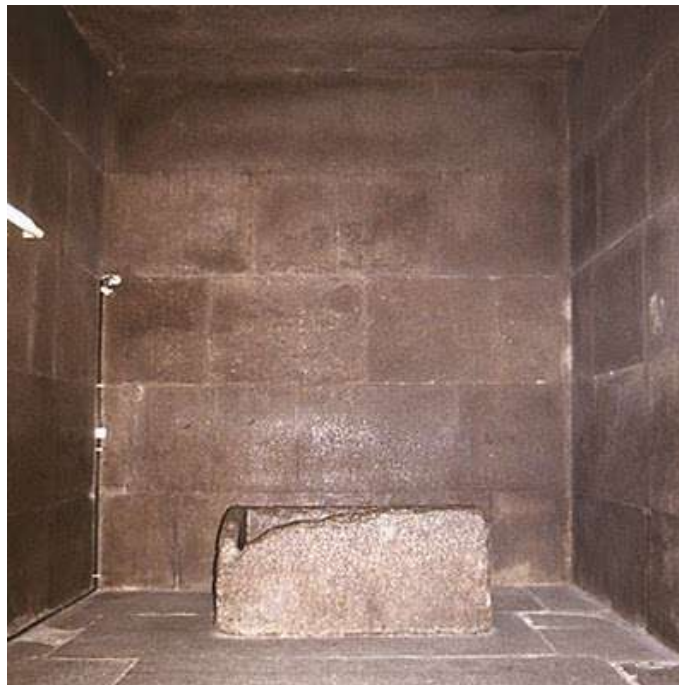




Wednesday February 9, 211

Pyramid of Khufu: two entrances and closing the King's Chamber, in the words of Jean-Pierre Houdin



The King's Chamber in its current state

In the new “reading” that the architect-researcher Jean-Pierre Houdin is suggesting for the pyramid of Khufu – *Khufu Reborn* – the King’s Chamber takes all the honors. And for good reason! This room is in fact the heart of the entire architectural system of the monument, its function and that of the entire pyramid being to contain the mummified mortal remains of the king who built it, for eternity.

Well, the funeral chamber of the Great Pyramid, has been, and still is, the subject of a great many interpretations and endless, sometimes stormy debates, regarding its purpose, its structure, its superstructure (what are known as the “relieving” chambers), its shafts (for “ventilation”), the damage it has suffered (well-known cracks in the ceiling, which have given the neighbors something to talk about), its final use (did it or did it not house the august pharaonic mummy?), its hypothetical counterpart lost who knows where in the bulk of the monument (did someone say “secret chamber”?), etc.

To the list of questions and answers, we must now add the entrance to this chamber, namely the only passage still “in service” today, under which visitors must “bow their heads” in order to enter the chamber, in the north-east corner. For centuries and centuries, the “Single mindedness”, to use Jean-Pierre

Houdin's expression, has taken this entrance to be the one used by the funeral procession transporting the mortal remains of the Pharaoh.

In *Khufu Reborn*, Jean-Pierre Houdin takes this entrance to be in reality merely an additional element in the service circuit, therefore already sealed long before the day of the royal funeral. According to his analysis of the pyramid, the King's Chamber had to be accessible through another – “real” – entrance, the end for the “Noble Circuit”, now hidden from our eyes.

Actually, not everyone's eyes! As the following demonstrates...

At a glance, the King's Chamber at its heart bears witness to the changes or upheavals the Great Pyramid of Giza has undergone over the centuries (sarcophagus lid missing, damage in the north-west corner, etc.), the various intruders, well intentioned or otherwise, not always having had the wherewithal to achieve their ends.

A more experienced eye will be able not only to interpret these changes, but also to recognize the original plan in the construction and lay-out of the chamber. Stones have their own language for those who can understand them.



Where is the block, to the right of the sarcophagus, gone? (Photo Keith Payne)

### First observation : the disappearing block

First observation made by Jean-Pierre Houdin: where did the stone block come from that we could still see, a few years ago, beside the sarcophagus, on the west side of the north wall of the King's Chamber? And what happened to it, since it has now disappeared?

The answer to the second part of the question is simple: during renovation of the King's Chamber in 1998, Dr Zahi Hawass, then supervisor in charge of Egyptian antiquities, ordered the block to be removed. No doubt he thought it was too untidy.

*“At the same time,”* comments Jean-Pierre Houdin, *“he removed ‘part of the puzzle’.”*

*“Happily,”* the architect continues, *“many witnesses had made drawings and taken photographs to prove the existence of this block.”* But as to where it is now... mystery!

More importantly: what was the original position of this block, and what was its function in the overall structure?



**Entrance in the northeastern side of the King Chamber**

The block's dimensions, observes Jean-Pierre Houdin, exactly matched (since it has disappeared, we should use the past tense) those of the entrance in the east of the funeral chamber's north wall. So it quite naturally had its place, as originally planned.



**“The block rests on the face which was the one visible from the King Chamber. It went on this face when the robbers broke into the room. Once set upright, it would be close to the sarcophagus height, less the part which was smashed by the robbers to get enough clearance to tip it over. On the far right, the most damaged part should be the upper part; on the left, its base; in the center, the west face of the block”.**

We should immediately note that there is a difference of 2 cm between the floor levels in the chamber and in the corridor, the latter being lower. We must also be aware that the cross-sectional area of the corridor between the Grand Gallery and the portcullis chamber is smaller than that of the corridor between the portcullis chamber and the King's Chamber. So for Jean-Pierre Houdin, the conclusion is clear: *"The block that sealed the entrance to the King's Chamber, on the east side, never passed through the portcullis chamber. And yet, it finished by exactly blocking access along the line of the north wall of the King's Chamber, pushed up against the floor in this room. For this reason, thieves who succeeded in reaching the back of this block via the entrance dug in the north face of the pyramid, the ascending corridor, then the Grand Gallery and finally through the portcullis chamber, were forced to break the top part of it and, when there was enough room, to tip it into the King's Chamber, where it loitered for 1,250 years."*



**“Northeastern entrance: to bow one's head”**

In other words, this block, whose function was to block the north-east entrance to the King's Chamber, was not put in place “after” the royal funeral ceremony. *“It was from the 17th year of the pyramid's construction, a date mentioned by graffiti in the last ‘relieving chamber’,”* explains Jean-Pierre Houdin, *“so when construction of the King's Chamber was finished and the counterweight system in the Grand Gallery no longer served any purpose, that, pushed from the inside of the chamber before the setting in place of the slab on which it stopped, it was put into the place it occupied until the year 850 AD (arrival of Al-Ma'mun), to seal access to the chamber. It was thus sealed for 3,350 years, no more, no less, until the day Al-Ma'mun's advance scouts broke it and then tipped it into the chamber. But it was then no longer in its original position.”*

*“It follows,”* continues our architect guide, *“that the migrant block, even if it was observed for a long time close to the grille covering the tunnel in the north-west corner of the King's Chamber, had nothing to do with this tunnel opened by Al-Ma'mun and later re-visited by Perring. It did not come out of it. It was actually made of granite, while the sapping opens onto limestone blocks. Note that I am using the past tense in my description of the block, as it is no longer accessible for observation following the strange decision by the ‘master of the house’ to remove it from our view!”*



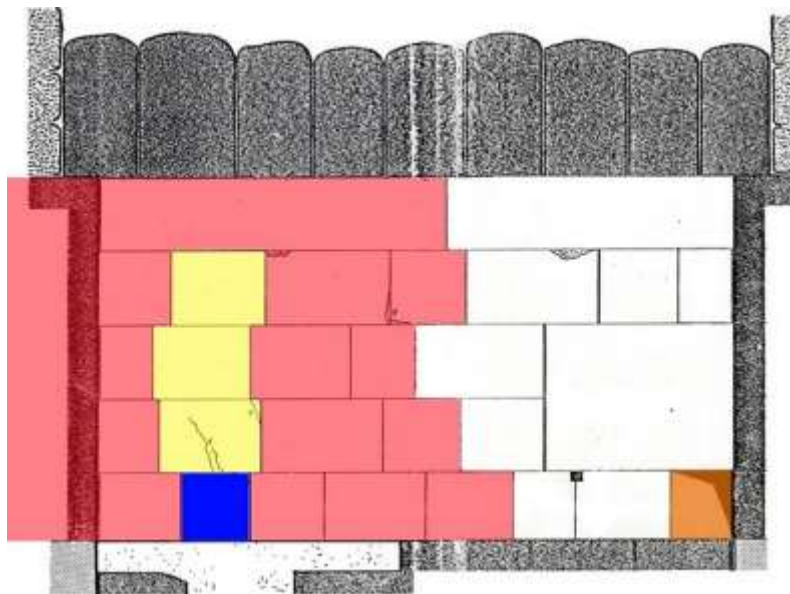
Al-Ma'moun sapping

**Second observation: a second entrance, “between the lines”  
in the north wall of the King’s Chamber**

It becomes a question of the sapping, on the west side of the north wall of the King’s Chamber. It has a quite unusual history.

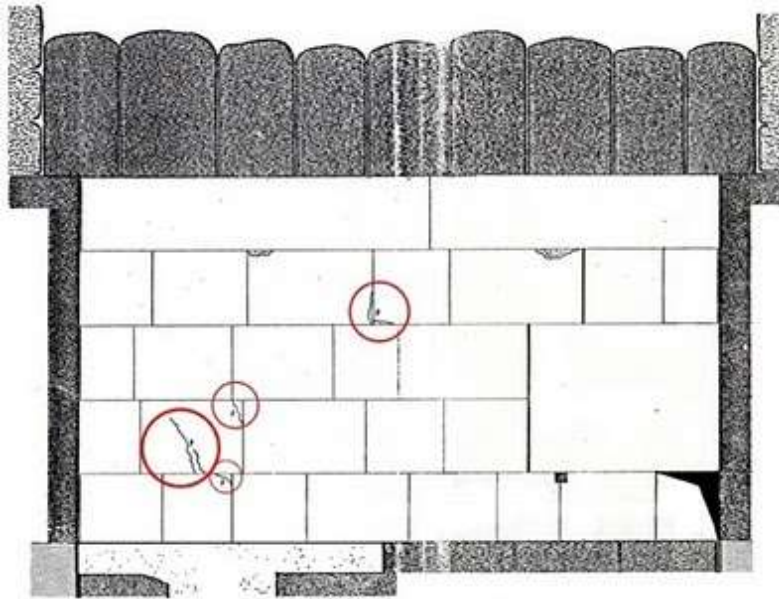
Why did Al-Ma'mun’s soldier-engineers dig here precisely? They must certainly have spotted clues “somewhere” in the wall, attracting their curiosity and justifying their efforts.

These clues, if they were really revealing, should still exist today. Al-Ma'mun, doubtlessly searching for any treasure associated with the funeral chamber, simply made a mistake in interpreting them. He had excavations made downwards, when he should have dug horizontally!



From Gilles Dormion drawings

So let's look at the north wall, following Jean-Pierre Houdin's instructions: "What do we see on the wall? On the right (east side, low down, in orange), the entrance through which we currently enter this room. On the left, the layout of granite blocks forms a doorway (in pink) that takes the entire weight of the (dark) granite ceiling beams. The (yellow) blocks filling the doorway do not bear on the central block at the bottom (blue). This seals the second entrance. It is free, exactly like the block that once sealed the first entrance. Free: in other words, it could be moved... for example, at the end of the king's funeral ceremony, when the pyramid had to be sealed.



The cracks on the North wall of the King's Chamber (from Gilles Dormion drawings)

"Since these observations, I have entered the pyramid numerous times, especially to the King's Chamber, to make a close analysis of this north wall. I then paid attention to several other details. The first yellow block above the blue block is cracked in two places, at the center. This proves that there was a space between the two blocks, so that the one above did not rest on the one below. Furthermore, we know that the ceiling beams have been cracked since construction, following subsidence of the chamber's south wall. Later, certainly when Al-Ma'mouns workers dug the hole at the foot of the second entrance, the north wall also moved a little, 2 or 3 mm, i.e. practically nothing. But this was enough for the yellow block to crack and rest on the blue block.

"I also carried out an experiment with an out-of-date plastic credit card: I tried to slide it into the right-hand joint between the blue block and the pink block of the doorway. I could do it easily, although it is practically impossible elsewhere. (It is often said of the joints in the pyramid that they are so perfect you could not insert a razor blade into them.) I slid this card, laid flat, along the stones, from block to block, to check their alignment. The only time my card stopped was exactly on this joint, proving that the blue block is slightly below the pink block. If the blue block had been put into position at the same time as the other blocks in the chamber, it would have been perfectly aligned with the others."



The true entrance in the King's Chamber

### We Close !

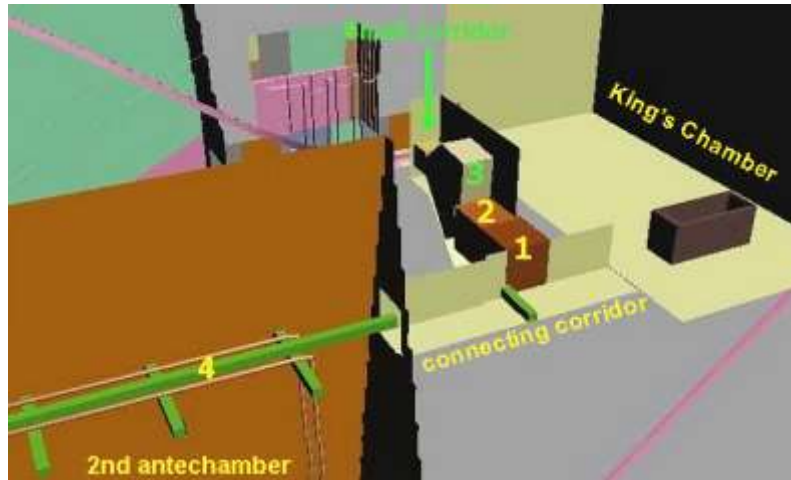
At this stage in the inventory of structures in the Great Pyramid, as made by Jean-Pierre Houdin, we find the subject of the previous note in this blog, concerning this author: the two antechambers. It is also good to remember certain developments from the second part of the exclusive interview given by the author to *Pyramidales* (see under the sub-title "A complex and wonderful closure system").

Passing (virtually) through the north wall of this room, from inside the King's Chamber, on the other side we actually find the upper part of the second antechamber, by passing along a fairly short corridor that plays an essential role in permanently sealing the funeral chamber, after the royal funeral.

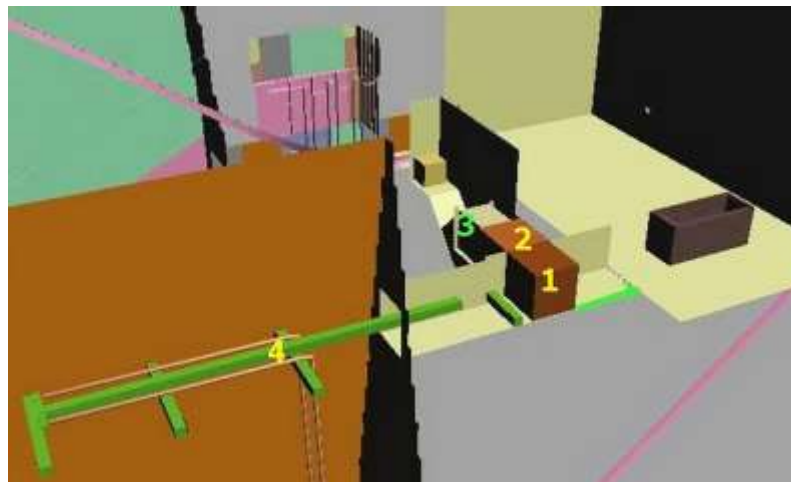
Finally, do we really need to insist, in order to put paid to a preconceived idea that found favor for a while? The King's Chamber was not permanently closed from the inside. The royal mummy could hardly make workers, however devoted, wall themselves up like kamikazes. While the stone blocking the first entrance - service entrance, east side - was positioned from inside the chamber in the manner and for the reasons given above, that blocking the second entrance – the "Noble Circuit", west side – was positioned from the outside by means of a pushing-block and piston operated from the second antechamber.

This technique introduced by Jean-Pierre Houdin in his reconstruction of the building of the Great Pyramid has been described and illustrated in the interview mentioned above.

Given its complexity, here is another explanation of it, a *Pyramidales* special, offered by the author:



**Block N°1 in its initial position**



**During the sealing process: the piston (4) will push block N° 1**

### **The problem :**

- 1 - For the day of the royal funeral, the corridor between the second antechamber and the King's Chamber had to be totally cleared to allow the funeral cortège to pass.
- 2 - Yet it had to be possible to close the King's Chamber with a granite block that sealed it perfectly, so having dimensions 2 or 3 mm smaller than its final position, and stored "nearby, on hand".
- 3 - The King's Chamber had to be closed from the outside, so that the workers were not imprisoned in the room after the operation, with no possible way out.
- 4 - It is impossible, "practically" and "materially", to store the closure block in the second antechamber, then to raise it 7 m and present it in front of a passageway having the same dimensions, to the nearest 2 or 3 mm, and insert it ... This would have required equipment and precision of movement that the Egyptian workers performing the operation could not possibly have provided.
- 5 - The "storage" area for the closure block therefore had to be located between the King's chamber and the second antechamber, at that level.



## The solution

- 1 - Presence of a small corridor, about 4 cubits long and 2 wide, perpendicular to the connecting corridor and on its east side
- 2 - In this small corridor, two “twin” blocks (1 and 2 on the diagram above) were placed, the first becoming part of the east wall to the connecting corridor, the second “stuck” behind it.
- 3 - The front face of the second in contact with the rear face of the first was very slightly concave so as to leave a small space over the greater part of the surface. A brass “pad” was inserted into the second block, two thirds of the way up, projecting sufficiently to be theoretically in vertical alignment with the face. Its role was to allow the first block to be pushed fully into the corridor without “jamming” it against the opposite wall. When pushed by the piston (4 on the diagram), only this pad would be rubbed and very quickly worn away by the granite of the first block.
- 4 - As the driving force for the system, a pushing block (3 on the diagram), based on the type of drop-stone trap built into a corridor of the Bent Pyramid: this expertise gave rise to a pushing block used for the Red Pyramid and Khufu’s Pyramid.
- 5 - Up to this stage, everything was done “automatically”, the system being triggered (removal of a wedge across the corridor) by workers further on, movement being achieved on a “layer” of very fine sand.
- 6 - A stop prevented the pushing block from going further in its movement than necessary. When the second block had taken the place of the first, it could no longer move forward because the pushing block was at the end of its travel.
- 7 - The piston was pre-assembled in the second antechamber, on cross-beams. It did not move as long as the first block had not been pushed into the connecting corridor.
- 8 - Once the block was in the corridor, the piston was moved up to its north rear face (formerly the north side face of the block when it was still in the perpendicular corridor), then placed against it.
- 9 - In order to get the 750Kg-f needed to move the block, eight workers climbed onto the traction ropes, and four others pulled on the assembly: the first block moved forward in the connecting corridor until it stopped against the raised edge of the King’s Chamber floor.
- 10 - At the end of the operation, everything that could be recovered was dismantled and removed.

### Access to videos

<https://www.youtube.com/watch?v=T37nieYENCg>

<https://www.youtube.com/watch?v=Gk00EnIQmXY>

