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The article examines, analytically and notationally, various elements in the structure and context of the music of West African drum ensembles -- those groups including such instruments as drums, gongs, and rattles. Stress is laid on analyzing the music on its own structural terms, rather than too readily associating it with Western equivalents. The notation used is the Time Unit Box System (TUBS), experimentally developed by the author and others in their search for a more adequate aid than Western notation in the analysis of the drum ensemble music.

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Analysis and Notation of West African Drum Ensemble Music

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Like much non-Western music, on relatively general levels of analysis West African drum ensemble music can be considered similar to Western music. Both traditions developed from earlier centuries within a broad association of music and dance within the even broader sociocultural context. Making up the traditions are the performances of various kinds of ensembles representing various genres. The genres, which are often intricate and intricately related, include often intricate and intricately related pieces. The component elements of a piece are patterns repeating, varying, or further alternating across the whole ensemble, its pertinent subgroups, and its individual parts. The patterns are interrelated in the congruent or complementary shape of their sequences of sonority and of rhythm, including accents, on at least one level of which pulses are generated which are both regular and common across the ensemble.

But on more specific analytical levels the two traditions are no more than equivalent. Most basically, on most structural levels in the drum ensemble music and its context there is only a relatively limited or infrequent divergence of elements, always within a characteristic unity: music and dance pieces within performances within the occasions at which they occur; part levels and pattern sequences within pieces; sequences of sonority and rhythm, including pulses, within patterns within pieces and generally within genres. Good analysis and notation of the drum ensemble music require frequent reference to that overriding unity. Some persons working outward from Western music, whose elements are often thought of as self-contained units, might too readily treat the drum ensemble elements the same.

Within this framework, many of the elements of West African drum ensemble music are equivalent to Western musical elements and can without too much qualification be referred to in Western musical terms—such as pitch, tone quality, rhythmic pulses, patterns, pattern interrelation, and so on. But other drum

ensemble elements have no Western equivalents, and those that do often occupy different levels of significance within their own structures than do the Western elements in theirs. Some persons with a Western orientation might focus study disproportionately on the drum ensemble elements that have Western equivalents and disregard or not recognize the others. As they apply Western descriptive terms to the former they might easily think of the drum ensemble elements within the framework of the Western structures that contain their equivalents, thus undervaluing and oversimplifying some of the elements and overvaluing and overcomplicating others. At the other extreme, the person who avoids such erroneous associations might simply assume that the drum ensemble music has little or no structural organization; thus his research data will remain erroneously chaotic.

Of course, the approach that can represent the unity of the drum ensemble music—and also avoid both the above analytical extremes—is to deal with the music strictly on its own structural terms, necessarily with the help of persons who have a firsthand familiarity with both the drum ensemble tradition and its artistic and sociocultural context. The following analytical and notational study attempts this. The study derives from the author's work with recorded samples and from extended live research with the Ewe master drummer Robert Ayitee and the Ashanti master drummer Kwasi Badu, who have taught drum ensemble classes at UCLA. Another to whose works the study owes much is J. H. Nketia, a major contributor to the knowledge of music not only in West Africa but also in the continent as a whole, who has given lectures and led seminars at UCLA. Still another is Philip Harland, assistant head of the UCLA drum ensemble class and the originator of the Time Unit Box System (TUBS), the notation used in this article.

Since in this particular subject there is no developed body of information, and since analysis must stop at the necessary limit of observed data, not all the discussion can be as specific and precise as one would like. Where the situation is known conclusively, the elements of the music are classified inductively in terms of the structures within which persons familiar with the tradition normally consider them to function. In a few cases where the situation is well known but not conclusively, the structures have been partially or tentatively deduced. Where the situation is little known, assumptions are avoided; in their place, sometimes the discussion is qualified, general, or even vague—at other times it is ambiguous, with two or more alternatives being given.

We begin our examination of the drum ensemble music by viewing it in context: the sociocultural occasions within which it occurs, and the total body of music and dance within which it is usually performed. From that vantage point we can study the drum ensemble music itself. After that we will briefly review the analytical approach of the article, introduce the notational approach, and then go on to some sample aspects of notational analysis.

The Sociocultural Framework

The drum ensemble performances are not formal concerts given before audiences, as in the West, but rather integrated portions of sociocultural occasions—weddings, funerals, royal ceremonies, political/religious meetings or processions, rituals traditionally related to war or hunting, and so on—which various people of a political or tribal grouping may attend. Usually the drum ensemble performs in interrelation with other performing participants: usually dancers, often singers, and sometimes melody instrumentalists. In each category certain kinds of performers and pieces, and thus the music and dance genres they represent, are usually present at certain kinds of assembly—weddings versus funerals, for example.

The drum ensemble and the melody instrumentalists are relatively set in personnel, including standbys, primarily on a basis of artistic competence. Certain other performers, particularly dancers, may be relatively prescribed on an artistic basis or a sociocultural basis—as when a dance is performed by the king and the queen mother or others of a royal lineage, by members of a political "warrior" society, by men or women, by young persons, by "hunchbacks," by certain members of a wedding party, by bereaved family members—or there may be little or no restriction on who performs. When the performers are prescribed the patterns that make up a piece are drawn from repertoires developed in training and practice; when the personnel is relatively unrestricted, the patterns are learned more by participation in performances.

Often in a performance certain pieces are placed at appropriate stages or points in the sociocultural occasion. In the Ashanti Kete drum ensemble a certain piece is played if the king wants to or is expected to dance. At another point the piece played may contain a speech-pattern equivalent conveying some pertinent historical event, proverb, traditional story, or sometimes even commentary. A Kete drum ensemble piece referring to gold is appropriate for participation by the king, who is associated with that precious metal and often displays the wealth of the tribe in his royal golden stool, sword, body ornaments, and so on. Another Kete piece might be played when the king gets up to walk, telling him to move slowly and carefully. The Kete master drummer can signal to performers, and also to others when he or other members of the ensemble want something, such as a drink.

The Various Performing Groups

Within the sociocultural framework the drum ensemble pieces, and consequently the genres they represent, are broadly interrelated with their counterparts among the other performers. While this interrelation may sometimes be relatively loose and simple, more often it is intricate and sometimes quite close. The interrelation is one of congruent or complementary patterns, which are relatively set

structures of rhythm and sonority repeating, varying, or further alternating across the various performers and the various pieces. The set patterns of a piece may be performed in more or less spontaneous sequence by the dancers and the master drummer—the leader of the drum ensemble—whereas in other cases the pattern sequences are relatively set. Neither patterns nor pieces have, as in the West, been characteristically created by composers and choreographers in some predominantly mental process; they seem instead to have been developed, performed, and passed on within the sociocultural tradition through a combination of mental and kinesthetic processes. The drum ensemble players, for example, learn and even perform their music—from single sounds to pattern sequences—largely in terms of the physical movements required to produce it, and the drum ensemble performers use certain direct speech associations—word phrases (sometimes "nonsense" ones), single words, and even disconnected sounds—as mnemonic aids. At the same time, the performers use analytical processes in controlling the timing relations among patterns to achieve the fantastic ensemble precision for which they are renowned. The timing interrelation (the act of playing together in time) is worked out during the performance—sometimes, as in the Ewe piece Agbekor, dancers and drum ensemble members rehearse particular patterns in advance.

Within the overall interrelation among the performing groups the drum ensemble often exerts a dominant influence, in the sense that the master drummer of the drum ensemble often selects, introduces, and leads the pieces that are played. But the influence also works in reverse, with the drum ensemble being affected by certain factors both within and outside of the performance. Sometimes, for example, the selection of a piece is determined not by the master drummer but by the desires of a ranking official in the assembly; by the decision of the leading singer, dancer, or even any one of the performers or other persons; or by something in the very nature of the ceremony involved. Sometimes the master drummer leads his own ensemble in changing from one piece to another because the singers have just made such a change. Or he may follow the patterns of a solo dancer.

Often dance patterns even serve as a structural foundation from which certain patterns of a drum ensemble piece are derived. At other times (as has been referred to above in another light) a drum ensemble piece or pattern may be based to some degree on a speech pattern or patterns, which the ensemble instruments approximate in the tonal and rhythmic shape of their patterns; also, the names of individual instruments are words that sometimes might be associated with the type of patterns the instruments characteristically play. But it should be remembered that even those drum ensemble patterns that are derived from dance or speech patterns are essentially musical structures. So while the dance or speech patterns can and should be treated as analytical equivalents to the drum ensemble patterns, they should never be literally equated—the characteristic nuances of the drum pattern's structure, being essentially musical, are of a different order from that of the other types.

The Drum Ensemble

If there are varying degrees of interrelation within the total group of performers at a West African assembly, inside most drum ensemble pieces—and indeed among many of the pieces—a predominant characteristic is the intimate interrelation of patterns on all component levels: individual patterns, pertinent subgroup patterns, and total ensemble patterns. For the performers any one pattern has little meaning out of that context; indeed members of an ensemble often experience difficulty in performing their pattern alone, their success in doing so being dependent on their ability to reconstruct mentally the other patterns of the piece.

Also within each drum ensemble pattern the structure is highly unified, with little divergence of rhythm and sonority elements. The importance of sonority cannot be overemphasized. Each instrument produces a relative sonority or range of sonorities—including all of pitch (although no instrument is intended to produce any specific pitch), loudness, tone quality, and carrying power—which is differentiated within the ensemble and at the same time compatible with the relative sonorities of the other instruments. The sonority is initially affected by the relative factors as the size of an instrument, especially its resonating chamber; the materials of which it is constructed, including the kind and thickness of leather used for the drumhead; and any attachments added to the instrument to modify the sound. To achieve the desired sonority, most of the drums are constructed by master instrument craftsmen and are made tunable. The tuning processes of putting water on the drumhead, tightening or loosening pegs, pounding the drumhead with the palm of the hand, and tamping the drumhead rim (all means of changing drum-head tension) are painstakingly carried out before and even during a performance. Very often the lesser supporting drums are the highest in pitch, the intermediate drums are in a middle pitch range, and the master drum is deepest in pitch. Nontunable instruments, such as gongs and rattles, are usually not made by instrument craftsmen; for example, Ashanti iron gongs (*dawuros*) are traditionally made by blacksmiths, and those with the desired sonority are selected by the musicians. Sonority in drum ensemble patterns is also affected by the nature of the implements used to produce sound on the instrument and by the players, who have precise techniques for controlling the sonority of sound (although duration is not controlled precisely except in certain cases) together with their rhythmic sequence to produce the individual, subgroup, and total ensemble patterns. Thus sonority and rhythm are generally equal in importance, rhythm being somewhat more significant in some patterns and sonority somewhat more in others, particularly those derived from speech patterns. For that reason, the drum ensemble patterns should be studied as rhythm/sonority patterns and must not be too much equated with Western rhythm patterns, which we often think of without including pitch and tone quality as significant elements.

Certain other aspects of the drum ensemble patterns can be quite difficult to pin down. The music itself is often noncommittal, and the musicians generally do not think analytically about it and do not describe it in precise terms. Some patterns are not thought of as having any particular beginning, in which case a performer might enter a piece anywhere in his pattern; or a player might demonstrate a pattern without beginning it at the same point each time, or if he demonstrates it consistently there is no rule requiring him to begin his participation in a piece that way. Some details of internal pattern structure—such as the relation of drum ensemble patterns to dance or speech patterns—often cannot be discerned without access to further performance or sociocultural information. The number of patterns in vertical interrelation in a piece is often unclear—as, for example, when two or more individual sequences might be considered either separate patterns or united to form a composite pattern. The number and length of patterns in horizontal progression may be ambiguous, depending on whether they are conceived to repeat, vary, or further alternate. For instance, in the sequence A1, A2, A1, A3, A1, A4... when do we decide that increasing variation has produced a B1, a C1, and so on? Or take the sequence ABCDABCD—this could be seen as one pattern (ABCD) repeating consecutively, as two patterns (AB, CD) repeating alternately, or as four patterns (A, B, C, D) repeating across a regularly intervening interval. Although any one of the above assumptions is theoretically logical, in the absence of further information I always define as a pattern the longest consecutively repeating sequence. This is partly in an effort to modify a particular Western tendency to subdivide analytically beyond the point of rational necessity—my own failures have convinced me that it is easier to add further information as obtained than it is to recognize when prior assumptions no longer fit the accumulating facts and to give up the assumptions in favor of the facts.

In performance the component patterns of a drum ensemble piece are arranged within two roughly interconnecting hierarchies classifiable on several levels. An order of dominance of performers' patterns runs through the relatively simple repeating patterns of lesser supporting instruments (drums, rattles, and sometimes gongs); the less simple and usually repeating patterns of intermediate supporting instruments (usually drums); the simple and usually repeating pattern of a basic supporting instrument (usually a particular gong, or "bell," in those ensembles that use gongs); and the complex and often varying patterns of the master drum as leader of the ensemble. Another order—of timing reference—runs through primary, secondary, and overall relation within the ensemble and peripheral relation with other performers.

As soon as each performer knows what piece is to be played, he selects the proper pattern or patterns from his repertory; this may be in advance if the piece has been previously selected, or during a set of cues as the music begins. A piece is usually begun by the basic gong; the master drum often signals the gong to begin, usually by playing the gong pattern. If the piece has not been pre-

viously identified and if the gong pattern does not identify it (the Kete ensemble of the Asantehene, the head of the Ashanti people of Ghana, plays a repertory of about twelve pieces with only four gong patterns), the master drummer identifies it by playing either his own pattern or the pattern of a particular intermediate supporting drum, a kind of second leader to the master drum.

From that point each intermediate drum and lesser drum, rattle, and gong enters at a certain place—or one of several permissible places—in the pattern of the previously entering player with whom he has a primary time relation, meaning that the two adjust their timing first to each other and only after that to the other performers. After his entrance each player joins the others in making the various timing adjustments necessary even in the best groups to achieve the proper pattern relationships that will fulfill the nature of the piece. The basic gong pattern is considered the central timing for the piece, subject to changes imposed by the master drum and also sometimes voluntary adjustments by the gong whenever a number of supporting instruments have inadvertently shifted their timing. Each supporting drum, rattle, or gong player usually performs his pattern in primary time relation with the basic gong or some one or two other instruments, and in secondary time relation with the gong if his primary relation is with another instrument or instruments. He also performs in an overall time relation with all other instruments, and in a peripheral time relation with the melodic instrumentalists and the singers and dancers.

Tempo may vary from time to time in a drum ensemble piece. So also may rhythmic structure on most levels, as in the West, with a consistently regular pulse appearing across the ensemble only on one level. In the African piece we call that pulse, which sometimes repeats seven hundred or more times per minute, the "fastest" pulse. As the proper pattern relationships are achieved and maintained in a piece the observer can hear the generation of the fastest pulse. Throughout the piece it is almost always being sounded, often by several performers at once, and is probably being filled in mentally the few times it is not sounded. In my opinion it has a basic function in the efforts of the ensemble to stay together; certainly West African drum ensembles achieve a precision of rhythmic timing on the level of the fastest pulse well beyond that of Western equivalents. The fastest pulse is structurally fundamental, there being no standard substructure internal to it or between it and any pattern as a whole. The fact that "split" pulses or beats often occur within it is relatively incidental, although in density analysis these would be taken into account. The fact that the repetitions of the fastest pulse often group themselves into "gross" pulses or beats is also incidental. But a person oriented toward the basic metrical system of Western music might easily underestimate the importance of the relatively unstructured African fastest pulse by considering the African gross beats, which can be associated with the prescribed regular beats of more highly structured metrical measures, as the level of precise

timing. The meter-oriented person will then tend to define the African drum ensemble pattern, like most Western rhythm patterns or melody phrases or themes, as a division or multiple of the measure; accent sequences in the drum ensemble pattern might be seen as having the usual regular to syncopated relation to the prescribed strong and weak gross-beat stress values within the metrical measure structure.

Problems arising from a metrical approach to West African drum ensemble music (whether vertically through an ensemble of instrumentalists, singers, and dancers or horizontally across a pattern, piece, or genre) have beset most scholars, including Africans, who have tried to talk about drum ensemble rhythms in terms of the music itself. The problems are small at certain levels on which the simplicity, unity, and repetition of the rhythm is such that thinking in terms of meter is easy; singers' and dancers' "motor-beat" and certain drum ensemble patterns and even entire pieces are cases in point. But even at these relatively simple levels a focus on "downbeats," "pick-up" strokes, "rests," and so on obscures the true character of the patterns as they are conceived and played. And even greater difficulties develop when the metrical approach is attempted with the great body of African drum ensemble music that has a relatively high degree of complexity, diversity, and variation. Increasing complexity of patterns will lead to increasing ambiguity of meter as the gross beats become more obscure. As patterns become more diverse and the gross beats fail to coincide across the ensemble, the metrical approach will show a confusion of differing meters among the varying parts. As patterns (especially of a master drum) increase in variation, the meter-oriented person must deal with the issue of ever-changing meter. Any one or a combination of these metrical factors will tend to divert his attention from the interrelated patterns of the ensemble as a whole and increasingly cause him to focus on relatively isolable patterns, such as those of the gong or some supporting drums.

Another, nonmetrical, approach the scholar might use may be linked to frequent statements to the effect that African drummers do not think in terms of meter. In this approach the scholar simply sets down every sound and "rest" that he perceives; on doing that, especially with precise aids such as the Seeger Melograph, he might find that even the fastest pulse is not completely regular and conclude (although these instruments would reveal the same fact about the Western metrical beat) that the African patterns have no rhythmic organization.

Finally, some scholars may avoid altogether dealing with the rhythm in precise musical terms and instead approach it from such organizational viewpoints as verbal meanings, movement, or sociocultural significance—these, however valuable in themselves and in the music, do not comprise a full and well-rounded analysis.

The Analytical Approach

To sum up the article thus far, it can be said that West African drum ensemble music rests primarily on three general principles: (1) the intimate and highly structured interrelation of rhythm and sonority (2) within the intimate and highly structured interrelation of individual, subgroup, and total ensemble patterns (3) on a common but relatively unstructured rhythmic base. In Western music (1) the interrelation of rhythm and sonority is equally intimate but not as highly structured; (2) the interrelation of pattern levels is equally structured but not as intimate; and (3) the rhythmic base is equally common but much more highly structured. Put another way: both the drum ensemble music and Western music have (1) intimate interrelation of rhythm and sonority (2) within a highly structured interrelation of pattern levels (3) on a common rhythmic base; but in the drum ensemble music (1) the interrelation of rhythm and sonority is more highly structured, (2) the interrelation of patterns is more intimate, (3) the rhythmic base is less structured.

The article has tried to demonstrate that such comparisons of the two musics—in terms of both this general frame and specific levels within it—can, if the similarities and differences are not too much ignored or emphasized, aid Westerners in better understanding the drum ensemble music. On the other hand, it has also tried to demonstrate that if the comparison is not so handled it can make better understanding virtually impossible. A major goal of the article is to show that the only adequate analytical approach is one that treats comparative study not as an end in itself, but as a subordinate byproduct of the study of the drum ensemble music on its own structural terms.

Let us apply to this analytical approach the proper test for any: what can be found out about West African drum ensemble music by a person acquainting himself with it for the first time and in this manner?

If his initial step is to listen to the music, live or recorded, he might discover certain general musical facts. Early in the performance of a piece he might identify the entrances and the horizontally repeating, varying, or further alternating rhythm/sonority patterns of some of the individual performers. As the proper timing relationships are achieved and maintained, he might recognize the composite patterns of some ensemble subgroups and also the total pattern of the full ensemble. On any of these levels, within a pattern he might hear gross rhythm/sonority pulses that are often equivalent, but no more than equivalent, to the prescribed metrical beats of Western music. Within the gross pulses he might hear the fastest regular and continual pulses, and within those often irregular split pulses.

But on any of these musical levels the information is so general that it allows only the most noncommittal conclusions. For more specific information the observer would have to go to the musicians and others. Information on such issues as the number, length, beginning points, internal structure, and interrelation of patterns might be gathered by talking to the players and having individual ones demonstrate their patterns. Talking with musicians and others can also provide information such as the hierarchy of instrument dominance and timing relation among the performers and the association of the drum ensemble patterns with dance and speech patterns.

It should be remembered that none of these types and sources of information is prior to another; analysis and notation do not have to begin with any one or follow any particular sequence—indeed they rarely occur that way from one piece of research to another. The only rule is based on the form and content of the music: do not make any assumptions—above all, not those based on a Western "musical sense"—when information is lacking or ambiguous; be ready to organize specific data, as it comes in from any or all the sources, in terms of the drum ensemble music itself; use each kind of fact only in correlation with all the others.

Now this kind of analytical approach is certainly not new—it just has not customarily been used very much by Westerners studying non-Western music. But its popularity is slowly growing as more Westerners find that its rewards are great and that its use takes only the small although steady effort of maintaining an orientation toward the music they are observing rather than from the music they may know best. And the fact of this growth has already exposed another major problem that lies at the very root of analysis, although not necessarily at its beginning—notation.

The Notational Approach

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 the 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 thousands—explaining the myriad differences between what the notation says and what they know to be true in the music.

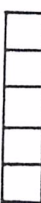
The Time Unit Box System (TUBS)—in which the examples that follow have been notated—is an attempt to bypass this problem. The system began to be developed in 1962 by Philip Harland for teaching purposes with the UCLA African Study Group, a performing ensemble in the Institute of Ethnomusicology, when


Harland was working with the Ashanti master drummer Robert Bonsu and the Ewe master drummer Robert Ayitee. The present author has contributed to its further development in collaboration with Ayitee and the Ashanti master drummer Kwasi Badu. A small but growing number of other persons have used the system in their work. TUBS represents the music on approximately the same level of precision that a trained observer hears; for those special analyses in which a more mathematically precise representation of rhythm and sonority is desired, elaborate mechanical tools such as the Seeger Model C Melograph and the Strobograph would be appropriate. TUBS can be an effective tool for transcribing and analyzing West African drum ensemble music; a person who is at least partly familiar with the ensemble playing techniques could use the system as a basis for performing or teaching the music.

Notation systems of similar type and effectiveness have been traditionally used to notate rhythmic patterns in such places as Java, India, China, and Korea, and several musicologists have developed their own systems. Traditional North Indian tabla notation, for example, consists of rhythmically grouped *bol*s, written syllables which imitate specific drum sounds. Harjia Susilo in his thesis *Drumming in the Context of Javanese Gamelan* (1967; UCLA Archive) transcribes drum patterns with his own adaptation of traditional notational practices in Central Java, using dots for rests and other symbols to indicate particular drum sounds. Many are familiar with the graph system used by A. M. Jones in notating Ewe master drum parts. More recently Moses Servawda and Hewitt Pantaleoni have described a tablature system for notating African dance drumming rhythms ("A Possible Notation for African Dance Drumming," *African Music [Journal of the African Music Society]*, Vol. 4, No. 2 [1968], pp. 47-52).

Although TUBS is no more rhythmically accurate than Western notation, we hope it will become evident in the following and final section of the article that the system has several distinct advantages in dealing with West African drum ensemble music.

A basic advantage is its ability to produce at least a rough structural sketch even with inconclusive information—as when the observer has nothing to work with but the ensemble music or when the musicians' description is too brief or ambiguous—and at the same time to insert notational detail when precise information is available.

In TUBS' horizontal sequence . . .  . . . the equal length of the time-unit boxes implies equal duration of sounds, emphasizing the fact that in the drum ensemble music precise durational control is not an important issue except in certain special cases. Thus TUBS gives a clearer picture of sequential temporal relations within and among patterns than do the notes and rests of varying precise duration used in Western notation.

Each box in TUBS represents one fastest pulse . . .  . . . , a basic time unit in the music, with subdivisions within the fastest pulse being notated with special techniques. In writing the sequence of fastest pulses TUBS avoids the time signatures 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.

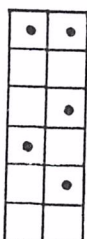
Each box in TUBS is left empty if no sound occurs in the time unit represented by the box, and is filled when one or more symbols to indicate any sounds occurring and to characterize their sonority by representing the techniques used by the performers to produce the pitch, loudness, tone quality, and carrying power of the sounds. Western notation has no effective capacity to indicate this full package of sonority—if sufficient diacritical markings were added to the notation in this direction the result would be virtually unreadable; conversely, in emphasizing precise pitch—or relegating it to one line as in the writing of rhythm—Western notation fails to recognize that in the drum ensemble music pitch is only one, although a necessary one, of several aspects of sonority. Of course, the degree of precision in indicating sonority is at the discretion of the notater. In some cases he might notate a sound without characterizing its sonority: when he is not familiar with the music; when the technical quality of recorded material or the conditions of a live performance are poor; when he finds it impossible to differentiate aurally the various sonorities, especially in fast or complex patterns; when sonority is a relatively minor factor in characterizing a drum ensemble pattern, that is, when there are no changes in sonority or such changes are random; or when for any other reason the researcher does not feel it necessary to become involved with details of performer technique.

On the other hand, when sonority is being dealt with more precisely, TUBS has a variety of appropriate symbols. These, together with various special markings and the notational arrangement in general, will be explained as the discussion progresses in the next section. Here we will simply give a brief example of how TUBS represents a segment of music on the simplest level, using a dot • to indicate sounds without characterizing their sonority. If we were to notate in TUBS a single drum playing the rhythm of "I've Been Working on the Railroad" it would look like



with the fastest pulse being visible between the symbols coming closest together. Very often the fastest pulse heard will result from the combination of the rhythms

of two or more instruments. Take for instance the so nearly ubiquitous feeling of three against two in African rhythm—notated in its component parts it would be



In density analysis we would treat this as a single motif . . . and we would find the fastest pulse visible between the three dots in the third, fourth, and fifth boxes.

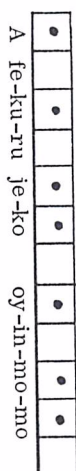
The two-line example above is a simple illustration of the graph-like notational stack in which TUBS arranges the various parts of the drum ensemble music. The stack allows an effective analysis of the horizontal structure of the rhythm-sonority sequences on any level of vertical interrelation—the totality of ensemble sounds, pertinent subgroups, and individual parts. Western notation, in treating the drum ensemble patterns as relatively self-contained units, fails to represent adequately their close interrelation.

Some Notational Analyses

When we listen to the music of West African drum ensembles, we first perceive the sound as an integrated whole. But as analyzers we very soon attempt to break down what we hear into comprehensible units, both vertically through the instruments of the ensemble and horizontally through time. As our attention shifts to ward these conveniently isolable but perhaps relatively meaningless units, we must constantly try to remember the interrelations that make up the totality of sound. And as we reconstruct these units in notation we must try to exhibit the broader organizational elements of the music. In this manner, let us examine some patterns and pattern relationships from various drum ensemble pieces as notated in TUBS. The analytical and notational techniques in the following discussion incorporate information obtained up to the time of writing; as further study develops, these will possibly change.

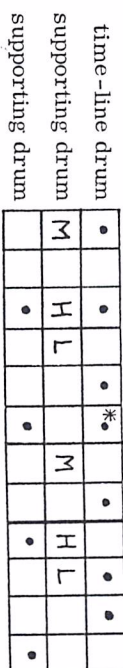
The first example is the beginning of *Fast Atsia*, an Ewe piece taught to the UCLA African Study Group by the Ewe master drummer Robert Ayitee and played by a basic ensemble of drums, gong, and rattle as the last piece in a dance suite made up of four interconnected but contrasting pieces. *Fast Atsia*, whose structure was set for performance purposes, is similar to two other pieces not done in the suite. All three of these pieces have the same gong pattern. *Atsia*, from which *Fast Atsia* derives, is slow in tempo. *Agbekor* is of medium tempo with certain differences from *Atsia* in the patterns of both supporting instruments and the master drum. *Fast Atsia* is very like *Atsia* in all respects except that the tempo, of course, is faster and correspondingly the master drum and dance patterns are probably somewhat simplified. Whether *Fast Atsia* should be considered a different piece or merely a faster version of *Atsia* is problematical—but, based on things that Ayitee has said and aside from all other factors, it is possible that tempo alone can serve to distinguish pieces.

A similar problem in analyzing the drum ensemble music from the viewpoint of gross-pulse structure exists in at least one of the pieces of a northern Yoruba hourglass stick drum ensemble in Nigeria. The pattern of the basic time-line drum is rhythmically the same as the gong pattern of Ewe Fast Atsia, and one supporting drum generates the same gross-beat structure which, if depended on for analysis, affects one's impression of the gong pattern as well as others. This might be a little difficult to hear because the Yoruba pattern is based on a speech pattern with a different beginning point and two primary accents

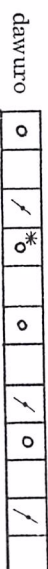


Referring to someone who eats two foods that do not go together.

and a third drum in the ensemble plays a pattern with low, medium, and high sonority variation (in the example, an asterisk indicates the beginning of the gong pattern as it is in Fast Atsia).

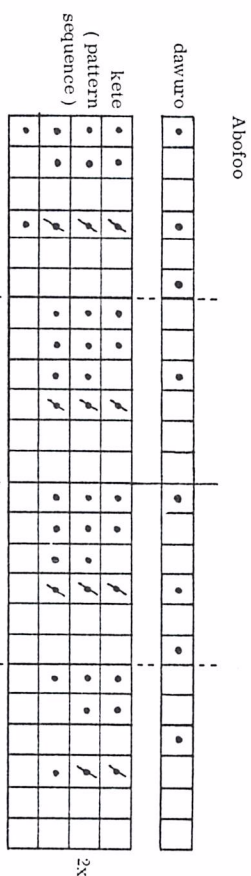


A comparable but even more subtle gross-beat situation exists in the music of Kete ensembles of Ghana, the drum groups that play for Ashanti paramount chiefs and for the Asantehene, the head of all the Ashanti people. The standard dawuro (gong) pattern, the time line, of a Kete ensemble is rhythmically the same as in Ewe Fast Atsia and the Yoruba piece mentioned above. That fact is hardly recognizable, not because of a strong gross-beat structure anywhere among the supporting instruments, but for other reasons. For one, the Kete gong pattern has a different beginning and also several damped strokes (asterisk indicates the beginning of the gong pattern as it is in Fast Atsia).

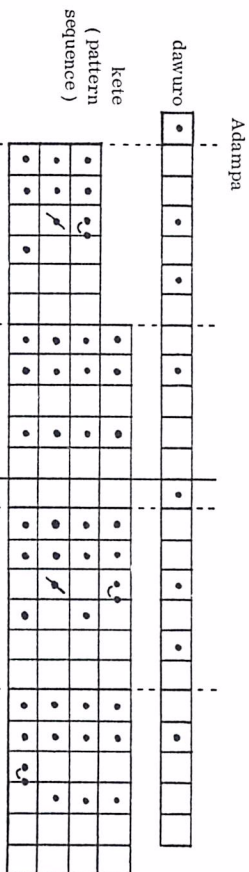


/ = a light damped stroke.

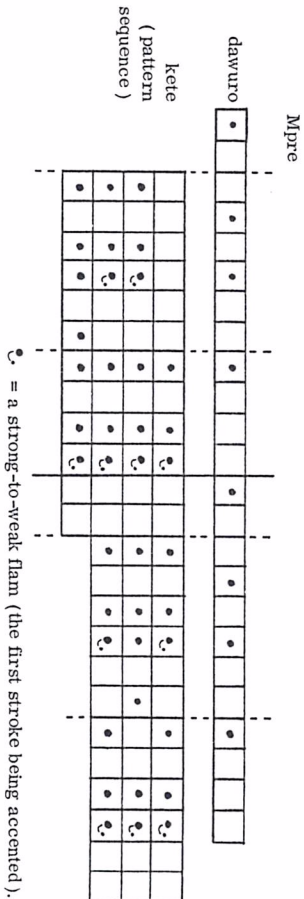
The dawuro pattern also sounds different from its counterparts because of the kete (master drum, played with two hooked sticks), which can be felt to generate a gross pulse. Moreover, since the patterns of that dominant instrument frequently change, the observer might experience a resultant feeling of change in the dawuro pattern from one piece to another and even within a piece. But even in relation to the kete the dawuro pattern is basically unchanging, as is attested by the Kete musicians—in this case by the Ashanti master drummer Kwasi Badu. As an example, below are segments of three Kete pieces—Abofoo (pronounced "Abofoa"), Adampa, and Mpre. The gong cycle is notated, as it is often played in these pieces, without the damped strokes of the "complete" pattern. The master drum patterns, all of which are notated from performance by Badu and one of which in each case is the piece-identifying pattern, are placed one under another for easy comparison but should be read horizontally from one line to the next without stopping. Since the musicians feel no difference in gong pattern from piece to piece, frame lines are solid



2x



⌣ = since this seems to be a timed technique dividing the fastest pulse in half, the first symbol appears in the center of the box and the second one on the line at the end of the box.



⌣ = a strong-to-weak flum (the first stroke being accented).

It has been said several times that to analyze the patterns of a drum ensemble piece individually is to miss the main characteristic of the music, which is the totality of sound produced by the interrelation of the various parts. This is particularly true in viewing the relation between the master drum and the rest of the ensemble. The supporting instruments perform patterns that are relatively unvarying. This fact produces structural similarities—within a piece and often from one piece to another, as in the three Kete pieces above—which must be taken into account. But to focus too strongly on it would do injustice to the master drum, whose changing patterns produce structural differences within a piece and especially from one piece to the next. Yet to focus too strongly on this fact would do injustice to the rest of the ensemble. What is needed is a comprehensive analysis that can encompass similarities and differences as components of the whole. This cannot be done intuitively or by standard Western musicological methods. A deeper probe of the music—involving such detail as the precise beginnings of master drum patterns, possible verbal meanings in subgroup or individual supporting patterns, and dance associations—would have to be made before any trustworthy conclusions could be reached. Such a probe is still at an early stage in the author's own work. We will, however, append to the article illustrations of various levels of notational approach presently being experimented with in dealing with whole pieces. The first score is the Abofoo of the Kete examples we have been looking at; the second is the Ewe piece Sohn.

APPENDIX I

Abofoo

Following are two selections of Abofoo, based on demonstration tapes in which Badu played the different parts in sequence.

Tape I

The first score — representing the full piece of 2:11 minutes with an fp (fastest pulse) of 504 per minute — is written exactly as the tape was heard. It includes all the instruments but the dombo, which Badu did not play in this recording because its pattern never changes from one piece to another in the Asantehene's Kete ensemble with which he is experienced. We will look first at the supporting instruments.

Diagram illustrating a Go board layout with three 2x2 corner regions highlighted:

- Top-Left Corner (2x2):** Labeled "apentemma".
- Top-Right Corner (2x2):** Labeled "aburukuwa I".
- Bottom-Right Corner (2x2):** Labeled "aburukuwa II".

The board is divided into four quadrants by a vertical line. The top-left quadrant contains the text "kete (cue)" and "dawuro". The top-right quadrant contains the text "time = 2:11 fp = 504". The bottom-right quadrant contains the text "throughout" with an arrow pointing to a specific cell. The board is filled with black and white stones, with some cells containing a black stone and others containing a white stone. The 2x2 regions are labeled "2x" at the bottom.

Tape II

In the second tape — 1:36 minutes of master drum and time line with an fp of 546 per minute — the sonority factor and the standard ending pattern are the same as in tape I, but otherwise there are some interesting differences in the master drum sequences. Without sufficient verbal information, it is impossible to know whether it is more significant to define the patterns in terms of six, twelve, or twenty-four time units or some combination of these. On the six-unit level, tapes I and II contain the same master drum patterns except for the last part of line 9 in tape I, which does not appear in tape II. On the level of twelve or twenty-four units, patterns reckoned from the beginning of the gong cycle in tape I — as in line 3 — start in the middle of the gong cycle in tape II — as in lines 3-4 (see brackets). Because of the many sequential repeats of some groups of twenty-four units, pattern analysts on that level might be fruitful — as has been said, my general preference is to analyze in terms of the longest sequences valid given the information obtained. But the most important thing is to have a notation and an attitude of mind that do not commit themselves to any one possibility over the others until sufficient information is available.

Abofoo

```
time = 1:36  fp = 546
```

[illegible]

APPENDIX II

Sohn

The Ewe piece Solu was a set piece as Ayitee taught it to the UCLA ensemble. The supporting instruments were allowed virtually no variation. The sequence of master drum patterns, which are related to the patterns of the dancers, never changed from one performance to another, although within that sequence there might be variation in the number of times a pattern might repeat, as indicated in the margins of the score. At spots throughout the piece the master drum plays a "stop" pattern as indicated; when he does this, the other instruments substitute his rhythm for their normal patterns and the dancers perform a particular related pattern. Below are the supporting patterns of Solu, and on the following two pages are the master drum sequences. (Sonority symbols are as specific in the notation as they are conceived by Ayitee.)

Supporting instruments

[illegible]

Since the pattern of rattle I has only downstrokes, after the first stroke these are notated with the noncommittal dot.

In rattle II, \mathcal{D} is a downstroke in which the rattle hits the thigh; \mathcal{U} is an upstroke in which the rattle hits the palm of the free hand.

toké I

$\$$ = on this instrument a damped stroke is made by the fingers of the free hand pressing on the drumhead and the stick striking at the same time or after and rebounding.

pattern 8

pattern 8	:S			P			P			P			\$			P			P			S	h	S	h:	2x
"stop" pattern	\$			\$		P		\$					h	S	P			\$							P	
pattern 3																									:h	S
"stop" pattern			h	s			h	s			h	s			h	s			h	s			h	s	:	1, 1½, or 2x
	\$			\$			P		\$				h	S	P			\$							P	
pattern 4	:S	h	h	S	h		S		P	f\$							P	f\$:	2-4x	
"stop" pattern	\$			\$			P		\$				h	S	P			\$							P	
pattern 3																									:h	S
"stop" pattern			h	s			h	s			h	s			h	s			h	s			h	s	:	1, 1½, or 2x
	\$			\$			P		\$				h	S	P			\$							P	