

Reclik 1972

- "Plain documentary" (28) = consciously diffuse documentary (28)
- Recorde film é "precisely outlined theoretical background" (28)
- Differences between "sural image" and "played image".

1. Inherent rhythms

2. Actor images

- Graphic notation = tablatura (31)

Três fases: 1- Traços verticais = frames } descritiva
2- " " = pulses }
3- Partitura } Prescritiva

- Substituição tripla do movimento em África. (34).

- ~~Inter~~ - rhythmic structure of movement patterns (38)

TRANSCRIPTION OF AFRICAN MUSIC FROM SILENT FILM: THEORY AND METHODS

by

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Research Film as Musicological source material

Most films on music and dance which are used for ethnomusicological research purposes are not research films, but documentaries. Research film in ethnomusicology has undergone important development in the last ten years. It can be distinguished from plain documentary in that it records intentionally those aspects of the event which later will allow the researcher to answer certain preconceived questions.

X-ray shots of a South African *kwela* flautist are research film if they are made with the intention of learning something about the typical embouchure and the blowing technique of the musician. Although a documentary is also restricted to within a preconceived thematic framework, the process of field recording should be as little disturbed as possible by the selective preferences of the film maker; the event should be filmed in its entirety, without interruption.² Research film on the other hand, is extremely selective. This can be seen from its concentration on a narrow thematic scope, and often from the constant camera angle and picture size throughout the film; and also from the choice of film material as well as from the film speed and the length of shots.

In other uses of research film the sequence of an event can be interrupted intentionally or broken into segments. So-called analytical recordings, as made by ethno-musicologists, break up a motor-aural process into its structural parts, which can then be studied individually. As in sound recording where the various parts of a drum ensemble can first be recorded one after the other and then in combination, the same can be achieved in the visual sphere by analytical filming.

In contrast to sound recording, research film can largely forgo separate analytical shots, because the playing of several parts can be seen together in sufficient size in a single take – as long as it is not too large an orchestra. If the camera angle is adequate six musicians, with a stick in each hand, playing a log xylophone, can all be brought into one picture and the music subsequently transcribed from the film. In contrast to analytical sound recordings, a simultaneous occurrence does not always need to be cut up into isolated parts which have to be recorded separately. This is of great advantage for fieldwork, for the more protracted and complicated the recording process the sooner do the musicians tire and their initial readiness to co-operate disappears. The larger the recording team, the more comprehensive will be the intervention in the intraculturally determined course of the event. Consequently, doubt can be cast on the scientific value of the recordings of even the most costly film expedition.

Research film can usually be managed on more slender means than documentary film, because of its economy of theme and precisely outlined theoretical background. Considerations such as these have played an important role in the development of ethnomusicological research film.

In contrast to the consciously diffuse documentary, the method of evaluation of an ethnomusicological research film is well established before shooting. The technique of

¹ This article was the basis of a lecture, illustrated with a film, given by the author on 6th October, 1972, at the Institut für den Wissenschaftlichen Film, Göttingen, Germany, as part of the international meeting for the 20th Anniversary of the *Encyclopaedia Cinematographica*. Translation by Andrew Tracey. *Ed. note:* Special phonetic characters are represented in this article by the nearest visual equivalent in italic.

² Dauer, 1969: 226, Kubik 1971: 65-91.

filming is therefore determined by how it will be evaluated later, e.g. frame-by-frame transcription, or movement analysis, by means of slow motion.

Here I should like to present something of my own work in this field in the past few years, with examples from Africa.

Transcription of African xylophone music from silent film

My method of transcribing instrumental playing from silent film³ was developed through the necessity of finding an answer to the difficult problem of transcribing. I was stimulated by the discoveries made during my field trips in Africa from 1959 to 1962:

1. *The discovery of so-called "inherent patterns"* (inherent melodic-rhythmic "gestalts") in several African instrumental styles and, connected with this, the difference between aural image and played image.⁴ Transcription of the aural phenotype of African musical forms from tape alone thereby became methodologically unacceptable.⁵

The most important feature of inherent patterns is that they are not played as such by any of the participating musicians, yet they are contained in the total structure of the piece. Instead of perceiving the different voices of an instrumental ensemble singly, or in toto, the listener suddenly becomes aware of a series of obtrusive rhythmic-melodic patterns at different pitch levels. It could be shown that this is a type of "gestalt" effect. There is a tendency inherent in human perception to hear "gestalts"; African instrumentalists make use of this tendency to an uncommon extent in comparison with musicians in other parts of the world.

2. *The importance of "motor images"* in African music as the deep structure of the audibly perceived part of the event. It was in the clapping of Gogo women in central Tanzania, and in the motor patterns on the *nankasa* drum of the Ganda of Uganda that the existence of "empty" stages in the movement first struck me, movements without sound but strongly accentuated. Air beats and other forms of empty beat can be so important in the motor behaviour of African musicians that it is impossible to understand the music by writing down its audible aspects only.⁶

What followed was the urgent need to develop a process by which the motor patterns of African music could be accurately transcribed, in order to go from an understanding of the movement to an understanding of the audible part of the total event – the "music".

On 15th October, 1962, in the Mitucue Mountains, N. Mozambique, I made an "analytical" silent film of a *mangwilo* log xylophone of the Ashirima, played by two well known virtuosi. The film was made with the intention of transcribing the "music" later by the frame-by-frame process. This material, of which I can only give an extract here, was published for the most part in African Music, 1965.⁷

We used an 8 mm. camera and Kodachrome II daylight film. All the shots were taken by my companion on the trip, Helmut Hillegeist, following my instructions. The film speed was 24 frames per second.

The *mangwilo*, a log xylophone with five to six keys on a base of green banana stems, was lying on the ground in the middle of the village. We asked the two musicians, S. Venjiwa and S. Jenja to be ready to play. The camera was then set up on a stand about one and a half metres from the xylophone, angled down sharply towards it so that the instrument and the hands and beaters of the players, who sat opposite each other, were fully visible. Fig. 1 shows the filming angle and the picture size for one of the xylophone pieces we filmed. Player I (*Opachera*) was on the left in the picture, player II (*Wakulela*) on the right.

³ cf. Kabik, 1965.

⁴ Kabik, 1960, 1961, 1962a.

⁵ Kabik, 1962b.

⁶ Kabik, 1962, 1965: 35.

⁷ See also Corrigenda in *African Music*, vol. IV, no. 4, 1970: 137. My field research in Northern Mozambique was carried out under grants from the Institute for the Study of Man in Africa, Johannesburg, and the International Library of African Music, Roodepoort, South Africa.

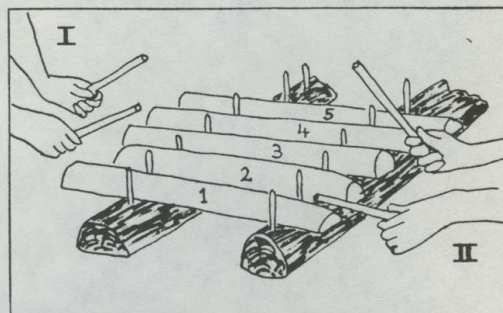


Fig. 1 The xylophone as it was filmed.

The two musicians were asked to play various pieces. Altogether we took extracts of eight xylophone compositions.⁸ At the same time we also made a non-synchronised tape recording of the virtuosi's music. This we did only in order to have a sound record in addition to the filmed music. *For the evaluation of the material, i.e. the transcription from the film, the tape recordings were not used.*

A characteristic of this method is that the motor images can only be obtained from frame-by-frame evaluation. In order to avoid any influence during the process of transcribing from silent film, tape recordings should not be consulted before the work is finished.

Although, for evaluation, the tape recordings are irrelevant, it is advisable on field trips for psychological reasons to make them simultaneously with the film, for often the setting up of a camera is interpreted and misunderstood by the musicians as a "photographic" situation. They then react by posing and do not play "really", as one of my informants once expressed it, but halfheartedly, as they think that it depends on the picture and not on the music. As a rule it does not occur at all to a cameraman who is little acquainted with African music that the musicians are only strumming, and he films cheerfully on.

In a field research situation one does well to stress that a recording is being made, and to make out that the filming is only incidental. This you can confirm credibly by playing back the recording after every piece.

For evaluation of the silent film, and "reconversion" of the motor patterns into music, it is necessary to record the tuning of the instrument on the spot. To allow eventual measurement with a Stroboconn pitch-measuring machine certain recording techniques should be observed, as A. M. Jones has fully described.⁹ In addition to tape recording, the tuning of xylophone keys, lamellae of a lamellophone, strings of a harp etc. can also be ascertained in other ways. Hugh Tracey recommends the method of comparison of the pitches on the spot with a set of 54 tuning forks, tuned at intervals of 4 v.p.s. (=Hertz). A set of these is used on the research trips of the International Library of African Music.¹⁰

When recording the *mangwilo* tuning I played the keys in order away from the camera. The key identified as No. 1 in the transcriptions was nearest the lens (see Fig. 1).

Xylophonists, particularly in south-east Africa, are often inclined to change the order of keys on a log xylophone from piece to piece. Individual keys are exchanged with each other, and this can happen so quickly between takes that it escapes the recording team if they are busy preparing the next shot. By transferring the same or similar motor patterns onto the new key arrangement the musicians can get completely new combinations of voices.

⁸ Original film No. A.7/1962; part copy, 16 mm in the Institut für den Wissenschaftlichen Film, Göttingen, Germany.

⁹ Jones, 1970.

¹⁰ Tracey, 1969.

If this is the case the new key order must be immediately recorded in the original fashion (e.g. in order away from the camera) after every piece filmed. Here a quick tap of the keys is quite enough for later identification of the notes.

I use long strips of graph paper glued together for transcribing the music recorded on the film. The vertical lines of the graph represent the consecutive frames of the film, the horizontal lines the xylophone keys; in this case there were five.

The transcription is done frame by frame. As the film is run slowly through the viewer, one observes the position of the beaters in each successive frame. Whenever a key is struck an entry is made in the corresponding spot on the graph paper (e.g. Frame no. 180, xylophone key no. 5).

For notation symbols for xylophone music I use unfilled circles for the right hand and black circles for the left hand. Fig. 2 shows the result of this type of transcription. Altogether 131 frames were evaluated here, a relatively brief shot. As there are two musicians playing, *Opachera*, the beginner and *Wakulela*, the answerer, they are notated on separate strips.

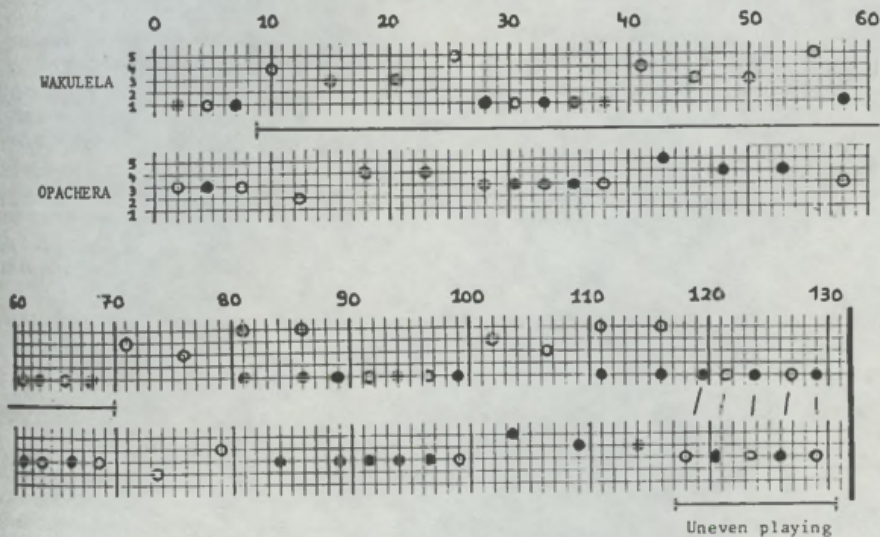


Fig. 2 Graphic notation of a piece of xylophone music. The tuning of the xylophone keys: No. 1 - 512 Hz (= v.p.s.), No. 2 - 850, No. 3 - 752, No. 4 - 626, No. 5 - 579.

Graphic notation is a kind of tablature. As this system is for transcribing from film, the vertical lines represent *frames* of the film. They bear no relationship at all to the rhythmic values of the piece transcribed.

The interpretation of this type of transcription therefore begins with looking for a rhythmic reference point. With material from black Africa we can start best by establishing the smallest rhythmic units. These are to be found in the shortest visible distances between two entries. In most cases we will have thus traced the "basic pulses", so important in African music.¹¹

Next one establishes the repeating sections, in order to find out the so-called form number¹² that bears a direct numerical relationship to the basic pulses. Having found

¹¹ cf. Duer, 1966, 1969: 6.

¹² Kubik, 1961: 198-9.

this form-determining element, then it is usually easy to locate a "beat" or guide-pulse.

Now we have to rewrite the transcription (Fig. 3). In the final form of this tablature the horizontal lines still mean xylophone keys, but the vertical lines no longer mean frames of the film. They must be replaced by other vertical lines, more widely spaced, which mark off the *basic pulses* (the smallest rhythmic units of which the music is constructed).

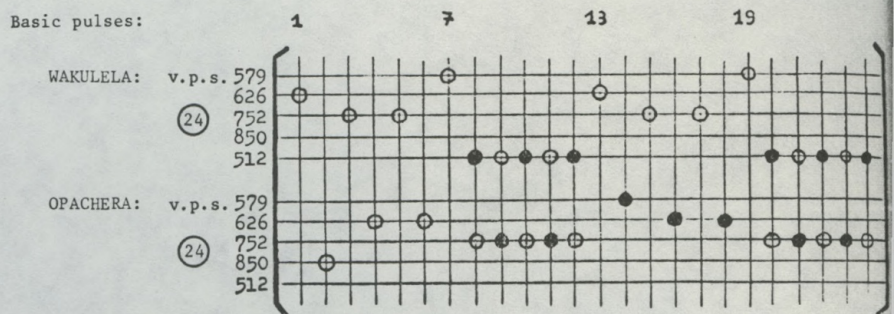


Fig. 3 Graphic notation, second stage, rewritten according to the basic pulses.

The pitch of the keys must also be identified, either by marking the lines in the transcription, or beneath in the form of a key. The tuning of each xylophone key, in the right order, is given in v.p.s. (cf. Figs. 2 and 3).

Lastly, at the start of each transcription the form number is written, following the now widely accepted practice in African music transcription, e.g. the number 24. This means that after 24 units (basic pulses), represented by the vertical lines, the same rhythmic-formal structure repeats (cf. Fig. 3).

The final transcription is a type of score, from which, provided that a correctly tuned instrument is available, the music can be reproduced.

Having found the basic pulses we can go on to calculate the speed of the music. This can be done using the simple formula $\frac{C}{P} \times 60 = M.M.$ The number of frames per second (C) in the present case is 24.

P means "pulse" and stands for the distance between the points of impact which represent the basic pulses. This distance is expressed numerically in frames and fraction of a frame. In the present case the average distance between successive entries (strokes) in the music is about 2.5 frames (cf. Fig. 2).

M.M. denotes Maelzel's metronome, the value of which we need. The calculation is $\frac{24}{2.5} \times 60 = M.M.$, i.e. 576 M.M. for the speed of the basic pulses and half this value for the speed of the guide-pulse or "beat" of each of the two musicians individually: 288 M.M. We are thus dealing with an unbelievably fast music.

Transcribing a single piece of music from silent film can demand many hours of concentrated work, but it is a rewarding undertaking, for the result shows what African instrumentalists are really doing, how their instrumental parts are structured and combined.

Ideally, xylophone music is transcribed by starting with the simplest part. You take one musician and only transcribe one hand, throughout the whole shot. Then you write back, transcribe the other hand, and then do the same for the other musician. One advantage of this method is that when transcribing each successive part, going back to the beginning each time, you involuntarily recheck what you have already written down and its relationship with the new part.

From transcribing a large number of films in the past ten years I have made some interesting observations. At a speed of 24 frames per second we could not expect every tiny phase of movement to be recorded on the film, particularly in such ultra-fast music as *mangwilo*. Many beats appear blurred in the frames, usually those parts of the movement where the beater is whipping down onto the key, or directly after the impact. The rise of the beater is usually visible at clearly defined intervals, as it takes place considerably more slowly.

Going through a series of frames it can sometimes happen that the beater appears to drop in steps towards the key, until it almost touches it, then in the next frame it is already on its way up again. This shows that the stroke came between two frames and we must therefore mark it between two vertical "time" lines (cf. Fig. 2, in several places). This is sufficiently accurate for transcription.

In general, one observes that tolerance of slight rhythmic unevenness on the part of the musicians is greater than one would initially expect. As can be seen from most of the written transcriptions, the distances between strokes which plainly ought to represent a beat or a regular basic pulse show considerable variation. While these strokes are clearly considered by the musicians as parts of a regular series of pulses, one cannot measure them with the regularity of a machine-made pulse.

The listener's and the player's time perception "corrects" this physical irregularity and unconsciously bends the beats into a regular series. These deviations are only visible on the graph paper. The danger exists, in interpreting transcriptions from film, of over- or under-estimating the importance of small deviations. By comparing them with the size of the basic pulses and other structural characteristics of the music transcribed we must find out in every case what are *intentional* and what are *accidental* (tolerated) deviations from rhythmic regularity.

Impact Notation and Inaudible Movements

My first transcriptions from silent film can be described as *impact* notation – notation of the points of impact in a movement pattern – because the *impact* of a beater on a xylophone key, the *touch* of a thumb on a lamellophone is what is notated. At the moment when the beater touched the xylophone key we made an entry on the graph paper.

This procedure has given extraordinary results, particularly in transcribing various types of percussion instruments (percussion beams and sticks, xylophones, lamellophones, slit drums) and chordophones (e.g. musical bows, zithers, harps). But even if impact point transcription allows the sound of the music to be correctly translated into its technique of production, it may still ignore that part of a motor pattern which is not expressed in sound. The musicians themselves may only unconsciously be aware of this "silent" element of movement, but it is indivisibly bound up with the total movement pattern. In other cases (see the example of the Fö girl below) it may be "empty beats" put in consciously for the purpose of rhythmic orientation, which form a component of an integrated music/movement pattern.

Furthermore, it is important to know that even a simple beat, in different cultures, can have a different internal organisation. I have noticed that some European students of the *akadinda* xylophone of Uganda lift their beaters in a somewhat different path from that of expert xylophone players in Uganda. One would normally say "he has a different beat", without being able to define just what that difference is. The Uganda experts play with a swing, elastically; after impact the beater moves slowly upwards, until it reaches its greatest distance from the keyboard, the high point, on the *third basic pulse* of a triple division of the beat. Then it whips down rapidly onto the key. European students of *akadinda* music, on the other hand, are often inclined, at least initially, to divide the distance between impacts either into half or else completely irregularly. Their beater reaches its peak somewhat earlier, about equidistant between two impacts. To an un-

biased observer, this looks stiff in contrast to the loose, swinging movement of the Ugandan musicians. This movement pattern, brought by European and American students from their own culture, is broken down in most cases after lengthy practice at the *akadinda*. Their motional behaviour thus becomes acculturated.

In transcription from film the internal organisation of a simple beat can be made visible. In addition to the impact points the path of the beater can also be notated, using suitable symbols.

Triple subdivision of the space of time between two strokes is frequently to be found in Africa, the lifting of the striking medium taking two basic pulses, and the downstroke one. This is also widespread in work situations, for example pounding maize and millet, or using a hammer or mallet. The rhythmic organisation of blacksmiths working the bellows has already struck many observers.

In 1965 I took some 8 mm. film shots of barkcloth beating in a *mukanda* circumcision school of the Vambwela of south east Angola.¹³ By analysing the sequence of frames it was possible to discover the intra-rhythmic structure of the movement. There is a transcription and a detailed discussion of the subject in my dissertation.¹⁴ The specific organisation of the movement and the temporal relationships of the "corner points" (impact point and high point) show a typical three basic pulse or "triplet" structure (see Fig. 4).

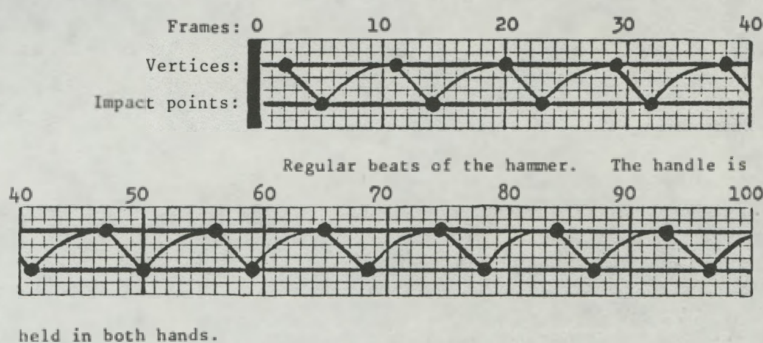


Fig. 4 Analysis of barkcloth beating.

Clapping of a Fõ Girl, West Africa

The importance of the inaudible parts of movement in many music cultures of Africa is exemplified with a comparison between a tape and a film transcription of the clapping of a Fõ girl in Togo. The recordings and film (8 mm. Kodachrome II daylight) were made in the town of Sada Gbonjenji, north of Atakpame, in January 1970, during an extended field study of the Fõ.

Young Fõ women and girls meet on moonlight nights for a song and movement game that they term *Aloyã*. The meeting usually takes place outside the village at a suitable place. The girls form a circle, sing short responsorial songs with leader and chorus in unison, and clap hands. At certain points in the sequence they bend their knees. The songs are about matters relating to young girls and women. (The texts are contained in the notes to my recordings in the Phonogrammarchiv, Vienna). The lead singer most active at that time, and acknowledged as such by the other girls was *Axosi*, who was about nineteen.

¹³ Colour film, F-6.

¹⁴ Kubik, 1971: 170-5.

Even at the time of recording that evening, it occurred to me that the clapping itself was only one aspect of a complex motor pattern. Analysis of the recordings showed that the girls, split into two separate clapping groups, combined their clap patterns as shown in Fig. 5.

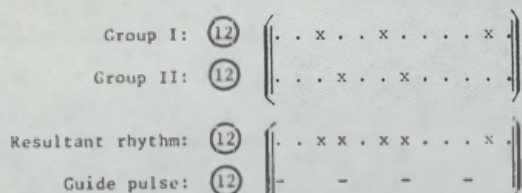


Fig. 5 Clapping in Aloyā songs. Tape Nos. 131, 133, in the Phonogrammarchiv der Österreichischen Akademie der Wissenschaften, Vienna. Performers: young women and girls. Leader: mostly Axosi, c. 19. Language: Fö. Recorded at Sada Gbonjenji, north of Atakpame, Togo, in January 1970. The guide pulse is discernible on the recording from the relationship between the resultant clap rhythm and the phrasing and accentuation of the song's parts.

Axosi, the lead singer, clapped with Group I, and started somewhat before Group II. With regard to the internal guide-pulse or "beat" felt by all the girls, on which the phrases of the song are built, it can be seen that Group II claps twice *on* the beat. Then follow many basic pulses where one hears nothing, but the girls bend their knees at various points.¹⁵ Group I's clapping, on the other hand, is completely *off the beat*.

In the transcription (Fig. 5) both the symbols used (an X and a fullstop) mean the same unit of time, i.e. a basic pulse. X is a handclap. This symbol is not intended to indicate the exact *type* of handclap at this stage, since this cannot be determined from the tape. Fullstops are the "empty" basic pulses, those points in the time sequence where nothing is audible on the tape.

The true organisation of Group I's clapping movement can only be seen on the film. Unfortunately, I was not able to make the film until several days after the recording. Although torn from its original context, 1) by being filmed by day, when the girls do not do this dance, 2) because I called the girls into the village and asked them to perform it again for me, and 3) because they did not form a circle, but sat on chairs or on the ground, the film gives a representative insight into the motor patterns of Aloyā. As well as the audible claps several other motional segments are present which carry strong accents.

In transcription I go from the fact that one can often analyse a movement in terms of *corner-points*, or points of inflection. Corner-points are those extreme points of the motor pattern at which a phase of movement is aimed, or directed. At the same time they mark the end of a section of movement. After a short rest or running-down phase follows a change or a complete reversal of direction. This change requires fresh energy. The terminology is based on the concept of energy consumption.

With a simple two-dimensional motion such as beating barkcloth there are only two corner or turning points. One is the impact of the hammer on the bark, the other the vertex, that is the furthest distance of the beater from the work. In the largely three-dimensional movements of dancing or in complex clap patterns several corner or turning points exist.

Before transcribing we must discover these corner-points by watching the film in slow motion. They form themselves into sounding or noise-making impact points and inaudible "air-beat" positions. Axosi's clapping moves through four extremes of position, four characteristic poses, which are linked by three "running-down" points or vague transitions (see Fig. 6).

¹⁵ See field notes, Phonogrammarchiv.

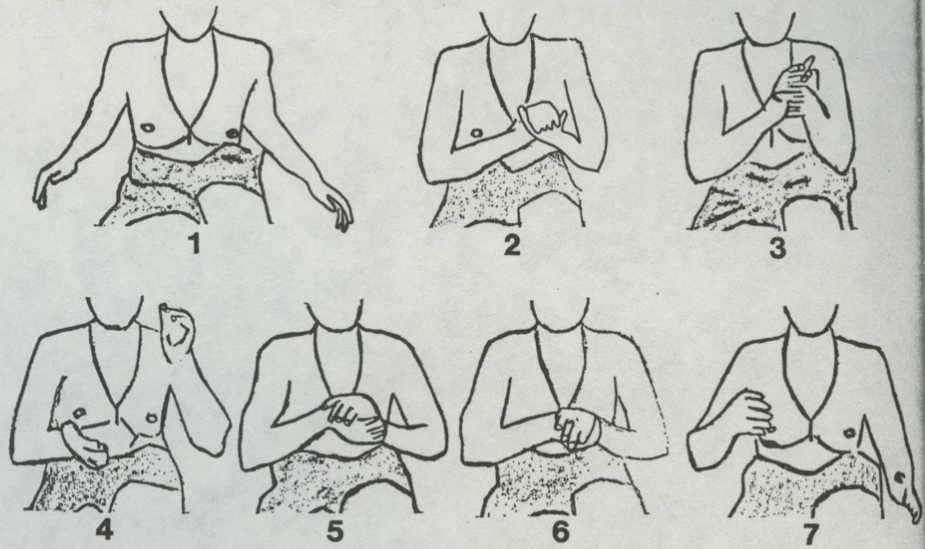


Fig. 6 The seven positions of the clap pattern, sketched direct from the film.

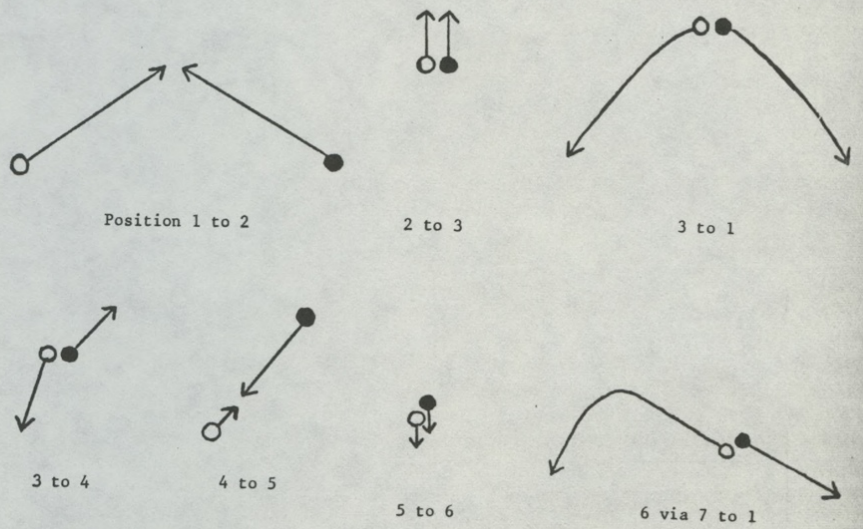


Fig. 7 Schematic representation of the movements in Fig. 6. The complete sequence of movement is: 1, 2, 3, 1, 2, 3, 4, 5, 6, 7.

1. Both arms are swung out to the rear as in the butterfly stroke in swimming (corner-point 1).
2. The hands come in from the side and clap in front of the chest (corner-point 2).
3. They are raised a little diagonally upwards (running-down point 1).
4. The hands are separated diagonally, left hand up, right hand down (corner-point 3).
5. The left hand claps down onto the right, which is held still (corner-point 4).
6. Both hands drop a little (running-down point 2).
7. The hands swing apart in a characteristic way, back to position 1. The right hand describes an arc that at one point seems to carry a strong accent (intermediate point 1).

The succession of positions inside one single repeat of the full clap pattern is this, according to the film: 1,2,3,1,2,3,4,5,6,7. The transitions between these seven positions, i.e. the real movement process, are drawn schematically in Fig. 7. Unfilled circles signify the right hand, black circles the left (as in the xylophone transcriptions). The movements of the hands, which are the functional part of the body in the present instance, are shown by arrows. The diagrams in Fig. 7 and the sketches in Figs. 6 and 8 were made by laying tracing paper over the screen and drawing in the positions.

Of all the seven positions of the total movement pattern *only two give rise to an acoustically perceivable occurrence*. Of the five silent positions, including the two corner-points which carry a strong accent, we detect nothing in the tape recording. And even with the two audible corner-points the manner of production is different, although on the tape the sound is recognised uniformly as clapping. The one time, in position 2, the hands clap coming in from the side; the outspread arms of the previous position have to follow a rapid "flight path". The second time, in position 5, the hands come together diagonally, one above the other. The left hand is held level and comes about a third of the way up to the right hand before this hand meets it.

In a side view of Axosi in the same film we see further that the elbows in position 1 are drawn far back, while head and shoulders sway forward at the same time. In the following position 2 the head and shoulders move back again and the hands clap in front of the chest (Fig. 8). It is also plainly visible in the film how, immediately after clapping, the hands move a short way diagonally upward, as shown by the arrow in Fig. 8/2.

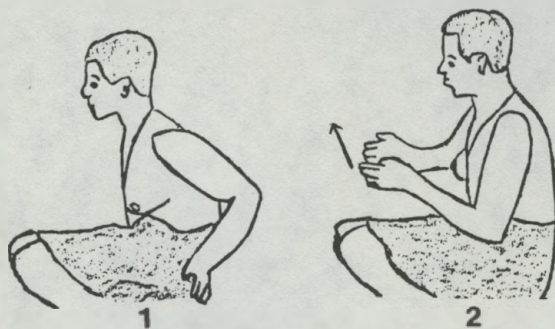


Fig. 8 Side view of positions 1 and 2.

I took several shots of Axosi's clapping. Other group 1 girls are visible in some of these, clapping similarly to Axosi. One girl reverses positions 4 and 5 – the left below, the right above. She is probably left-handed.

In order to represent the clap pattern on graph paper, using the frame-by-frame method, a range of notation must first be found for every position. Fig. 9 shows an extract of my transcription of the first shot of Axosi's clapping, in which 308 frames were examined. The four corner positions (Nos. 1, 2, 4 and 5) are shown by thick horizontal

lines. At the moment that one of these positions is reached an entry, a black circle, is made on the graph. The duration of a corner position is shown by white flags following the black notes. Running-down phases (cf. positions 3 and 6) are shown by flags blowing either up or down, in order to indicate the changes in position that are characteristic of these movements. Transition point 1 (position 7) is not marked in the present transcription, as the exact position of the accent could not be clearly made out from the film.

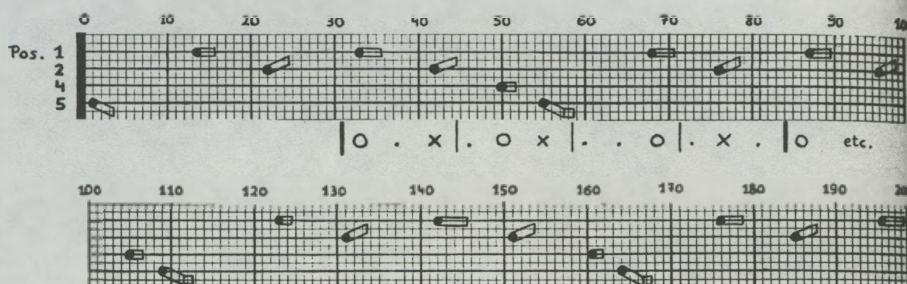


Fig. 9 Graphic notation of the clap pattern.

A comparison of the graphic notation of the clap pattern with the tape transcription (Fig. 5) shows that the silent corner-points of the motor pattern coincide with definite basic pulses. Position 1 comes on basic pulse 1 and 9, position 4 on the 5th basic pulse. The arrangement of corner-points can be seen in Fig. 10. The silent ones are shown by open notes, the sound-producing impact points by X. The same transcription has been inserted into Fig. 9 as well, at one point, to show the correspondence between the two figures.

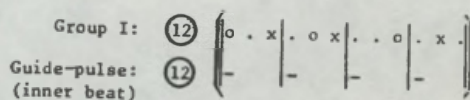


Fig. 10 The arrangement of silent corner-points (o) and claps (x) in group 1's clap pattern.

The results of our transcription from film show the intra-rhythmic structure of this clap pattern. To our surprise we note that the silent corner-points are regularly organised among themselves, and follow each other at exactly the interval of four basic pulses (cf. the position of the open notes in Fig. 10). They divide the twelve-unit summary meter by three, and so stand in a bimmetrical relationship with the underlying guide-pulse, which divides the metrical form by four. The audible beats of the clap, shown as X, form a further rhythm on their own which contrasts both with the guide-pulse and the inaudible corner-points. This fascinating clap sequence is built up of the distances 3 plus 5 plus 4 basic pulses.

Combined with the clapping of group 2, the first two X-beats of group 1 strengthen group 2's beat, anticipating it as they do by one basic pulse. Against this the third X-beat falls at a point in the basic pulse system which is a component of a duple superimposition of the guide-pulse. Thus it contrasts with the inner guide-pulse, or beat, which is built on a three basic pulse structure.

While group 2's claps coincide with the beat, all the accents of clap pattern 1 fall off the beat, with the exception of the first, silent, corner-point, which marks the beginning

of the pattern. In accordance with the practice of time-line patterns in other west and central African music cultures, the entry point of the pattern coincides with the beat. This is a widespread characteristic. The first beat or the starting point of a pattern, in the mind of the musician, is at the same time the reference or *pivot-point* from which the pattern "hangs" and which is also inseparable from the inner beat. This pivot-point can be inaudible, as we have here.

With group 1, it seems, their reference to the guide-pulse is apparent in the running-down phases and transitional movements. These often give us a lead to the positions of the beat (compare the flags in Fig. 9). They are the most weakly accented points, which only shows anew how firmly internalised the guide pulse is in this West African music culture.

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