# Time and Perception in the Structure of Music

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How sound waves reach our brains and how we respond and react to these wave falls outside the domain of ethnomusicology. Nevertheless, in order to consider something about the way music functions in different human societies, it will help to clarify some of the junctures between natural sound waves and the humanly created construct we know as music. In this manner we can think about where the differences occur between the ways people hear and use music in different societies.

## The Properties of Music

### Music in Time and Memory

One of the important parallels between the arts of music, dance and speech lies in the fact that they all require the passing of time to be perceived. They exist in time in contrast to the spatial character of the plastic arts. Dance and theater move both through time and space. Literature and poetry can also use time when they are being read, but both these forms are most frequently expressed and conceived in their static printed forms. In fact all the arts deal in a realm of temporal and spatial thinking and between them many parallels can be found.

Music can be notated and read from a static printed page much like poetry or literature. We usually think of music in its aural mode, however. It is either played live or reconstructed again and again in time by means of a recording. Music is a temporal and spatial arrangement of events into a humanly recognizable form. The manner in which one person creates an arrangement of sound events is based on that individual's previous culture experience and assumptions.

This may seem obvious but think about, for example, the fact that the entire scope of music in one part of the world may be faster, slower, louder, quieter or have a higher or lower range of notes than that of another. All these expressions still exist in time, but the scale of velocity, volume and range may be different for each cultural group and will seem logical and appropriate to those who are a part of that culture.

In order to effectively work in time, music requires that we use our memory. We are hearing the sounds at the moment at which the sound waves reach our ear drums but we make music of this constant stream of sounds because of our ability to remember what we just heard and thereby estimate what it is we just might be

hearing next.

Our ability to remember what we have just heard has natural limits. There is also a great variety in this ability from one human to another. The ability to remember in order to understand a music also varies with the culture. Until the middle of the 20th Century, the tradition of Western Classical music depended on the listener's ability to retain in memory long and complex streams of music in order to be able to recognize the formal pattern of the music and what the composer had done with it. Many of the traditional musics of Asia also required that the listener be able to retain long music structures in mind in order to appreciate the performances. Much modern music, by contrast, saturates us with its sounds and does not require us to rely on memory of long complex patterns. We are expected to immerse ourselves in the sound without having to remember long or complex patterns that were previously heard. Other musics create a predictable pattern which allows the listener to become one with the music and perhaps even to dance to it.

**James Carlsen's Experiment with Expectancy**

The systemic musicologist, James Carlsen carried out experiments which compared groups of young people from Hungary, Germany and the United States, groups which included both individuals who were trained in music and those with no particular music training. In this study he illustrated that the patterns of expectancy for the Americans and the Germans were close while those of the Hungarian group were most distinctive. While it might at first seem that culturally, the Germans and Hungarians would manifest a greater number of similarities, the distinctive linguistic features of Hungarian, which set that language completely apart from the Germanic, Slavic and Romance type languages of most other Europeans must account for the distinctive showing of the Hungarians as a group in these experiments.

Memory plays a vital role in the process of listening to music. It enables us to encode new information and to relate it to previous experience. Our ability in daily life, to process new information and relate it to that information we already know enables us to absorb more new material easily and to establish new patterns of association and to learn. Long-term memory process is something separate from the short-term memory that is required in the virtually instantaneous process of actually hearing and rapidly scanning back over what was just heard immediately preceding what is being heard at the present moment. Listening to music we need both of these processes.

As we scan through what we have just heard while we hear what is going on now, we also have expectations about what we will hear next. This is controlled by our preconceptions based on previous experience. Our expectations about what we

will hear next are controlled completely by our previous experiences. People with common experiences in listening will share common sets of similar expectations. Although no two individuals can have the same expectations, similarities do follow along cultural lines.

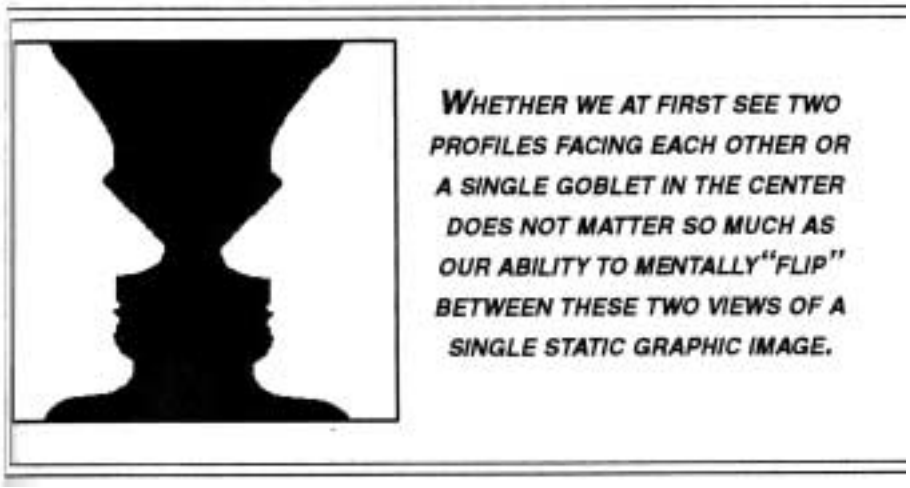


**Fig.39** Example number 1

### Listening vs. Hearing

It is entirely possible to hear and yet not listen. If we find the music we are hearing uninteresting or unpleasant we may hear it without listening. If we hear music from a different culture, we may not be able to discern the key to comprehending it, and may decide that we cannot listen to it as music at all. The line between hearing and listening is defined by culture. Previous experience guides us through new experiences and sometimes limits us as well.

The ability to hear and enjoy music is defined by our culture. As we listen, we look for patterns, an indication that the sounds were humanly organized. We then look for patterns that we recognize. This process helps us to decide if this is music we want to enjoy or not and helps us to know if we should sit and listen to it or perhaps dance to it, perhaps march.

### Music and Speech: Parallels and Contrasts

Music and speech intersect each other at many junctures. Perhaps man's first music consisted of the intoning of words. Music and speech develop in close connection and in many cultures, poetry is always sung, a joining of music and speech. We also use speech to talk about music. We create labels to talk about music in our culture, labels that describe the kind of music and where it is to be played, but

also labels which say whether we like it or not.

Speech and music are parallel in many ways, but different in very important ways. Language is used to communicate messages and feelings, most often in an attempt to effectively communicate what it is we have to say. Although the same can be said of music, it is much more difficult to be certain that the message has been understood. Often even when we know that the music has been accepted, we cannot know in what way the message was understood. We cannot know if the message intended by the creator or performer was the same one that was received.

In another way music and language have strong parallels. Common music styles and forms often grow and develop around common and related language families. The stress and accent patterns in different languages have a deep effect on the melodic stress and accent patterns in the music. The tone patterns in tone languages such as Chinese, Burmese and many Bantu languages in Africa have a strong effect on the melodic patterns of those musics.

Culture, politics and economics also exert strong influences on music and can override the natural relationship between language and music. The Basque language of South Western Europe is structurally and linguistically different from the languages of its neighbors. Yet Basque music, while unique in its specifics, is structurally little different form the music of its neighbors. The Japanese and Korean languages are very different from the modern languages of Western Europe. Current contemporary popular music in Japan and Korea has modeled itself so strongly on contemporary Western popular music that these no longer follow the traditional Japanese and Korean patterns of stress and accent.

## On Language and Music Acquisition

### The Process

Much of the culture we acquire we acquire through the medium of language although not all of it. We take this process for granted and yet there are an infinite number of variations in the manner by which this is accomplished as we consider different languages and cultures.

Children are constantly engaged in the process of absorbing and rejecting from all that they experience each day. Through this process they are constantly selecting and developing a vast repertory of responses, both positive and negative, developing sets of likes and dislikes, and attitudes that generate approval and disapproval. All of this eventually provides them with a guide through the paths to becoming the adults that every society expects and demands.

### The Lullaby as Metaphor

The lullaby in a sense serves as a convenient metaphor for the all of the earliest communication to the new infant from those already established members of his

society. In the lullaby speech patterns stress, tone and accent and the sounds of the language are passed on to the infant. The infant also hears the sounds that the adults and older children use to communicate among themselves. The infant is also developing positive emotional associations with these sounds at the same time.

We think of the lullaby as something pleasant and soothing that the mother sings to put her baby to sleep. In Romania the classic prototype of the *Cintec de Leagan*, the lullaby, has strong ties to, and eventually led to the folk love song of Romania, par excellence, the *Doina*. Even the polished love song character of the Romanian Doina retains something of the soothing lullaby quality in it.

There are some cultural practices which suggest that the lullaby may be something else. Among the Aymara speaking Indians of the Puno region of Peru , the lullaby takes on a different nuance. The strident quality of the mother's voice sounds at times as though she is shouting or chiding the child into sleep. In India one might be astonished at the process by which mothers put their babies to sleep. Mothers in India usually sit and lay the baby across their knees while vigorously tapping the heel up and down causing the baby's head to bounce rhythmically. The babies do quickly drop off to sleep. Certainly this is antithetical to the Western idea of lulling the baby into a state of quiet which leads to sleep.

The apparent primary purpose of the lullaby is to draw the infant into sleep. This does not mean specifically that it must lull the infant into a state of drowsiness. It provides the infant with a sense of the mother's presence even if she is nearby and continues to work. As long as the infant hears the voice of the mother, or physically feels her presence, the necessary sense of security pervades and sleep can then follow. It was this same reaffirmation of the presence of the mother that was going on between the mother in India and her infant. While lulling, comforting and soothing sounds may be what the Westerner believes to be essential in the raising of a healthy infant, what the survival of the species requires is in essence sleep and this can only come about when a sense of safety and security has been established. The species has survived because there are various cultural adaptations to the need to get infants to sleep.

The lullaby, and perhaps, by extension, also music itself, comes to be associated with love, safety and comfort. We cannot say that this is why so many people in so many of the world's cultures love and value music. Nevertheless, music first appears in human life in combination with very positive experiences and this fact may enhance the manner in which it is regarded throughout the human life cycle.

**Chopi Music**

In the summer of 1971, I was in the Marieshaft Mine Compound near Johannesburg, South Africa to hear and record the *Timbila* or xylophone ensembles

of the Chopi workers there. I had just returned from spending a few short happy weeks in Mozambique — all that the then government would permit — studying this same music.

Andrew Tracey, the South African musicologist, knew the musicians at the mines, and had arranged for the recording session. The ensemble of musicians for that day consisted of 12 *Timbila*, xylophones of different sizes and about an equal number of singers and dancers. They played several pieces from one their current *ngodo* suites with amazing fire and polish.

The musicians of the ensemble were all polite but with the reserve one found as one of the unfortunate results of the constraints imposed on cross-cultural social exchange at that time in South Africa. After the recording, Andrew told the musicians that I had just returned from their homeland in Mozambique where I had been studying a bit of *Timbila* with the Master Musician, Chambini who had, incidentally, also, at one time, been Andrew's teacher. The musicians were anxious, perhaps only curious, to hear me play. I was terribly embarrassed having only had time to quickly learn about ten pieces from Chambini. But from frequent experience in situations like this, I have learned that as a visitor once the suggestion is out, there is nothing for it, but to do the best you can and hope that the sincerity of the effort will carry the day.

One of the musicians got up and insisted that I sit at his instrument. I began to play one of the pieces Chambini had taught me, one for which he gave no special name saying only that it was a kind of study. The musicians in the ensemble did not wait long before they joined me in the most thundering and exciting performance in which I have ever participated, notwithstanding that I was only playing the basic structure of the piece. The basses rumbled and two of the *cilanzane*, the leader *timbilas*, were elaborating marvelous variations on the basic pattern and it seemed that the entire mine compound was resonating with the sound.

The excitement of this "cross-cultural friendship" performance soon got the best of Andrew and I heard him exclaim, "I want to play this, too". He sat down and watching the hands of the player seated next to him quickly picked up the pattern and was soon a part of the performance. After we continued playing this same piece for some minutes, Andrew suddenly put down his sticks, jumped up and shouted, "I know this piece! Chambini taught me this one, too!"

At the time we laughed at this incident which we both found amusing. Yet, in retrospect, that incident tells us about the complexity of procedures going on in the brain when we hear music. How was it possible that one can and quickly learn and then be playing what seems to be a new piece only to discover a moment later, that one already knew it? In this instance, two things are clear; at the outset Andrew thought he did not know the piece and sat down to try to learn it. Andrew did, in fact, sit down and proceed to learn the piece as though it were a new one and one

with which he was not familiar. But it is also clear that he did already know the piece and only realized it after he had been playing it for some minutes.

**Fig.40** The Chopi *timbila* ensemble of Zavala, Mozambique. This large ensemble of *timbila* players, singers and dancers create and perform a new *ngodo* suite every year. Their playing style is marked by great technical proficiency and polish.

Perhaps, had this particular piece had a fixed title - most of the Chopi *Timbila* pieces bear the name of the movement of the *Ngodo* suite in which they appear - he might have recognized it more readily. It is also in the nature of the "kaleidephonic" and cyclical quality of much Sub-Saharan African music to permit the perception of the pattern of a composition from a different starting point, and thus with a different mental configuration of a same single pattern. Hearing a familiar pattern from a different starting point might at first give the false impression of hearing something completely new.

This story exemplifies two points: first, it shows that it is possible to retain at least two different mental reconstructions of sound; one in which we are actively engaged in thinking about or acting upon and another, which may be the result of an earlier stimulus dealing with the same phenomenon, but about which at the moment of engaging in the first activity, we are not conscious. Second, the manner in which we first perceive the stimulus codes it in such a way that we categorize it, treat it according to the set of behaviors filed under that category where it remains until

something calls it up again or suggests that the existing and current code may need to be changed.

**Early Speech Acquisition**

Children naturally acquire the speech patterns of the language of those heard speaking in their environment. This is true of the music as well. The Indian child in Peru finds it natural and reasonable to sing within the boundaries of this same system. Children in China and Japan and Shona children in Zimbabwe likewise grow up hearing music and speech that come to define their musical cultures.

Several kinds of information are being transmitted during this very early process of speech/music exchange between the infant and those around him, all occurring long before language as we usually think of it has begun to even serve as a means of communication for the new learner. Formal structural information about both speech and music is communicated along with an emotional layer of information. The lullaby contains both these type of information and there is no doubt that the infant is absorbing them both. The child first learns by the tone of speech. The lullaby becomes a pleasant sound by association just as the tone associated with stern words and reprimands then develop negative associations.

From infancy the child absorbs both structural and emotional patterns of the language. These are the basis of the music of the infant's culture. Positive associations with music may begin here. Music comes to be associated with comfort, warmth, security and protection. Eventually we learn to associate that pleasant feeling with the lulling sounds of mother's quiet singing or with the sounds of a thirty man Balinese *gamelan* that the child grows accustomed to hearing as he falls asleep in his father's or mother's lap at all night performance. These sounds come to be associated positively with a sense of peace and well-being. Later in life the same individual may recall some of that sense of peace while half drowsing through an all night performance of the *Gambuh* Theater. Hearing the names of ancient fabled cities and of kings and princes transmitted through the music come in a spoken language that is so classical and archaic that he cannot fully comprehend it.

A Shona child growing up in rural Zimbabwe is soon accustomed to hearing the rich sound of several *mbiras* as they are played almost continuously for two or three days at a time in the huge smoke filled banya, or meeting house. It becomes natural for him in later life to associate this sound with a sense of well being, and of unity with his community. Eventually he will probably begin to do as most others in the village also do, to become absorbed in the process of picking out various combinations of sounds in the music. Growing up in this environment he may perhaps naturally and uneventfully one day even become entranced by the music and use it as a link to communication with the ancestors through dreams of music.

Such group experiences serve as an excellent means of communal bonding that

at the same time reinforce the cultural values of the group. In the examples described above, the overt pattern of music may seem simple and repetitive. To those in the culture however they gain much more depth - the complex layers of character definition and historical reference in the Balinese *Gambuh*, the complex and ever changing pattern of kaleidoscopic sound in the Zimbabwe mbira music. Among the Tarahumara Indians of Northern Mexico, the music for the Matachines is played by a group of eight or nine violins. While the overall impression is one of an incessantly repeated melody played by all the violins, the musicians and listeners become entranced by listening to the subtle interchange of variations between one musician and another.

## Content of Early Language Acquisition

In this manner the child in any culture learns the emotional messages appropriate to his or her culture and together with them absorbs in gradual increments, the tonal and structural pattern of the language which then leads to understanding and recognizing the structure of the music of that culture.

The structural principles of spoken language help to determine the pattern structure in the music of the speakers of this language. The very close relationship between language and music in the early periods of acquisition reflects this process. For most of us there is music which has very strong positive emotional associations. Some of these positive associations may go back as far as we can remember. We have been convinced by many, many years of indoctrination that music, as an aspect of our culture is, a cultural refinement, an enrichment of our daily lives, etc. Given the very strong positive position which music has in every known society in the world it is certainly a likely vehicle for more than enrichment and refinement. It is likely that music serves a function vital to the continuation of our very complex species. The manner in which we learn music - to listen to it and to participate as we can in its production - serves to constantly refine and expand our vocabulary of spoken expression. It does so by refining and enhancing our sense of emotional coloring as expressed in minute shadings of tone and stress pattern heard in music. Music may be man's primary means of sustaining the process socialization and as such serves as man's most important and effective civilizer.

### Studio Musicians

The task which routinely faces a professional musician playing in a New York or Los Angeles recording studio is also complex. Because of the pressures to keeping steadily mounting studio costs down the method of recording underwent great changes from those days in which an ensemble sat together rehearsed and recorded. Today musicians often sit in small isolated recording booths and listen on earphones to what other musicians may have recorded previously, days or even

weeks ago and perhaps even in another part of the country. To the sound they hear on earphones - sometimes all they are given to hear is a rhythmic click drawn from the other performance with which to synchronize. Sitting in this small booth, listening to whatever comes over on the earphones, they must blend in the new part to be added. The player must forget that he is all alone in the recording studio and that the other musicians are only there on prerecorded tape.

Because of the high costs of studio time there is a great pressure to get the performance right first time. Thus it is those musicians who can play whatever written music is placed before them at the first try who are most highly considered. But these recordings, be they backup for popular records, TV or film soundtracks, or even TV commercials, must sound as though they originated in a spontaneous live performance. Therefore studio musicians must not only be able to read at sight whatever new music they are given with no mistakes and consequent retakes, but they must also sound acceptably fresh and spontaneous - as if they were creating or improvising the music on the spot. The complexity of musical activity required would seem as great as that required for the symphony orchestra performance.

Although the ideal studio musician must be able to lend an authentic quality of spontaneity to the recording this system does favor the technically proficient musicians over those who might be great individual interpreters but who might require a more conducive and freer atmosphere to do their best. But the preference for a less spontaneous and more regularized interpretation over a freer if rougher performance is a matter of choice which is also based on constructs drawn from previous performances which have entered into our memory, which while themselves subject to constant and regular change, nevertheless continue to color and influence our responses to everything we hear.

**Talking about Music with Words**

We can use speech to clarify thoughts about music and to communicate with other what we think and feel about music. In some societies there is little talk about music in words. In others, great discourse about music as art, about certain creators and about certain particular compositions takes place. But music is a system of communication in itself, and thus communicating about it in another system, language, is bound by clear limitations.

The anthropologist, Claude Levi Strauss in the chapter and section headings to his book, The Raw and the Cooked, which he describes as an introduction to the science of mythology, uses labels based on forms of European art music.[1)] There are sonatas, arias, fugues and canons. He sets out by describing myth as a system with deep affinity to music and even dedicates his book to music, but in the design of his book he attempts to parallel its formal structure to the forms of Western musical composition. Were the labels to be removed, however, and had the author not

mentioned this in the introduction his intentions could hardly be guessed.

Another work is an example of an adventurous enterprise using as model a verbal thesis in musical form. This is Douglas R. Hofstader's, Gödel, Escher, Bach: an Eternal Golden Braid. Each chapter deals with mathematics, music and visual art. To each of these chapters, the author has affixed a section titled after a composition of J.S. Bach. The content of each of the last sections of each chapter is in the form of a fabulous dialogue, but the formal structure is based on particular composition of Bach. Hofstader's essays can be read without knowledge of the musical composition on which each is based. But the work does read like a puzzle because of the knowledge that an unknown musical form is guiding it.

In the books of Levi-Strauss and Hofstader the reader is asked to make a leap of faith in accepting the author's intentions. There is no way from the clues provided in each work, that the reader can, nor perhaps should, fathom the precise model on which the author has based his work was based. Both books stand as intriguing attempts by their authors' to communicate with words in a manner usually reserved to music. Hofstader's book, in particular is, in every section and chapter, about the interrelationship of science, music and visual art, - not a description of their interaction, but an expression in them.

Ordinarily, we use words to say things about the music we like or don't like. Musicians use words to communicate with other musicians as well as with their audiences about what they will perform or perhaps use words to provide some background about themselves or the music to be heard.

**Hearing, Sleep and Dreams of Music**

As yet we understand only little of the nature of the listening process which takes place when we sleep. Sound may continue to reach our eardrums but we are probably not conscious of what it is we may be hearing. Recent studies indicate that it was possible to control the breathing of subjects during all stages of sleep by playing audible tones while they slept. A burst of alpha wave activity at the start of the tone indicated response but did not wake the subjects. Therefore it would seem that perhaps REM/dream stage level consciousness was not maintained but the tones could still affect the breathing rate during sleep. From this we can infer that the sounds were heard and responded to, but not processed in the way dreams are during REM sleep.[1)] (Pietro Badia, John Harsh, Thomas Balkin, Peggy Cantrell, Allen Klempert, Diane O'Rourke and Lawrence Schoen, "Behavioral Control of Respiration in Sleep", Psychophysiology Vol. 21, No. 5, (September 1984) 494-500.) It may be that attempts to stimulate learning during sleep may have harmful effects in that they cause an interruption of the necessary dream-time required for the brain to process new information received the previous day. Experiments have shown that prolonged REM sleep deprivation results in nervous disorders of extreme

severity.

It seems like this unconscious kind of hearing without conscious listening must be different from the kind of hearing without really listening we are engaged in when we hear “Heavy Metal” sounds coming through the walls of an apartment while we are engrossed in other activities, or while hearing “MUZAK” in the supermarket when we are certain we have succeeded in blocking these sounds out of our consciousness. In these last two instances, we may suddenly become “conscious” and aware of the intrusion and at the same time perhaps unpleasantly aware that we have actually been listening and scanning while we thought that our thoughts were elsewhere.

This certainly seems different from what we understand of the nature of hearing during sleep. To grossly simplify the function of sleep, we might think of the various stages of deep sleep as “body sleep” and the REM stage (during which Rapid Eye Movement occurs) as “mind sleep”. Our sleeping hours are spent switching back and forth between various levels of deep sleep and REM depending evidently on the type and intensity of activity in which we were engaged during the previous day. Dreaming generally occurs in the REM stage which seems to be the period during which the brain “processes” the various stimuli received during the day, many of which may not have entered into full consciousness at the time.

Most likely we do not scan and process sounds which are being “fed” to us while we sleep unless they intrude so much as to begin to wake us into consciousness. More than likely during our dream states we process those sounds which we have stored in memory which along with the other stimuli of the day are being reviewed for cataloging, resolution and filing. I find it is something of a relief to believe that the brain floats between the REM and deep sleep stages all through the night. There have been occasions on which I would go to bed with some example of music going through my head and awakened the next morning to find the same tune still there in the first moments of consciousness. At such times I would feel weary at the thought that I must have been “working” all through the night.

It seems that dreams help us to better remember what we have experienced during our waking hours.[2)] If emotional responses to music which we have heard during the waking hours cause this music to enter into our dreams, then such music might stand a better chance of being stored in memory for possible later recall. Could this music dreaming activity establish the emotional coding which would then permit its recall through emotional association when hearing others musics with patterns which appear to us to be similar?

If our tangible knowledge of the function of dreams is small, evidence which sheds light on dreaming of or about music is even scantier. Recollections of dreams about, or with music which we remember occur during the REM stage which must

be arrived at after passing through some level of deep sleep. Whether music appears to us in deep sleep has not yet been reported or documented. One element of this question is quite interesting. People who recall dreams with or in music most often recall them in some "real" context - in the dream someone is actually playing the music or in the dream they are in a situation in which music is being played. This kind of music/dreaming has been described by people in many parts of the world, and in fact among the Shona people of Zimbabwe, such dreaming of music of music functions as one of the most significant means by which the ancestors speak to the members of the tribe.[3)]

The existence of empirical evidence describing music dreamed in a real context cannot preclude the possibility that some individuals may dream in pure music, that is in pure sound, without any dramatic or story context which they might easily recall on awakening. People who are engaged for long periods of the waking day in the performance or conceptualizing of music spend more time processing musical thoughts than others and some of this activity might well occur during sleep. Some of this recursing or replaying activity in "pure" music, that is, without dramatic context, may also occur during the various stages of deep sleep.

**Communicating about Music Non Verbally**

We also communicate about music without using words in many different ways. The manner in which we react to a performance, even the degree to which we respond or ignore the performance are ways of communicating about with music without words. Musicians in performance communicate with each other either through silent signals or body language during the performance and in this way enhance its quality. Musicians in many different cultures of the world greatly value this ability to communicate with other musicians in the group during performance.

In the story about the two Czech musicians, two different kinds of communicating, one about music with words and the other in music have taken place. In the discussion the name of the Czech composer, Jirovec comes up. Here the verbal dialogue is used to recall something in the memory of each of the two men. The name of the composer is known to both and at the beginning of the scene each of the two may have had different experiences with the music of this composer and therefore different attitudes about it. After that common shared experience has been established, another kind of communication about Jirovec begins to take place. At the mention of the name of the composer each of the musicians has drawn upon his memory and whatever associations with that name he may already have. One of them is then is then able amplify the experience of the other by sharing his experience. But this second part is shared in actual participation in the music.

This special kind of communication takes place whenever musicians get together everywhere from Mexico to Japan to Africa. The appearance given by this

kind of interaction is, in fact, deceptively simple. Two musicians sit down, exchange a few brief words, then begin to play. What could be simpler? Yet, before they can begin to "do" together there must be agreement on what it is they will "do". This agreement is established by their common culture and refined by their further common experiences. It becomes much more difficult for this reason, when musicians come from different musical cultures.

Musicians who perform together must have or must create a common musical culture, points of agreement between them, if the musical performance is to succeed. After establishing the parameters, most of the communication occurs at a non verbal level.

**Verbalized vs. Noverbalized Communication**

A string quartet comes together for a rehearsal. The working session consists of much playing interspersed with talk, about phrasing, tempo, and dynamics. Details are discussed, perhaps argued and finally agreed upon. At the final concert performance the musicians enter satisfied that what has been agreed upon in rehearsal ensures a successful performance. The audience is appreciatively stunned at the grace and delicacy of the interpretation and at the overall cohesiveness of the ensemble. Certainly the compromises and agreements worked out at the rehearsal have much to do with the united front presented to the audience in the final concert. These preliminary verbalizations about tempi and phrasing do much to lay the groundwork for the final consensus that is the actual public performance, but this ground plan is really only a very rough map compared to what occurs in the final performance. The rehearsal provides a partial verbalized concept upon which there is general agreement. In the actual performance, on the basis of this verbalized and memorized framework each of the players must be prepared for yet an additional and much more minutely refined level of redefinition to occur spontaneously as the result of hearing and responding to the interpretations and interaction of his colleagues.

At the time of the actual performance, the four musicians are listening to each very careful and adjust and adapting to what they hear. In this climate based on previous common experience, they can respond to each other in minute matters of fractions of a second and minute changes in volume and expression. It is the ability to sustain this flexibility in performance that makes a great string quartet performance.

A kind of communication occurs among musicians of the Burmese *Hsaing* orchestra, an ensemble of about eight musicians playing a varied set of bronze gongs, tuned drums and double reed pipes. The Burmese gong ensemble music plays with great virtuosity manifested in rapid changes of tempo and dramatic textural changes and frequent quick changes into tempos of the fastest pace imaginable. The

ensemble is led and controlled always by the player of the large drum circle, a set of twenty one tuned drums. The leader controls the ensemble only through the playing of the drums and never gives any verbal message nor does he conduct the ensemble overtly or visually. The sound of his drums is the sole means of communication between himself and the other musicians in the group. The ensemble might be, between pieces casually sitting, chatting, sipping tea and carelessly and lightly touching their instruments. In the midst of this quiet confusion, the leader sounds one clear but not particularly loud stroke on one of his drums. There then follows an instantaneous silence among the musicians, for they know that the next stroke, whenever it comes, will be the first note of the composition and all are expected to begin at precisely the same moment.

Here again, there are two kinds of signals that take place; the starting sound on the leader's drum is an overt signal that something is about to begin. This is the kind of signal which in other societies could have been communicated verbally, or even by a stamp of the foot. It is not a signal that means that after a fixed number of beat the composition will commence. It is a call to attention and all are to be prepared for the beginning of the piece whenever the leader decides it should start. The other kind of communication occurs during the process of playing and is similar to that which occurred in the performance of the string quartet just described. In the Burmese ensemble speed and style change so rapidly and with such style and flourish that it is only by being extremely attentive to each minute change of inflection and speed that

**Fig.41** Gypsy or Roma musicians from Andalucia Spain. Here Anosonini Del Puerto, Joselero and Deigo Del Gastor improvise on the *bulerias* form. Each musician has a clear idea of the basic pattern of possibilities that the form implies, yet at any time either the current singer of the guitarist may choose a substitute note of harmony for interest. Each has then to be prepared to adjust his improvisation to the other's probable outcome. This is in part what makes this music so spontaneous sounding and so exciting.

the ensemble manage to accomplish such minute gradations. These minute contrasts would be impossible were there a single conductor standing before them attempting to lead them through these changes.

Most musicians will agree that this kind of communication during performance exists and that it is important for a good group performance. A level of nonverbal sensitivity and reflex is vital to the performance of music and this seems to be at least one value that transcends several different otherwise isolated cultures. It is also at this level that endless heated discussions on the merits of a particular performance occur, very often with no tangible or measurable evidence which could conclusively sway stubborn personal conviction one way or the other.

Cohesiveness is perhaps a good word to encompass all of those difficult to define elements that are refined and agreed upon between musicians in performance without the assistance of verbalization. This same word may be used to describe that positive quality of good rapport and ensemble responsiveness that makes us prefer the performance of certain ensembles to others.

## Notes

1) Claude Levi-Strauss. The Raw and the Cooked. New York: Harper Colophon, 1975. 342 pp.
2) Christopher Evans. Landscapes of the Night. How and Why We Dream. New York: Viking Press, 1983. p.230.
3) Robert Garfias. “The Role of Dreams and Trance in the Mbira Music of the Shona People of Zimbabwe”, Journal of Altered States of Consciousness.