.

Both Doczi and Rothstein confirm that the geometric proportion of the golden section also appears in man-made forms. Consider the following passage from Rothstein's, Emblems of Mind:

This geometric form, like the numeric ratio, has been deemed so beautiful over the centuries that it has been considered "golden." The Greeks made it the foundation for the designs of the Parthenon, which reproduces it in its internal proportions as well as in its overall shape. When the Renaissance rediscovered Greek architecture and art and the doctrines of proportion became central, ... ratio became a reference point for painters and architects ... The divine proportion has been traced in the plans of Gothic cathedrals and, even more recently, in the work of the Impressionist painter Georges Seurat, who was fascinated with its properties. The eye senses in this proportion a continuous internal recurrence. It also finds stability in its dimensions, a piquant restfulness, as the ratios can be imagined reproducing themselves within it again and again. (Rothstein 1995:162)

Echoing Rothstein, Doczi offers even further examples of man-made phenomenon displaying the divine proportion: traditional basketry, the traditional weaving of fabrics, traditional pottery designs,
the great Pyramid of Egypt, the Colosseum of Rome, the Pagoda of Yakushiji temple, and the simple proportions of traditional Japanese tea rooms.

The Greek composer Xenakis, who essentially based his theories of composition on mathematical properties, was first an architect. Commenting on his relationship with the French architect Le Corbusier, Xenakis states:

He ... opened my eyes to a new kind of architecture I had never thought of. This was a most important revelation, because quite suddenly, instead of boring myself with more calculations, I discovered points of common interest with music (which remained, in spite of all, my sole aim). One day in 1952, I asked him if I could undertake a complete project with him, and he accepted with enthusiasm. This was the Couvent de la Tourette. I worked on it for three years making all of the plans for it. The solutions to my new problems in architecture which I arrived at were influenced by musical researches I had previously made. (Xenakis 1967:5)

Xenakis later designed the Phillips Pavilion at the Universal Brussels exhibition of 1959. It was based on ideas from his 1953 composition Metastaseis. Xenakis' direct display of the relationship between geometric proportions, music and architecture calls to mind the words of Goethe, who was keenly aware of the
relationship between nature, structure, and art. In one of his most eloquent and concise statements, Goethe sums up his observations: "I call architecture frozen music" (Goethe - date unknown). I can think of no better metaphor to describe this fundamental relationship.

The determined use of golden section proportions by composers such as Bach, Stravinsky, and Bartok is well documented. It was in an analysis of Bartok's music that Lendavi provided our linear description of the golden section. These numerous examples confirm that the golden section proportion exists as a significant structural element in both the natural and the man-made world.

I've mentioned repeatedly that I cannot endorse the notion that the offbeat seven-stroke key pattern and the diatonic major scale are rhythmic and melodic parallels of each other. However, I also have repeatedly noted that both of their respective structures are founded on the same operating principle: the 3:2 relationship as it manifests itself as either rhythm or pitch. I've confirmed that the 3:2 relationship is observed as a natural phenomenon that is not exclusive to any race, culture, or geographic region. In fact, it is not an invented phenomenon but, instead, an observed and imitated one. Through time, various musical and nonmusical structures have been founded on the same basic operating principle.
of proportional relationships. Xenakis believes that a comprehensive theoretic vision would account for phenomena generated by these relationships in all musics. I thoroughly agree with Xenakis on this crucial point. A comprehensive theoretic vision, without bias, must account for proportional phenomena from the Greeks, to the West, to the East, and (most importantly for this document) to Africa.
CHAPTER 11

THE POLYRHYTHMIC STRUCTURE OF WEST AFRICAN MUSICS

Having completed my initial analysis of the proportional 3:2 relationship, I will now outline typical polyrhythmic textures found in West African musics based on the four-beat 12/8 metric scheme. I have argued that the proportional 3:2 relationship serves as the foundation of timelines in West African musics. As was the case with the key pattern, I would also argue that the 3:2 relationship (and permutations of it, such as 3:4 or 3:8) is the foundation of most typical polyrhythmic textures found in West African musics.

Large numbers of symmetrical and asymmetrical polyrhythms and cross-rhythm can be displayed using the 12/8 metric scheme as a model. Many of these phenomena, such as quintuplet division of the beat or septuplet division of the metric scheme, are not common to West African or West African-derived musics. In this document, I
will present only those samples of polyrhythmic textures that are inherent in the musics of West Africa.

As was the case when I first presented the standard 12/8 model, we must be accept that the metric accent is represented by a four-beat scheme with ternary subdivisions, and that this scheme carries with it no preassigned emphasis or hierarchy of beats.

When detailing the foundation of the key pattern, I displayed the construction of the 6:4 cross-rhythm as the first extension of the 3:2 relationship. I did so by grouping the pulses in the standard 12/8 model in duple subdivisions rather than the normal triple subdivisions. When related to the four-beat metric accent, this created a 6:4 cross-rhythm.

If we follow the construct of the 6:4 cross-rhythm but group the pulsations in a quadruple rather than a duple structure, a 3:4 cross-rhythm is created between the three quadruple groupings and the four-beat metric accent. Please refer to figure 71 for a visual reference.
If we then only attack the first pulse of each quadruple subdivision, the attack points of the 3:4 cross-rhythm are revealed. Please refer to figure 72 for a visual reference.

Following our earlier model, when the 3:4 cross-rhythm is analyzed in terms of its static and dynamic character, we find that this cross-rhythm begins, predictably, with a static moment of resolution on beat one. It continues, however, by crossing the beat scheme throughout the rest of the cycle, creating dynamic moments of conflict until the moment of resolution on the following downbeat. The three notes of this cross-rhythm can be labeled in relation to the moments of resolution or conflict they create. The 3:4 cross-rhythm represented in figure 72 has the character of static - dynamic - dynamic.

As noted in the construct of the key pattern, the starting point of the cross-rhythm can also be shifted, in effect, to alter the character that the cross-rhythm displays. In fact, the 6:4 cross-rhythm was displayed in two distinct characterizations: the onbeat
6:4 cross-rhythm and the offbeat 6:4 cross rhythm. Because the 6:4 cross-rhythm essentially divides the 12/8 metric scheme into six groups of twos, only two distinct realizations of the rhythm are possible before it repeats itself. The 3:4 cross-rhythm, however, divides the 12/8 metric scheme into three groups of four, thus creating four distinct phrasings of the rhythm before a repeat occurs in the pattern.

If we choose to attack only the second pulse of each quadruple subdivision from figure 71, we create the following phrasing of the 3:4 cross-rhythm.

![Fig. 73](image)

This phrasing of the 3:4 cross-rhythm begins with two moments of conflict and ends with a moment of resolution. It has the character of dynamic - dynamic - static. Note that the moment of resolution between the cross-rhythm and the four-beat scheme occurs on beat number four in this phrasing. I shall follow the model of my teacher, C.K. Ladzekpo, and refer to this specific representation of the 3:4 relationship as the fourth phrasing of
the 3:4 cross-rhythm. This terminology relates in principle to the onbeat/offbeat terminology used earlier in describing the 6:4 cross-rhythm.

If we choose to attack only the third pulse of each quadruple subdivision from figure 71, we create the following phrasing of the 3:4 cross-rhythm.

This phrasing of the 3:4 cross-rhythm begins and ends with moments of conflict divided by a moment of resolution. It has the character of dynamic - static - dynamic. The moment of resolution between the cross-rhythm and the four-beat scheme occurs on beat number three, and is referred to as the third phrasing of the 3:4 cross-rhythm.

Finally if we choose to attack only the fourth pulse of each quadruple subdivision from figure 71, we create the following phrasing of the 3:4 cross-rhythm:
This phrasing of the 3:4 cross-rhythm, like the first, begins with a moment of resolution followed by two moments of conflict. It has the character of static - dynamic - dynamic. The moment of resolution between the cross-rhythm and the four-beat scheme occurs on beat number two, and is referred to as the second phrasing of the 3:4 cross-rhythm.

Following this established nomenclature, we can now refer to the original representation of the 3:4 relationship as displayed in figure 18.6 as the first phrasing of the 3:4 cross-rhythm. Both the first and second phrasings of this cross-rhythm display the identical character: static - dynamic - dynamic. The second phrasing, however, maintains its own identity because of its shifted starting point.

With the four possible phrasings of the 3:4 cross-rhythm now represented and confirmed, it is appropriate to consider
additional terminology which is often applied to continuous occurrences of both the 6:4 and 3:4 cross-rhythms in West African musics. In complex 12/8 polyrhythmic structures, the continuous reoccurrence of a 6:4 or 3:4 cross-rhythm often significantly disrupts attention away from the four-beat scheme of the metric accent. Because the temporal disruption is, at times, so consistent and so significant, these cross-rhythms are referred to as generating "secondary beat schemes." When this terminology is adopted, the four-beat scheme of the metric accent is then referred to as the "primary beat scheme" (sometimes the "main beat scheme").

As earlier codified, pulses in divisive rhythmic structures are generated as the subdivisions of symmetrical beats. In other words, in divisive structures, given that a pulse is generated by a beat, and that beat, by definition, cannot be divided into only one (or a fraction of one) pulsation, a beat must consist of two or more pulsations to be a beat. If we think of the beat in the most general terms, as the basic temporal marker of music (what one would most naturally tap their foot to, or dance to), we realize that a limited number of symmetrical divisions in a given metric structure can actually function as true secondary beat schemes.

Using our 12/8 metric structure as a model consisting of twelve pulsations, and given that we must have at least two pulses per
symmetrical beat, we can easily determine that only two possible
and practical secondary beat schemes can exist. These would be the
three-beat scheme (3x4), and the six-beat scheme (6x2). As
previously noted, there are two possible manifestations of the
six-beat scheme and four possible manifestations of the three-beat
scheme commonly recognized in West African musics. These could
referred to as alternate phrasings of the secondary beat schemes.

Of course, just as shifted phrasings of the 6:4 and 3:4 cross-
rhythms were created, so could one shift the attack point of the
four-beat metric accent to one of its two offbeat pulsations,
thus, creating three phrasings of the four-beat scheme. This is,
in fact, very often the case in many West African musics.
Remember, however, that by previous definition, these offbeat
phrasings of the four-beat scheme are classic examples of
syncopation and cannot truly be considered secondary beat schemes.
By our working definition, secondary beat schemes can only be
generated by the continuous recurrence of a cross-rhythm that
significantly disrupts attention away from the four-beat scheme of
the metric accent. Of course syncopation, by previous definition,
is not cross-rhythm.

For the same reason, the division of the measure into a two-beat
scheme (2x6) does not generate a true secondary beat scheme.
Certainly, by our previous models, this scheme would generate six
distinct manifestations when shifted to begin at attack points
other than the downbeat of the measure. It cannot, however, be thought of as a secondary beat scheme, because the 2:1 ratio that generates the two-beat scheme does not create a cross-rhythmic relationship to the four-beat metric accent of the 12/8 structure.

We now have made a distinction between those divisions of the 12/8 metric scheme which can and those which cannot be considered secondary beat schemes. We have dissected the 12-pulse metric model into two, three, four, and six equal divisions. Of these divisions, the three-division and the six-divisions, existing in a cross-rhythmic relationship to the metric accents (the four-division), can be thought of as secondary beat schemes.

Let us now explore another common cross-rhythmic texture found in West African musics, this one based on an extension of the 4:3 relationship. If we take our 12/8 metric model and double the number of subdivisions per beat from three to six, the following rhythmic texture is created:
We have, then, created a four-beat 12/8 structure with 24 equal subdivisions represented. If we group these 24 subdivisions into eight groups of three, the following structure is formed:

If we choose to attack only the first pulsation of each of the eight groupings, the following structure is revealed:

As the notation of figure 78 is getting cluttered with rests and getting more difficult to read, I will use the value of the dotted eighth-note to represent the eight attack points in this structure. Please refer to figure 79 for a visual reference.
Of course, the dotted eighth-notes in the previous figure imply a specific length, or duration. This notation is a compromise based on intelligibility rather than on the actual aural phenomenon. In essence, the dotted eighth-notes in figure 79 signify attack points only and are not meant to carry any implication of duration.

Throughout this document, the four-beat metric accent has been notated using a dotted quarter-note. Like the dotted eighth-notes in figure 79, these dotted quarter-notes have been a notational compromise based on intelligibility and not aural phenomenon. They are meant to signify attack points only. Actually, in all of the musical examples presented in this document, the various note values are meant to represent attack points only. They should not be thought of as carrying any true durational value. With this understood and accepted, it allows for the notation of transcriptions that are much easier to comprehend.
Let us return to figure 79. We have created, in this example, the eight-division. The ratio 8:4 is an extension of the basic 2:1 ratio. It cannot be thought of as existing in a cross-rhythmic relationship with the metric accent. The eight-division also cannot be considered a secondary beat scheme, which would imply that a listener or performer could consider it the primary temporal referent of the composition. No one with a firm understanding of the concepts of beat and pulse would refer to the eight-division in a 12/8 metric scheme as the beat.

The eight-division, in function, is a duple subdivision of the primary four-beat scheme. In this sense, the duple subdivision creates a 2:3 cross-rhythmic relationship with the original (and always present) ternary subdivisions. Please refer to figure 80 for a visual reference.

In terms of its character, this interaction between the duple and triple subdivision of the four-beat scheme produces four very fast 2:3 cross-rhythms consecutively, all with the internal micro-
character of static – dynamic, or resolution – conflict. As stated by C.K. Ladzekpo in reference to the eight-division, “the fast progression of tension and relief creates an incredible effect of vitality very much favored by the Anlo-Ewe” (Ladzekpo 1995).

Further subdivisions of the 12/8 metric scheme are produced by the 12-division, the 16-division, and the 24-division. These three divisions are represented notationally in figure 81.
The 12-division is nothing more than the full representation of the 12/8 metric structure realized as a four-beat scheme with ternary subdivisions. This division has the characteristic of absolute static behavior. The 24-division, which is the 12-division doubled, subdivides each beat into six pulsations. This division displays consistent static behavior, reinforcing both the four-beat scheme and the ternary subdivisions it generates.

The 16-division, however, is a highly dynamic subdivision. Functioning as the eight-division, but doubled, this division generates an extremely rapid 4:3 cross-rhythm on every beat of the metric structure. This gives every beat the micro-character of static - dynamic - dynamic - dynamic, or resolution - conflict - conflict - conflict. As the eight-division created "an incredible effect of vitality," the 16-division does so doubly. When the 16-division is then juxtaposed with the 24-division, a 4:6 cross-rhythm is generated on every beat of the scheme, creating the micro-character of static - dynamic - dynamic - static - dynamic dynamic, or resolution - conflict - conflict - resolution - conflict - conflict. As further manifestations of these symmetrical divisions begin to be juxtaposed, the true polyrhythmic texture of the 12/8 African rhythmic structure is revealed.

When considering these symmetrical and multilayered structures, I cannot help but reflect on the words of Rothstein, as quoted earlier from *Emblems of Mind*, in reference to the beauty the
ancient Greeks saw in the properties of the divine proportion.
"The eye senses in this (divine) proportion a continuous internal recurrence. It also finds stability in its dimensions, a piquant restfulness, as the ratios can be imagined reproducing themselves within it again and again" (Rothstein 1995: 162). Rothstein's words are equally appropriate describing African rhythmic structures as when describing the Greek Parthenon. In both cases, proportional symmetry is not only represented by the construct, it is integral to it.

We've now shown that in African rhythmic structures the 12/8 metric scheme is normally divided into symmetrical and equal groupings. These groupings are commonly represented as the 2-division, 3-division, 4-division, 6-division, 8-division, 12-division, 16-division, and 24-division. When considering the rhythmic motion of these divisions, clearly the 2- and 3-divisions represent rhythmic motion that is slower than that of the metric accent; the 4-division represents rhythmic motion that is equal to that of the metric accent; and the 6-, 8-, 12-, 16-, and 24-divisions represent rhythmic motion that is faster than the metric accent. The 3-division and the 6-division may also function as secondary beat schemes in relation to the primary beat scheme of the four-beat metric accent.

Sometimes in African rhythmic structures extended cross-rhythms require two or more measures to reveal themselves. One of the most
common cross-rhythms used in this manner is based on the 3:8 relationship. If we consider our model to be not one but two measures of a 12/8 metric scheme, and we then group the pulsations into three groups of eight, a 3:8 cross-rhythm is created between the three groupings of eight pulses and the four-beat metric accent. Please refer to figure 82 for a visual reference.

If we only attack the first pulse of each grouping, the attack points of the 3:8 cross-rhythm are revealed. Please refer to figure 83.
We noted earlier that both cross-rhythms often exist in phrasings which offset the beginning of the cross-rhythm from the downbeat of the metric accent. Where the 6:4 cross-rhythm produced two phrasings, and the 3:4 cross-rhythm produced four phrasings, the 3:8 cross-rhythm generates eight phrasings of the rhythm before repeating itself.

Often, the 3:8 cross-rhythm defines the starting points of sequenced rhythmic motives. This phenomenon was observed and transcribed by Locke in his article of 1982.

Dance drumming uses simple phrases within a carefully designed polyrhythmic ... matrix to create musical structures full of rhythmic potency. The pattern is built from a ... motive which is played thrice over the span of two bell cycles before the entire configuration is repeated. (Locke 1982: 231)

Locke then provides a visual example, represented below as figure 84.

![Fig. 84](image)
In figure 84, the starting points of the 8-pulse rhythmic motive (represented as occurring three times) outlines the attack points for the 3:8 cross-rhythm as defined in figure 83. This is then an excellent example of the 3:8 cross-rhythm defining the starting points of sequenced rhythmic motives. Predictably, this relationship becomes more complex when initiated from one of the alternate phrasings of the cross-rhythm.

In addition to the 3:8 example above, Locke, in his 1982 article, presents an excellent general outline of the common divisions of the 12/8 metric scheme in Ewe rhythmic structures. In an example represented on the following page as figure 85, he displays how the 12/8 model can be divided into 2, 3, 4, 6, 8, 12, 16, and 24 parts.
The mastery and absolute understanding of the various cross-rhythms and divisions in this analysis can only be attained when one can relate all of the rhythms, not only to the four-beat 12/8 metric accent, but also to the four-beat 12/8 metric accent juxtaposed with the various manifestations of the key pattern. In other words, only when one can successfully juxtapose three elements—the metric-accent, the timeline, and the cross-rhythm or division—can one begin to appreciate African rhythmic structures.

Often in the study of West African musics, students are so interested in learning the specific drum parts of a given style, or copying the sequence played by the master drummer, that they deny themselves the true understanding of what they are playing. More crucially, they deny themselves the true understanding of how their individual part fits into the polyrhythmic framework of the whole structure. I feel strongly that the most intelligent and
efficient means to learning specific patterns and parts in any music is to first master the framework from which the patterns and parts were generated. It would be a rare occasion, for instance, if one could fully comprehend the harmonic motion in a Beethoven Piano Sonata without first having some knowledge of scale construction.

To this end, my teacher, C.K. Ladzekpo, presented me with an extremely challenging and exciting exercise. I tap the four-beat metric accent with the feet while both clapping a key pattern (choose one) with the hands and reciting all of the possible divisions of the 12/8 scheme (from two to twenty-four) with the mouth. Another variant of this wonderful exercise is to tap the feet to the four-beat metric accent and, while tapping the strong hand to a key pattern, tap out all of the possible divisions of the 12/8 scheme with the weak hand. A further extension of this variant would be to verbally recite the accompanying drum parts of a given musical repertoire while maintaining all of the other elements of the exercise, as described above, intact.

The only possible way to efficiently accomplish, and consistently re-create, these exercises with any sense of accuracy is to integrate all of the various elements of the given exercise into one unified framework, or composite rhythm. Speaking specifically to the topic of composite rhythm, C.K. Ladzekpo details the significance of the concept as follows:
As a child growing up and struggling to make sense of cross-rhythmic textures and make them part of my usable rhythmic vocabulary, verbalizing the composite structures by giving each character a syllabic pitch and singing them like a melody in their proper rhythm was very helpful in my discovering and absorbing the distinct texture. Many Anlo-Ewe kids do this and often turn it into a communal game of playing drum verbally. Each kid would sing a specific cross-rhythmic texture that interlocks with one another into a dynamic fabric. They would entertain themselves spiritedly with the structure while enriching their understanding and ability to carry their own weight in the complex fabric. (Ladzekpo 1995)

As an example of the above technique, Ladzekpo offers the following application:

A syllabic pitch "Kpla" is designated for a moment of resolution or when two component beats coincide. The pitch 'Tu' represents main beats, in alternate motion with secondary beats, articulated with the syllabic pitch "Ka". (Ladzekpo 1995)

An application of the syllabic pitch designations above to the basic 6:4 cross-rhythmic model as it exists in the 12/8 metric scheme is represented in figure 86.
In figure 86, line C represents the four-beat metric accent of the 12/8 scheme; line B represents the 6:4 cross-rhythm; and line A represents the composite rhythm of the two.

C.K. Ladzekpo's functional mnemonic, Kpla - Ka Tu Ka - ('Kpla' is pronounced as 'Pla'), serves to integrate all of the various elements of the cross-rhythm into one unified framework, or composite rhythm. I stress here that these syllabic pitch designations, or mnemonics, function not only as an aid for memorization but also to reveal structural and functional frameworks. It is interesting how the mnemonics reinforce the character of the cross-rhythm. The syllabic pitch, Kpla, defines the static moment of the cross-rhythm, while the pitches, Tu and Ka, define the dynamic moments.
This same mnemonic is also a very useful tool when verbalizing the different manifestations of the key pattern. Figure 87 displays the concept of composite rhythm mnemonics as applied to the five-stroke key pattern, the offbeat seven-stroke key pattern, and the onbeat seven-stroke key pattern.

Fig. 87

5-Stroke

offbeat 7-Stroke

onbeat 7-Stroke
Note how the mnemonics reinforce the character of each timeline. Another excellent application of composite rhythm mnemonics can observed in figure 88, where they are used as a verbalization of the four phrasings of the 3:4 cross-rhythm.

Fig. 88

First Phrasing—3:4

Second Phrasing—3:4

Third Phrasing—3:4

Fourth Phrasing—3:4
As in the previous examples, the mnemonics reinforce the static and dynamic moments of each specific phrasing, outlining the character of their four individual identities.

My final example of the application of composite rhythm mnemonics to cross-rhythmic textures is represented in figure 89, where mnemonics are applied at the micro level to the 8-division as it functions in a cross-rhythmic relationship with the ternary subdivisions of the four-beat scheme.

![Figure 89](image)

Predictably, the character of the texture represented in figure 89 is, again, revealed through the use of mnemonics.

When, through the use of these verbalizations, one has successfully integrated all of the various cross-rhythms, divisions, and timelines accurately with the four-beat metric scheme, it becomes possible to move to the next level of
integration. As stated earlier, the understanding and mastery of the various cross-rhythms and divisions can only be attained when one can successfully juxtapose three elements: the metric-accent, the timeline, and the cross-rhythm or division.

As a representation of this phenomenon, I will use the basic example of the four-beat metric accent integrated with the first-phrasing of the 3:4 cross-rhythm and the offbeat seven-stroke key pattern. In the following example, line D represents the four-beat metric accent; line C represents the 3:4 cross-rhythm; line B represents the offbeat seven-stroke key pattern; and line A represents the composite rhythm of all three parts. Please refer to figure 90 as a visual reference.
Certainly the composite rhythm, as it is displayed on line A, accurately represents the combined rhythmic activity of the three individual parts. As a percussionist, however, I have found it more useful to represent the composite rhythm's vertical relationships using a multiline notation system. This reveals not only the complete composite, but all of the individual activity and all of the two-part combinations that occur. Please refer to figure 91 for a multiline transcription of the composite rhythm previously notated as a single-line rhythm in figure 90.

![Fig. 91](image)

The multiline system allows one to represent all three parts as they function in both vertical and linear dimensions. As suggested earlier, one of many possible ways to practice this composite rhythm would be to tap one's feet to the four-beat metric accent while tapping out the key pattern with the strong hand and tapping out the cross-rhythm with the weak hand.

As a more complex example of the juxtaposition of the metric-accent, the timeline, and the cross-rhythm or division, I will now use the example of the four-beat metric accent integrated with the 8-division and the five-stroke key pattern. In the following
example, line D represents the four-beat metric accent; line C represents the 8-division; line B represents the five-stroke key pattern; and line A represents the composite rhythm of all three parts in a multiline notation. Please refer to figure 92 as a visual reference.

![Figure 92](image_url)

Obviously, figure 92 represents a much more challenging composite rhythm that our previous example.

Earlier I suggested that a further extension of this variant would be to verbally recite the accompanying drum parts of a given musical repertoire while maintaining all of the other elements of the exercise in tact. One of the most common accompaniment parts in the Anlo-Ewe 12/8 repertoire is the part often played by the kaganu drum (the smallest and highest pitched drum of the Ewe drum
family). Using the mouth as a surrogate for the drum, the mnemonics Ka - Ga are normally used to represent the two offbeat attack points of the kaganu part. The mnemonic Nu is implied directly on the beat, as one stops the resonance of the previous syllable (Ga). This is represented in figure 93 below.

![Figure 93](image)

This pattern serves to emphasize all of the offbeat subdivisions of every beat of the four-beat scheme.

If we now integrate this drum part into our structure, as displayed in figure 94, the following texture is created. (In the following example, line E represents the four-beat metric accent (feet); line D represents the 8-division (weak hand); line C represents the five-stroke key pattern (strong hand); line B represents the kaganu rhythm (mouth); and line A represents the composite rhythm of all four parts in a multi-line notation.)
The composite rhythm displayed in line A is an extremely useful tool for the study and mastery of these stimulating rhythmic textures.

Appendix A of this document will include transcriptions in the 12/8 metric scheme of the 12-pulse five-stroke key pattern, the 12-pulse offbeat seven-stroke key pattern, and the 12-pulse onbeat seven-stroke key pattern integrated with both the four-beat metric accent and all of the phrasings of the 3-division, 4-division, 6-division, 8-division, and 12-division. Each example will include a multiline composite notation of all three elements combined. This
should serve as a useful tool for future study and analysis of the African rhythmic structure discussed here.

At this time, rather than further developing and analyzing African rhythmic structures, I will relate the previously analyzed elements, especially the phenomenon of cross-rhythm, to fundamental concepts of life. This was explained to me by C.K. Ladzekpo.

The most meaningful relationship between life and cross-rhythm is formed by using the analogy of the four primary beats of the 12/8 metric scheme as a metaphor for one’s purpose (or, goal) in life, and then using a given cross-rhythm as a metaphor for a conflict that one will encounter and be forced to reckon with. It should be stressed that to properly come to terms with the encountered conflict, one must be very confident and secure with their purpose in life.

For instance, if one addresses too much attention to the conflict, s/he will lose touch with their important purpose or goals in life. To work through this potentially stressful situation, one must integrate conflict and purpose into a resolved state of coexistence. Musically, if one is to begin to come to terms with a complex cross-rhythm, one must be certain of the foundation of the primary beats. One can only master the cross-rhythm when
integrating it into the structure of the primary beats and creating a composite rhythm.

So often in our lives, when faced with a conflict, we direct all of our attention to the conflict and lose track of our purpose and identity. Musically, the same axiom holds true: If we focus all of our energy on the conflicting rhythm and lose track of the beat, we have lost all of our grounding and reference. In his own words, C.K. Ladzekpo discusses this phenomenon:

As a preventative prescription for extreme uneasiness of mind or self-doubt about one's ability to cope with impending or anticipated problems, these stimulated stress phenomena or cross-rhythmic figures are embodied in the art of dance-drumming as mind nurturing exercises to modify the expression of the inherent potential of the human thought in meeting the challenges of life. The premise is that by rightly instituting the mind in coping with these simulated emotional stress phenomena, intrepidity is achieved.

Intrepidness, or resolute fearlessness, in Anlo-Ewe view, is an extraordinary strength of mind. It raises the mind above the troubles, disorders, and emotions which the anticipation or sight of great perils is calculated to excite. It is by this strength that ordinary people become heroes, by maintaining themselves in a tranquil state of mind and preserving the free use of their reason under most surprising and terrible circumstances. (Ladzekpo 1995)
I often remember stories related to me by C.K. Ladzekpo, of how his grandfather would be so upset with him in his youth when he would lose the rhythm—not for musical reasons, but because he thought C.K. was not preparing himself properly for his life and his future. Music, in this sense, had no separation from life.

Again C.K. Ladzekpo reflects on this topic:

In another Anlo-Ewe definition, rhythm is an important instructional medium in the development and reinforcement of the basic Anlo-Ewe mental and moral consciousness in terms of what is real and important in life, and how life ought to be lived. In this view, rhythm is the animating and shaping force or principle that underlies the distinctive quality of being. Its medium provides the training and the logical means of subjecting contrasting forces or moments in human existence to human control. In this world, a good rhythmic sensitivity is very essential and is the most desired musical skill. (Ladzekpo 1995)

Commenting on the methodology used by the Anlo-Ewe to attain the necessary functional musical skills to advance, C.K. offers the following perspectives on the technique of combining rhythms into composites:

In the cultural understanding, the technique of composite rhythm embodies the lessons of establishing contact between two dissimilar states of being, or in particular, the right way to look at despair. Let me paraphrase an old Anlo-Ewe song to further illustrate the real-life lessons inherent in the technique of composite rhythm. The song says, despair is
not only useful, it is vital. Those in despair recognize the facts of their existence, rather like a drowning swimmer admitting the water is there. If you block off the despair, you block off the joy. More simply, an avoidance of contrasting obstacles is avoidance of the real challenges of life. It will only stifle progress. (Ladzekpo 1995)

As a final thought on the profound topic of the connection between the function of rhythm in music and life, I recall the occasion when I questioned C.K. Ladzekpo on the use of terminology in his native language to describe the concept of cross-rhythm in music. He replied that there was no word, per se, but rather that it was thought of as a concept of life. When I asked for more detail, he explained that when one encounters a conflict or obstacle in their path, that one must always 'step across it and not with it.' I have always considered that statement to be the poetry of cross-rhythm.
As my general outline of African polyrhythmic textures draws to a close, I would like to present one final area of consideration in terms of cross-rhythm and the key pattern. That is the effect and application of these structures in African derived musics of the New World. I have asserted for many years that the clave patterns of Cuba are not merely related to the African key pattern; they are, in fact, manifestations of it. It has been widely documented that the Son Clave and the Rumba Clave patterns made their way to Cuba through the enslavement of the Yoruba culture of Nigeria. According to noted the Afro-Cuban pianist and author Rebecca Muleon, among the patterns traditionally played on percussion instruments which accompany the bata drums in Nigeria, there exists an exact version of Son Clave in 12/8 time. Additionally, the highly complex Abakua music (from Calabar tradition) contains a pattern that is identical to Rumba Clave in 12/8 time (Muleon 1993: 50-51). The Son Clave in 12/8 time is, in fact, the
identical pattern identified by King as the "standard pattern in Yoruba music" in his famous article of 1960. Undoubtedly, both Clave patterns can be found within the seven-stroke key patterns described at length earlier.

Through extensive research and performance study, the noted Afro-Cuban scholar, John Santos, has confirmed that these patterns mutated from their original format in 12/8 time (ternary division) to their most popular present day forms in 4/4 time (binary division) during the late nineteenth century. They were popularized in the 1920s through the Afro-Cuban music known as Son. As stated by Santos: "This Son clave rhythm began its widespread influence during the 1920s, when the Son style (which originates from the Oriente province of Cuba) became the rage of the capital, Havana. Even during the nineteenth century, Cuban composers were arranging music based on the clave feel within the styles known as Contradanza, Habanera, and Danzon" (Santos 1986:32).

As these timelines became integrated into the popular dance musics of the day, they were transformed from their ternary-based structure into the binary structures common to the popular styles. For a transcription of the Son and Rumba clave patterns in both their ternary (12/8) and binary (4/4) manifestations, please refer to figure 95 on the following page.
Here is an excellent exercise to familiarize oneself with the different, yet similar, feels of the 12/8 and 4/4 manifestations of these patterns. First, establish a solid 12/8 metric framework by tapping the four-beat metric accent with the feet, and clapping the offbeat seven-stroke key pattern with the hands. Second, after firmly establishing the full key pattern, omit the stroke on pulse number six or five (for Son or Rumba) and the stroke on pulse number twelve. You will have transformed the seven-stroke key pattern into either the Son clave (the original five-stroke key pattern) or the Rumba clave in ternary division. Finally, after firmly establishing the Son or Rumba clave pattern in ternary division, gradually mutate the pattern into the feel of the binary (16-pulse) division. Of course, after the transition process is complete, an excellent and rewarding extension of the exercise is to gradually mutate the pattern back into its original ternary format.

In reference to terminology and identification, the Son clave pattern in ternary subdivision is identical to the five-stroke key pattern (i.e., King’s original standard pattern). Further the Rumba clave pattern, like the Son, also consists of five attack points. In fact, both of these patterns can be thought of as five-stroke key patterns. When the need arises to specifically delineate one five-stroke pattern from the other, it is useful, as with the seven-stroke pattern, to further apply the labels, offbeat and onbeat, to distinguish their descriptions. We will
refer to the Son clave pattern as the onbeat five-stroke key pattern and the Rumba clave as the offbeat five-stroke key pattern.

Both the Son and the Rumba clave pattern have the same static - dynamic - dynamic - static character in reference to the metric accent, meaning both patterns are in resolution on beats one and four and in conflict on beats two and three. It follows, then, that one cannot apply the designations onbeat or offbeat strictly based on the patterns' static/dynamic character in reference to the four-beat scheme. If instead, we analyze the character of each pattern in reference to the 6:4 cross-rhythm that generates it, a unique static/dynamic identity is revealed. Please refer to figure 96 for a visual reference.
In figure 96, in reference to the 6:4 cross-rhythm, the Son clave pattern takes on the character static - static - static - dynamic - dynamic. The Rumba clave pattern takes on the character static - static - dynamic - dynamic - dynamic. This analysis justifies the rationale behind designating the Son clave pattern as the onbeat five-stroke key pattern and the Rumba clave as the offbeat five-stroke key pattern.

As a point of reference, I will now display the character of the previously delineated offbeat seven-stroke key pattern and onbeat seven-stroke key pattern in reference to the 6:4 cross-rhythm that generates them.
In figure 97, in reference to the 6:4 cross-rhythm, the offbeat seven-stroke key pattern takes on the character static - static - static - dynamic - dynamic - dynamic. The onbeat seven-stroke key pattern takes on the character static - static - static - static - dynamic - dynamic - dynamic. Our analysis confirms the previous offbeat/onbeat designations of these patterns. Perhaps then, this is another example of the eternally pleasing inherent symmetry which can be observed in African (and African derived) rhythmic structures.

Of course, a further analysis of the clave concept in Afro-Cuban musics would yield more parallel structures and developments, the analysis of which is far beyond the scope of this present document. John Santos presents a concise overview of the clave principle in his previously referenced 1986 article, "Clave: Cornerstone of Cuban Music." Santos details the transition of clave from triple to duple time. He also explains other important aspects of the modern clave structure, such as determining the 3-2 or 2-3 nature of the clave sequence, and the art of playing "in Clave" with others. In summary, Santos presents a concise, informative, and, above all, accurate portrayal of the function and significance of clave as the true key to properly understanding Afro-Cuban musics.
Other applications of the clave concept and the key pattern can be found in practically every musical situation where Africa has had an influence. Throughout the Caribbean and the Americas, clave is the foundation and the driving force behind many rhythmic structures in both traditional and popular musics. One only needs to tap out the popular Bo Diddley Beat found in American Rock and Roll music to realize how far the timeline concept has gone, and how influential it continues to be.
CHAPTER 14
CONCLUSION

I have presented in this document a clear outline of the structures and foundation of timelines and rhythmic structures in West African musics. I have analyzed the common terminology used to describe West African musics, and I have provided models for the distinguishing descriptions of these terms. I have built my analysis on the recognition of regularly occurring beats subdivided by evenly spaced pulses, and I have stressed the profound significance of the 3:2 relationship as it functions as the foundation of cross-rhythmic permutations. I have learned from, and been inspired by, the work of earlier scholars in the field, though I have often disagreed with their conclusions.

I have approached my topic not as a scholar, but from a performer's point of view, stemming from my intense desire to learn to play the music accurately. I have been trained entirely in the United States by an African teacher who convinced me that
my experience as a “musical hybrid” had provided me with a unique set of tools for presenting my theories. Above all, I have stressed the importance of understanding the entire rhythmic system as the integration of all of its components, rather than forsaking one element to conquer another.

In my introduction, I stated that I would not be the musician or person I am today if I had chosen not to make the commitment to study West African musics. As I am now at the conclusion of this document, I find myself reflecting on numerous changes in my life that this study has provoked. Perhaps the most meaningful changes have occurred mentally and spiritually, as I have attempted to view the skills required for good music-making as metaphors for the skills required in life. I have discovered that I must rely on an integrated composite which combines stability and conflict within the same structure to balance the existence of these contrasting, yet related and ever present, elements. Finally, when in doubt, either musically or personally, I follow the greatest lesson of my teacher and find stability in my primary beat as I go forward and step across the inevitable obstacles in my path.
BIBLIOGRAPHY


APPENDIX A
COMPOSITE RHYTHMS

In the following examples, line D represents the four-beat metric accent; line C represents the cross-rhythm or division; line B represents key pattern; and line A represents the composite rhythm of all three parts.

Transcriptions of the five-stroke key pattern integrated with the four-beat metric accent and all of the phrasings of the 3-division, 4-division, 6-division, 8-division, and 12-division appear on pages 251-254; transcriptions of the the offbeat seven-stroke key pattern integrated with the four-beat metric accent and all of the phrasings of the 3-division, 4-division, 6-division, 8-division, and 12-division appear on pages 255-258; and transcriptions of the the onbeat seven-stroke key pattern integrated with the four-beat metric accent and all of the phrasings of the 3-division, 4-division, 6-division, 8-division, and 12-division appear on pages 259-262.
Third Phrasing--4 Division

onbeat 6:4

offbeat 6:4

253
Fourth Phrasing--3:4

First Phrasing--4 Division

Second Phrasing--4 Division

260
Third Phrasing--4 Division

onbeat 6:4

offbeat 6:4

261
Additive rhythm: Rhythm which is realized as the addition of groupings of twos and threes and their sums. It is, by nature, asymmetrical. It is not based on an equal and regular beat scheme with equal and regular subdivisions.

Beat: The basic temporal referent of a composition, usually divided into smaller pulsations, often referred to as subdivisions. The history of the term is related to the marking of time in music by movements of the hand.

Cross-rhythm: A specific term reserved to define examples of polyrhythm consisting of rhythmic/metric contradiction which is regular and systematic and which occurs in the longer span - that is, systematic rhythmic/metric contradiction that significantly disrupts the prevailing meter or accent pattern of the music.
**Downbeat:** The first beat of every measure of a musical composition, usually marked by the downward motion of the conductor's hand. It is also sometimes used to signify only the first beat of a composition.

**Divisive rhythm:** Rhythm which is realized as products of twos and threes and their multiples. It is, by nature, symmetrical. It is based on an equal and regular beat scheme with equal and regular subdivisions.

**Hemiola:** A linear rhythmic phenomenon in ternary structures where two groups of three are alternatingly regrouped into three groups of two. In essence, hemiola represents a linear realization of the ratio 3:2, formed by the regrouping of note values. Two classic examples are the regrouping of two bars of 3/4 meter into three bars of 2/4 meter and a sequential succession of bars alternating between a 6/8 and 3/4 metric accent.

**Offbeat:** Any attack point, or subdivision, that does not coincide with a beat.

**Onbeat:** Any attack point that does coincide with a beat.

**Pickup:** One or more notes preceding the first strong beat of a phrase or section of a musical composition.
Polyrhythm: A general and nonspecific term for the simultaneous occurrence of two or more conflicting rhythms, of which cross-rhythm is a specific and definable subset.

Pulse(s): The smaller, equal subdivisions between the beats.

Sesquialtera: A vertical rhythmic phenomenon in binary structures where two even note values are substituted by a three-note triplet figure, thus making the triplet a borrowed division. In essence, sesquialtera represents those specific examples of the vertical realization of the 3:2 relationship that are formed by the substitution of borrowed divisions. The classic example of this phenomenon occurs in 2/4 time when two quarter-notes become a quarter-note triplet.

Syncopation: The regular and even shift of rhythmic accent from the strong beats of the metric accent to the weak. Thus, syncopation will take the form of continuous and even offbeat accent in relation to the metric accent. The metric accent, although challenged by the syncopation, is never disturbed to the level of what could be identified as a “significant disruption of the prevailing meter,” as is the case with cross-rhythm.

Upbeat: The last beat of every measure of a musical composition, usually marked by the upward motion of the conductors hand. Sometimes used synonymously with the term pickup.
APPENDIX C

THE TRANSCRIPTION OF AFRICAN MUSICS

This appendix examines the validity of the use of the Western notational system for the transcription of African musics. Many opinions exist on both sides of this issue. Those opposed to the system state that Western notation carries with it a set of doctrines that are too limited for the description of African rhythmic concepts. Those in support of the system assert that the notation, although not perfect, does allow for the accurate transcription of African musics. Perhaps the two most famous and referenced arguments against the use of Western notational systems have been presented by James Koetting and Simha Arom, while the most important and convincing argument in favor of its use has been presented by the African scholar and author, Kofi Agawu.
In his landmark article of 1970, James Koetting spends a great deal of time discussing the validity of notational systems. He concludes that the standard Western notational is not adequate for the notation of African drum ensemble musics. Koetting states:

Most scholars who have tried using the Western system to notate African rhythms have keenly felt its disadvantage, and many have pointed out why. The problem is that the notation, developed in the context of Western music tradition, shares particular highly analytical and precise structures common across most pieces in the tradition and will tend to transmit these structures to the drum ensemble music. But though many scholars are fully aware that Western notation cannot adequately represent much non-Western music, they continue to use it because it is readily at hand and understandable to their usual readers. Then they must add to their writing many words—often many thousand—explaining the myriad differences between what the notation says and what they know to be true in the music. (Koetting 1970:125)

As an improved notational system, Koetting promotes the Time Unit Box System (TUBS), developed by Philip Harland at UCLA in 1962. This system presents a sequence of linear boxes that represent the fastest pulse, or basic time unit, with special techniques used to notate faster subdivisions. Koetting continues his presentation with the following argument:

TUBS avoids the time signature and bar lines of Western notation, which mislay rhythmic emphasis onto gross beats and which translate the drum ensemble patterns into particular
metrical measures with an inherent stress structure (even without these the manner in which western notation groups notes together with joining flags and writes notes and rests of varying duration implies a stress structure, or at least an ordering of rhythmic sequence according to some organizational principle however ambiguous). The fastest pulse should not be confused with meter—there is no inherent hierarchy of stress or accent in the sequence of fastest pulses, and in the notation no one box is more significant than another. (Koetting 1970:127)

Koetting admits that this system is no more metrically precise than traditional notation, but he consistently promotes it as a more desirable system.

While Koetting continuously restates that the TUBS notation does not outline the measure, like Western notation does, all of his transcriptions in the TUBS notation are 12, 16, or 24 boxes long, corresponding directly with 12/8 meter, 4/4 meter, and 12/8 meter in a two-bar sequence. Koetting is correct, however, that the TUBS does not outline the metric accent of a beat structure, and he feels that this better represents African musics. This document will later prove, however, that this is a distinct flaw in Koetting’s rationale. It will be shown that many African musics do, in fact, have beat structures, and that it is the understanding and representation of these structures that is
crucial to the proper understanding of African rhythmic systems. Not to depict these beats in a notational context would be to inaccurately represent the foundation of many African musics.

Koetting initially asserts that the use of the Western notational system has forced many scholars to include additional texts of explanation describing special circumstances and variance in performance practice, and he is extremely critical of this phenomenon as it relates to African musics. In using the TUBS system, however, Koetting continually is forced to explain the ever changing and inconsistent symbols that denote various activity, both within the boxes and from one part to another. For example, while "S" denotes an open stroke on the atsemiwu, "o" denotes an open stroke on intermediate supporting instruments. While "L" denotes low and "H" denotes high on some instruments, in the rattle parts, "D" denotes a downstroke or low tone. Further ambiguity is introduced into the system with the use of the symbol "e" as a noncommittal means of identifying sounds without characterizing their sonority. Often this noncommittal symbol is used as a substitution for other symbols, like "D" or "o," in cases where Koetting feels the desired sonority is already understood. More examples of inconsistency are easily observed, many centered around the problem that, at times, Koetting chooses a label based on the stroke type, at other times, he chooses a label based on the resultant sound, and at still other times, he chooses to use a noncommittal label.
Even more troubling is Koetting's use of letters in the TUBS boxes as symbols for words in the English language that describe sounds or strokes. For instance, by virtue of his use of "H" for high and "L" for low to designate pitch ranges, Koetting has assumed that all users of this system will either understand the English language or will adapt to it. Or perhaps it is the intent of this system for the symbolic letters of the alphabet to change and adapt to whatever language the user is comfortable with. For instance, if used by native speakers of the Italian language, would "H" become "A" (for Alto) and would "L" become "B" (for Basso)? Unfortunately, these questions are never addressed by Koetting. Many more critical aspects of the TUBS system are equally as troubling, especially the ability, or lack of ability, to accurately represent all possible levels of subdivision.

Many who still maintain their support for TUBS notation do so based on the belief that it is an easier system for beginners, or non-trained musicians, to grasp, and not because they feel it represents the music more accurately. This was certainly not Koetting's expectation. He originally asserted that scholars often use Western notation simply because "it is readily at hand and understandable to their usual readers" (Koetting 1970:125). Even more ironic is the fact that many of the teachers, in fact all that I have personally witnessed using TUBS notation with their students, were doing so to represent musics with the regular metric structures of 12/8 and 4/4. These teachers were all
describing the musics as having four main beats with subdivisions and were, in most cases, marking the main beats as a part of their TUBS notation. Again, this is completely contrary to Koetting's original defense of the TUBS notation as a system which does not display the main beats and is best used in musics with no true metric stress structure. Clearly, based on defendable rationale, I cannot approve of or support the use of this extremely problematic TUBS notation as a valid tool for either scholarship or performance.

With a basic understanding of Koetting's view of traditional notation noted, and an overview of the TUBS system and its flaws recognized, I will now turn once again to the work of Simha Arom. Almost the entire third chapter of Arom's text, African Polyphony and Polyrhythm, deals with the concept of describing rhythm. In short, Arom strongly believes that Western notations are not suitable for the transcription of African musics. Arom states his views as follows:

The use of a method of writing suited only to cultured Western music ... can only result in distortions. While bars set off quantities, the indication of measure also entails a specific kind of distribution of accents. (Arom 1991:208)

Arom, like Koetting, criticizes the use of the Western notational system, based on his belief that the intermediate level of the "measure" does not exist in African musics, and that African
musics are, instead, based on steady and even pulsations with no matrices. Arom asserts that the measure implies an accent structure that, in essence, doesn’t exist in the music (Arom 1991). Unfortunately Arom, like Koetting before, has promoted the belief that a beat structure does not exist in African musics, and again, this has proved to be the flaw in his rationale. As was previously emphasized, many African musics do, in fact, have beat structures. Further, it is the understanding of these structures that is essential to the accurate representation of African musics, and specifically, African rhythmic systems.

Perhaps the strongest and most convincing argument in favor of the use of the Western notational system is made by the African scholar, Kofi Agawu, in his article of 1986, "'Gi Dunu,' Nyekpadudo," and the Study of West African Rhythm," and in his recent book of 1995, African Rhythm: A Northern Ewe Perspective. Agawu, unlike Koetting and Arom, believes that the use of standard Western notation is not only adequate but preferable, because it renders the transcribed material immediately comprehensible. He goes on to argue that while the acceptance of this system is said by some to imply also an acceptance of certain a priori regarding the nature of musical organization, such a priori have had no significant influence on his analysis and are often disregarded by contemporary musicians (Agawu 1986). Agawu begins his argument by noting that several different methods have been employed to
describe African musics, noting the contributions of Chernoff (the use of suggestive language to describe rhythms), Jones and Locke (the use of Western notation to describe rhythm), and Pantaleoni and Koetting (the use of new notational systems to describe rhythm). He notes that "none of these modes of representation—verbal or graphic—can hope to convey the musical experience in all its manifold detail ... therefore, choosing among them—including attempts to combine them—is perhaps ultimately a personal decision" (Agawu 1995:186). Agawu then, quite astutely, laments that, "unfortunately, no indigenous system of musical notation survives among the Northern Ewe" (Agawu 1995:186).

Continuing his analysis, Agawu draws the comparison between musical notation and language. He accurately details how colonial languages are no longer thought of as belonging exclusively to Western culture. In a further reference, Agawu notes that colonial languages "have been used continuously in Africa for several centuries, and have been used adequately, if not in superior ways, by African writers" (Agawu 1995:186). Taking this argument further, he asserts that Western notation is "so widely used by literate or semiliterate African musicians that, despite their manifestly 'foreign' origins, they can no longer be dismissed as unauthentic ways of representing musical relations." To further this strong argument, Agawu declares that, "if one casts a backward glance at the history of representation of African
rhythm, one is struck by the decidedly marginal role played by those who have sought to invent more adequate notations for African music" (Agawu 1995:187).

I strongly agree with Agawu on all of his points, and would add that instead of viewing African music as foreign to Western ideals, and reinforcing this division with concocted notational grids, we should instead realize its similarities and strive to display them. As was previously detailed, the ancient ideal of "beat one always being a strong beat" is no longer present in the minds of Twentieth Century composers or performers. In my mind, the notational system no longer has the implications attached to it that it once had. It certainly is not a system without shortcomings, but it is, at the same time, sufficiently sophisticated for the notation of many African musics.

When one considers the modern jazz idiom, it becomes obvious that the Western notational system allows for a wide range of expression and interpretation of rhythmic nuance. Certainly the actual feel of jazz music cannot be portrayed through notation. Instead, the notation acts as a guide, with maximum responsibility placed on the user of the notation to research, through observation, imitation, and participation, the proper 'feel' of the music. I propose that this is also the case with African
musics. Certainly, the notation acts as a guide for the recreation of musics, but it is only powerful in the hands of a trained interpreter.

Many critics have asserted that the act of notating African musics is improper, because the musics were originally conceived and created without notation in mind. If this logic is accepted, should this mindset also apply to the verbal and written word?

Consider the case of Dr. William Smalley, an American linguist, anthropologist, and missionary to the Hmong peoples in the mountains of Laos. The Hmong people had no lasting system of written language, even though they had developed their own dialect and speech traditions. Using the 26 letters of the English alphabet, Mr. Smalley provided phonetic translation to the vowel, consonant, and diphthong sounds of the Chinese-based Hmong dialect. According to Yang Dao, the writing system developed by Smalley was very significant. Dao comments as follows:

This writing system helped us (Hmong) to preserve our culture and tradition and history. Now it is used by Hmong all around the world. It is used, among other places, on Hmong web sites on the internet by some of the 200,000 Hmong who settled in the United States after the war in Vietnam. (New York Times: 12/26/97; pgC7)
The example of Dr. Smalley is quite applicable to the case of African musics and the use of the Western notational system. In essence, it is the communication that serves as the end for any notational means. In conclusion, I strongly believe that if we can use the same alphabet to spell words and signify thoughts in English, Italian, German, Spanish, French, Hmong, and even African languages, we must certainly be able to use the same notational system to signify musical thoughts by English, Italian, German, Spanish, French, Hmong, and even African composers.
This appendix presents a brief survey of the classic literature on African rhythmic structures as presented by scholars of African musics. There have been numerous theories advanced over the years concerning African rhythmic concepts, some of which were detailed during my discussion of time-lines and the standard pattern. I offered severe criticism of some of the theories and the analysis of African musics presented by the scholars, specifically those concerning the foundation of time-lines and rhythmic structures. However, it is with the greatest respect for the integrity of their work that I offer these authors this criticism. It is with this same respect that I will offer my criticism of ideas presented by the authors to be reviewed in this section.
As may be predicted, though, I do disagree conceptually with most of the theories and analysis of African rhythmic structure advanced over the years. My initial interest in this field was not as a scholar, but as a percussionist. For this reason, my interest has always been in prescriptive (how to play the best) rather than descriptive (general characteristics) methodology. Even so, my primary criticism of most of the scholarship, whether instructional or observational, has been that it does not describe what is actually being played. I strongly believe that if one were to attempt to function as a musician actually trying to play the music, it would not be possible to perform African rhythms using the conceptions and descriptions put forward by most scholars.

Again, I have the greatest respect for the integrity and the intentions of the many scholars who have advanced ideas and theories on this topic over the years. And in spite of my criticisms, my thoughts have been greatly stimulated by their presentations. One must understand the methodology of the pioneers in the field to better present the material with conviction today.

The common flaws in many of the studies are twofold. The first is a lack of understanding of a universal divisive beat structure at the foundation of the rhythmic structure. The second is a lack of understanding of the significance of the 3:2 relationship in defining the time-lines and rhythmic character of the music. Although scholarship relating specifically to African rhythm dates
back at least to W.E. Ward in 1927, it was not until over fifty years (and at least twenty scholarly publications) later that David Locke accurately outlined the basic structure of African rhythmic principles. Note that Locke himself actually did learn how to play the music. I feel this gave him a significant edge over the scholars who preceded him. With a good working understanding of Locke’s text, a musician could have good success actually playing the music.

My brief survey of the classic literature in this field will focus on the primary concepts put forward by each author. It will not attempt to be a comprehensive study or critique. In many cases, the articles referenced discuss many topics other than rhythm, and in such instances, I will only reference the applicable contents. In other cases, I will have discussed an article in detail earlier in this document, so I will only offer a brief summary here.

In cases where authors have presented numerous articles or studies, I will reference only the most pertinent. Further, I will not reference more than two specific articles from any given author. I will present this survey in chronological order, from the oldest reference (1927) to the most current (1998). I’ve chosen a list format rather than paragraph form, as this will allow for the most efficient presentation for each author.
Ward (1927) "Music in the Gold Coast"

Ward presents four primary points in this, the first reference to speak in detail on African rhythmic phenomena. First, Ward states that, while Western musics have one specific beat in command, African music uses two to four different meters in combinations. In essence, Ward argues for the existence of multiple metric structures, where instead, there exists polyrhythm within one metric structure. Second, Ward claims that a deep and booming regular beat is in place, but only on the first beat, and that other rhythms may have no similarity or connection except for this first beat. Obviously, African rhythmic structures can be extremely difficult to decipher, but every beat is, in fact, coordinated. Third, Ward asserts that triple time is unknown to African musics. I can only postulate that Ward was referring to the European waltz rhythm, which the Western musician would notate in a 3/4 metric scheme. It is difficult to follow Ward on this, however, because he does not refer to binary or ternary division of the beat, leaving us unsure of his actual meaning. Finally, Ward believes that drummers are at liberty to improvise, though they must not take more than one measure for their figure. Again, it is hard to follow Ward on this, because I don’t know if he is referring to the master drum only or all drums. For an article so early in the study of this music, however, I am impressed with the direction Ward took in some of his analysis. He should be commended for his efforts and for his scholarship.
Motor behavior is the primary focus of Hornbostel's most referenced study of 1928. He analyzes the physical motion drummers use to play the drum and concludes that it is this motion, or motor behavior, that actually generates the rhythmic structures of African musics. He claims, in fact, that this up-stroke and down-stroke are the keys to African rhythm. He also asserts that syncopation cannot exist if the rhythm is allowed to determine its own structure.

Actually, the physical motion is the result of an emotional decision made by a drummer to play a specific note at a specific attack point in the structure. It is true that the drummer's motion results in a note being played, but consider those who sing accurate rhythms in the same rhythmic structure. They obviously do not rely on motor behavior (up-stroke/down-stroke) for their precision and rhythmic drive. When a drummer chooses to play a note, a movement is the necessary result, because the hand must hit the drum. The drummer, however, does not play the movement, but instead, plays the drum. Although motor behavior is a fascinating and thought provoking concept, it does not generate rhythmic structures in African musics.
Waterman (1948) "Hot Rhythm in Negro Music"

Waterman’s article is significant because in it he introduces the theory and concept of “metronomic sense,” later promoted by several other scholars. Waterman argues that a common fast beat is present among the musicians of an African ensemble, even if that beat is not heard. He asserts that African music is so complex that it needs a guiding operation in place. Waterman echoes Ward’s belief in multimetric and mixed-metric structures. In essence, Waterman’s insight has recognized the existence of the pulses, or subdivisions of the beat, without fully realizing the actual divisive beat structure generating them. His concept of the common fast beat (pulse), however, proved a useful tool for other scholars to develop.

Jones (1954) "African Rhythm"

This famous article by Jones was thoroughly discussed earlier in reference to his observation of what we now know as the key pattern. To quickly summarize some other points, Jones states that the primary beats “never coincide,” so he objects, in transcriptions, to running the bar lines down the page in the same relationship for every part. He also feels that the music should be transcribed in mixed-meter rather than one time signature. And he is famous for his phrase, “clash of rhythm,” to describe what we now call cross-rhythm in African music. Although I criticized
Jones severely earlier in this document, I would like to repeat that I hold the highest regard for his work and his integrity as a scholar. His contributions are both prolific and classic.


Blacking summarizes and promotes the ideas previously advanced by Hornbostel in 1928. He mentions that A.M. Jones' informant does not concur with Hornbostel's theory, but Blacking still promotes Hornbostel's ideas. Blacking strongly believes that Hornbostel's work has not been fully appreciated, and urges further review of his theories.

Merriam (1959) "African Music"

Merriam presents an excellent and thorough review of the work of previous scholars on the topic of African rhythm. Specifically, he summarizes and analyzes the work of Ward, Hornbostel, Waterman, and Jones in a highly informative and insightful style. His interpretations of the literature are, in most cases, right on the mark. His coverage is concise yet complete. Unfortunately, based on what he refers to as very strong evidence, Merriam's major conclusion is that the foundation of African music is based on the concept of simultaneous multiple metric schemes.

Rose Brandel is the first scholar to recognize the true significance of the 3:2 relationship in African musics. As described earlier, Brandel argues for what she refers to as the African Hemiola Style as the key to understanding African rhythm. However, she gives the term hemiola a new and different meaning when referring to African musics, including both symmetrical (Western) and asymmetrical (ancient Greek) phrasings. She also expands the meaning of African hemiola to account for not only linear events, but vertical events as well, with most of her examples being asymmetrical. She opposes the work of Jones, who claimed that African rhythm was both additive (song) and divisive (claps). Brandel, on the other hand, incorrectly asserts that African rhythm is entirely additive, when it is, instead, entirely divisive. Although I find Brandel’s approach creative, and her recognition of the 3:2 relationship insightful, I cannot accept her analysis, founded on the premise of an asymmetrical additive structure.


As this article was previously reviewed in detail, I will simply add that this has been one of the most often referenced articles in the entire body of accumulated literature on African rhythm. It
is, in fact, the first article I ever read concerning African rhythm. As a young musician who had a basic understanding of African time-lines in the four-beat metric scheme, this article left me completely confused. It made me doubt what I felt I had understood to be true. As I reviewed this article with my friends who were also interested in African musics, we debated whether King's extremely additive analysis was actually the way we should be thinking. We felt that, perhaps, we had somehow missed something in our own study of these time-lines. Since King's additive view was so much more sophisticated than our view of the time-line in 12/8, we thought it must have some merit.

After struggling to feel the time-line in additive terms and maintain a good "groove," I eventually gave up on King's analysis, and went back to feeling it in 12/8. However, I must credit my reading of Anthony King's article of 1960 as the inspiration for my determination to better understand time-lines and African rhythm as a whole, and also as the impetus to explore the other classic scholarship concerning African rhythm. Indirectly, it has been the inspiration that led me to the writing of this very document.
Koetting (1970) "Analysis and Notation of West African Drum Ensemble Music"

This landmark presentation by Koetting is important for many reasons. The introduction of Phillip Harland's Time-Unit-Box-System (TUBS) for the notation of African musics in this article has been previously documented. Koetting, of course, favored and promoted this system, and it was used (and is still used) by many others. It has, however, become known as a simple and limited system favored by those who are not literate in Western notation, rather than as the preferred system for analysis and scholarship for which Koetting hoped.

Two points need to be made here that were not referenced earlier. First, Koetting, in defending the TUBS notation, asserts that similar systems have been used to notate musics of Java, India, China, and Korea. Here is a major flaw in Koetting's logic: instead of accepting African music as music and dealing with it in musical terms, he instead views it as exotic and deals with it like something from an exotic land (i.e., Java, India, Africa). This mistake has been repeated too often. Second, also as a defense of the TUBS notation, Koetting uses the logic that the note values used in Western notation give a false impression of durational values that do not really exist in the drum music of
Africa. On this point, I must agree with Koetting: African rhythmic structures are based on attack points rather than on durational values.

Koetting affirms that the "fastest pulse" system (from Waterman's "common fast beats") is the best system for analyzing African musics, because there is no internal substructure implied. He says Westerners incorrectly consider the gross beats as the timing referent and normally disregard the more important fastest pulse. He maintains that, because the gross beats are not sounded by all players of the ensemble, they cannot be fundamental to all of the parts. He also claims that eventually, the gross beats do not coincide, which, when taking the metric approach, results in mixed meter transcriptions. Koetting concludes that the only way around this problem is a combination of the TUBS notation and the fastest pulse analysis.

But both of the transcriptions in TUBS notation included at the end of Koetting article are incorrect as far as the proper downbeat of the time-line and interlocking parts are concerned. In his transcription of Abofoo, Koetting's downbeat is actually pulse number five of a 12/8 metric scheme. In his transcription of Sohu, Koetting's downbeat is actually pulse number nine of a 4/4 metric scheme. In Abofoo, Koetting has made a mistake similar to that of Anthony King before him (although Koetting represents a different
time-line). In Sofu, Koetting represents beat three of a 4/4 metric scheme as his downbeat.

Even with my numerous criticisms, I still must credit Koetting for his passion in the study of African musics. It is both inspiring and contagious. He devoted significant time to the study of the African rhythmic phenomenon, and he consistently shared his dedication for his studies with others. For this, he should be remembered.

**Hood (1971) The Ethnomusicologist**

The primary emphasis of Hood’s study is what he terms, the “density referent” of African music. Hood, like Waterman (common fast beats) and Koetting (fastest pulse), has identified the pulses (subdivisions of the beat) without recognizing that a structure (four-beat metric scheme) is in place. I do, however, endorse Hood’s term density referent. In fact, I have found it to be used advantageously quite often in other scholarship in the field.
Pantaleoini (1972) "Three Principles of Timing in Anlo Dance Drumming"

Although Pantaleoini developed a much clearer idea of the phenomenon later in his life, at the time of this article, Pantaleoini claims that players do not follow a common beat but, instead, derive their own pulse suited to their own needs. Through substantial work with Kobla Ladzekpo throughout his career, Pantaleoini eventually altered his position on this and other issues.

Kolinski (1973) "A Cross-Cultural Approach to Metro-Rhythmic Patterns"

Kolinski's concise yet thought provoking article has been referenced previously during my discussion of additive and divisive rhythms. Kolinski also comments on the studies of A.M. Jones and compares his own analysis of additive (isometric) and divisive (heterometric) rhythm to Jones'. He claims that Jones' theory of African music being both additive and divisive simultaneously is incorrect, but (as others have) concludes that African music is isometric (additive) rather than heterometric (divisive). He offers the useful terms commetric and contrametric as tools for analysis, but his usage of this terminology is somewhat confusing. At times, his conclusions seem to reverse the meanings of the terms, isometric and heterometric.
Nketia (1974) *The Music of Africa*

Although I do not agree with every theory presented in this book, I consider it to be a masterpiece in its own right. It is comprehensive, yet relatively concise, and it covers many aspects other than the rhythm of African music. We reviewed this text repeatedly earlier in reference to terminology, and it stands as a first call reference on many other topics as well. Nketia does not emphasize the metric structures of African rhythm, nor does he recognize the foundation principles of the 3:2 relationship in terms of time-lines and structure. In all, however, I consider this book to be excellent—certainly, required reading for anyone with a sincere interest in African musics.

Ekwueme (1975) "*Structural Levels of Rhythm and Form in African Music*"

This study was referenced earlier concerning the standard pattern. Although I respect the creativity of thought contained in this work, I cannot accept Ekwueme's concentration on variation at the expense of the true understanding of the structure. He makes astute observations at times, but in the end, he is not aware of the proper context in which to represent them.
Kauffman (1980) "African Rhythm: A Reassessment"

Like Merriam's work twenty years earlier, this is an excellent summary of previous scholarship. Kauffman intelligently reviews the work of Hornbostel, Waterman, Hood, Jones, Brandel, and Nketia, among others. He follows with four basic conclusions concerning African rhythm, based on his survey. He concludes, first, that the density referent of Mantle Hood is the preferred system for analysis and performance. Second, he argues for the existence of additive and divisive structures. Third, he asserts that only one specific player outlines the basic rhythmic feeling in African ensemble music. Finally, he describes his concept of "cross-patterns," essentially outlining polymetric existence and "cross-beats." As has been the case with other studies, I fundamentally disagree with Kauffman's conclusions, though I find his work thought provoking and extremely well written.


This is an extremely interesting article, though I feel that, in the end, Merriam's premise has little to do with African rhythmic structures. Merriam's central focus in this article is his concept of time-reckoning. He asserts that Africans do not divide time in the Western sense. He claims that most Africans have no concept of "what hour of the day it is" or that there is "four or five hours
between events." He continues by stating that Africans have no idea of a linear sequence and no points of reference where activities must conform with precision. He states that numerical calendars do not exist in Africa, and that time is not measured with an apparatus (clock).

As interesting as these assertions seem, they have nothing to do with the 12/8 divisive metric structures of African musics. I relate the sense of time in African music more to the gate of one's walk, or the footsteps of a dance, than to the hands of a clock, or a chronological appointment schedule. Some consider Merriam's comments to border on intellectual, if not racial, prejudice. I find Merriam's comments outrageous, but I do not feel he meant any purposeful slander toward the intelligence of the African people. He is simply attempting to put into terms a phenomenon which does not relate to his sense of time-reckoning.


This article was thoroughly discussed earlier. I find it to be the first published article accurately describing the structure of African rhythmic systems. For this reason, it stands as a monument in the field of scholarship. Locke's analyses are educated and well presented. The only major point that Locke has missed is the significance of the 3:2 relationship as the foundation of time-
lines in African musics. Along with the work of Nketia, this work stands as primary required reading for any student of African musics.

**Stone (1985) “In Search of Time in African Music”**

Stone’s primary point in this article is that African music exists in “Mosaic Time,” a term borrowed from Paul Berliner’s book, *The Soul of the Mbira*. Stone believes that African music is conceived in an overlapping additive structure rather than a divisive and unilinear one. She reviews the work of Brandel, Jones, and Koetting and draws her own conclusions. She does not believe that all patterns adhere to a basic time, nor does she believe that the standard pattern is conceived in quantitative means. She believes that we should no longer search for a unifying beat in African musics, because it is not likely that Africans perceive homogeneous units of measure. Obviously, Stone is far from accurate in her assertions. I only wish she had been aware of the work of David Locke from three years earlier. Had she been aware, I do not feel she could have presented this paper without severe doubts of its validity.
Koetting (1986) "What Do We Know About African Rhythm"

In this article, which appeared after his death (edited by Roderick Knight), Koetting references Jeff Pressing's comparison of the standard pattern to the major scale. He speaks of interlock, gives examples of hemiola (3:2), and mentions that his own analysis is still done on the basis of the fastest pulse theory. After an interesting survey of ideas, Koetting concludes that scholarship still has not reached a theoretically sound bottom line. Again, I disagree. I strongly feel that the bottom line was reached in 1982 with the publication of Locke's work.

Agawu (1986) ""Gi Dunn, Nyekpadudo, and the Study of West African Rhythm"

This is an excellent and informative article, and I am in agreement with almost everything Agawu presents. Agawu stresses the fundamental existence of a regular beat scheme. He argues that the downbeat exists, even when it is not sounded. He claims that performers are not only aware of, but fundamentally reliant on the beat. As previously noted, he argues strongly in favor of transcribing African musics using the Western notation. After criticizing others' mixed-meter transcriptions, Agawu then presents his own transcription, in which a 2/4 scheme is interrupted by a 5/8 scheme, essentially turning the onbeat into
an offbeat. I am surprised by this incorrect transcription. It is, in fact, the only aspect of this otherwise excellent article that I cannot agree with.

Arom (1991) *African Polyrhythm and Polyphony*

Arom’s work is a profound and in-depth study of African rhythm. Arom reviews the work of previous scholars, severely criticizing Jones in particular. He also discusses the work of Kolinski, Brandel, Pantaleoini, Kubic, and Merriam. Presenting his own theory, Arom contends that the arrangement of durations in African music is based on the same idea as the Medieval tactus. He asserts that African music is not based on measures but on pulsations only. In other words, where Western music is based on 1 - 2 - 3 - 4, African music is based on 1 - 1 - 1 - 1. Arom uses the term pulses as a substitute for tactus. He then asserts that since there is no beat structure, there can be no syncopation either. Also, since the pulse is the only temporal marker, there is no concept of measure present. He disagrees with Kolinski stating that African music is contrametric, rather than commetric. In conclusion, Arom draws comparison between African music and the isorhythmic motet. His three main points in summary are: first, the pulsations are regular; second, there is an absence of strong beats (the measure is obsolete); and third, the rhythmic system is finite (it does not have infinite variety). As I respect Arom for his high level of scholarship, I find his text extremely thought
provoking and poignant. I cannot, however, accept his analogy of the isorhythmic motet or his belief that the tactus is the primary structural element of African music.

Kubic (1994) *Theory of African Music*

This is the first volume in a yet-unfinished, two-volume set. As volume two will predominantly cover rhythm, there is very little in volume one to comment on, other than the reference to the attack-points (or strokes) in reference to time-lines (as previously documented). Kubic briefly alludes to the relationship between music and dance. He also briefly mentions interlock and cross-rhythm. But I will wait for the release of volume two to analyze Kubic's comments on rhythm in detail.

Agawu (1995) *African Rhythm: A Northern Ewe Perspective*

This, the most recent text on African music, is also one of the best conceived, and I applaud Agawu for his effort. Agawu's excellent comments on the use of the Western notational system have been presented earlier in this document. Agawu also talks about the previous scholars, such as Jones and Brandel. He correctly asserts that African music is divisive in nature. He talks of the wisdom in using a simple metric scheme, stating that his hope is to de-mystify African rhythm and take it out of the realm of the exotic. I could not agree with Agawu more. He
believes efforts to understand African rhythm will continue to flounder until scholars recognize there is a stable background to the music, highlighted by a foreground of rhythmic tension. It was this very concept that eluded Jones. Agawu also recognizes the importance of the 3:2 relationship, but he does not detail the constructs that it creates. In this sense, Agawu is close, but still lacking the proper insight into the 3:2 relationship as the foundation of time-lines and the character of rhythmic structures. Agawu's conclusion is extremely well stated. He believes efforts to analyze African music as somehow fundamentally different from that of the West have failed because, in essence, the musics are more similar than different.

As my brief study of the scholarship of African rhythm draws to a close, I will quote the words of Kofi Agawu. I feel that his eloquent statement reveals both the primary flaw of the past and the certain key for the future of scholarship in African musics:

By failing to make a case for a "unique" Northern Ewe sensibility in this book, and by implying that their songs share rhythmic and metrical features with other musical traditions, I hope to have demystified the Northern Ewe in order to return our view of their musical practices to a "normal" sphere, a sphere in which what is extraordinary about them can be better assessed. (Agawu 1995: 195)
Born October 29, 1960 in Cleveland, Ohio, Dr. Eugene Dominic Novotney received his Bachelor of Music Degree in Percussion from the Cincinnati Conservatory of Music and his Master of Music Degree & Doctor of Musical Arts Degree from the University of Illinois with emphasis in Percussion, Composition, and Ethnomusicology. He has studied Brazilian percussion at the “Instituto de Investigacio Musico” in Salvador, Brazil, and Ewe drumming and Dagara xylophone music at the “Dagara Music Center” in Medie, Ghana, West Africa. He has also conducted research trips to Rio de Janeiro, Brazil, Port-of-Spain, Trinidad, and Accra, Ghana, West Africa, resulting in numerous transcriptions and analytical studies. He has studied Percussion Techniques with Stacey Bowers, Bill Youhass & Thomas Siwe; Orchestral Percussion with Richard Weiner; Composition with Herbert Brün, Ben Johnston, & Morgan Powell; Electronic Music with Jonathan Kramer & Scott Wyatt; Anlo-Ewe Drumming with C.K. Ladzekpo & Afadina Atsikpa; Dagara Gyil (Xylophone) with Bernard Woma; Afro-Brazilian Percussion with Guilherme Goncalves, Marivaldo Paim, Ze Ricardio Sousa & Luiz Carlos Oliveira de Souza; and Afro-Cuban Percussion with David Penalosa, John Santos & Michael Spiro. He has been a member of the South Dakota Symphony, the Sioux City Iowa Symphony, the Champaign-Urbana Symphony, Sinfonia da Camera, and the Cleveland Chamber Orchestra, and has served on the faculty of the University of Illinois and the University of South Dakota. Presently, he is Professor of Music at California State University-Humboldt, and is the founder and co-coordinator of the ‘Percussion in World Music’ program for the California State University Summer Arts Program. He was the first percussionist to win the Krannert Center’s Debut Soloist Competition, and was awarded the Edgard Varese Percussion Award from the University of Illinois and the Meritorious Performance and Professional Promise Award from the California State University system. Most notably, in 2006, Dr. Novotney was awarded the prestigious Wang Family Excellence Award by the California State University Board of Trustees, a $20,000 award that recognizes and celebrates California State faculty who, through extraordinary commitment and dedication, have distinguished themselves by exemplary contributions and achievements in their academic disciplines. He is the chairman of the Percussive Arts Society’s “New Music/Research Committee,” and has organized and
participated in numerous workshops and performances for the P.A.S. International Convention. He is the founder of the Humboldt Calypso Band of Arcata, California, and the I-Pan Steel Groove of Urbana, Illinois, and on three occasions has performed in Trinidad’s National Panorama Competition as a member of both the Hummingbird Pan Groove of St. James and the Phase II Pan Groove of Woodbrook, Port-of-Spain. In addition, he has served as an adjudicator for Pan Trinbago, the national governing body for the advancement of steelband music in Trinidad & Tobago. Most notably, he was a member of the adjudication panel of Trinidad’s World Steelband Festivals in 1998 & 2000 held in the Jean Pierre Complex in Port-of-Spain, Trinidad, and Trinidad’s World Steelband Festival 2004-05 held in Madison Square Garden, New York, NY. In addition, he was a member of the adjudication panel of the 2000 European Steelband Festival held at Park de Villette in Paris, France, and the adjudication panel for the 2005 Trinidad National Schools Music Festival held in the Jean Pierre Complex in Port-of-Spain, Trinidad. His recordings have been released on the Bembe, Delos, SANCH, Pogo, Rituals and Earthbeat (Rhino) labels, and his compositions and arrangements have been performed internationally. His classical and experimental percussion works appear in the collections The Noble Snare and Marimba Concert and are available through Smith Publications of Baltimore, Maryland and his compositions and arrangements for steelband are available from Panyard Publications of Akron, Ohio.