

# MEMNON, THE VOCAL STATUE

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## ABSTRACT

The most famous talking statue of the past is the “colossus of Memnon”, the sandstone colossus still rising over 65 feet in front of Luxor, the ancient Thebes. For about two centuries, at dawn, when the sun rays touched the statue, a plaintive sound came out of the stone. The 108 epigraphs carved on the legs of the colossus, together with the words of Strabo, Tacitus and Pausanias, are the reliable witnesses of the phenomenon. Up to now, among the various hypotheses, the most common ascribes the sound to natural causes, such as the temperature, the rarefaction of the air and so on. The results of recent researches give a new interpretation of the fact. A careful exam of the chronology of the epigraphs confirms that the death of Antinous, Hadrian’s favourite, has to do with the secret of the statue.

## 1. INTRODUCTION

When we have drawn the history of the talking machines [1], following the tracks of the artificial voice, we have realized that it is quite easy to go back until the 17th century, where it is possible to find wonderful experiments on the acoustics of the resonating tubes.

To go further back in time, we must be very careful to separate reality from chronicles and legends mixing experiments with magic. Nevertheless, it is really the period from 11th to 15th century that marks the beginning of the experimental research in the field of the artificial voice. In fact, after the first impulse that leads us to smile at the many talking bronze heads and statues answering to questions, it becomes evident that in the Middle Age there is a rich thread of research, mainly due to the Arabic cultural influence, whose experimental results seem to be work of magic to the contemporaries’ eyes.

Through the Arabs, we can go back to the ancient Egypt and be astonished by the most famous talking statue of the past, the “colossus of Memnon”.

The Colossi of Memnon, built in the 14th century B.C., are two enormous statues, nearly 16 metres high, plus a four-metre basement. They stand in front of the ruins of a temple in the plain of the ancient Thebes, on the left bank of the river Nile. They depict the Pharaoh Amenophi III sitting with his hands on his knees (fig. 1). Greeks called them Memnon because of the resemblance of the name of the Homeric hero either with the word *mennu*, term used by ancient Egyptians to indicate a funerary temple, or with the word *noni*, which means “made of stone”, word becoming *menoni* in the fourth case [2].

In the Greek mythology Memnon was the son of Tithonus and Eos, the Aurora. He was sent by his father, king of Egypt and Ethiopia, to help the Greeks besieging Troy. After killing Antilocus, Nestor’s son, Memnon was killed by Achilles. He had magnificent funerals and many towns in Asia and in Egypt erected monuments in his honour. The Aurora, desperate, with loose hair and eyes filled with tears, threw

herself at Zeus’ feet and begged mercy for her son. The prodigious events which took place during the stake did not soothe her pain. From then on, every morning, Aurora keeps on shedding tears thus creating what we all call the dew (fig 2).

At first the two colossi were monoliths very much alike. It was about in the 27 B.C. that the northern colossus, owing to an earthquake, broke into two pieces: as the pedestal leaned of 2° 40’, the bust slid on it along an inclined line of fracture that is still now evident on the stone. The statue was restored by order of Settimius Severus in the year 196 A.D.

During these two centuries, as the 108 epigraphs carved on the legs of the colossus testify, the phenomenon of the *vocal statue* took place. At dawn, when the sun rays touched the statue, a plaintive sound came out of the stone. According to the legend, Zeus, finally moved to pity by Aurora’s tears, allowed Memnon to come to life again once a day: when his mother caressed him with her rays, Memnon answered with a plaintive voice.



Figure 1. The Colossi of Memnon.

There are many descriptions of the emitted sound: according to Strabo it was just a noise similar to a faint stroke [3]; according to Pausanias it was a sound like the one produced by the breaking of a lyre string [4]; Tacitus calls it “vocal sound” [5]; for Plinius it was a crackle [6].

The hypotheses advanced in order to explain the phenomenon can be summarized as follows:

1) natural hypothesis: Memnon’s voice was the result of a natural phenomenon, in no way provoked by work of man. According to somebody the phenomenon was due to some small cavities existing in the statue.



Figure 2. Eos and Memnon.

The inner air, heated by the sun rays, came out through narrow cracks giving rise to a whistling. According to somebody else the sound was caused by the high temperature diurnal range. The sudden heating, at dawn, produced some microfractures of the sandstone round quartz crystals, in such a way as to give rise to the sonorous creaking [7]. The main objection against this kind of hypothesis is that the other colossus, which stands still intact, made of the same material, having the same size and shape, has always been silent. If the environmental conditions were exactly the same, why weren't there any microfractures of the sandstone on both? Furthermore, this hypothesis cannot explain why, after the restoration, the block formed by the pedestal and the legs has stopped talking. Therefore, this hypothesis leaves many questions unanswered.

2) artificial hypothesis: the phenomenon is the result of a device placed somewhere inside the statue. According to somebody, inside the head there was a concave mirror conveying the sun rays on a set of metal levers. Their dilatation, due to the heating, got them to hit a sort of keyboard made out of the stone [8]. The main objection to this hypothesis has always been the following: if the statue has been made by its creator Amenhotep with a secret device in order to generate a sound, why did the phenomenon take place only when the statue was broken into two pieces? And for what purpose to give voice to a Pharaoh who has nothing to do with Eos and her rays?

So, none of the two hypothesis can dispel all doubts. Taking up the natural hypothesis again, we have to say that from Sinai to Egypt, from Amazon to Pyrenees, there are many examples of resonating stones. Many travellers in their journals assure us they have heard some noise coming from the rock and they have always imputed the phenomenon to natural causes such as sudden changes of temperature, humidity and so on. Nevertheless, in spite of all appearances, all these testimonies do not strengthen the natural hypothesis at all. In fact none of these accounts has ever aroused great interest neither in the writers nor in the readers. Charles Darwin, in his journal on board of the Beagle, gives only a few lines to the *bramidos* coming out from a hill near Copiapo, in Chile. Alexander von Humboldt does the same for the sound emitted by the rocks of Paraguaxo in Brazil. The same goes for Jollois and Devilliers, members of Napoleon's Commission of Egypt, who affirm to have heard, at dawn, a sound coming out from the granitic blocks of Karnak temple.

As we have said, nobody has ever doubted about the natural causes of those creaks of the rocks. Well, in the case of Memnon things are different. For two centuries the colossus has been object of pilgrimage in a period when, it is worth remembering, to travel meant discomforts, sacrifices, often danger, always great expenses. All the 108 epigraphs carved on the legs of the statue testify the deep emotion of people who are aware they have just witnessed an extraordinary event. After a first visit, many of them came back with the family to hear Memnon's voice. Among them there are simple wayfarers but also centurions, prefects, consuls, scientists, cultured men, poets and writers such as Strabo, Pausanias, Tacitus. Finally, the Roman Emperor himself, Hadrian, with the Empress Sabine and the whole retinue go to Thebes in order to hear the voice of the colossus. Is it possible that the Emperor goes during the night to the plain of Thebes and waits for the dawn at the foot of the statue in order to hear a simple creaking of the stone? Honestly, this is even harder to believe than a talking statue.

Let us examine the artificial hypothesis again. The objections we have made are of course legitimate: first, Amenhotep, the colossus' creator, cannot have placed any mechanism inside the statue as it spoke only when it was broken as a consequence of an earthquake; and furthermore why should he have done it? So, if it is a mechanism, it must have been made by someone else, someone for whom it made sense to give voice to the statue so that Memnon could answer to his mother's rays. Therefore it must have been a Greek, or a man of Greek culture. As the phenomenon begins in the first century B.C., the question is: was there in that period, in that place, anybody able to plan and carry out a device emitting a sound when hit by the sun rays?

In that period Egypt was a very important cultural centre, where Greek rationalism and oriental mysticism merged into a current of thought based on the relation between philosophy and religion. The centre of this civilization was Alexandria, especially in the scientific field, in mathematics, astronomy and medicine. The first polytechnic in a modern sense started in Alexandria in that period under the direction of a great engineer and a brilliant mathematician: Heron.

## 2. HERON OF ALEXANDRIA

We know very little about Heron's life. Until the early twentieth century people have talked about two different Herons: the Old, called the Mechanical, who lived in the 3rd century B.C., and the Young, called the Geometer, who lived between the 3rd and 4th centuries A.D. Nowadays there is a general agreement that the Mechanical and the Geometer are the same person, who lived between the 1st century B.C. and the 1st century A.D. [9] [10]. Heron developed mechanics very much, particularly applied mechanics. He wrote also two important treatises on mechanics, *Pneumaticà* and *Autòmata*. As Heron himself underlines, the machines described in the two books are intended to arise pleasure and astonishment. Those described in *Pneumaticà* are able to emit sounds, whistlings, cries of birds and voices. They are generally constituted by a basic vase-shaped structure, called *miliarium*. From the descriptions of these devices it comes out that they have really been built, following the teaching of the Alexandrian school, according to which theory has to come out from practice.

### 3. SUN AND SOUND

Let us go back to Memnon's voice and let us consider the possibility that Heron has something to do with it. We can find the first half of the answer in the 47th theorem of *Pneumatica* [11] where Heron describes a fountain which trickles by the action of the sun's rays (fig. 3). When the sun falls upon the globe EF, the air in it, being heated, will drive out the liquid, which will be carried along the siphon G and pass through the funnel H into the pedestal ABCD. But when the globe is in the shade, having the air escaped through the globe, the tube will again suck up the liquid, and fill the void which had been produced; and this will take place every time the sun falls upon the globe.

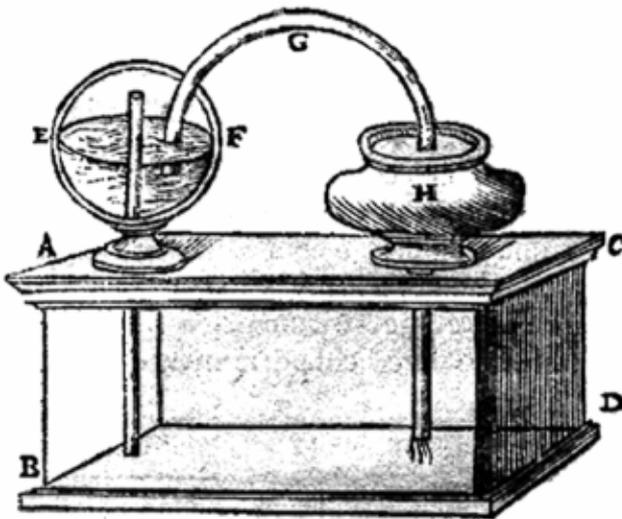


Figure 3. Heron's device.

How it is possible to get a sound by pouring water into a vessel, is explained by Heron in many theorems. In general, if the base is connected with the outer air through a very thin pipe, the inner air will be pushed in it abruptly giving rise to a hissing sound. According to what there is at the end of the pipe a bird will chirp, a dragon will hiss or a trumpet will play (fig. 4).

Heron is able to conceive a device that can emit a sound by means of the sunbeams. He lives in Egypt in the 1st century B.C., as it is witnessed by the remains of Heron's nilometer that Strabo sees in that period (see also [1]). Heron has a Greek culture and so he knows the myth of Memnon, son of Eos, well.

When the colossus starts speaking, Heron, or one of his followers, is there to place his device on the left knee of the statue, as it is proved by a cavity still visible there. If we accept this hypothesis some questions arise: how could that device work for about two centuries? How is it possible that no one, pushed by curiosity, has ever climbed the statue to find the source of the sound? Finally, what happened to the statue when it was restored by Settimius Severus?



Figure 4. Heron's trumpet player.

### 4. MEMNON'S WONDER

To find the answers to these questions, we must go on step by step. Let us suppose that Heron has made a device to give voice to Memnon. The device keeps on working for two centuries, so it is evident that this is possible only by means of the work of someone else. Who else if not the priests guardians of the temple of Amenophi III, situated just in front of the two statues? They are the only ones who can have kept the situation under their control for such a long time. Who else could benefit from the magic phenomenon which gave a supernatural halo both to the statue and to its guardians? Greeks, Romans, poets, ambassadors, the emperor himself, everybody came to admire that mysterious site. It was a great advantage for the priests, at first only for a question of prestige, but soon for an economic reason too, if we consider the big tourist flow; to cite Heron's words: "to see, they do not care about money".

### 5. OUR HYPOTHESIS

About 20 B.C. the two statues are linked up with Memnon by Greeks. Heron, who knows the Greek mythology well, decides to give voice to Memnon so that he can answer to his mother's caresses. The priests of the temple, fascinated by the prodigy, allow Heron to get ahead with his project. Of course everything is kept secret, because the aim of the experiment is not only scientific but it is also to rouse astonishment by the magic of the "talking statue". Once the mechanism is going, the trick works perfectly. The first visitors are astounded by the event and begin to carve their names on the stone as a memory of their fantastic experience. We must suppose that, after having provoked everybody's astonishment, Heron decides to reveal the secret in order to draw the world's admiration on his work and on his school. Something or somebody must have prevented him from doing it. The point

is that, as we have already said, all information about Heron's life and death has been inexplicably lost.

If our reconstruction of the facts is near the mark, then we have to suppose that, in order to prevent that the secret is revealed, the priests of the temple get Heron and his assistants to vanish without leaving any traces. From then on the guardians of the temple arrange things so that the phenomenon keeps on taking place: when necessary, they also repair or substitute the device which they know well. In the year 130 A.D. the emperor Hadrian himself and his retinue come and hear Memnon's voice: is it possible that nobody discovers the trick? Probably if somebody does, he is reduced to silence. Antinous, young man of exceptional beauty, emperor's favourite, dies mysteriously in that occasion.

## 6. AN UNSOLVED CASE

The circumstances of Antinous' death are not clear. According to Dio Cassius' "Historia Romana", he drowns himself in the Nile owing to the words of an astrologer, who had predicted that his sacrifice could save Hadrian's life. Such an explanation, even if completely unjustified and illogical, has been accepted reluctantly by many historians only because all the hypotheses of a murder inevitably fail for lack of a motive. Now, in the light of what we have said about the sound emitted by the colossus, also the death of Antinous can be seen from a new point of view. Let us examine why.

Antinous dies on the 30th October of the year 130 and in that same day Hadrian decides to found the town of Antinopolis. The funeral celebrations and the visit to the site where the town will rise last a few days, then the imperial retinue resumes the journey southwards and without further stops it reaches Thebes on the 18th November. The day after, at dawn, Hadrian visits the colossus, but it keeps silent. On the 20th the empress Sabine with the poetess Balbille visits the statue in order to hear its mournful voice. This time Memnon speaks clearly at the first hour after the dawn. The day after, on the 21st November, Hadrian visits the colossus again and this time he can hear Memnon's voice at the second hour. Now, if we re-examine the chronology of the events carefully, we realize that the main effect of Antinous' death is that the imperial journey stops for some days so that the visit to the colossus is deferred to about ten days or two weeks later. Now is it possible that in order to gain just a few days somebody has decided to kill the emperor's favourite and, taking advantage of Hadrian's superstition, has let a murder appear as a suicide? Well, according to us things must have been as follows.

## 7. THE MOON

The device placed by Heron keeps on working for many years, giving rise to Memnon's fame. Then, eventually, the phenomenon stops, either because the device breaks down or because of the unskillfulness of people charged to activate it. In fact in the three years before Hadrian's visit there are not any inscriptions of visitors. But now the emperor is coming here just to hear Memnon and it is necessary to gain time. Antinous' death arrives at a too right time to be fortuitous. This is confirmed by the fact that at Hadrian's first coming, on the 19th November, Memnon is silent. Something is evidently still wrong with the device, but from the following day it starts working to perfection. Furthermore, from the chronology of the epigraphs carved on the statue another

aspect of the problem arises that strengthens our hypothesis. It has something to do with the moon.

We have already said that the tragic end of Antinous delayed Hadrian's visit to a couple of weeks and we have also underlined the importance to gain time for the guardians of the statue. But why exactly on the 18th November? Why is this day different? We have found a curious coincidence: the night of the 18th November of the year 130 A.D. the plain of Thebes was completely dark because of the new moon. We think that for such an important event as the emperor's venue, it was much better for the priests to be safe from prying eyes while they got the miracle ready.

Driven by this conviction, we have checked the lunar phases of the dates when the other epigraphs had been carved on the stone [12]. Of course we have excluded the undated ones as well as those of a doubtful dating. On a total of 37 certainly dated inscriptions, only 4 correspond to nights in which the moon was, totally or partially, visible. In all the remaining cases, the plain was immersed in the darkness either because it was a new moon night, or because the moon was below the horizon line. So, 90% of moonless vs. 10% of moonlit nights: it seems to us that this ratio is too unbalanced to be considered just random.

The last question to be answered is about the restoration made by Settimius Severus in the year 196 A.D.: why has the "miracle" ended for ever since then? The answer is given by Spartianus when he says that, in order to restore many Egyptian monuments, Settimius Severus "Memnonem... diligenter inspexit" [carefully inspected] [13]. So, the priests must act immediately to avoid the fraud being discovered. The device is promptly destroyed and since then Memnon has been silent, maybe waiting for somebody to give him again the possibility to answer to his mother's caresses.

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