Ethnomathematics and Symbolic Thought
The Culture of the Dogon

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Abstract: This paper deals with the following aspects of the culture of the Dogons (Mali): the specific mythological context and the related cognitive system; fundamental poles in the Dogon numerical symbology; the density of 5’s significance; the spiral as a coreography of thought; ethnomathematics “logosymbols” as “event” and social meaning; educational implications (transcultural expression of thought and feeling).


ZDM-Classification: A30

1. The dogon
Mali has different kinds of ethnic groups. After the dryness of 1970, its nomad population (Touareg, Peuhl and Moor) decreased significantly. Among the sedentary population there are two main groups: the Mandingue (Bambara, Malinké, Dioula) and the Sudanese (Dogon, Saracollé, Bonzo, Sonrai).

The territory of the Dogon is situated between the Mali city of Mopti and the border of Burkina Faso. The cliffs of Bandiagara are a main place of Dogon’s life. The Dogon are traditionally characterized by their sharpness, vivacity, agility and resistance.

Usually, the Dogon can understand quite well several tongues (Bambara, Bozo and Peuhl, namely), but their daily tongue is radically different from those that are spoken by their neighbours. They have a second kind of language, a secret and rhythmics language (Sigi ‘So), just known by certain initiated persons and used in specific ritual ceremonies.

2. A cognitive system based on a principle of exponential duality
Although Dogon thought has been researched for many years, we are still far from appreciating the secret wealth of their hidden knowledge. Furthermore, among the Dogon this knowledge has been appearing progressively in different stages of initiation, the most perfect of which are only reached by some exceptionally gifted individuals.

Dogon mythology is based on a dualised unity – or an original uni-duality – represented by an infinitesimally small form of living atom (kize ści), which turns into the egg of the world (aduno tulu) where the cosmos comes from. This atom is symbolised on earth by the seed of the Digitaria Exilis (Palau Marti 1957: 53–55).

There are two main versions of the creation. Both refer to Amma, the supreme Lord the heavenly regions, and to the appearance of sets of twins who became the ancestors of the Dogon people. Regardless of whether Amma married the earth and made it fertile with his divine seed (rain), or man developed from the egg of the world, the principle of duality always appears through the first set of twins, Nommo, (one male and the other female). This duality is reinforced by the two collar bones from which the embryo of man developed, (where duality is translated as axial symmetry) and by the two complementary “half-placentas” from the egg of the world or primordial matrix.

Double duality is immediately apparent as each of these “half-placentas” produces a hermaphrodite couple. These couples became the 4 mythical ancestors who in turn gave origin to the first 80 descendents.

When dealing with the general and totalising character of 4, we can see how these 4 ancestors joined in chains of symbolic correspondence, not just in 4 tribes, 4 trees and 4 social institutions, but also in the 4 cardinal points and the 4 fundamental elements.

Amma used 4 elements, contained in the initial living atom, to create the substance that later became vivified through the “parole”: “la parole” being the life of the world, born of water (Dieterlen 1982: 18).

Earth was sullied by the introduction of trouble by Nommo’s rival, Ogo (also known as Yurugu or the Pale Fox) who came down to earth after appropriating the 8 seeds initially created by Amma and after having stolen the secret of “la parole” (Dieterlen 1982: 17; Beaudoin 1984: 70).

Curiously, Ogo’s revolt seems to have been caused by his particular form of birth: he was born a male from one half of the original egg, but without a female twin who would have integrated him into the principle of normal duality. The world was re-purified by Amma through the death and resurrection of Nommo. Nommo’s sacrificed body was divided and thrown in the 4 directions of space.

The development of the original mythical duality explains the symbolic importance of 8 by multiplicative unfolding, and intrinsically joins the semantics of spatial representations that is an ever-present in Dogon thought. An analysis of the symbolic dimension of $2^n$ ($1 \leq n \leq 3$) will form part of a separate study. However, attention must be paid to the set of numerical entities that do not derive from the principle of duality, but which also play a major part in Dogon symbolic thinking.

3. Some fundamental poles in the complex Dogon numerical symbology

266
The Dogon have 266 signs that prefigure the categories of everything in the universe, both objects and beings: “these signs, substitutes and images constitute a vast system of correspondances, in which every term is interlocked within what seem to be specific categories; these categories in their turn, whether linked or opposed, are themselves correlated” (Dieterlen 1982: 69; Palau Marti 1957: 56).
These 266 signs are also called “the 266 parts of Amma’s body” or “the 266 things of the beginning”. They belong to the initial design of the “plan of the world” – that Amma conceived of and drew on the basis of water – symbolically carried out on earth, more specifically in “the field of the ancestors” (Dieterlen 1982: 18, 69; Griaule/Dieterlen 1965: 86–87).

• 60
60 is also “involved in the diagram of the world” (Griaule/Dieterlen 1955: 103) yet it also played a part in Amma’s purification of earth, as Nommo’s sacrificed body was divided into 60 parts (Dieterlen 1982: 18).

60 also appears as an essential symbolic value in rain rituals and in the autumn harvest, where 60 Dogon chiefs are present; at funeral ceremonies, where 60 urns are on display; and especially at the itinerant festival of the star Sigui, held every 60 years and dedicated to the revelation of the “parole tissée dans l’eau” and to the appearance of death in the world. The 60 year gap between these cyclical festivities corresponds to the time taken by some heavenly bodies to orbit around Sirius, which the Dogon call “the star of Sigui” (Dieterlen 1982: 18).

The symbolic efficiency of number 60 extends further to include operative efficiency, as 60 is one of the bases of the mande reckoning.

• 22
22 is another central pole in Dogon numerical symbolism, around which several different cognicultural organizational systems revolve. For example, 22 dots are represented in the “déroulement des éléments” scheme, as witnesses of the exterminated and classified world (Dieterlen 1982: 46–47).

In addition it is associated to the cult of the ancestors, which involves the invocation of the 22 members of the first mythical generations (Griaule/Dieterlen 1955: 105). Furthermore, the Dogon acknowledge 22 leading families of living beings and attribute 22 joints to Nommo’s resurrected body (Dieterlen 1982: 21, 61–62). For the Dogon, “the science of clothes” is an account of the mechanism of creation, and the cloth is considered the “centre of the world”: 22 is linked to this knowledge of dressing, as the tunic of the Hogon (religious leader) is made up of 22 squares (Dieterlen 1982: 61).

We must not forget that a man is only considered to be completely adult until he is 22 years old.

• 7
The symbolism invested in 7 appears to be linked to the origins of creation. Not only are there 7 orders of reproductive vibrations, but 7 is also the number of segments that prefigure man in the egg of the world (Griaule/Dieterlen 1955: 85, 93; Palau Marti 1957: 55).

It was the seventh ancestor who taught man the word of Nommo (Palau Marti 1957: 54). There were 7 animals who had been the allies of Nommo (Griaule/Dieterlen 1955: 104). The future Hogon would retire to a cave for 7 days in preparation for his mission among men (Dieterlen 1982: 84). There were 7 sacred plants, 7 taboos and 7 seeds that Yurugu stole from man.

4. The brightness of the forgotten 5
At first sight, 5 does not seem to form a part of the symbolically relevant numerical entities of Dogon thinking. However, in a closer analysis, its implied present reveals a density of significance in a large numer of occasions, some of which we will examine below.

5 and temporal maturity
The Dogon venerate the first 5 generations after Nommo, as it is believed that is was during their age that all the social and religious institutions were created. Even today, every individual relates to the 5 generations around his own, the three that preceded him, his own generation and the one that will follow. This cult of 5 generations exists regardless of the individual’s lineage, within the 4 fundamental Dogon lineages (Palau Marti 1957: 56).

Houses have 5 niches on each side of the door, for the express purpose of representing these ancestors (Beaudoin 1984: 90).

The number 5 determines the age groups that are socially recognised by the Dogon, namely, the period from birth until the age of initiation, adolescence, youth, maturity and old age (Palau Marti 1957: 49).

According to Paulme (1985), children are breast-fed for 5 consecutive seasons. The Dogon week has 5 days and local market are held every 5 days. This temporal division of time seems to have a symbolic relation to Nommo’s blood, which ran for 5 days when he was sacrificed. In addition, it took Amma 5 days to resuscitate Nommo, which explains the ritual of the dead (Dama) takes place every 5 years in every village. In addition, the Dogon believe that the soul only reaches the land of the ancestors 5 years after death (Beaudoin 1984: 87, 90, 174, 201–203).

The itinerant festivities of the star Sigui (related to Sirius and to the appearance of death in the world) were celebrated for 5 consecutive days (Dieterlen 1982: 97).

Consequently, 5 appears as a measure of maturity reached through the achieved or of the cycle of resurrection. Thus it is the symbol of mythical and perfect completion of time, ages and generations, or what might be termed the human face of time.

5 and the purification of earth
Mother Earth – according to one of the Dogon creation myth, was Amma’s wife and shared the temporal and cyclical maturity symbolised by 5 – wore a skirt made of 5 handfuls of fibres at the front and at the back (Griaule 1948: 26).

The organisation and pacification of the world was characterized by 5 attributes, known as the “5 attributes of Nommo”, all of which were associated to the fertility of the earth. Their names were day, humidity, fertility, order and life. The fifth attribute, life, should be noted as the central point where the other four meet. The contrast death/life leads to a new set of attributes assigned to Ogo, Nommo’s rival. These are night, drought, sterility, disorder and death (Palau Marti 1957: 53). Ogo’s rebellion stained earth. After he had stolen the initial seeds created by Amma and appropriated the secret of “la parole”, he came down from heaven and managed to take control of a field where he dug 5 rows of holes in the damp soil.