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Drugs, Rituals, and Altered States of Consciousness

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# AUDITORY DRIVING, HALLUCINOGENS, AND MUSIC-COLOR SYNESTHESIA IN TSONGA RITUAL

The Tsonga live on either side of the Mozambique — South African border, and thus are of major contemporary interest as a vital factor in the policy of detente between the newly de-colonialized nation to the east and the bastion of apartheid to the west. Often referred to in the literature as the Thonga or Tonga, the two million or so Tsonga have recently adopted the name Shangana-Tsonga in order to be clearly distinguished from the well-known groups Plateau Tonga, Zambesi Tonga, and Inhambane Tonga, from whom they are culturally and linguistically distinct. Shangana derives from the name of an ancient Tsonga chieftain, Soshangane. The Tsonga are a patrilineal, virilocal Bantu-speaking people, a considerable number of whom propitiate their ancestor spirits and engage in polygyny. In addition to the staple maize, the Tsonga plant squash, pumpkins, sugarcane, and groundnuts. A few cattle, goats, sheep, and fowl are kept. Male migrant labor is now a key factor in Tsonga economic life.

The Tsonga possess two social institutions in which rhythmic sensory stimulation via fast drumming, and the ingestion of the hallucinogenic plant-drug Datura fastuosa, are prime mechanisms for the achievement of an altered state of consciousness.

1. 'Khomba', the Tsonga girls' initiation rites, are a series of structured fertility rites held every year after the May harvest. Dance, mime, song, drumming, and drug-ingestion are the basis for an integrated set of symbolic activities.
2. 'Mancomane', the Tsonga exorcism rites held mainly during the period January-March (the South African summer), is a series of healing and transformational rites involving the expelling of undesirable alien spirits from possessed individuals, and the graduation of fledgling exorcists.

In one of them — 'khomba' — occurs the interesting phenomenon music-color synesthesia.

Each of these social institutions comprises a sequence of symbolic activities bearing mystical titles. This indigenous classification of the components of the rites facilitates the approach, comprehension, and

participation of the novices who pass through them as a group. Edmund R. Leach, in his classic essay on ritual discusses the Lévi-Strauss viewpoint that "the drama of ritual breaks up the continuum of visual experience into sets of categories with distinguishable names and thereby provides us with a conceptual apparatus for intellectual operations at an abstract and metaphysical level" (1968:524). For the Tsonga, who place high value upon musical performance in ritual contexts, the continuum includes aural experience as well as visual.

Each of the two social institutions named features a transformational process — from girlhood to womanhood in the one and from possessed person to practising exorcist in the other — during which there occurs an anticipatory build-up toward a climactic point in the rites. The stages of the build-up contain a vast number of symbols which depend for their cultural and contextual interpretation upon the attitudes and perceptions of the novices, hence the strict authoritarian control and direction by exegetes. This can also be viewed in reverse: the musical, social, and ritual ambience of the scene of the rites is such that tribal authority and gerontocracy is maintained and reinforced. The changed status of the group of individuals passing through the rites in no way challenges the hierarchical order; it is but one revolution in the Tsonga calendric cycle of ritual events. E. D. Chapple & G. S. Coon refer to such rites as rites of intensification: "A rite of intensification conditions the people to the new relations to follow by building up interaction in habitual channels to a high pitch of intensity, through the use of a wealth of symbolism. Each symbol used refers to the context of situation of the interaction of the celebrants in terms of their technology. The reason for this is that the mechanism of the conditioned response, through which the symbols obtain their meaning, depends on a regularity of repetition" (1942:528).

The girls' initiation rites and the exorcism rites share certain interesting features. Most important among the observed commonalities is the controlled use of *Datura fastuosa* ('mondzo' or 'muri wa ku bonisa' — 'that which opens one's eyes'), a hallucinogenic subsynchronous plant of the Solanaceae family bearing ovate-oblong leaves, blackish-brown seeds, and purple flowers. Its roots are ground and brewed to make a thick tea which, when administered by an officiant in reasonably small doses, produces hallucinations and disorientation in the subject. Other observed commonalities include the following:

- a. Loud, fast drumming at approximately the frequency of alpha waves (8-13 c.p.s., the basic human brain wave), probably employed to bring about auditory driving.
- b. The use of polyrhythms, probably employed to bring about auditory driving in a group of individuals, each of whom possesses a different basic brain wave frequency.
- c. Violent, energetic dancing and other prolonged kinesthetic activity such as miming, bringing about hyperventilation, low blood glucose, and high adrenalin flow.



- d. Insistent reiteration of commands and suggestions by a feared authority figure, probably constituting an example of the use of hyper-suggestibility.
- e. Perceptual hypnotic mechanisms such as the repeated waving (in front of the subject) of a large colored headdress or 'milala' palm-leaf branch.
- f. Rhythmic tactile reinforcement in the form of beating with a switch or shaking of a blanket.
- g. Prolonged exposure to the rays of the midday sun, probably in an attempt to reduce biochemical resistance to the drug's effects.
- h. Immersion in water (the 'crossing-over' component of the rite-of-passage sequence — separation, liminality, and reincorporation).
- i. The use of a large sea-shell (i.e. water-associated object) as a ceremonial container for the drug to be administered.
- j. The selection of a site near a tree, i.e., virile 'phallic' object containing white sap ('semen', 'mother's milk').
- k. The consumption of a small quantity of human fat or powdered bone (in initiation and exorcism this is to obtain protection from witchcraft by doing that which witches do, i.e., eat human flesh; in the trial-by-ordeal it is to force the accused to do in daytime that which he committed at night, thus tricking him into 'losing' his human form, i.e., his normal mental state).

My working hypothesis is that the observed commonalities (a) through (g) exert a cumulative, complementary influence upon each other, and that all of them aid in the reduction of biochemical resistance to the drug's effects. Observed commonalities (h) through (k) represent culture-specific traditional beliefs which shape the motivations, expectations, and attitudes of the participants, maximizing the goal-oriented direction and guidance (by the power-wielding elders) of the participants' visions, supernatural voice-hearing, and other hallucinatory experiences.

Tsonga hallucinatory experience is thus (i) culturally patterned; and (ii) a mechanism for reinforcing the power, prestige, and authority of the tribal elders (as the controllers of drug-use) over the rank and file of the rural community (Figure 1).

As part of the evidence to support the hypothesis, I now present summarized data collected in the field, being my eyewitness account of the ritual use of *Datura fastuosa* and auditory driving within two Tsonga social institutions: initiation and exorcism.

#### DRUG-USE IN THE TSONGA GIRLS' INITIATION RITES

'Khomba' the Tsonga girls' initiation school, teaches the women's role of husband-pleaser, infant-bearer, homekeeper, and tiller of the soil,

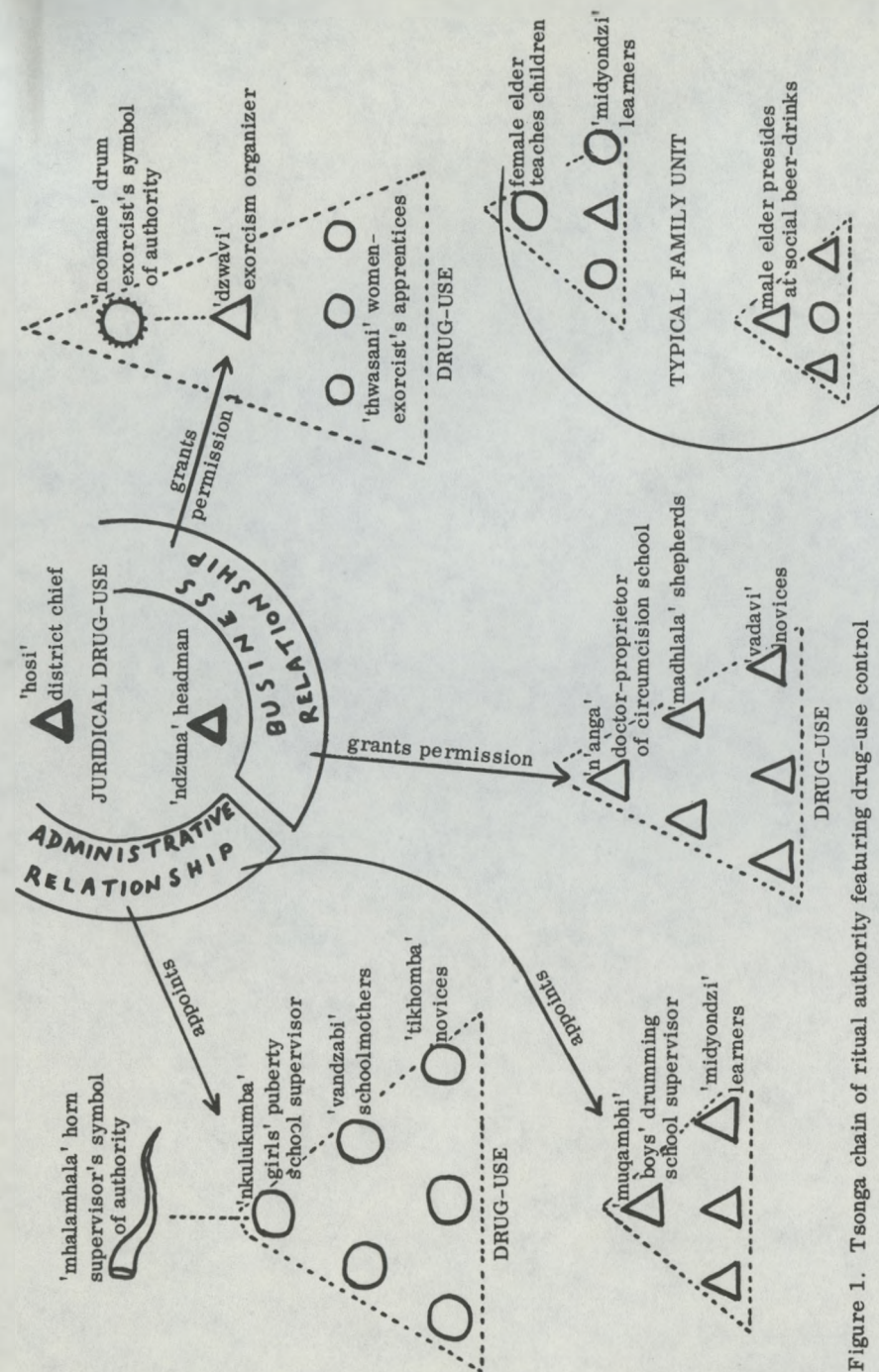


Figure 1. Tsonga chain of ritual authority featuring drug-use control



in that order. It also provides eligibility for marriage, thus bringing cattle to the girl's father. This last is an important economic consideration, for even after graduation through the rites and subsequent marriage, a girl does not fulfil her social obligations until she has born an infant. Should she prove infertile, the cattle will have to be returned and disgrace will follow. 'Khomba' therefore emphasizes fertility, and the drug-use, recitation of secret formulae, dancing, and miming which comprises the initiation rites is largely aimed toward this goal.

Administering of the *Datura fastuosa* must be preceded by a complex series of mimes and energetic dances, accompanied by loud, fast drumming in polyrhythms, many repeated suggestions from the supervisor, the waving of a large yellow headdress before the eyes, spanking with a switch made from the *Datura* plant, disrobing and exposure to the sun, immersion in the river, and a strange water-rite in which initiates stretch a skin over a large container of water while officiants puncture it with poles and swish the water below ('flow of amniotic fluid at parturition'). The series of mimes leading up to the climactic drug-taking ceremony is shown in Figure 2.

During part of the rites girls wear blue-dyed salempores, paint their faces blue, and erect a blue flag. Under the drug they are required to perceive bluish-green patterns; it is more than coincidence that the small snakes (*Dendrophis subcarinatus*) which inhabit the eaves of Tsonga huts are bluish-green and are considered to embody ancestor-spirits. Called 'xihundze' locally, the snakes are revered and never harmed except by the foolish. The following proverb is commonly heard

U nga dlayi nyoka u ndzuluta, ta mincele ta ku vona.

Swikwembu swa ku vona, swi ta tirihisela.

Do not whirl a snake on high if you should kill it.

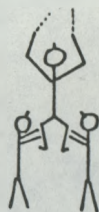
The spirits will see you and exact revenge.

The bluish-green perceivings of the drugged initiates is thus culturally patterned; the cones, spheres, and other geometrics of the human optical system become amenable to observation under the effects of *Datura fastuosa*, take on the color prescribed by the culture, and are associate with the fertility gods. The perception of snakes by drugged subjects is not, of course, culture-specific. Masters and Houston report several drug experiments involving the perception of snakes: "dragons and snakes, especially, are at home here and are not fighting" (subject, after an experiment, in Masters & Houston, 1966:286). But the Tsonga association of blue-green, snakes, and spirit-communication is culture specific. Furthermore, cultural patterning is to be seen in the Tsonga association of water (purification, cleansing), 'crossing over', adulthood, and fertility (amniotic fluid). The Tsonga term for river-mouth ('nyanzwa') is the same as that for uterus, and numerous terms connected with puberty school musical instruments are related to both fertility and water (Figure 3).

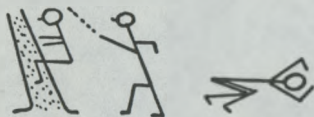
For drug-ingestion the initiates lie on a mat which 'separates them from the dust they knew as children'. They prepare for their 'journey of fantasy' ('rendzo ra miankanyo'), and sing of 'crossing over', as follows:

Call: She is mature, my child  
The ship lies on the far bank of the river.

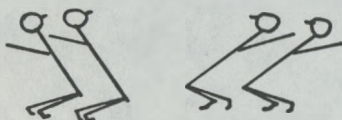
Response: 'Iye, iye', go home (repeat several times).



The shoulder-high mime, with the novice (hoisted high by the others) wielding two sticks to demonstrate labia minora elongation measurements



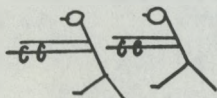
The tree-climbing mime, with the novice being beaten and a third novice in quasi-foetal position on the ground



The backward-leaning 'prisoner' dance, with a song about not forgetting one's identification passbook in the town



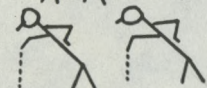
The mime in standing position with hands on head



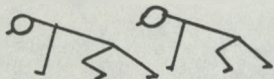
The bangle dance, with arm outstretched to receive bangle for protection from barrenness by witchcraft



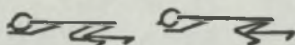
The hands-on-hips childbirth dance, with a novice in quasi-foetal position



The firewood-gathering mime with stick tapped on the ground



The crocodile mime and lobbing of the head



The 'baby-crawl' across the river-bed

Figure 2. The series of mimes leading up to drug-ingestion in the girls' initiation school (note the progressive upward 'growth')



Plate 1. Novices of the Shangana-Tsonga girls' initiation school ('khomba') in the Northern Transvaal. The blue-dyed uniforms and blue paint on the face have religious significance, being associated with the bluish-green snakes called 'xihundze' (*Dendrophis subcarinatus*) which inhabit the thatched roofs of Tsonga huts, and which are revered as ancestor-spirits.







Plate 2. Prior to a religious rite in which a hallucinogenic plant-drug is administered in order to facilitate supernatural voice-hearing, warm-up dances are performed. This one is called 'nanayila'; novices wave wooden hatchets and blow metal whistles in time to fast drumming by middle-aged women.

Plate 3. The fast, energetic dancing seen here is a mechanism aiding the supernatural voice-hearing goal: it causes low blood glucose, high adrenal in flow, and possibly hyperventilation, thus reducing resistance to the drug's effect.

Plate 4. After the 'nanayila' dance an even more energetic dance ('managa') is performed by two novices at a time. In the background is the hand of the supervisor, who is 'consecrating' the ground with black medicine. The latter brings black rain-clouds, which makes the crops fertile. 'Khomba' is believed to make the girls fertile.









Plate 5. The first of a series of important mimes performed by novices to the rhythm of the drum. Bodies are low, for the 'baby-crawl' mime.

Plate 6. Bodies rise higher for the firewood-gathering mime. The long, twisted antelope horn seen here is used to produce frightening supernatural bellowing sounds in the night, represented as the sound of spirits. It is also used to deflower the novices.

Plate 7. Bodies rise higher for the hands-on-head mime. Note pile of discarded clothing — novices take a new name and fresh clothing after the rites.







Plate 8. The climax of the 'rising posture' series of mimes. Each girl is shoulder-hoisted in order to demonstrate elongation measurements — the extent of achieved elongation of the 'labia minora'.

Plate 9. In preparation for drug-ingestion, a novice lies in quasi-foetal position on the 'milala' palmleaf mat which separates her 'from the dust she knew as a child'. The entire vision sequence may be seen as a period of transition and crossing over, from childhood to fertile womanhood.

Plate 10. The 'doctor' wraps each novice in a blanket and selects a clay square in which straws have been stuck. This is inserted between the legs to represent the re-growth of pubic hair which has been shaved as an act of separation. The bangle before the kneeling woman will be given to the graduating initiate as a charm against sterility by witchcraft.





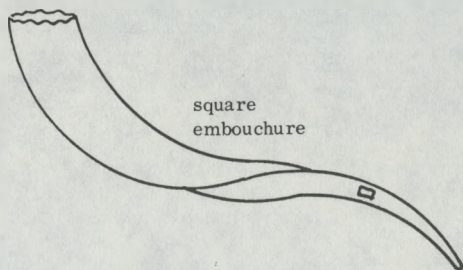
Plate 11. The 'doctor' brings the drug-potion (a brew from the plant *Datura fastuosa*) in a ceremonial shell, and carefully administers a measured draught to each novice, who then customarily reports the hearing of supernatural voices and the perception of bluish-green patterns.

The officiant sprays the initiates with saliva; this is called 'ku pela marhe', to 'cross over' water. She produces a large shell containing *Datura fastuosa* and chants the following:

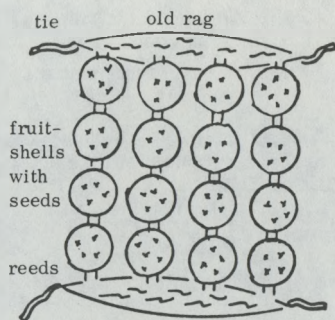
Solo chant: One digs up the medicinal plants.

Take the medicine of which you have heard so much!

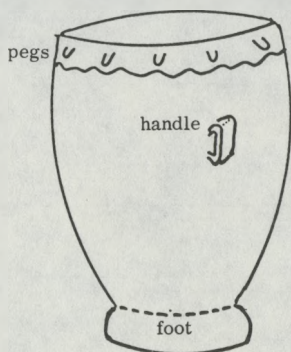
Cocooned in colored blankets, the drugged initiates are beaten with *Datura* switches and told that they are expected to hear the voice of the



A. The kudu horn, symbol of authority of the puberty school supervisor and means of deflowering initiates, is flushed with water before blowing.



B. The fruitshell leg-rattles, whose sound is 'the voice of the gods' which guides puberty school dance-steps, are also used in Tsonga rain rites.



C. The pegs of the puberty school drum are called 'penis', and the hole in the bottom is referred to as 'vagina'. Tension of the head forecasts rain/no rain.

Figure 3. The musical instruments of the girls' puberty school possess fertility symbolism.



fertility spirit. The initiates, in a dream-like state, find spirit-communication easy, for the Tsonga customarily communicate with their gods in dreams (an instance of biochemistry-plus-culture complementarity). Drug-use for spirit-communication has been widely reported in the psychological literature (Blum, 1964:6; Masters & Houston, 1966:257; Barber, 1970:36), and the importance of hypersuggestibility has been emphasized by Tart: "the person comes to rely more on the suggestions of the shaman ... the suggestions of the person endowed with authority tend to be accepted as concrete reality" (1969:17).

The initiates are taught that the mime-specific drumming rhythms produce the bluish-green patterns. This type of music-color synesthesia has been reported in the psychological literature:

... in one study (Klee, 1963) the experimenter clapped his hands in the air while the subjects, who had received a high dose of LSD, were observing visual patterns with their eyes closed; the subjects typically reported that they saw flashes of color in time with the clapping. In another study (Guttman, 1936) mescaline subjects were exposed to music while they were perceiving lines and patterns with their eyes closed; the subjects typically reported that the lines moved and changed colors in harmony with the music. Similarly, a third study (Hartman & Hoolister, 1963) showed that, as compared to non-drug controls, drugged subjects exposed to pure tones reported significantly more colors and patterns elicited by the tones (Barber, 1970:35).

Much separational and phallic symbolism permeates the 'khomba' school, emphasizing the initiates' newly acquired adulthood and possibility for motherhood. For instance, clay squares bearing porcupine-like straws are inserted between the legs of initiates, representing the regrowth of pubic hair which has been shaved off prior to the rites; a tree which is climbed is referred to as the 'xipingwana' (drum-peg); and initiates are required to squat upon an upturned elongated drum.

Infertility, when discovered after the rite, is attributed to witchcraft from enemies; this is true even in the case of literate schoolgirls, showing that Western-style education is not necessarily dissonant with traditional beliefs. To combat sterility from witchcraft the officiant mixes a little human fat or powdered bone with the Datura fastuosa, this being thought to provide an antidote. Fresh Tsonga graves are frequently disturbed during the night by prowling hyenas; the flesh-eating which occurs is attributed to witches, whose activities can be countered by re-enacting the witch-role.

To conclude this account of Tsonga initiation use of *Datura fastuosa*, it is appropriate to point out certain interesting cross-cultural comparisons. My findings concerning the Tsonga association of water, snakes, and fertility closely match S. G. Lee's findings in his 'Social influences in Zulu dreaming' (1958:265-283), and my findings concern-



ing spirit-communication during initiation drug-use tally closely with the findings from research carried out among the Fang of northwest equatorial Africa (see Balandrier, 1963:226; Fernandez, 1965:902-929; Swiderski, 1965:541-551; and Pope, 1969:174-184).

### AUDITORY DRIVING IN THE TSONGA GIRLS' INITIATION RITES

Barber has noted (1970:9) that hallucinogens induce changes in audition. It is also true that certain kinds of audition can intensify the biochemical effects of hallucinogens. In fact, audition and drug-ingestion can be seen as complementary mechanisms for achieving altered states of consciousness, particularly in certain non-Western drumming rituals. In the Tsonga girls' initiation rites, each dance, mime, and symbolic act, including the drug-ingestion act, is accompanied by rite specific drum patterns. These are performed by an exegete loudly and at high speed, close to the heads of the novices, on an untuned drum of general low frequency. The auditory and psychological effect of such a drum is broad, for it is not limited to the single nerve pathway taken by a pure-toned instrument of specific pitch such as a flute. Psychological experimenter Neher states that:

A single beat of a drum contains many frequencies. Different sound frequencies are transmitted along different nerve pathways in the brain. Therefore, the sound of a drum should stimulate a larger area in the brain than a sound of a single frequency. A drum beat contains many low frequencies. The low frequency receptors of the ear are more resistant to damage than the delicate high frequency receptors and can withstand higher amplitudes of sound before pain is felt. Therefore, it should be possible to transmit more energy to the brain with a drum than with a stimulus of higher frequency ... The range of individual differences in basic brain wave frequency is from around eight to thirteen cycles per second ... We expect to find, therefore, a predominance of drum rhythms in the range of slightly below 8 to 13 c.p.s. in ceremonies that precipitate the behavior in which we are interested (1962:152).

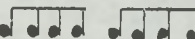
Figure 4 gives the speed of the drum rhythms used in five Tsonga girls' initiation songs, as tape-recorded at the river-bank near Samarie, Northern Transvaal, in 1970, and musically transcribed in Johnston (1972:160, 178, 179, 185 and 190).

This figure shows that the accompanying drum-rhythms of these five Tsonga girls' initiation songs occur at the average rate of eight drum-beats (♩♩♩♩♩♩♩♩) every 1.0864 seconds, or just over 8 c.p.s. If this appears low compared to the range of human basic brain wave frequencies (8-13 c.p.s.), it should be pointed out that slightly lower

Song: 'Nhwanyana xo managa xi nga khombangi hoza cawo'  
(The girl wore a headcloth before initiation)

Drum-rhythm:  every 1.05 seconds


Song: 'Va ta mi khomba' (Coming to arrest the girl)

Drum-rhythm:  every 1.05 seconds

Song: 'Va ta dlaya Ndaheni' (They will kill Ndaheni)

Drum-rhythm:  every 1.166 seconds

Song: 'Hlamba mahlweni yi ku caca' (Wash your eyes clean)

Drum-rhythm:  every .966 seconds

Song: 'Bamba ni Chiawelo' (I'm going to Chiawelo)

Drum-rhythm:  1.2 seconds

Figure 4. Proximity of Tsonga girls' initiation drum-rhythms to human basic brain wave frequency (8-13 c.p.s.)

frequencies favor sound stimulation, for the auditory area of the cortex exhibits the low-frequency theta rhythms.

Further to our discussion concerning changes in audition, it should be noted that, where two independent rhythm sources have been utilized in laboratory experiments, subject response was intensified: "For a few experiments, two light sources were used simultaneously with independent light frequencies . . . the hallucinations described by subjects were of character so compelling that one subject was able to sketch them some weeks later" (Walter & Walter, 1949: 63-64). In all of the Tsonga girls' initiation songs and dances that were tape-recorded, two or more independent drum, rattle, or clap patterns were used simultaneously — this is a well-known feature of most African music, and it may represent a psychophysiological 'net' evolved by adaptive cultural processes, functioning to ensnare individuals of different basic brain wave frequencies by the use of one integrative mechanism (Figure 5).

With regard to the remarkable sensory effect color-music synesthesia, we have noted that Tsonga initiation school novices are expected to see bluish-green color patterns ('mavalavala ya rihlaza') under the influence of the drug and during the playing of mime-specific drum-rhythms. The association of color and sound exists in many cultures. Among the Lau of the Solomon Islands "a low note is called 'bulu' (black), and a high note 'kwao' (white). These names are taken from charcoal marks made on a plank to indicate the tune: heavy down-strokes being 'black', and light up-strokes 'white'" (Ivens, n.d.: 98; quoted by Merriam, 1964: 96). In Mauritania, "within the different styles there are

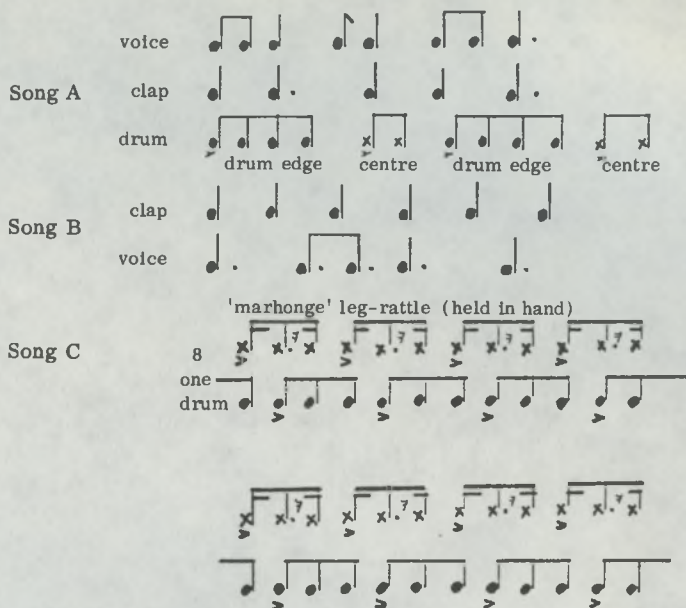


Figure 5. Examples A, B, and C. The use of two or more different rhythms simultaneously in Tsonga girls' initiation songs

two manners of performance — the 'white' and the 'black'. The latter, called 'Lekhal', is preferred by the Griot people since it allows more spectacular effects — the voice spanning a wide range and the notes being held longer ... the 'white' manner — or 'Lebiahd' — is favored by educated people. It is closer to the Arab tradition, and produces a smoother performance and more subtle singing" (Nikiprowetzky, 1961: n.p.; quoted by Merriam, 1964:97). In music in the West, certain instruments are considered to possess a 'dark' tone, usually low instruments such as the bassoon and cello. Trumpets are thought to have a 'bright' sound. Many keyboard artists think of the different possible tonalities in terms of colors. Scriabin wrote a major work during which a light-show was to be given.

In hallucinogenic drug experiments in the West, subjects often appear to perceive, emphasize, or select the 'hot' segment of the color arc: reds, oranges. Among the Tsonga, drug-ingestion during initiation appears to result in perception of the 'cool' segment of the color arc: greens, blues.

The following list gives the color-perception responses of the twelve novices, as described by them at an interview some hours after the rite.



Color-perception responses of Tsonga initiation school novices under the influence of *Datura* and drumming

Novice	Her report	Translation
Novice A	tinyoka ya rihlaza	bluish-green snakes
Novice B	swivungu ya rihlaza	bluish-green worms
Novice C	tinyoka ya rihlaza	bluish-green snakes
Novice D	vilavila ya wasi	a blue whirlpool
Novice E	xihlovo ya wasi	a blue spring (water)
Novice F	mindzhati ya rihlaza	bluish-green lines
Novice G	tinyoka ya rihlaza	bluish-green snakes
Novice H	swirhendzewutani ya rihlaza	bluish-green balls
Novice I	mindhendzewuti ya rihlaza	bluish-green circles
Novice J	ndzhandzheni	the opposite river bank
Novice K	ndzhandza	the river bank
Novice L	tinyoka ya rihlaza	bluish-green snakes

Blue-green is the color of the harmless snakes found under the eaves of Tsonga huts, and which are thought to be ancestor-gods. Water in dreams is customarily associated with fertility. As for the lines, balls, and circles, hallucinogens enhance visual effects by changing retinal image and permitting the appearance of geometric forms and patterns. These visions are the physiological structures in one's own visual system, including the lattices, cones, cylinders, and other geometrics, suddenly amenable to observation.

Concerning distinction between blue and green, the Tsonga appear to be vague about it; it is interesting to note that the Kamayura Indians of Brazil use one word for the two, meaning parakeet-colored. Within the Tsonga environment green is certainly the more meaningful color, and the term 'rihlaza' is a catch-all for green and bluish-green objects.

Tsonga emphasis upon perceiving snakes may be compared to Zulu dream-interpretation: "The snake and 'tokoloshe' dreams are frankly sexual in character — and are often of violent sexual attack by either of these. The local interpretation of the snake dream is frequently: this means that there is a man that you fear" (Lee, 1969:322). The Tsonga possess many myths associating snakes with water. Water-fowl, for instance, are reputed to store small green snakes in their nests. The snake-like kudu antelope horn which is used to signal dance and mime directions, is repeatedly flushed with water during use. The selection of a riverbank site for performing the 'khomba' initiation rites must be done with care by an exegete, for fear of offending the snakes which are thereabouts.

The perception of the Tsonga bluish-green fertility snake and the hearing of the voice of the fertility god is largely stimulated by the suggestions of the officiant, who is knowledgeable in Tsonga ritualistic

lore and in the psychological manipulation necessary to ensure group conformity during the rites. With the enforced diminution of the novices' critical faculties there is a decrease in reality testing, bringing about the compensatory need to seek support and guidance. The dissolution of self boundaries diminishes primary process thinking (doubting, etc.), external suggestions assume a concrete reality, and a supramotivational state ensues. The officiant becomes the silent inner voice. Manipulating the novices with powerful music, she leads them into the various consecutive mimes and dances with their soundings upon the kudu horn. It is she who suggests the music-color association, the hearing of voices, and the fertility vision.

## CONTRIBUTIVE EFFECT OF THE DANCING

In Tsonga dancing, the feet stamping at one rhythm, the hands clap at a second rhythm, and the voice sings syllables which float at a third rhythm over the accompaniment 'grid'. The hips, shoulders, and head meanwhile sway and undulate in time to various aspects of the music in a typically African series of gestures and postures. Neher states that "violent dancing and gestures make hyperventilation a possibility and increase the production of adrenaline, as well as cause a decrease in blood glucose which is used for energy" (1962:157). It has been shown that low blood glucose and the production of adrenaline increase susceptibility to tapping of the basic brain wave rhythms (Strauss et al., 1952).

Complementary to the drug's effects are the auditory driving, the dancing, tactile reinforcement (beating with switches), visual effects (swaddling in see-through colored blankets), the suggestions of the officiant, and the cultural imperatives which associate dreams with the fertility-god and fertility with social success.

## PRIMARY SCHOOL EDUCATION AND BELIEF IN WITCHCRAFT

All of the novices involved were senior students at Samarie Primary School, utilizing textbooks in English, Afrikaans and Tsonga, and studying modern scientific subjects such as (elementary) biology. They nevertheless believe firmly in the power of witchcraft, and greatly fear barrenness by witchcraft. One of the key dances in the 'khomba' rites involves a posture where the novices stand in file extending one arm and one leg, to receive consecrated amulets guaranteeing immunity from witchcraft curses. Such curses may emanate from within one's closest social circle, by reason of envy or just plain malice. A common source is one's co-wife, jealous of the husband's temporarily preferred sleeping companion. The Tsonga sing many witchcraft songs:



Call: Hey, you witches  
 Response: I really shall not live  
 Call: My grandmother there at the old place  
 Response: I really shall not live  
 Call: Has left the village on that account  
 Response: I really shall not live  
 Call: Wash your eyes clean  
 Response: I really shall not live  
 Call: We told them, we shall not be spared

Here, "We shall not be spared" refers to the danger of barrenness by witchcraft, and "Wash your eyes clean" refers to both the fact that women must watch out for witchcraft in their husband's village, and to the fact that the drug-ingestion 'washes one's eyes', facilitating perception of the fertility-god.

The strong present-day belief in witchcraft, by adolescents attending a European-type school, suggests that such beliefs may not be dissonant with modernization and on-going social change. Jahoda's study of supernatural beliefs and changing cognitive structures among Ghanaian university students found "coexistence between African and Western ideas and beliefs" (1970:115-130). In the parallel but different case of drug-ingestion, however, this state is difficult to envisage, for South African laws override native law in declaring the practice illegal.

#### AN ECOLOGICAL AND ENVIRONMENTAL EXPLANATION OF 'KHOMBA'

Much searching of the records of the Bantu Administration failed to turn up reliable figures of Tsonga infertility and infant mortality. We are dealing here with a rural, traditional society where malnutrition and diseases such as syphilis are sometimes prevalent and where it is not generally determined whether the husband or the wife is the infertile partner, where infants are not considered fully 'human' (recognized members of the society) until after the first year, for fear of their early death. Bilharzia and gastroenteritis claim some victims during this period. The closest approach to reliable figures came from the Swiss-manned clinic and mission at Elim Hospital, near Sibasa in the Northern Transvaal, where doctors' estimates put infertility in Tsonga women at about 30 per cent and infant mortality during the first year at about 35 per cent. Deceased infants are quietly buried, often without being reported. A well-known Tsonga song likens healthy infants to a true-ringing, well-baked clay pot that has survived the crucial firing process, and tells how 'weaklings' are buried in a broken clay pot, "for they cracked in the firing".

What is certain is that Tsonga bride who proves childless is in great trouble. It is not merely that the cattle which have been paid for her

must be returned; often, the cattle have already been spent to bring the girl's brother a wife, and a chain reaction is involved. The barren woman may expect a lifetime of disgrace and working for others. To avoid the consequences of believed sterility, 'khomba' laws are strict. A novice declaring inability to perceive the required visions has, in the past, been known to receive supplementary *Datura*, thus ending heretic doubts.

## DRUG-USE IN THE TSONGA EXORCISM RITES

Probably rooted in Tsonga history and migration, the Tsonga fear of Zulu ancestor-spirits and Ndau ancestor-spirits is manifested today in the phenomenon called 'mancomane'. spirit-exorcism. Undesirable alien spirits possessing Tsonga individuals are commonly diagnosed as either of Zulu origin (the 'mandhlosi' spirits) or of Ndau origin (the 'xidzimba' and 'ziNdau' spirits); they are expelled via drug-use and the performance of spirit-specific music. Both the scale and the rhythm of the performed music is tailored to the nationality of the possessing spirit, as is the language of the song-words. The complex of interesting cognitive distinctions made by the Tsonga in their classification of spirit-associated phenomena reflects not only tribal history as it actually occurred, but Tsonga conceptions of what occurred.

The first signs of possession are a nervous crisis, chest pain, thinness, or excessive yawning. The set of sixty-four divining bones are thrown to determine the possibility of successful exorcism. If the four seashells among the bones should fall on their back, with the opening facing upward, the spirit will come out. If they fall face downward, the ceremony will be in vain.

The exorcist covers the patient with a blanket, burns *Datura fastuosa* roots, seeds, leaves, stalks, and flowers in a circle of embers under the blanket, and, together with his assistants (often his wives — the display of many wives constitutes a sign of previous successful practice), commences the prolonged loud, drumming on the tambourine-drums. An interesting aspect of this drum is that it is not indigenous to any other southern African people, but is found in the same shape, size, and function among Siberian, Guatemalan, Northern Irish, and other folk-healers. This may be due to its light weight, its simplicity of manufacture, and its solar appearance. The drumming is fast, around 9-12 c.p.s.

When the effects of the drug and the drumming (along with hyper-suggestibility, tactile reinforcement, and heat-exposure) take their toll, the patient reveals the spirit's origin by singing. Possession by undesirable alien Zulu spirits ('mandhlosi') is revealed by singing songs containing the names of 19th-century Zulu conquerors of the Tsonga, such as Nghunghunyane:



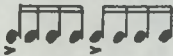
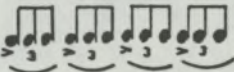
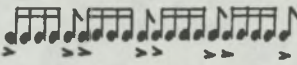
Possessing spirit	Language of songwords	Melodic pattern	Rhythmic pattern
'mandhosi'	Zulu	pentatonic	
'xidzimba'	Shona or Ndau	heptatonic	
'xiNdau'	Ndau or Rotse	heptatonic	

Figure 6. Spirit-specific characteristics of the music accompanying exorcism drug-use

#### Song 1

Call: Nghunghunyane, personification of our people!

Response: We name him the Ideal One!

Call: We are his followers / His son neglected us /  
We never catch sight of him.

The diagonal strokes represent a repeat of the Response.

#### Song 2

Call: Nghunghunyane was killed in the bush.

Response: His enemies remain dancing.

To expel the Zulu spirit the exorcist will then order his drummers to play the appropriate 'mandhosi' rhythm; should the spirit be revealed to be of Shona or of Ndau origin, there are special rhythms for each case (Figure 6).

In addition to spirit-specific rhythms, spirit-specific scale-patterns must permeate the melodies of the exorcism songs. The pentatonic (5-tone) scale is appropriate for Zulu spirits, and the heptatonic (7-tone) scale for Shona and Ndau spirits; this is confirmed by an interval-count of fifty-one 'mandhosi' songs and twenty-four 'xidzimba' and 'xiNdau' songs (Figure 7). The heptatonic songs contain 8.5 per cent minor 2nds, which interval does not occur in Tsonga pentatonic music.

Following successful exorcism of the undesirable alien spirits, the patient is led to a spot under a special tree called the 'gandzelo', where his (or her) head is splashed with treated water from a large ceremonial seashell, and he is required to consume a small pellet of human fat or powdered bone. The throat is then tickled with a feather, inducing vomituration, which is thought to appease the spirit.

Then follows a long period of rehabilitation and propitiation, indicating the transitional nature of the rite and the Tsonga fear of regressing (because of negligence) to one's former state. Tsonga individuals who have been through possession evince a much higher degree of religiosity than those who merely placate their own ancestor-spirits. For com-

## Interval preference in 51 pentatonic exorcism songs

Interval (total of 1014 intervals)	% (approx.)
major 2nd, descending	29
minor 3rd, descending	21
major 2nd, ascending	15.5
minor 3rd, ascending	9
4th, descending	8.5
4th, ascending	5
major 3rd, descending	3
5th, descending	3
minor 7th, ascending	1.5
major 3rd, ascending	1.5
8ve, ascending	1
5th, ascending	1
major 6th, ascending	0.5
major 9th, ascending	0.5
	100%

## Interval preference in 24 heptatonic exorcism songs

Interval (total of 496 intervals)	% (approx.)
major 2nd, descending	35
minor 3rd, descending	15
minor 2nd, descending	8.5
major 2nd, ascending	7.5
minor 3rd, ascending	6.5
major 3rd, descending	5.5
4th, descending	5
4th, ascending	4
minor 2nd, ascending	3.5
5th, ascending	2.5
minor 7th, ascending	2
major 3rd, ascending	2
5th, descending	1.5
major 6th, ascending	1
major 7th, ascending	0.5
	100%

Figure 7. Table showing cognitive distinctions made by the Tsonga between scales suitable for expelling Zulu spirits from drugged patients, and those suitable for expelling Shona and Ndau spirits (these last two require heptatonicism)

parative information on Tsonga exorcism in the early 20th century. consult Junod (1927, 2:479-504).

Tsonga exorcism, involving belief in spirits and other aspects of the supernatural, is a part of the overall Tsonga religious system, and forms part of an important dichotomy in which family spirits are at the other pole. Figure 8 shows the role of drug-use and of drumming in different contexts involving ancestrolatry and spirit exorcism.

## CONCLUSION

Each of the ritual situations described is a rite of intensification, a tripartite sequence of separation — liminality — reincorporation of the group of novices, involving progressive stages of socially recognized (by the Tsonga) identity. The establishment of group social identity appears to take precedence over that of individual identity, which is one important difference between Tsonga society and Western society. Each of the biochemical, psychophysiological, musical, and cultural mechanisms utilized by the officiants at each stage of the rites of initiation and of exorcism, appear to be directed toward a group status-defining goal. Although some of the mechanisms employed have long



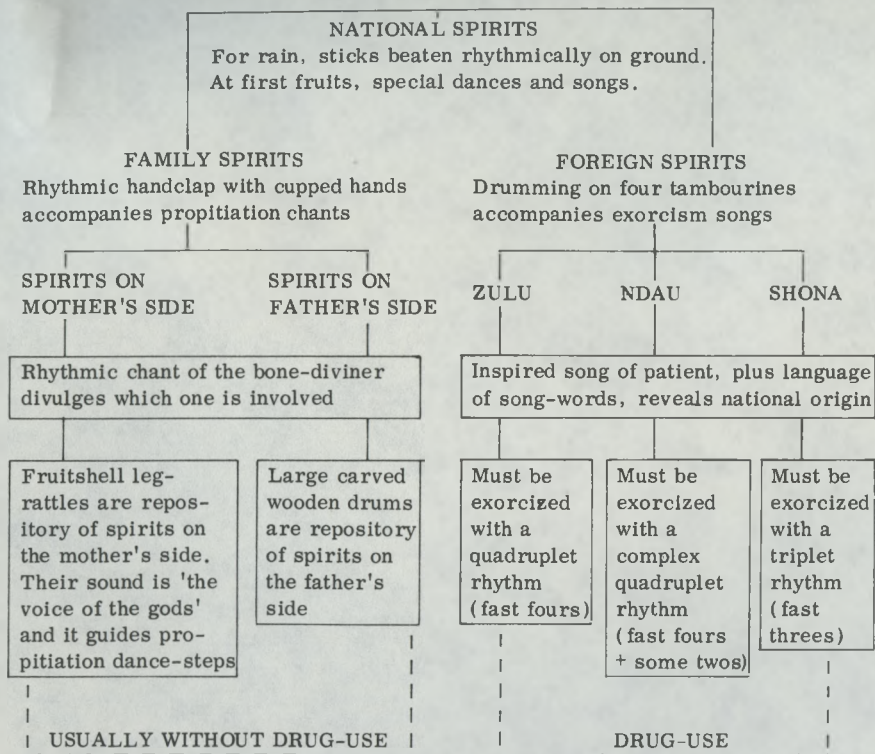


Figure 8. The role of music in the Tsonga religious system

been known rather superficially to explorers, missionaries, and early anthropologists as typical African phenomena (drumming, dancing), their origin and function have only recently come to be more fully understood. Too often in the past, African sociomusical behavior has been attributed to some mystical, hedonistic, or eudemonistic pleasure-search or lack of a sense of ethical responsibility. In fact, African drug-use, drumming, dancing, and singing are pragmatic and problem-solving. They are a culture's adaptive response to ecological and environmental pressures, and their particular mode of manifestation is determined by deep-rooted historical and psychological factors. Specifically, the availability of timber in the great wet rain forests of Africa, where drummers fell an entire tree for one drum, and the availability of tropical and subtropical plants containing hallucinogens, are complementary botanical assets of which the African has long taken advantage, and the use of which has subsequently diffused southward. The ecosystem which facilely yields drums and drugs, also generally yields tropical and subtropical ailments causing widespread sterility, hence the use of one to counter the effects of the other. These aboriginal

cultural adaptations have throughout history been variously modified by contact and influence from encroaching alien cultures, so that there exists a complex of historical, social, and psychological forces inhibiting the continuance of traditional drug-use practices, and an opposing complex encouraging them, as follows.

A. Those tending to inhibit traditional drug-use practices

1. Labor migration and the acquisition of new values.
2. Government schools and European teachings.
3. Religious broadcasts from urban radio stations.
4. The use of imported religious phonograph records.
5. The disapproval of European-manned Christian churches.
6. The disapproval of (some) African Christian churches.
7. Attendance at government health clinics.
8. The close presence of the (prestigious) European farmer.
9. The introduction of new medicines such as aspirin.
10. White government legislation banning the free use of hallucinogens.

B. Those tending to encourage traditional drug-use practices

1. The existing linguistic code referring to magical potions.
2. Its strong identification with traditional social activities.
3. The great utility of many folk-healing practices.
4. Inculcation of children via folktale-telling.
5. Inculcation of traditional values via initiation schools.
6. The still strong authority of traditional herbalists.
7. The still strong kinship ties and hence tradition-oriented hierarchies.
8. The strong traditionalism of women, who are the culture-guardians.
9. Price in tribal origin.
10. Deliberate native preservationism, by African intellectuals.
11. Deliberate anthropological preservationism by European scholars.
12. The collection and dissemination of herbal practices by Asian traders operating herbal stores.
13. The dynamic renewal process by intertribal diffusion of medicinal and religious practices.

Not the least of the social problems which arise from drug-use by different cultural groups is the legal question. To relate this paper to the situation in the United States, it is sufficient to point out that, to the peyote-users of the Native American Church, government drug-control laws are oppressive, while, to the narcotics bureau, Indian drug-use practices represent a violation of national law. In Africa, the remoteness of many areas precludes strict law enforcement, but this condition may not prevail indefinitely, and African governments may soon have to face problems similar to those found in America.



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PLANT HALLUCINOGENS, OUT-OF-BODY  
EXPERIENCES AND NEW WORLD MONUMENTAL  
EARTHWORKS

To the anthropologist interested in the problem of interpreting archaeological remains, particularly the belief systems and mythologies of now extinct peoples, New World massive earthworks present a fascinating problem worthy of consideration. Mounds containing burials and often enigmatic, massive symbolic earth formations difficult to interpret can be found in three major culture areas of the New World — the Adena/Hopewell peoples, the Olmec of the Gulf Coast of Mexico, and the Nazca peoples of southern Peru.

In my area of specialization, hallucinogens and culture, I have had occasion to conduct cross-cultural research on the use of such psychotropic plants, often prior to European contact in traditional societies of the world. In preparing a report for the U.S. National Commission on Marihuana and Drug Abuse (Dobkin de Rios, 1973a), I found common themes emerging from the ethnographic data among a number of world societies where such psychoactive plants have been used for magico-religious purposes. I would like to draw upon some of the generalizations available from this material in an attempt to make sense out of the content, structure and meaning of the New World massive earthworks.

In this paper, I will argue that due to shamanistic, out-of-body experiences, the so-called aerial voyage, prehistoric New World massive earthworks were constructed. The purpose of such expenditures of time and labor was to make known certain cosmological messages not only to supernatural forces, but to members of the community, as well as other shamans in conflict with the social group. To argue this point, I would like to evaluate the archaeological record, synthesize clinical studies available concerning hallucinogenic ingestion in patient and experimental populations and ensuing out-of-body experiences, analyze the cogent characteristics of shamanism generally pertinent to my thesis, and examine common, recurring themes of relevance linked to the use of psychotropic substances in traditional world societies.

In arguing these points, I must reiterate (as I have done so previously in print, cf. Dobkin de Rios 1972c, 1974a, 1975) the importance