The Perception of Pattern in Music

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Space and Pattern

Walking through the streets of the Vieux Carre' in New Orleans, one experiences an intense sense of atmosphere brought about by the physical appearance of the area which sparks the imagination with vivid thoughts about its past. Simultaneously one experiences the actual sense of being there in real time. One's imagination flits back and forth and between the present and imaginary thoughts of the past colored by one's knowledge of its history. For blocks and blocks all of the streets are of equal length and width. Recurring patterns of related architectural styles are repeated at irregular intervals. Shuttered windows and ironwork balconies heighten the sense of unity in that location and contribute to the sense of "place". We might be moved to think of this part of the city in light of how it might have been at the period when it was planned and built or about how it might have looked at particular times during the years following.

The experience of walking the Vieux Carre' is heightened by whatever knowledge of its past we may be able to add to it. The information about events associated with the area intensifies the vividness of one's images. In addition the memory of one's own previous visits to the place add additional layers of color to the already intense experience.

Each musical event, be it a performance, a composition, an improvisation, a mental or graphic conceptualization of any of these forms, even that aggregate of musical events we might call a style of music, is capable of creating in the mind, something parallel to this sense of place and time. Images created in response to music can become vividly etched in the mind as one experiences patterns and contours, formal structure, style and interpretation. Thus, listening to music, of course depending on the level of involvement in that listening, can be as vivid and real as that of walking through the streets of an old city.

To continue with this analogy a little longer, consider for example, walking the broad avenues of the Inner Palace City, the Gosho, of Kyoto, Japan. Unless it is a special festival day, this vast walled city within the very center of the city of Kyoto is apt to be largely deserted and usually very quiet, with only a faint murmur of Kyoto traffic audible beyond. Broad and long gravel roads bisect the area at precise and regular intervals. These gravel roads separate the area into parks and gardens and blocks of seemingly endlessly long light earth-gray colored walls of the palace

buildings, each marked by five continuous white lines which run the length of the walls and which indicate the Gosho's relation to the Imperial Household of Japan. Here no cars are allowed to enter, nor do noisy crowds interfere with one's musings on how this sacred Imperial compound might have looked and sounded in the years before the Meiji restoration. Only an occasional cyclist wheeling across the wide gravel roads reminds one that this place is in the middle of a large modern city and that passage through it is the most convenient means for walkers and cyclists to cut through to the other side of the city.

The Gosho of Kyoto, like the Vieux Carre' of New Orleans gives an intense sense of place and time. It is strongly evocative of the past and yet also makes one very much aware of the present because of the contrast between the quiet of the inner city and the bustle of modern Kyoto just outside. While both the Vieux Carre' and the Inner Palace of Kyoto evoke a strong sense of place and are colored by those experiences and what knowledge we bring to them, each is, in addition a very different place. Each has a different treatment of space, a different relationship of building to thoroughfare and a different proportional relationship between the visitor walking through it and the walls and buildings around him.

Perceiving Structure

The analogy with music is useful. A musical structure is colored by previous knowledge and experience, and in particularly by what we have most recently experienced. In addition, however, each musical structure, composition or event has a structure and set of formal and temporal relationships and proportions in and of itself. These relationships form the context to which we bring our own individual contributions whenever we experience it.

We perceive structure in music as well as style in music as we pass through it, or as it passes over us through time while we stand still. What we really experience is a constant string of single instants when particular sound waves reach our eardrums. The scanning process by which we mentally move back and forth between what we remember of what we have just heard and compare that and relate it to what we are now hearing, allows us to perceive pattern out of this continuous flow of successive instants. The pattern then becomes registered in our brains and enables us to sort out groups of patterns and directions in the sounds and to begin to establish certain expectancies about what will follow. The perception of form and structure in music is possible only because of our ability to "wander" into the pattern that our memory has convinced us to believe really exists. But in the instant of hearing music, we are not only engaged in scanning back to what we remember. It is also the expectation of what might come next, increasingly delineated by what we have just heard that absorbs us and keeps us listening.

Fig.35 The Vieux Carre, or Latin Quarter of New Orleans

Fig.36 The inner walls of the Gosho, the old Imperial Palace of Kyoto.

In some musics it is evident that the composer/creator wants the listener to follow carefully and to gain maximum appreciation by mentally analyzing the patterns he has created. In some musics, however, it might seem that the perception of form and structure was intended to be subliminal, that the listener was to feel the form and pattern of the piece rather than be conscious of it.

We experience a very different perception of space when we enter a very large space, like the main salon of the Palace of Versailles, than were we to enter the palace broom closet. Our eyes tell us immediately about the differences in the ordering and proportions of space in these two places. Yet, we would still experience much of this same difference if we were alternately to enter these two spaces in total darkness. What I suggest here is that there are many constructs in music that we experience without resorting to conscious analysis or to the necessity of recalling conscious verbal descriptions which affect our listening. The parallel examples of the perception of physical space and, in particular, of the planning of cities are useful here. Patterns of sound created in music as either conscious or unconscious elements have the same importance in listening to music as do the physical characteristics of the space we occupy.

The perception of form in music requires the ability to maintain a mental reconstruction of the pattern of the music and to apply an analysis of it that renders it into meaningful and discernible segments. In one culture or another of this planet the precise definition of form would require modifications enough to make such an exercise futile. The principle that operates in the perception of form is, in essence, based upon the recognition of discrete events in time. Strokes produced on two gongs of different pitches insofar as they are perceived as discrete events can be thought of as exemplifying form. If we hear two equally spaced strokes on the same gong we might also perceive this as two discrete events and thus as form. If the evenly spaced strokes continue we shall need to determine at some point that it has become a predictable and repeating series. If two strokes of the same gong are irregularly spaced apart in time these two strokes can much more easily be recognized as separate and forming the initial segment of a potential pattern.

A Visual Analogy

The visual parallel to this aural process of perception would be to draw analogy to the availability of only two options, a space which can only be entirely white or black, that is completely covered with uniform information or containing none at all. The next step is to take this single area and divide into two different areas, one white and the other black. The process of continually subdividing an area into increasingly smaller units creates increased definition of the area. If, however, we begin to rearrange these black and white units into different configurations, the increased

subdivisions allow for a greater scope of variation and a higher degree of definition.

We could continue this until it would be possible to reproduce the level of definition of a high quality photograph. There is no particular point at which we cease perceiving discreet blocks of black and white, and begin to see larger complex units. It just suddenly happens. We need to be jogged into seeing pictures in collections of arranged minute black and white dots on paper. In the same way at some point we cease to hear individual strokes, or beats and if they begin to come close together we may begin to hear them as a single sound. Conversely, the lowest pitches we can perceive as "notes" are in the range of about 20 vibrations per second, at which range one can almost hear the individual beats. Lower than that we hear a series of rapid beats or undulations no longer aggregated into a single event.

The higher degree of subdivision allows a greater degree of definition of the area within the space and by the juxtaposition of the smaller units obtainable within the area more complex variants of the possible patterns become available. Further subdivision of units thus allows scope for the representation of more complex patterns. From two discrete events moving to more complex forms thus is a matter of degree and of level of complexity. The perception of a new event helps to define or redefine a previous one, an event that might have gone otherwise unnoticed. For example, a single group of pitches can be perceived as forming a meaningful segment of a larger unit because of the structural relation which we believe to exist between the individual units in the segment.

Meaningful Segments into Sequences

The grouping of these segments results from our having been predisposed by prior experience to expect and therefore define meaningful segments in what we hear. In our perception of a series of sounds, it is our prior experience which allows us to group these sounds into a single unit for comparison with other units and therefore to begin to predict what larger units or segments might follow. In this way we can group a segment of sounds together, consider them either as a series of individual sound events if we wish, or group them together as the beginning of a "melody" or other meaningful grouping.

The manner in which the device known as a sequence in Western European Art music is perceived is a result of this process. The sequence is, on the surface, a seemingly simple device by which a single short melodic or rhythmic motif is repeated at a different pitch or at a new point in the rhythmic pattern. The listener perceives a group of notes, first as a new unit or grouping. At the repetition of the same sequence of notes at a different pitch the contour of the pattern just heard and now reinforced by repetition, becomes highlighted and fixed in attention. Repetition delineates the pattern, but repetition gives the pattern a life of its own and

expectation then permits the sequence to move into perhaps unusual tonal relations if the perception of the formal pattern is retained.

The sequence, because it draws on the pre-established pattern of the first statement, is allowed a high degree of melodic or rhythmic innovation in relationship to what has already been established in the tradition of that music or even in that particular composition. Thus in the European art music tradition, the introduction of a sequence based on a melodic unit can also use the entire supporting harmonic structure as well and in both the melody and harmony introduce in the repetitions, melodic intervals and harmonies which would not usually be heard. In the context of the sequence they are accepted because the listener has been prepared by the established pattern of the first statement. At the same time, a very important feature of the sequence is that, by its use of repetition it establishes firmly a pattern that can now be predicted.

In the music of Burma sequences are very frequently employed. In certain forms of Burmese music, the music for the theater in particular, sequences appear almost at least once in every composition. Invariably such uses of the sequence technique consist of three statements of the melodic phrase usually descending by conjunct steps. Modulation from one mode or tonal system to another is common in Burmese music. However, the use of sequences allows for some modulations which, in the Burmese system, might otherwise be perceived as surprising or unacceptable if introduced without preparation. The device of the sequence in establishing first a threshold of predictability creates a context that allows the listener to comfortably relish the still exciting shifts into surprising tonal relationships.

The use of sequences to create this type of subtle surprise also occurs throughout the history of European art music. Its effect is a little difficult to explain. In both the Burmese tradition as well as in Western music, the mechanical device of the sequence permits the listener's acceptance of a short melodic phrase which outside the context of the sequence might be considered harsh and yet within it creates a subtle stimulation for the listener.

In the music of India, by contrast, the rules for melodic generation as embodied in the raga system are too firmly fixed to allow for melodic sequences on different intervals. Such a practice might thus introduce fragments from different ragas, a practice which is allowed only in certain very sharply defined types of performance and is usually strictly forbidden. By contrast, however, the Indian rhythmic system makes regular use of rhythmic sequences in both North and South Indian classical systems. The Indian rhythmic sequence in its most frequently encountered form is a rhythmic cadence called tihai in the North and *mora* in the South. As in the Burmese melodic sequence, this consists of three consecutive statements of the pattern culminating in this case with a synchronized return to the main beat of the rhythmic cycle. Just as the melodic sequence allows for the introduction of otherwise unusual

intervals and harmonies, the rhythmic sequence does something similar. It allows, by virtue of having been first previously established as a pattern, the introduction of a rhythmic pattern on an unusual starting beat of the rhythmic cycle, one which would otherwise not be expected.

As well as allowing for the introduction of melodic or rhythmic material which would otherwise be unusual, the principle of the sequence also provides an important means of reemphasizing the importance of the initial statement as a meaningful segment. The sequence is a particularly overt expression of a principle that is going on constantly during the process of perception. Each newly heard event redefines whatever is remembered to have preceded it. The basis on which this redefinition occurs is different according to the particular tradition and the experience of the listener in hearing this particular form, style or tradition.

In the classical or Art music tradition of the West the particular and unique skill of the composer lies in his ability to create forms and structures which are engaging and into which the listener can, with concentration, penetrate. This process might not necessarily require conscious analysis. The composer, particularly, from the late 18th century until the middle of the present century, attempted to lay out a plan, simple enough so that all who wished to could follow, but complex enough so that the task would be challenging. Much of the music of the West during this long period tended, not surprisingly, to unfold much as does literature. The listener is not engaged as an active participant but as a respectful witness who sits and listens attentively as the story unfolds before his ears. He allows himself to be transported, and the composer's intention is that he should, by the skillful devices contained in the composition. At the end of the performance the listener is expected to appreciate that something of beauty, and perhaps also of complexity has been presented to him.

How Culture Defines the Listener's Role

This may be something of an exaggeration of the passive role which the Western concert goer is expected to take. His response to the music may also be such that he is not conscious of himself listening to the creation of another human but may feel himself deeply engulfed in the experience of the sound. The role of the Western concert goer does stand in great contrast, however, to the more active role which is expected in many other societies. In the culture of many of the Indian groups of the Americas, every one present is expected to function as a participant and one who contributes something to the performance. North and South Indian classical music provide additional examples of the active roles which audiences are expected to play. This is also true in many Sub Saharan African cultures. The various roles which audiences are expected to play is in direct relationship to the manner in which the music event is structured in time, which is to say that these

different audience roles are a reflection of the very different conventions by which musical form is employed.

At first glance it might seem that the requirements for the Indian concert goer are essentially the same as those of his Western counterpart. There is, however, a vast difference in what is expected of each. In order to appreciate a concert of Indian music the listener must be very familiar with the structure of the music. The audience is expected to be familiar with the raga and *tala* system enough to recognize the major ragas of the system in order to fully follow the development used by the performer of the moment and to be able to appreciate his unique contribution to it. He must also be well enough acquainted with the *tala* rhythmic system that he can recognize and mentally or by tapping quietly keep time to the often complex rhythmic patterns. This requires not only the ability to count in often very complex metric units, but to recognize a number of fixed rhythmic patterns and to continue counting them to oneself while the performing artist is executing rhythmic and melodic variations on it.

What one sees and hears at a concert of Indian music is an audience often physically moving to the changes in the music. The audience is often overtly keeping time by clapping out the time patterns of the *tala*, and sometimes enthusiastically calling out a word or praise to the performer for some particularly skillful turn. Members of an audience attending a concert of Indian music often emit audible sighs, or gasps of appreciation. At the height of the performance, an intense spirit of cooperative competitiveness takes over as the melodic soloist - instrumentalist or singer - and the drummer move into increasingly complex melodic and rhythmic variations make the audience's task of keeping up with the counting increasingly challenging. At the end of the performance the audience applauds almost as though they were themselves in part responsible for the excellence of the event, so intense was their participation in it.

While it is true that the Western concert-goer is expected to be familiar with the basic repertoire, the level of required knowledge is relatively small when compared with the knowledge of the melodic and rhythmic theory found in the larger percentage of an average Indian concert audience. The expectations are not unreasonable ones in India because so many members of the audience there are amateur musicians themselves. The process of listening to Indian classical music involves considerable background knowledge. The audience must discern discrete and meaningful units of sound by continually relating what is being heard to that which was just heard or was heard on other some occasions. In this manner the listener is first, able to create in his mind, the defining characteristics of the particular raga which is being spelled out step by step. At the same time as he comes to recognize which raga is been interpreted, he is also able to compare this execution with the nuances, new phrases, new tonal relationships which this particular

composer/performer is giving in his interpretation.

In the *mbira* music of the Shona people of Zimbabwe the listener becomes immersed in the repeated pattern which he hears. The basic pattern repeats so much that it becomes a strong predictable element on which then the minute and subtle variations take on greater significance. The listener does not expect dramatic changes in the music nor displays of virtuosity. These would be out of place the context of this culture. Instead the audience becomes drawn in deeper and deeper into the pattern. He hears constantly changing patterns like those which result from the turning of a kaleidoscope. In this process of picking out and making up in his own imagination new patterns and new groupings of the sounds which he hears, he may be gradually and quietly drawn into a state of trance. The music, so long associated by the Shona people, with their ancestors, may move some even to speak with their ancestors while immersed in this music and in a state of trance.[1)] The seemingly endless repeated pattern in the music, the lack of linear formal structure and the context strongly associated with the spirits of the ancestors all contribute to the special type of audience response in this culture.

Fig.37 The *mbira dza vazimu* of the Shona people of Zimbabwe. On a small wooden board a number of metal tongues are attached and tuned. These are plucked with the two thumbs and, in the case of this particular type of *mbira*, with the first finger of the right hand plucking the high keys from under. The *mbira* is usually played in interlocking pairs in Shona.

In both the Indian classical music as well as the Shona music of Zimbabwe, the listener is not listening to a gradually unfolding linear pattern or form being

presented to him in increasingly accumulated segments. To describe this other, non-European kind of listening as a way of perceiving of form is to stretch the usual and somewhat narrower usage of the term form. Still, the process of listening is much the same. It is in the culturally defined parameters of the terms we use to describe what we are listening for where the differences lie.

Balancing Spontaneity and Familiarity

In a sense the ideal mode of listening in Indian music requires sufficient time to develop the aural image of the complex of tonal relationships, that is, the *raga*, which the composer/performer is creating. The end result should be a construct image in sound that does exist in time, but which remains flexible and fluid enough to permit many interpretations. A performance is not one fixed map or a formal structure of tonal relationships that are repeatable and exist in only one fixed sets of time relations. Here reference to the distinction between general spacetime and music timespace used by the musicologist Charles Seeger will be useful. While every performance of the Beethoven Seventh Symphony is conceptually the same in specific space/time, in the larger context of general space time no two events are ever precisely repeatable. Each performance of a raga has a unique set of temporal relationships that constitute the actual specific performance at that moment. Repeated performances of the same raga, even when by the same performer attempting to recapture the mood of an earlier performance and even within minutes of each other, would not be heard by Indian audiences as having the same structure in specific space/time. The differences in every performance of the same raga, even by the same performer are the very essence of that which in India is considered the performance.

The western counterpart of repeated performances of a Beethoven symphony would not be the identical either. Each performance would be considered distinct and such performances could be also critically compared. However, any number of even widely divergent performances of the same Beethoven symphony can be abstractly conceptualized as a set of tonal relationships with a significance of their own which stands outside the context of any particular performance of that piece.

These three different usages of time as space in music, the tradition of European art music, the classical music of India, and the mbira music of Zimbabwe, provide us with a few of the countless approaches to the organization of time that humans have thought up during this short period of existence on the planet. They provide some idea of the scope of possibilities which man's imagination has enabled him to create. Each is a solution to the challenge of working within the limits of man's ability to conceptualize, to remember and to create from this combination of activities a mental image of what has been defined as the preeminent "message" of

the music in the culture.

All these examples require time and pitch for definition and thus can be thought of as being in some way mapped out in time. Yet only in the Western classical music tradition does the analogy of a map seem appropriate, that is to say a sound diagram or plan which is in some way analogous to the plan of a city or a diagram of a building. If an analogy may be used only to emphasize the contrast, the conception of Indian music might be thought of as like the basic principles and theory of city planning which the master builder brings with him to the task of building. By contrast the Shona *mbira* music might be exemplified differently. Think of an analogy of an imagined scheme or blueprint that describes the form and pattern of a city. In practice the same blueprint could be used for many possible cities. In each realization difference could occur and thus each manifestation would be but one of these possibilities. Many possibilities could occur from the same blueprint, and some might never be realized or ever recreated again in the same way. The perception of pattern or structure in music and the means by which we exemplify it is that which enables us to relate what we are hearing at any one moment to what we have heard before. In short, it provides us the key with which we are able to place whatever we hear in the larger context of our own highly individual cast of our common culture.

Humanly Controlled Change

In any culture what is considered beautiful in music will be unique and may be incompatible with what is considered beautiful in another even closely related culture. The one trait that many, if not all appear to share is that in the process of listening to the music, the listener is in some way aware that this is a human creation even though there may be only a subliminal consciousness of this. One might hold that the most beautiful music ever heard was the sound of the wind through the trees. There is as yet no society known to us that uses a definition of music that includes such non-humanly produced or controlled sounds within its boundaries although there are many cultures in which such natural sounds are considered very beautiful. It is the fact of human creation and execution that in all societies defines music.

One of the most common means for being aware of the human factor in what we hear is in the perception of a pattern of change. Although humans are physically and mentally capable of producing sound which consists of endless and exact repetitions of a single unit this is not done. While there may be people in one culture who may perceive that other peoples' music is static and repetitive this is usually the view from the outside. There does not appear to be any consciously created music by humans, in which change of some type or another does not indicate the active control of its creator. It is in the perception of change that the conscious awareness

of form in relation to the passing of time takes place. Change is perceived as this moment being different from that moment, of "now being different from "just now".

Perception of Change and Its Limits

The perception of change in music is limited and bounded by the culturally defined delineation of the meaningful units in that music. The listener participates in the process of music by using his memory to experience and define each change he hears as it occurs. The perceived change can be used in the European manner of listening to the gradually laying out of a plan or structure. Change can also be recognized as the gradually increasing number of possibilities from which the listener can contribute to the creation of yet others as in many types of African music. It is, of course true that this same principle operates in strong evidence in much of the contemporary popular music of the world. To acknowledge this fact, is to recognize the distinctly Afro-American element in the origins and roots of this music. In all types of music time and change work together to create that which the listener has been prepared to expect by his cultural conditioning. This consciousness that what is being heard now is different from what was heard just now has evolved as the important element to create cohesion and a common sense of predictability between creator and audience in many cultures. As is the case in all other aspects of music, the manner in which this principle manifests itself is different from one music to another.

Ways of Controlling Contrast and Change: Theme & Variations

In Western music the principle of contrast is typically exemplified in two classic forms, the theme and variations, and the variations on a ground. The variations on a *ground* is a method of construction which was introduced into Europe in the 16th century from Spain, perhaps based on Arabic or North African variation principles. It consists, in essence, of a melodic line, usually in the lower part, which is repeated continuously while variations in the upper voice are superimposed.

This form of contrast in which the basis for the variation, the ground, and the variations themselves are heard simultaneously, flourished throughout Europe for over two hundred years, under various names while being gradually modified. The variation form, which later supplanted the ground and which we today typically think when we talk of variation in Western music is the theme and variations. In this structure a theme is stated first in simple form and then the theme, has in the West come to be that which first comes to mind when we think of variation. The older structure of the ground as a basis for superimposed variation is a manner not very

different from that used in African mbira music or for that matter, the American form of piano blues known as boogie-woogie. In each of these three systems, the ground, mbira music and boogie-woogie, the bass line is not really the theme on which variations are superimposed. The bass line is the fundamental rhythmic and tonal structure within which all the variations grow. Yet, no single fragment, nor even the repeated bass line itself, could appropriately be considered the equivalent of the theme as in the linearly conceived theme and variations concept.

Distinctive approaches to variation are not only a matter of thinking in terms either of linear or of global patterns. To be perceived change in music must occur in time but the approaches to this use of time are virtually limitless. In the *gamelan* music of Central Java, to choose one of many possible non-European examples, a large ensemble plays compositions each of which has a distinct formal structure. In the tradition of Javanese music there are compositional types. These are systematized structures that delineate a punctuated rhythmic pattern and each may several individual compositions that employ it. Some of these formal types are long, others very long and rarely used and with only a few compositions in each. The formal structure of the composition is heard in a manner that at least superficially parallels the ideal method of appreciation of form in European art music. The listener hears, remembers what he hears and adds that to the gathering information in his memory and thus gradually makes in his mind a map of the structure of the composition.

The Javanese approach to the organization of space and time seems identical to that which is characteristic of much of the music of the Western world. The anticipated audience response to Javanese music may be truly different from that expected from a Western audience. The Javanese composer expected that his audience would more than likely be wandering around during the performance of his music and knew that periods of rapt attention and concentration would be short and sporadic. Audiences in Central Java, as in many of the cultures of South East Asia are free to roam about, to enter and leave the performance area at any time, frequently arriving late and not remaining until the end. Javanese would, however, deny that wandering around or even dozing represented a less satisfactory audience demeanor than sitting in rapt attention. In many Asian theatrical and dance traditions it is understood that even those who might appear to be indifferently attending what is taking place in the performance are, in fact active participants. In many such traditions the music is structured so that it can be heard and enjoyed at several different levels of concentration.

It might seem that this practice is evidence of the low esteem in which music is held in Asia. It must be true that if focused concentration is not predicted or expected from the audience it would be unreasonable for an Asian composer to prepare music which would require it. A large number of the listeners seated in the

Western concert hall are not willing or able to follow the intricacies of the form that the composition of the moment may demand. The expectation, that is, the attitude predicted by both audience and composer is that they will certainly try. The expectations of audience and composer in the culture in this way have a profound affect on the path that the creation of new forms will take. One interesting distinction between the Asian approach to audience perception of structure and form, for example, and that of the West is that music is planned in order that several different levels of involvement with the music can occur. In the West when there is the expectation that in a certain context, at a supermarket, for example, people will likely not be listening attentively, they will likely be provided canned music, Muzak - certainly a type of music which begs to be ignored!

The fact that the audience in a traditional Asian music performance, like that for the Javanese *gamelan*, may not be concentrating on the gradual unfolding of the structure and form of the composition does not mean that the form of the music is not perceived. The lack of rapt concentration on the part of the audience has certainly not constrained composers to use simpler and more easily comprehended forms for their compositions. It is indeed likely that in Javanese music the structure of the music is re-enforced by the complex system of layering several levels of ornamentation all based on the underlying formal structure. Even the process of anticipating certain key notes in the unfolding of the piece all works to subtly saturate the listeners unconscious with the imprint of the meandering of the melody and consequently, its form.

Formal Pattern & Structure

We perceive formal pattern and structure in music as it unfolds in time. Since the willingness to accept the music we hear as something which falls within our personal cultural parameters for what constitutes music, an even brief conscious period of listening must take place in order for that judgment to be possible. In its broadest sense pattern, or structure, is the organizing system by which we are able to discern music, since without it we could only perceive sound at the instant the sound waves hit our eardrum. When we decide that what we are hearing is music we have already been engaged in some scanning activity, however brief, which has enabled us to find form and relate to those categories stored in our long term memory. The apparently sleeping elder at a Javanese concert must have been engaged in exactly that activity before he decided to relax and absorb the music subconsciously.

Ideally the perception of form and pattern in music requires conscious concentration for the pattern to be retained in memory. Yet we must be scanning the sounds we hear even when we are not actively concentrating on what we hear. Anyone who abhors the impersonal, artificial sound of Muzak forcibly piped into his

surroundings and who manages to avoid listening to it only to find himself humming one of their insidious tunes long after leaving the supermarket, should need little more to be convinced of that idea.

Notes

1) Robert Garfias, “Role of Dreams and Spirit Possession in the Mbira Dza Vadzimu Music of Zimbabwe,” Journal of Altered States of Consciousness, Vol. 5, No. 3 (1980) pp. 211-234.

Fig.38

The process of transferring graphic information into a digital format offers a parallel to rhythmic density in music. Visual analog data is changed into dots in varying shades of color. The density of these dots in each inch of a graphic image (dpi) determines how closely the printed or the screen image will resemble the original, the higher density of dots per inch, the greater refinement of the image. The smaller number of dots per inch renders the image so grossly as to be unrecognizable. Similarly, rhythmic cycles of higher numbers offer the possibility of greater and more subtle rhythmic definition.