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**Sirius in art and astronomy of Dogon**

**Efstratios Theodossiou  
Associate professor- University of Athens**

**Abstract**

Sirius B is a white dwarf discovered by Alvan G. Clark only in 1862 with the help of powerful telescope. The performance of Sirius B is kept in the secret rituals of an isolated and primitive tribe. It is sacred taboo of the race, so they did not call him by its name, but as Kize Uzi, meaning "little thing". Shown in the sacred architecture, carved in woodcut artwork and woven textiles in the race. Also this tribe, the Dogons, reaffirms its unity every 60 years with the Sigi celebration and constructing a large wooden mask for each separate community.

**1. Astronomical data for Sirius**

The motion of Sirius presents an anomaly period of approximately 50 years, which was attributed, in 1844, by Friedrich Wilhelm Bessel (1784-1846), in an "invisible body", following Sirius. That is the bright star, Sirius A, has a companion. In 1851 Mr. Peters calculated the orbit of this invisible companion.

The companion star of Sirius A, Sirius B, as it was called, of magnitude 8.6 -therefore invisible to the naked eye- discovered by Alvan G. Clark, manufacturer of astronomical instruments, on January 31, 1862 with the telescope of 47 cm which was intended for the Observatory of Dearborn.

From a series of micrometer observations, which lasted over a century -observations were not been at the years 1894 and 1944 when Sirius B passed from the periastron of its orbit-, found that its period is  $T = 49.9$  years, its distance from Sirius is equal to  $3 \times 10^9$  km, and its mass is equal to 0.98 of the corresponding solar mass. Although Sirius B belongs to the same spectral type as Sirius A, is 10 magnitudes fainter. That radiates 10,000 times less than Sirius A, which has a mass of 2.28 solar masses and absolute luminosity 22 times greater than the corresponding solar. Sirius A and Sirius B are a pair of double stars, located 8.6 l.y. or 2.63 pc from us.

The difference of brightness, although both have the same surface temperature, caused that the extent of luminescent surface of Sirius B is much smaller than the surface of the Sirius A. Sirius B, whose diameter is

equal to 0,032 solar diameter and its absolute luminosity equals to 0.0022 of the corresponding solar, is a white dwarf.

Similarly, we can say that its diameter is three times the diameter of the Earth and its density is 275,000 times of the Earth; therefore 15cm<sup>3</sup> of matter from it is equal about to 1 ton. Also, the intensity of the field of gravity is 35,000 greater than that of the Earth.

In 1926, the Observatory of Johannesburg announced that some researchers discovered a second companion of Sirius A, Sirius C. So actually we are talking about a triple star system. This star, of 11th mag., which was a companion of Sirius B, since then not seen again. According to the practice for correct observations of double and multiple star systems, in order to ascertain the existence of the third companion in the Sirius system, the attendant star, Sirius B, must move enough from the primary star. Then run the best stellar observations. The last maximum distance of Sirius B from Sirius A was in 1974, while Sirius B, in 1994, passed again from the periastron its orbit.

However, modern astronomers in their observations did not confirm the discovery of the Observatory of Johannesburg. In particular, the American astronomer Irving W. Lindenblad, who first in 1970, after a seven-years observations, managed to photograph Sirius B, considers that the existence of Sirius C it is rather unlikely.

## **Dogon tribe**



Marcel Griaule

The Dogon tribe, in Mali of West Africa, lives near Tombouctou, in the highlands between Bantiagkara and Ompori.

For Dogons, the main information about this tribe comes from Marcel Griaule and Germaine Dieterlen, two famous French anthropologists, who since 1930 and for about 20 years studying the habits and the customs of the Dogon tribe.

After so many years near Dogon in Mali, the two French anthropologists joined the race and the Dogons decided to reveal the depths of the worldview of their race. Two magicians priests, the Yébéné (priest of Binou Yébéné) and Manda D'Orosongo (priest of Binou Manta), a chieftain, the Ongkoulou Ndola and Innekouzou Dolo priestess (Ammagiana) of Amma, the god-creator of the Universe, reported in Griaule, in 1946, that a dominant position in the mythology and

cosmological legends of the tribe occupies Sirius, the brightest star of the night sky.

Then they drew with a stick on the ground the orbit of Sirius and its secondary star (Sirius B), saying that this bright is actually a double star system.



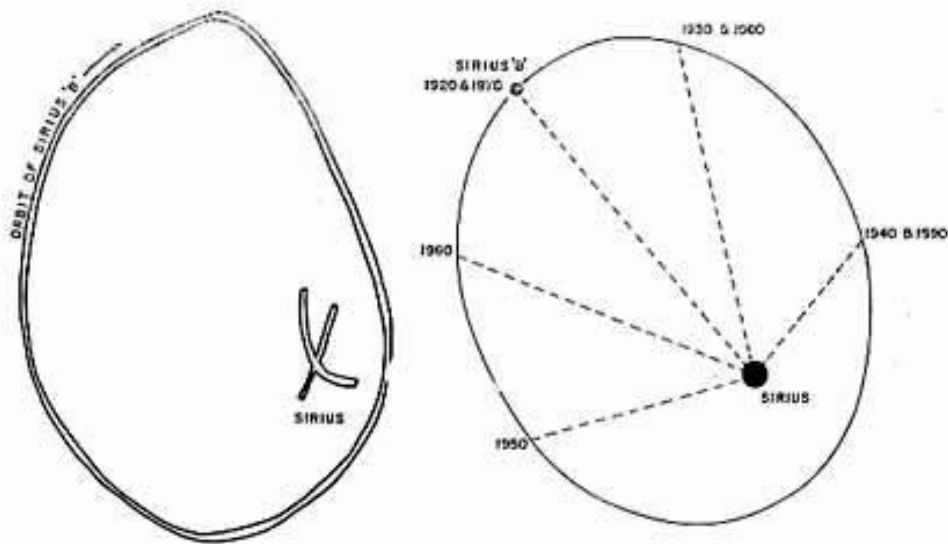
Priest Yébéné

They argued, then, that the visible Sirius, calling the Sigi Tolo star, is located at the one end of the path of a smaller star, which they call Po Tolo or Yurugu Tolo (star of Yurugu). Yurugu means the Pale Fox, for this reason the work of Griaule and Dieterlen called “Le Renard Pâle”, which in French means the Pale Fox. Yurugu, according to the beliefs of the tribe, was born as a being who is stigmatized by fate to endlessly chasing his female soul, which is his ideal duo. Originally tried to catch it, he has stolen from his mother Earth, a piece of cake -which came after his birth- thinking that it was the twin soul.



The stellar system of Sirius (Sigi Tolo)

A= Sirius, B = Sirius B (Po Tolo),  $\Gamma$ =Sirius  $\Gamma$  (Emme)



Sirius A and its invisible companion, Sirius B

As we can see from the figure of the motions, the Dogon placed Sirius at the focus of an ellipse and not in the center of a circle. This shortage represents the trajectory of the Po Tolo, the invisible companion of Sirius, which has a period of 50 years. According to Dogon, the star of Yurugu, the smallest and heaviest star in the sky is the beginning and end of all things. It consists of a metal named 'sagala', lighter than iron, but the star is so heavy that not getting all the power of the Earth to lift it. They also say that the star weighs as all seeds or all of the iron of the Earth.

All the above, although it is inexplicable how the Dogon knew them, are true if this star, or like today called Sirius B, is a white dwarf, discovered by Alvan G. Clark only in 1862 with the help of powerful telescope. The performance of Sirius B is kept in the secret rituals of this isolated and primitive tribe. It is sacred taboo of the race, so they did not call him by its name, but as Kize Uzi, meaning the 'little thing'. Shown in the sacred architecture, carved in woodcut artwork and the woven textiles of the race. Also Dogon tribe reaffirms its unity every 60 years with the Sigi celebration, constructing a large wooden mask for each separate community.

Dogon say that in this system belongs and a third star, Sirius C, which they call Emme. Sirius C, which is greater than Sirius B, considered four times lighter and Dogons believe that moving to a higher orbit, and a period as the Sirius B, equal to 50 years. The respective positions of the two stars are such that the angle formed by the rays being correct. For

Sirius C, the Dogons say that is the Sun of the Women (Nyan Nai) or a small Sun (Nai Dagi), which accompanies a planet, called Emme gia, or the driver of Emme or the Star of the Women (Nyan Tolo) or the Guide of goats (Enegirin). The female star moves on an ellipse with Sirius C in on focus of the elliptical orbit



The Sigi celebration



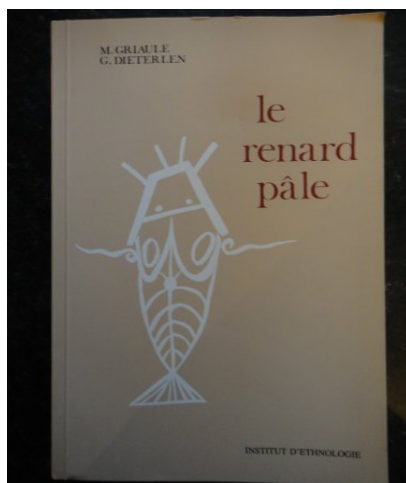
Masques Dogons-The Sigi celebration

**The calendars of Dogons**

Marcel Griaule (1898-1956) and Germaine Dieterlen (1903-1999) even said that Dogons possess, surprisingly, the following astronomical knowledge:

1. Earth moves around the Sun, like the other planets, in an elliptical rather than circular orbit. Earth rotates around its axis, a motion that makes the sky appear to be flipped.
2. Jupiter (Danna Tolo) has four satellites, calling them Children of Zeus (Danna Tolo Unum).
3. Saturn has a ring.
4. They believe that Sirius has two companions, not one. The second companion, Sirius C, which is greater than Sirius B, they said that it is four times lighter than that and moves to a larger, almost circular orbit.
5. They distinguish three kinds of celestial bodies: the fixed stars (Tolo), that is the celestial bodies do not spin around another celestial body. Planets (Tolo tanaze), celestial bodies which spin around another celestial body, and satellites (Tolo gonoze), celestial bodies that make circle around the planets.
6. They know that there is an infinite number of stars and additional talk about their apparent movement from east to west.
7. Finally, they profess that there is, in our Galaxy, a rotational force with which it is connected Earth.

Dogons know, yet, according to the reports of the two French anthropologists, the various phases of Venus, which are recalled in a wide geographical range with a series of shrines, standing stones or special structures in caves and shelters. The phases of Venus also specify a calendar of Venus, corresponding to the Mayan calendar. The tribe however is using a set of four calendars. The three are priestly-functional calendars wizarding-priests and tribal chiefs of the race: the calendar of Venus, mentioned above, the solar calendar and the calendar of Sirius. The fourth is the simple lunar calendar, which the farmers and the breeders of the tribe use.



On page 96 of the book of Marcel Griaule and Germaine Dieterlen by the title “*Le Renard Pâle*”, described the lunar calendar. It contains a table with twelve columns, one for each month.

These twelve lunar months are considered as “the period in which moves Earth”, that represent the Earth’s orbit around the Sun, within a year. During this movement, Earth spins around its axis every day; the Earth’s orbit around the Sun is called the “space of the

Earth”

The front page of the book

Finally, what we want to emphasize is that although all of the above are quite strange, creating a host of problems and question marks in the archaeological and the broader scientific community, we felt our scientific obligation to record, keeping all our reservations, since so far no scientific research has not overturn.

Also, the works (books and scientific papers) of Marcel Griaule and Germaine Dieterlen are deposited as scientific evidence in the Library of the Institute of Ethnology (Institut d’Etnologie. Musée de l’Homme) in Paris, from where we get the data during our stay in France (Observatoire de Paris, December 1993).

In conclusion, we report that Dogons have a detailed knowledge of the Universe, which for the cultural level of the race is very accurate. In particular, the work of Marcel Griaule by the title “*Masques Dogon*”, which refers to the cosmogony and metaphysics of the race, leads to an extremely complex way of thinking and a worldview that speaks of ancient beliefs and requires long processing by expert researchers. The view of Germaine Dieterlen at this point is that: “*Dogons, if nothing else, have some astronomical and other knowledge that it is unreasonable to have them!*”

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