

## IX How Music Organizes Time

### Rhythm as Pattern

Usually, when we think of rhythm, we tend to think of it as a beat, a steady series of strokes which by their regularity tell us that the sound we are hearing is humanly controlled and something we should listen or dance to. But a simple series of strokes is not what compels humans to move. It not until we recognize a pattern of these strokes, only then do we hear the imposition of a human sense of order on what would otherwise be another of the random or chaotic number of events which we constantly hear around us.

Victor Zuckerkandl has said, "Music is not just in time. It does something with time."<sup>1</sup> (Victor Zuckerkandl. *The Sense of Music*. Princeton University Press. 1959. pg. 99.) This is an important distinction. Music does exist in time, but in a real sense, music is a playing with time, creating patterns, changing them, repeating them.

It is not just that music exists in time, is it that music is about time. What engages our interest and stimulates our response to it is the manner in which music defines time for us while we listen to it or dance to it. We heard sound in motion and try to recognize humanly generated form and pattern in it.

### Abstracting Patterns in Music

All music events, performances and even when we imagine actual music in our minds, occur in time. Although they occur in actual time, musical events can be conceptualized and then repeated in time at will. Each performance of music, each time we think of a song, that performance or that memory occurs once in actual time, yet we can repeat the ordered pattern of the song in performance or in memory many times. The musicologist, Charles Seeger referred to these two different types of time as general spacetime, to refer to our perception of seemingly never ending and never repeating time, and, in distinction, music timespace to refer to discrete units of time, as in musical performances or compositions which could be repeated in different general spacetime contexts. <sup>2</sup> (Charles Seeger. *Studies In Musicology 1935-1975*. Introduction: Systematic (Synchronic) and Historical (Diachronic) Orientations in Musicology. Berkeley: University of California,

1977.)

It is helpful to think of the manner in which music exists in time in these two distinct ways. Any music, performed, heard, or even imagined, occurs at one particular point in time, at a single unrepeatable point in history. Music can also exist as an abstract concept outside the limitations of general spacetime, as for example in the case of a recording on tape or CD. The abstracted musical composition can then be repeated as a separate event in general spacetime. Music can thus also be imagined away from the context of the original performance. This specific timespace is what we use to conceptualize about specific musics, while each particular act of conceptualization occurs in general spacetime.

Mozart's Symphony No.40 has a formal structure and a pattern of durations and spaces in time which form a culturally shared concept in our culture even when the symphony is not actually being performed. While this way of thinking about time may appear obvious, it is helpful when we begin to look at the manner in which music functions in cultures other than the Western European Fine Art tradition. For example, until recordings became commonplace, each improvised performance in either the classical music tradition of India or in American Jazz, was conceived of as a unique and unrepeatable occurrence in general spacetime. There was no culturally conceived abstraction of the music beyond the performer's and the listener's memory of it, which could be carried over from one performance to another. As memory faded, the possibility of reconstructing or repeating the performance faded as well.

Although we can think of the Mozart Symphony No. 40 as a fixed and particular composition, no two performances of it can ever be identical to each other either. The difference between the Mozart symphony and North Indian classical music for example, is that the Mozart symphony can be conceptualized in that culture as an entity apart from any one performance of it, something which is not feasible, desirable, nor appropriate in either the Jazz or Indian music traditions.

## Spaces Surrounding Sounds.

Music occurs in time and requires time to be realized. The contours and forms perceived must be perceived in space and time. A sheet of paper with a drawing of a star on it is more than just a presentation of a star on paper. The space around it as well as its placement on the page make it more than only the pictorial description of the object. Music also uses space and time in the same way. What we think of as a melody is

more than a group of sounds or notes. Perception of the melody is as much the result of the spaces and silences between the sounds as the sounds themselves.

In teaching us to see more accurately in order to draw realistically, Betty Edwards in her book, *Drawing on the Right Side of the Brain*, advises us that we must first overcome the natural interference created by the preconceptions that the “logical” and “thinking” functions of our brains have been trained to tell us about objects we see. We need to see things as our eyes see them, not as our “intellectualizing” brain tells us it knows it really is. She suggests that we may learn to achieve this by attempting to look not only at the object but also around it at the abstract pattern of shapes created by the spaces around the object. By thus concentrating on these abstract patterns of space for which we have no logical or verbal preconceptions the actual form of the object we are attempting to depict will appear in more accurate proportions.

In music we are accustomed to thinking of sounds, but these sounds would not lend themselves to organization into meaningful patterns without the spaces which set them off. While in many cultures music is thought of as a pattern of sounds, in fact, the durations, pauses, rests, or empty spaces which surround the sound are also a vital element in delineating patterns in our perception. In our culture we sometimes speak of a person as having a bad sense of rhythm. This usually means that this person is not careful or skillful in preserving the spaces around the sounds, although the sounds themselves might be correct.

## Organization of Patterns

Let us look in more detail at how we use pattern in music. We can speak about the particular approaches to organization of space, melodic contours, form and rhythm, used by a particular musicians, or by an entire culture for that matter. Speed of performance, tempo, and pulse are one means of talking about differences between one music performance and another. In fact much of what we perceive about speed in performance is subjective. Music can be both fast and slow at the same time. When we hear, for example, music in slow tempos but with rapid streams of notes, do we determine that this is to be experienced as fast or slow? To give an illustration, let us imagine a music in which there is a basic pulse while there is a slow melody going on in lower range and at the same time rapid melodic activity in the higher range.

Thus, for example:

If in the previous example we were not able to hear the basic

Basic Pulse: \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*  
High Range .....  
Low Range: 0 0 0 0

pulse but only the low range slow melody and the high range fast melody we might decide that the music was either fast or slow. We can enjoy music without having to verbally describe it as a fast or slow tempo, but should we want to do so, the way in which we decide about the speed will come from the context which has already been defined for us by our previous experience and not from an abstract analysis we might make as to whether the low melody or the high was a better indicator of tempo. In other words, sometimes music can be heard as either fast or slow depending on how our culture has defined it and how our own previous experience has prepared us.

It is our own culturally learned verbalizations and conceptualizations which delineate the boundaries within which we make judgments about what we hear. But our culture also creates limitations for us in dealing with such aspects of music, limitations of which we are usually unaware and which often interfere with our ability to hear new relationships in music with which we may as yet be unfamiliar.

## Cultural Preferences and Tempo

There are broad patterns of music which show up in specific cultures as distinct preferences for faster or slower rates of speed (*tempi*). This makes the music of one culture seem relatively faster or slower by comparison from the vantage point of another culture. In spite of variations in the perception of speed between one music and another we may notice that in a particular culture or style of music one particular performer regularly plays at a faster tempo than another performer or that one composition is played faster than another. We are able to measure this perceived difference by relating it to time. What occurs is that we become accustomed to our cultural labels of fast and slow in the type of music we are accustomed to and may find that our labels do not apply when we enter the realm of another culture.

In the music of Central Java as in the music of Bali there is a practice in which the higher pitched ornamenting parts of the ensemble execute rapid streams of notes at slow tempos than at a higher rate of fast to slow parts than is usual when playing at more rapid tempos. The effect of this standard Indonesian practice is that at slow and moderate tempos, there is a great degree of articulation, rapid melodic lines, in the higher instrumental parts which gradually decreases and falls away as

## Time and Space in Japan

Japan is a culture in which great emphasis is placed on balance and symmetry. In Japan, there is as much thought for spaces as for the objects which they frame. This concept manifests itself in many aspects of Japanese life, from traditional brush painting to the manner in which food is prepared and served. In modern colloquial Japanese the word for "wrong" is "*ma chigau*" which literally means the spaces are different or wrong. The words for "different" and "wrong" are derived from the same root. This does not mean that every time a Japanese speaker wishes to indicate that something is wrong he is consciously referring to objects and spaces. However, the root meaning and original intention of these word strongly corroborates the importance given to space as a concept in the general culture.

We might not immediately be struck by the evidence of the Japanese sense of balance between object and empty space, when we hear Japanese music, but for the Japanese, it is there. In learning Japanese music for example and in particular, in the study of Japanese singing, the length of each note and the length of the space between notes is from the earliest steps, considered very important to the process of learning. Even school children in Japan sing in loud strong voices, almost at the top of their lungs, carefully observing the timing of the rests between notes.

the music gets faster.

The analogy one might draw is to the shifting of gears in an automobile; at slower speeds there is more rapid turning of the gears relative to the axle than at faster speeds. The overall subjective impression received by both those familiar with this music as well as by even those who may not be so familiar with the music is clearly that the tempo has become faster. However, there is an important difference in the manner in which the impression of tempo change is given in the Indonesian examples compared to the manner in which the effect would be produced in the West. The use of this "shifting of gears" technique in the music of this part of the world gives it a very distinctive "Indonesian" character whenever a change of tempo occurs.

Basic Principles of Rhythmic Organization

The Divisive Principle

In the West the organization of rhythm is approached from a divisive principle. Units of time are, either added together to make them longer, or subdivided into smaller and usually equal units of time. In theory, we conceptualize a regular and fixed unit of time and then subdivide it. Therefore, the traditional rhythmic patterns of the West have historically tended towards evenly divisible rhythmic groups of two, four, six, eight, twelve and sixteen. The metric pattern based on a unit divided into three has, of course, also had considerable favor in Western music. It is the basis for such important traditional dance forms as the *waltz* and the *minuet*. This unit of three beats occurs just a little less frequently than the even meters of two, four, and eight, in the Western tradition. When a three beat rhythm does occur, it too is subdivided into smaller units which causes the subdivision to return again to an evenly divisible number such as six or twelve.

The divisive principle in Western music is not an absolute limitation. It is however, the basis for the notation system in Western music and is the underlying structural principle in the music. Note durations are organized in relationships which are twice as long, or twice as short, or one and one half times as long as another. Single durations are divided into equal subdivisions, usually of even numbered values, two, four, eight, and sometimes three, but also at times into 5, 7 or 9. This is not to say that all music in the Western tradition is written in these values exclusively. Composers have imaginatively devised new patterns and the means of notating them. Nonetheless, it is important to remember that the notation system was devised to accommodate the most frequently used types of rhythmic organization and the divisive principle does this well.

## The Additive Principle

The subdivision of a unit of time into regular and equal parts comes quite easily to us. Before the beginning of this century rhythmic meters using five, seven or nine beats were extremely rare in Western or Central European music. Turkish music has had an important influence on the music of Eastern Europe, in particular in the Balkan states of the former Yugoslavia, and in Albania Macedonia, Bulgaria, Romania and Greece. Turkey has for hundreds of years approached the organization of rhythm from the additive principle. By this means units of time are added together to make patterns. Subdivisions of beats into smaller and shorter durations do occur, but the basic rhythmic organization is by the adding together of shorter units of time. In Turkish folk or classical music some metric patterns may be evenly divisible and others not. That is because the addition of some units, two plus two, for example, results in an evenly divisible unit whereas the addition others, two plus three, for

example, will not.

In Turkish music a metric structure of eight units, being also a combination of units of two, can occur as easily as one of seven or nine beats. However, since adding together units of either only twos or only threes can produce nothing but endless, and to the Turks uninteresting, strings of repeating twos or threes, the basic additive unit in Turkish music became the addition of two plus three. Meters made up of various strings of mixed twos and threes became characteristic. So we commonly find in Turkish folk music and in the music of those areas of the Balkans which came under Turkish political and cultural influence, meters of five, seven, nine, eleven, thirteen and even twenty-five units and longer ones.

These units function in a manner roughly equivalent to the use of measures or bars in the Western European tradition. In the Classical music of the Ottoman court, each rhythmic pattern is called an *usul*. The Usul patterns can be very long and complex with certain *usuleri*, as these rhythmic cycles are called in Turkish, comprising as many as 64 or more units. Since these *usul* are made up of varying combinations of groups of two and three units, the overall pattern created by the irregular alternation of twos and threes creates for each *usul* a singular and unique identity.

These references to Turkish and Western European metric principles were chosen here as means of illustrating two distinct rhythmic systems based on different principles. The Turkish rhythms seem complex to Westerners who are accustomed to divisible metric units and thus see these as asymmetric rhythmic patterns. However, even the term asymmetric belies a Western prejudice. The word additive seems to better explain the governing principle.

## Additive plus Divisive

The music of India provides us with yet another metric system, one which uses both additive as well as divisive principles. It seems that in the older forms of folk music of the Indian subcontinent, additive meters of combined two and three unit groups were commonly used. In the classical music traditions of both North India and South India great emphasis has been placed on the systematization of all possible permutations of tone and rhythm. In terms of the use of rhythm in Indian classical music it is perhaps not quite the same principle of equal divisions of a single unit that one finds in the West. In the music of India the basic additive approach to the fundamental number of metric units is enriched by the potential for subdividing each unit into a smaller number of sub- units, which may in turn consist either of equally divisible sub- units

or asymmetric numbers. In addition, however, the entire larger unit may be redivided into another pattern of sub-units and then that one again further subdivided.

To choose a simple example as an illustration, in a metric structure of eight beats it is possible to further subdivide each of those eight beats into two, three, four, five, six, seven, eight or nine sub-units. In addition, it is possible to take the larger eight beat unit and within precisely the same space of time in which it took to execute eight beats, now execute a different number of total beats. To illustrate the principle, let us create a simple example.

A basic cycle of eight beats;

1 2 3 4 5 6 7 8

can be subdivided into threes;

1 2 3 4 5 6 7 8  
123 123 123 123 123 123 123 123

making a total of 24 beats. This total number of sub-units permits a different possible configuration of beats, which results in the potential for a new pattern. Since 24 can also be subdivided by 2 into 12, by use of this technique, a very different pattern emerges out of what was first heard as a pattern which consisted of 8 beats;

1 2 3 4 5 6 7 8 = 8  
123 123 123 123 123 123 123 123 = 24  
1 2 1 2 1 2 1 2 1 2 1 2 = 12

This new subdivision into 12 might be further regrouped into groups of three;

1 2 3 4 5 6 7 8 = 8  
123 123 123 123 123 123 123 123 = 24  
1 2 1 2 1 2 1 2 1 2 1 2 = 12  
1 2 3 1 2 3 1 2 3 1 2 3 = 12 divided into 3

In an Indian music performance the actual use of this technique becomes considerably more complex. The story in the box may serve as an example. Since the principle by which Indian musicians divide units of time is based on their ability to remember and “sense” the duration of a large unit of time, the challenge in a good performance is very different from what it may appear to a Western trained listener. To draw a simple comparison, with Western practice, in general slower tempos are considered easier from the standpoint of technical difficulty than faster tempos. In India, however, slower tempos are considered most difficult by musicians because it is necessary to be able to maintain and work with a mental image of a longer period of

## Discovering The Indian Rhythmic Principle.

I can remember some years ago at a performance of North Indian classical music my sense of astonishment and satisfaction when the late Chaturlal, a great North Indian *tabla* player, performed a rhythmic improvisation in an unusual *tala*, or rhythmic cycle. This was the *tala, Pancham Saveri*, a rhythmic cycle of 15 beats. *Pancham Saveri* is not of a simple string of fifteen beats, but instead an interesting pattern consisting of 2 + 4 + 4 + 2 + 1.5 + 1.5 making a total of 15. In the course of his improvisation he took the audience through many complex and minute subdivisions of the basic pattern of 15 beats which defines this *tala*, always returning, however, to the basic 2 + 4 + 4 + 2 + 1.5 + 1.5 of the basic *tala*.

Throughout the course of his improvisation he maintained the same basic tempo. Therefore each repetition of the 15 beat pattern or cycle was covered in the same amount of time. In the midst of this improvisation he suddenly introduced a new pattern of 10 beats which exactly covered the same period of time in which he had been playing 15 beats. After some thought it became clear that what Chaturlal had done was to mentally divide each unit of the basic pattern of 15 into 2, thus producing a common denominator of 30. By then emphasizing every third beat of the 30, he could now execute a pattern of 10 beats in the space of time in which he had been playing 15. Thus:

Tala: Pancham Saveri.

1 2 1 2 3 4 1 2 3 4 1 2 12 3 12 3	= Pattern
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	=15
.....	=30
1 2 3 4 5 6 7 8 9 10	=10

By using the common denominator of 30 total beats in each cycle Chaturlal was able to alternate between a rhythmic cycle of 15 beats and a superimposed pattern of 10, both of which were executed in precisely the same period of time. I say precisely with the understanding that comparison by a stopwatch or certainly by more precise means of time measurement would doubtless have revealed minute but natural human fluctuations. However, to all present the perception was that the theoretical, mathematically precise feat had been accomplished.

I recall that I had a great sense of self-satisfaction at discovering a small, but to me very significant, key as to what goes on in Indian rhythm. However, a few short years later my confidence was shaken by a concert in which another *tabla* player, this time Mahapurush Mishra, improvised in a rhythmic cycle of seven beats. During the course of various permutations and subdivisions of the seven beat cycle, he suddenly shifted into a pattern of ten even beats, again within what was perceived as precisely the same amount time in which he had been playing seven beats. The only possible common denominator for both 7 and 10 is the number 70, but at the rapid tempo at which he had been performing it would have been absolutely impossible for any human to conceptualize 70 subdivisions of that unit of time — and yet, try as I might, I could think of no other means of accomplishing this feat.

The answer, which appeared obvious upon reflection only much later, was corroborated for me by other Indian musicians. If a musician has been trained to be very sensitive to the perception of varying periods or lengths of time, he can retain the mental image of that period of time while subdividing it into various units. This is to say that it is possible to perceive and hold in memory, the period of time, the duration of time between fixed points of time. Thus the Indian musician playing a cycle of seven beats has a mental image of how long it takes to complete the seven beat pattern. He can then subdivide this same period of time into various sub-units. My Western orientation, based as it was on the principle of equal subdivisions of units of time, made it difficult to imagine that the solution would lie in that a span of time of about six or seven seconds in length could be thought of as a tangible entity that could be mentally sliced up by various numbers into equal portions.

fixed time as a single fixed unit upon which to draw varying permutations. Thus, playing fast becomes a matter of technique and dexterity but playing in slow tempos requires an ability to a fixed spatial memory of a single long duration and then to impose mathematical permutation of it.

This illustration of different approaches to rhythmic structure gives some idea of the scope of variation which becomes possible as the result of differences of cultural tradition which have evolved along independent paths. It is also important to think these differences as directions or paths rather than as static conditions. They manifest themselves as different practices and grow and change. Thus one can easily see how the cultural context not only sets the situation in which a different type of rhythmic problem is encountered, but the solution to the problem must also follow from the culture as a natural step. In this way the North Indian musician, who has been making use of multiples based on additive patterns, when searching for a stimulating solution in an improvisation performance will not reasonably consider choosing the Western method of symmetrically equal subdivisions of a rhythmic unit.

## Multilayered Rhythm

It is in the study of the world's music that one finds some of the most intriguing examples of man's ingenuity in devising new and unique cultural solutions to cultural forms for which we might otherwise have thought there were no more possibilities. It was not too many years ago that many Westerners, Americans and Europeans, thought of sub-Saharan Africa as a region of primitive or primordial rhythms. Most of us today have had some even minimal experience with

African music and, we trust, have a more objective impression of what goes on there. In fact, what may have to the first European visitors seemed like unschooled and disordered music was, in fact, some of the most complex music devised by man on the planet.

One important element in the African cultures of the region south of the Sahara desert is a strong sense of social cohesiveness. Members of most communities are closely linked and a sense of a unified group is something reflected in the music, as well.

## Native American Rhythm

While it is difficult to speak precisely about the concept of rhythm as it is employed by the Native Americans of both the Northern and Southern hemispheres, it seems that rhythm is not thought of in terms of fixed rhythmic cycles which are repeated or divided. It may be more appropriate to think of this music as being held together by a constant, never ending beat, so strong in its directness that one can imagine that it goes on in the mind even when it is not heard. It is also very common for the rhythm of the voice to be separate and independent of the accompanying percussion rhythm. Whereas in Sub-Saharan African musics, it is possible to find points of synchronization between varying layers of simultaneous patterns, this is more difficult to explain in Native American music. That voice and percussion should exist in separate and independent spheres even when played by a single performer is something understood and accepted in the native cultures of America without the need for any written or verbalized theory to explain it.

Characteristically, performances give the impression of not beginning or ending at any precise moment. The rhythm begins as though it had been going on silently in everyone's mind and at some point everyone made it explicit and audible. The devotees of the Peyote religious cult in the Southwestern United States say that they must always have a campfire to sit around during the ceremonies and that the change in perception takes place as one stares at the endlessly changing patterns of the flames.

While in most of the cultures we have talked about here, the abstraction of time is used to function as the organizing unit in music performance. This unit can then be stretched, compressed and accelerated or prolonged according to the requirements of that tradition or that particular performance. It does also appear, however, that there are traditions, like those of the Native Americans and some few others in which this artifice may be considered unnecessary.

## Uncountable Rhythms

It is possible with precise tools of measurement to record events occurring at even minute fractions of a second. Cognitive scientists

say that somewhere about one twentieth of a second is the threshold of human perception. Although scientific equipment can record events at levels beyond the limit of our ability to perceive them, what is important in the study of man, is what lies within those limits. There are certain rhythms used within the many music cultures of the world which seem to defy unaided human measurement. These rhythmic patterns are regular enough so that we know that they are humanly control and deliberate, and yet at the same time even experts are baffled and disagree about how they are counted.

One interesting example of this type occurs among the Maguindanao people who live on the Island of Mindanao in the Southern Philippines. They use gong ensembles called *kolingtán*, or *kulingtán*. One of the many rhythmic patterns used by the Maguindanao is called *titdu*. This is a pattern is two beats, barely unequal with a slight prolongation of the first beat in relation to the second. The sound is of a two beat rhythm which sounds just a bit off, but not as distinctively off as say to be counted 3 to 2. The Maguindanao musicians may simply think of this as their style of playing a two beat pattern. When asked them to play a simple pattern of two regular even beats, the musicians played what again sounded like *titdu*.

The Gypsy musicians of Romania play many kinds of music for all audiences in Romania When they play their own Gypsy music for themselves, they have a rhythmic pattern used only for one type of their own special urban Gypsy love songs. This pattern, called *tiitura de of*, is another example of a pattern which consists of two slightly unequal beats. The tempos used for these expressive songs are moderately slow and the voice seems to float along effortlessly while the rhythmic accompaniment can only be described a moving with a "graceful limp". The first of the two beats, like in the example of the Maguindanao *titdu* described above, is longer, a difference which is made even clearer with the generally slower tempos use in the Romanian music.

Romanian Gypsy musicians have no need to count the rhythm. To refer to it by its name, or even just to suggest a song usually accompanied by this pattern is enough for all to agree on the execution of the rhythm. Romanian musicologists argue over whether this is a pattern of 8 followed by 7 counts or 11 followed by 9. Upon measuring a recording of this rhythm electronically, the durational differences each first beat and each second beat turned out to vary minutely in each case. No two were found to be precisely alike enough to be able to describe the rhythm a proportional label. The ratio of long to short beat averaged .75 but ranged from .73 to .80. Therefore by converting these ratios to the Western metric system, this music wandered between a possible 7 beat pattern of 4 plus 3, through a 37 beat pattern of 21

plus 16, to a 9 beat pattern of 5 plus 4. 3( Robert Garfias, "Survivals of Turkish Characteristics in Romanian Muzica Lautareasca", Yearbook for Traditional Music. 13(1981) pp.97-107.)

What is important to performers and their audiences alike, is not the precise measure of the pattern. In fact, one can feel the slight changes in the duration of the beats and this must give the pattern some of its flavor. These numbers simply represent the closest approximation to a meter which will accommodate the execution of these unusual patterns. The conceptualization in the musicians minds is enough to recreate the fluid sense of rhythm required for the music and clear enough in each of their minds to maintain the fluidity of the performance without straying into some other rhythmic pattern. As they play the musicians let the rhythm fluctuate slightly in reaction to the melodic phrase at the moment.

Another interesting example occurs in Africa. Throughout Africa south of the Sahara, one finds frequent use of what appear to be regularly repeated and fixed rhythmic patterns. These patterns are often grouped together in multiples of six beats, that is either six beats, 12, 24 or 48 beats. These rhythmic patterns are easily discernible as regular and predictable and one might easily venture that whether the African musicians conceptualize the patterns in numbers or not, they do conceive of them as regular sets of even beats. However, electronic measurement of one such "regular" and "rhythmically even" performance, one in a rhythmic grouping of 6 beats, revealed that the time space between beats 5 and 6 averaged a 20th of a second longer than the time space between beats 4 and 5.4 (Robert Garfias, "Symposium on Transcription and Analysis: A Hukwe Song with Musical Bow", Ethnomusicology VIII No. 2 (September 1964) pp. 233-240.)

## Time and Rhythm as Cultural Constructs

Again and again and in many places throughout the world, we find that in attempting to explain and understand the practice of music, theoreticians have devised and employed convenient templates to better explain practice. The difficulty is that these devices soon begin to take on lives of their own. They begin as a convenience become rules even when they are not useful nor even applicable to the situation at hand and as such can influence and color our perceptions. Concepts of time and how it can be measured arise out of the culture and music practice likewise develops out of the same culture and uses the same concept of time. Although the explanations of the theorists may be of little use to the performing musician, both theory and practice arise from the same basis.

In some cultures, such as our own, time is conceived as a unit which is to be then divided, added, or multiplied. In some cultures, time is instead thought of as endless, almost as though each performance occurs as part of a continuous segment briefly abstracted out of general spacetime. Music thus conceptualized can then be organized around the concept of a steady and regular pulse rather than a fixed and repeated metric structure. The music of the Indians of North, Central and South America comes to mind, for while one might try to apply some principle of metric organization to the analysis of this music, the results fail to explain the sense of continuity.

## Summary

We have observed the use of pattern and principles of organization of time in music as they have developed in a number of different cultures. In each of these cases what we have been describing is a set of performance principles which have evolved over a long period of time. There has been in every case a mixture of newly created practices which eventually have become standard within that culture. We observe the final results today as vastly different principles of rhythmic organization, however, some may have developed independent threads out of original connections. The use of rhythmic pattern in the Far East, India and the Middle East has made use of extensive borrowings of each others practices and what we see today as highly individual cultural characteristics may have been, perhaps five hundred years ago, much more like common practice.