

## THE PHENOMENON OF INHERENT RHYTHMS IN EAST AND CENTRAL AFRICAN INSTRUMENTAL MUSIC

by

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### *Definition and Analysis*

In some East and Central African instrumental music, particularly in music for *likembe*, *zither*, *harp*, *lyre* and *xylophone*, one can make an interesting observation. The musicians playing together (or in the case of a soloist, his left and right hands or fingers) produce rhythmic patterns, which are not perceived by the listener as they are actually played by the musicians. Instead of this he hears a conflict of other rhythms, which are not played as such but arise in his imagination.

I must emphasize that these rhythms as heard do really exist and are not a product of phantasy. They can be recognised and deduced from any sheet of correct transcription. However, none of the musicians play them. We can say: *The image as it is heard and the image as it is played are often different from each other in African instrumental music.*

The notes of the music are the same both in the heard and the played image. The listener does not add any notes, but their grouping in his perceiving mind is often different from the grouping in the musician's hands! How is this possible?

African composers take advantage in a marvellous way of a psycho-acoustic fact. The human ear — like the eyes — does not perceive isolated particles but always a "gestalt". In a sequence of notes with *large intervals* the ear is inclined to pick out those of approximately the same level of pitch, and group them together separately. If this sequence of notes is, moreover, rhythmically regular, perception in different conflicting "gestalten" is enormously stimulated. This gestalt-psychological element plays a great part in listening to and composing some kinds of African instrumental music.

Listen to a Central African *likembe* player: marvellously complex rhythmic lines are evident and yet the thumbs of the musician are not moving in as complicated a way as it seems from what we hear.<sup>1</sup> What he plays is a sequence of notes in a "jumping" movement, in intervals as large as, or larger sometimes than an octave. The magnitude of the intervals is perhaps the first condition for this phenomenon of *inherent rhythms* as I have called it<sup>2</sup> — rhythm patterns which automatically emerge from the total musical complex, delighting the ears of both listeners and players, but which are not being played as such.

The larger the consecutive intervals the more clearly, it seems, do these rhythms come out. This holds true up to a certain point. If the intervals are too large — up to

<sup>1</sup> This explains partly why an African instrumentalist can so often with apparent ease add a vocal line with a different rhythm to the instrumental basis woven by his fingers, which in the heard image seems to be extremely complex. The fact that African soloists "play", as it seems, four to five different rhythms simultaneously with only two hands and then are even able to add a singing line which is again "off-beat" in its main accents is something that has been considered beyond comprehension.

<sup>2</sup> G. Kubik: "The Structure of Kiganda Xylophone Music" in *African Music*, Vol. 2, No. 3, 1960.

one and two octaves — the inherent rhythm effect decreases again. We shall understand in the course of our considerations why this is so.

I stumbled against this strange phenomenon for the first time, when I was learning to play the xylophone music of Buganda. There I discovered one day that in the tape recordings everything sounded curiously different from what I had just performed together with the two other Baganda musicians. Our playing when recorded sounded much more complicated than it actually was, and I heard a number of rhythm patterns which I was sure that none of us had played, while on the other hand the rhythms which we had actually played were inaudible on the tape.

In “The Structure of Kiganda Xylophone Music”<sup>2</sup> I identified the inherent rhythms in *Amadinda* playing with the *Okukonera*-parts of the five *Miko* (transpositions). For the *Akadinda* xylophone, however, I only stated that the phenomenon of inherent rhythms was present there as well, though there was no *Omukonezi* to pick them out and duplicate them in a higher octave. At that time I did not give any example of inherent rhythms in *Akadinda* music and want to do it now.

Hugh Tracey made a number of recordings of *Amadinda* and *Akadinda* music in the Kabaka's palace, Kampala, as far back as 1952. These recordings, I hear, will soon be issued on a long-playing record. Other musicologists will then have the opportunity of checking my observations.<sup>3</sup>

Some of the titles on Tracey's tapes I know very well from my xylophone lessons in Uganda two years ago. There is one composition which is particularly instructive for a comparison of the image as I know it to be played and the image that is heard by anyone from the recording. It is called “*Basibira malaika*” (“Moslems are fasting”)<sup>4</sup> and played on a 17-key *Akadinda* xylophone by three performers. The unknown composer constructed this little tune in a way that a number of inherent rhythms emerge from the played image, one of which is so obtrusive in the recording, that a listener can hardly escape from it. This rhythm pattern, which is certainly not *played* by any of the three musicians sitting opposite each other, appears exactly from the moment they are in full performance. (Fig. 1).

*An obtrusive inherent rhythm as heard from “Basibira malaika”*



Fig. 1.

Listeners to whom I played the recording of “*Basibira malaika*” and who at once perceived the rhythm of Fig. 1 as something separate were very surprised to hear from me that it was not played by any one of the three musicians sitting at the xylophone.

What the three *Akadinda* musicians play is entirely different from what we hear on the tape. The following illustration reveals the origin of the rhythm in Fig. 1 and shows how our perception forms this pattern by picking out notes of the same pitch level. (Fig. 2).

<sup>2</sup> “The Sound of Africa” Series. A.M.A. TR. 137.  
(Now available from the Library or Society.—Ed.)

<sup>4</sup> Recorded on 26/6/52 by Hugh Tracey, I.L.A.M. TR. 137. B 4.

"Basibira malaika"<sup>4</sup>

1 2 3 M.M. = ♩. 210

The score consists of three staves. The top staff is for the voice, labeled "One man (Omuwazi) plays:". It features a melodic line with a 1-2-3 rhythmic pattern. The middle two staves are for guitar, labeled "Two men (Abawazi) play:", with fretting patterns 3 2 1 and 3 2 1 indicated. The bottom staff is labeled "The listeners hear:" and shows a simplified rhythmic representation of the perceived sound.

Fig. II.

Listening to our tape we soon notice that this inherent rhythm is not the only one emerging from the composition "Basibira malaika". It was simply the clearest and loudest one. But as soon as our minds gets attracted by the higher notes we hear some more.

*Inherent Rhythms in African Guitar Playing*

Now I wish to demonstrate the rise of inherent rhythms in a very simple pattern for guitar. It was shown to me by a young African guitarist from Maragoli, Kenya. He used it as a repetitive vase for one of his songs called "Bibi safari . . .".

There are reasons for the choice of a guitar pattern as the second example. The reader in Europe or anywhere else outside Africa will hardly be able to get an African xylophone or a likembe for a test; so the guitar is most probably his only possible means of direct experience of the phenomenon. Moreover, the device of composing musical complexes with inherent rhythms has been applied by Africans to the guitar as well.<sup>5</sup>

Take an ordinary Spanish guitar and put a capotasta behind the third fret. This makes the normally tuned strings sound a minor third higher.

The "shortening" of the guitar seems essential for playing it in the African way. The inherent rhythms come out much more clearly, if the tone is brighter and the notes shorter. Learn now to play the phrase of Fig. 3 very fast, but keeping strict time. It is

<sup>4</sup> The employment of European notation in transcriptions of Akadinda music does not mean that the music uses the European tone system. The tuning of the Akadinda on which "Basibira malaika" was played was recorded by Hugh Tracey on the spot: 140, 156, 182, 208, 232, 280, 312, 364, 416, 464, 560, 624, 728, 832, 928, 1120 and 1248 V.p.s. From these figures we obtain the following scale for this particular Akadinda:

European tempered scale (for comparison):	C   C <sub>♯</sub> D   E <sub>b</sub> E   F   F <sub>♯</sub> G   A <sub>b</sub> A   B <sub>b</sub> B
Akadinda scale:	
Names of notes (in Luganda):	B <sub>1</sub> FE   KI   JC   VU   B <sub>2</sub>
Transcribed in staff notation as:	C   D   F   G   A   C

<sup>5</sup> Recordings of Katangese guitar music, where inherent rhythms appear:  
 (a) "Masengu", "Mamwana kufiki munda", "Antoinette wa Kolwezi", "Mama Josefine" and other compositions by P. Ilunga and V. Misomba, AMA TR 25.  
 (b) Anatole Kaseba "Muleka" Decca LF 1170.  
 (c) "Sokuchomale jikita" (G.B. 1587), "Masanga", "Dingala Town" (G.B. 1586) and other compositions by Mwenda Jean Bosco. Recordings of Northern Rhodesian guitar music: "Nakatekwe" by S. Tsotsi Kasumali, AMA TR 52.

absolutely essential to play it completely evenly without metric accentuation. Do not "think" it in terms of strong and weak pulses!

The three bottom strings of the guitar should be plucked by your thumb and the three top strings by the *nail* of your right index. This will make the top notes sound metallic and clear, and bring out their rhythmic independence well.

*The played image:*

(Capotasta at 3rd fret)



Fig. III

After having played Fig. 3 for some time you will feel as if there were two rhythms:

*The heard image:*



Fig. IV.

*Conditions for the rise of inherent rhythms*

One of the conditions for the rise of inherent rhythms we mentioned was: *largeness of intervals*. Another condition is that the performance of the musical complex must be *metrically unaccented*. The moment one plays the first note of the triplets in Fig. 3 as a "strong pulse" and the rest as "weak pulses" no inherent rhythms will emerge. Accentuation, however, to *help* the inherent rhythms come out, is a frequently used means of excitement by African musicians. For example, if you always emphasize in your playing the third note of the triplets in Fig. 3, it will increase the tension between the two inherent lines. The same applies to "*Basibira malaika*". Emphasizing the crotchets in the *Okwawula* part will first of all increase the tension between the two *played* cross rhythms and as a result of this give rise to a number of inherent rhythms, which have not appeared so far.

The third condition essential for creating inherent rhythms is that the sequence of notes must be played *very fast*. Speed brings all notes nearer to each other. There seems to be a kind of "cohesion" in music. The more rapidly notes follow each other, the more association is stimulated. The same happens, if the notes to be picked out are elodically "logical" in their sequence, such as in Figs. 1 and 4.

The fourth condition is the most essential one. A composition from which inherent rhythms should emerge must be constructed in a way that all notes of the same pitch occur at such points of time, that amongst themselves they form a *rhythmical* regular "gestalt".

I have occasionally observed inherent rhythms in the music of Bach and other Baroque or Renaissance composers as well. These inherent rhythms, however, quite contrary to African music, are always *metrically* regular. African composers on the other hand make their inherent rhythms rhythmically *additive*. An excellent example is Fig. 1 — and all the other rhythms shown in this article are additive as well, the only exception being the simple guitar pattern of Fig. 3. It is my impression that the appearance of inherent rhythms in the listener's mind is encouraged if they are *additive*. This would be a fifth condition for the rise of inherent rhythms.

*Analysis of two Likembe tunes from the Congo*

The Central African composer of instrumental music usually aims at the inherent rhythms. This is true particularly for the instrumental music of Uganda (from the Baganda-Basoga group right up to the northern Acholi, Lango and Alur), for the Southern Sudan (Azande) and for almost all Congo.<sup>6</sup>

Recently the same phenomenon has been observed in Southern Rhodesia by Andrew Tracey, who in an excellent study reveals the structure of his friend Jege A Tapera's *Mbira* tunes.<sup>7</sup>

The following two miniature compositions from the Northern Congo will give an idea of how a *Likembe* tune can be constructed to give inherent rhythms. I recorded them in Bondo, Province Orientale, on the 8th July, 1960. Although it was not the best time for a peaceful research trip into the Congo, the traditional musicians were as friendly to me as everywhere, and quite willing to explain the played image by performing very slowly, so that I could transcribe the music from their fingers.

Composition for Likembe an Azande musician from Bondo, Congo.

Scale: (*Approximate intervals transposed into the key of C*)

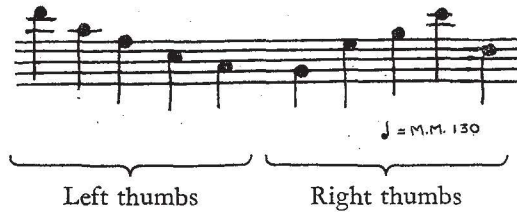


Fig. Va.

*Played image:*



Fig. Vb.

<sup>6</sup> Records of traditional African instrumental music with highly developed inherent rhythms:

- (a) LF 1171 Music of Africa Series, No. 6, Side 1: "*Sitima senda na moto*" (Mbunda Tribe, song with Kathandi mbira; Barotseland). "*Maria and Dzoli*" (Medje Tribe; North Eastern Congo; love songs with Neikembe mbira). Side 2: "*Gitari na Congo*" (Zande/Bandiya Tribe, North Congo; song with Kundi 5-string harp).
- (b) LF 1172 Music of Africa Series, No. 7, Side 1: "*Kemai*" (Baluba Tribe; Chisanzhi mbira solo). "*Amana*" (Bobwa Tribe; humorous song with Lisanzo mbira).
- (c) LF 1173 Music of Africa Series, No. 8, Side 1: "*Kyenda*" (Banyoro Tribe; topical song with Likembe mbira); "*Kinyiri*" (Basoga Tribe; topical song with Budongo); "*Musingasinga yakore egali*" (Banyoro Tribe; Ntara dance tune with Ntara xylophone); "*Kikwabanga*" (Baganda Tribe; Ndere end-blown flutes and drums). Side 2: "*Irambi*" (Banyoro; Makondere gourd horn tunes); "*Ganga*" and "*The Executioner*" (historical songs to the harp by Temusewo Mukasa, Baganda Tribe); "*Kalagala ebewembe*" (Baganda, Amadinda xylophone tune); "*Nsibira ya muanananga Katego*" (Baganda; Entenga drums).
- (d) Recordings of Ntara xylophone of the Dholu people, Uganda, and *Embairé* Music from Busoga and the recordings show the use of inherent rhythms in an extreme way. "A.M.A." TR 130 A 4 and 5 and "A.M.A." TR 140 B 7 and 8.

<sup>7</sup> Andrew Tracey: "Mbira Music of Jege A. Tapera", *African Music*, Vol. 2, No. 4. Compare page 52 (last paragraph and Fig. 6), page 63 (second and third paragraph, plus illustration).

*Heard image:*



Fig. Vc.

*(The notes in brackets have been slightly touched by the thumb.)*

### *A short examination of Wahenga drum rhythms*

Is there a difference between the heard and the played image in music for drums? In some drumming distinctly, as for example the melodic 12-drum instrument of the Baganda, called *Entenga*.<sup>8</sup> Indeed, Southern Uganda seems to be a place where the composing of inherent rhythms is especially developed. But other drumming seems to be constructed strictly on the lines of cross rhythm which A. M. Jones has discovered and analysed.<sup>9</sup>

Here, however, is an example of inherent rhythms in drumming from Nyasaland, which introduces us to a new aspect of this phenomenon. The Wahenga (Tumbuka) have a dance called *Vimbuza*.<sup>10</sup> Two tall conical drums with single membranes are used during the performance, each of them being referred to as *Mohambu*. The membrane of the drum is a cow hide and in the middle of it a lump of black wax is put. Each drummer plays with his two hands, and by tapping different spots of the drum he produces different tones. The drumming is done with the front part of the palm of the hands.

*The first drum and how it is played:*

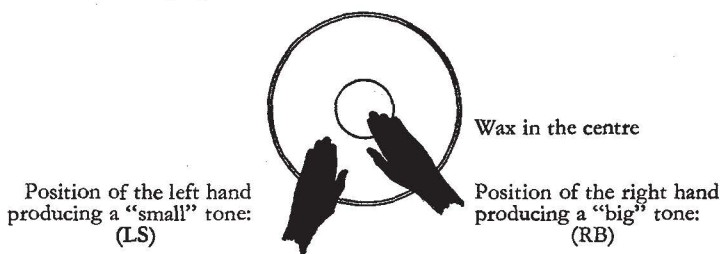


Fig. VII.

*The second drum and how it is played:*

The player of the second drum has two possible positions for each of his hands. I wish to refer to them as LS (-left hand, "small" tone). On the drum the four positions are these:

<sup>8</sup> In addition to this, three accompanying drums of the *Entamiyu* type are used making an Ensemble of 15 drums. An example of Entenga drumming you can find on Music of Africa Series, No. 3, LF 1120: "The drums of East Africa", Side A, item 3: "Kyuma" (The Roundabout). The fast main theme has a construction similar to *Amadinda* music.

<sup>9</sup> A. M. Jones: "African Music in Northern Rhodesia and some other places" (Livingstone: Rhodes Livingstone Museum, 1949).  
A. M. Jones: "Studies in African Music", London, Oxford University Press, 1959, Volumes I and II.

<sup>10</sup> I made the recordings in July, 1962, at Thete village near Rumpi. Central Nyasaland. They are now in the Phonographic Archive of the Academy of Science, Vienna; the Director of which, Herr Univ. Doz. Dr. Walter Graf made this research trip possible by sponsoring me with a tape recorder and tapes.

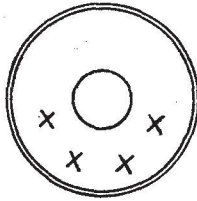


Fig. VIII.

And this is the combination of rhythms as used in one particular part of the *Vimbuza* dance:

*The played image*<sup>11</sup>:



Fig. IX

The striking thing about this combination of cross rhythms is the great difference between the movements of the second musician's hands (motor image) and the pattern actually coming out (acoustic image). In their motion his hands move strictly in *duplets*:



Fig. X

But he arranges the actual beats of his two hands so that acoustically a pattern of two conflicting triple rhythms emerges:



Fig. XI

We see from this example that besides a difference between the heard and the played image, there can also be a difference between what I would call the *motor image* and the *acoustic image*. Not to confuse our terminology I wish to define these notions: The terms "heard image" and "played image" are both acoustic terms. But there is also a motor

<sup>11</sup> I was taught the drum patterns by one of the drummers at Thete village.

image in the mind of the performing musician, which cannot be heard at all. This motor image may produce an acoustic image or *may not*, as for example the *tacet* movements or "beating into the air"<sup>12</sup>, which I recently observed in the drumming of Wagogo women in Tanganyika and in drumming of *Nankasa* within a Baganda xylophone ensemble.

The body movements of the dancers are also motor images and are extremely important in the performance of the music. I hope to devote a special study soon to the relationship of these with the acoustic images of the music.

In all our previous examples there was no difference between the motor image and the acoustic image (as played). But in our example from Nyasaland there is a great difference. We must not take this as granted and understood, but ask the question: Why does the musician on Mohambu II produce his pattern in that way? We have seen that the result of his left-right manipulations in duplets is two inherent rhythms in triplets. *But couldn't these two rhythms* (Fig. 11) *be produced in another much simpler way?* (Fig. 12).



Fig. XII

It seems, after all, to give acoustically just the same result. And there would be no difference between the motor image and the acoustic image. Why then does the drummer not produce it like this?

*The reason is that his motor image and his acoustic image stand in an inaudible but mentally very effective cross rhythm against each other. This inaudible cross rhythm is the clue to the drummer's most subtle joy: with the motor image of his hands he influences the metrically different acoustic image at times! The drummer, for example, can "apply" the motor image (Fig. 10) to the acoustic image (Fig. 11) in a way that all right hand beats are emphasized. This creates two nice inherent rhythms:*



Fig. XIII

There are many more ways of working out a "change", a *variation* in the appearance of the pattern by applying an inaudible motor image to an acoustic image of different meter or rhythm. We can see now: if our drummer had played the pattern as in Fig. 12 it would be much less interesting, much less enjoyable. It would give the impression of stereotyped repetition, a feature absolutely absent in African music.

The difference between a motor image and an acoustic image partly reveals the secret of the subtle variations, which are so often noticed in African instrumental music. A different motor image is gradually "applied" to the acoustic image. This is a technique of variation, the discovery of which may lead to an understanding of some of the psychological backgrounds in African music and of what the musicians "feel".

<sup>12</sup> These *tacet* beats have nothing to do with E. M. van Hornbostel's hypothesis of the "strong up-beat" in African music.



*The changing "view"*

As a last demonstration of the phenomenon of inherent rhythms I wish to analyse a composition for *Enanga*, the harp of the Baganda. It is a particularly good example of the refinement with which African composers use this device. The *enanga* is an eight-stringed instrument tuned approximately to the following scale:

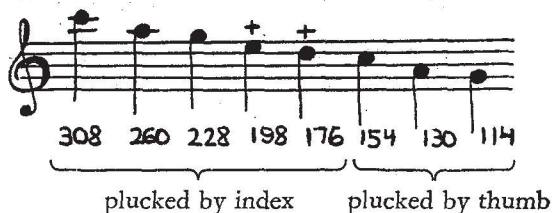


Fig. XIV

To the neck of the harp eight rings are attached, made of the porous skin of a big water lizard.<sup>14</sup> Each of these rings is put half a millimeter from each string, so that the string touches it slightly each time it is plucked. This gives the buzzing sound to the strings which is desired by the traditional harpists.<sup>15</sup>

The musician holds the harp in his lap with its neck away from his body, and plucks the strings with the thumbs and forefingers of both hands. The music consists of three parts. Two instrumental parts and a vocal part called *Okuyimba*. With each hand he produces on his instrument an isorhythmic series of notes, which combine in just the same way as the patterns of the *Omunazi* and *Omwawuzi* on the *Amadinda*.<sup>16</sup> These interlocking two parts are called *Okunaga* and *Okwawula*. (Fig. 15).

*Harp-Composition "Enyana ekitudde" (A calf wandering loose)<sup>17</sup>*

The played image:



Fig. XV

What the listener perceives is very different from Fig. 15, which shows what the fingers of the harpist do. The interlocking parts performed by the left and the right hand of the musician are themselves constructed in such a way, that a number of inherent rhythms emerge. (Fig. 16).

<sup>18</sup> These values are taken from field cards to recordings of the Enanga-harp by Hugh Tracey, 1952, by his kind permission. (Research No. F 3 R-8).

<sup>14</sup> Compare K. P. Wachsmann in "Tribal Crafts of Uganda", page 395, 2nd paragraph: "The rings consist of banana fibre sewn into lizard skin. A small wooden wedge is inserted between ring and neck to make the fitting of the ring easier . . ."

<sup>15</sup> The most famous harpist of Buganda is Temusewo Mukasa. Recordings of him are available on LF 1173, Music of Africa Series, No. 8, Uganda Protectorate and on "A.M.A." TR-138. Particularly fascinating is his composition "The Executioner", where he starts to imitate the *Okunaga* part played by his right hand by singing nonsense syllables until at an incredible tense climax his voice bursts out with *Okuyimba*. Mukasa is perhaps the greatest living composer in Buganda. But as it was with many great men, his art seems to have died before his body. During a short visit to Uganda in 1962, many people gave me the alarming news saying he had gone mad, and that it was now quite impossible to talk to him or even see him at his home. — There is a 16-mm film made by Hugh Tracey in 1952 in the I.L.A.M., showing Mukasa and his harp.

<sup>16</sup> Many musical pieces played on the *Enanga* have been transferred to the *Amadinda* the 12-key xylophone of the Baganda. It is said that all *Amadinda* music was originally invented on the harp.

<sup>17</sup> The construction of harp music was explained to me by my African teacher Evaristo Muyinda.

(NOTE.—All the "Music of Africa", the "Sound of Africa" (A.M.A.), the Gallotone GB, and the Decca LF series of discs can be obtained direct from the African Music Society at P.O. Box 138, Roodepoort, Transvaal, South Africa. Catalogues are available.—Editor.)

The heard image:



Fig. XVI

But strangely enough the grouping of the notes of "Enyana ekitudde" as shown in Fig. 16 is not the only possible heard image. Another listener or the same listener at another time may perceive different inherent rhythms in the same composition. Here is the place to deal with a question raised at the beginning of this article. We asked, why does the possibility of inherent rhythms decrease, if the intervals in the played image are too large? The reason is this: in the case of very large intervals two or three inherent rhythms may easily appear and remain separate throughout the performance. But if the intervals are not so extremely large, say, as in "Enyana ekitudde", then there may be great instability in the formation of inherent rhythms. Since the possible inherent rhythms are much nearer to each other, some notes can easily "break away" from a group and form a new inherent rhythmic line with neighbouring notes. Only a little change in accentuation by the performer creates another heard image. And we may think we hear a variation. This leads to the result that more inherent rhythms emerge from a composition where the intervals are large, but do not regularly surpass the range of one octave.

The notes of "Enyana ekitudde" can very easily change into the following heard image:

*Another heard image of "Enyana ekitudde":*



Fig. XVII

African instrumental compositions are often like picture puzzles. There is not one but a number of ways of perception. From moment to moment the notes may form different groups, because they can be associated in more than one direction. The composer has to cope with all these possibilities. His African composition will only move the dancers and the listeners if it is a *perfect* image from all possible angles. (This he certainly does not achieve by intellectual or even mathematical experiments. The reciprocal way — detailed analysis — is something belonging to another sphere of human experience than *creation*. We should keep this in mind when trying to understand the structure of African music.)

The performer can also help to let this or that grouping appear — by accentuation of those notes he wishes to form into a group. If he shifts his accentuation and as a result of this other inherent rhythms are brought into the foreground, we often believe we hear a variation. But in reality none of the notes have been changed. The same fragments have only formed a different image in the kaleidoscope.