

# Pyramids at giza



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There have been several mysteries associated with the Great Pyramid at Giza, which is the only remaining wonder of the ancient world. The construction of the pyramid which is made of huge blocks of stone weighing in tons has been the subject of various debates, archeological expeditions and numerous research conducted by many scientists across the world. Around 2 million blocks of stones with an average weight of 2.5 tons is estimated to have been used for its construction and how these blocks were moved up to the top of the pyramid has been the subject of major archeological research studies. Many theories have been proposed to explain how the huge blocks of stone were maneuvered up the 481-foot tall pyramid. Of the many theories proposed two theories have gained prominence and these are the crane theory and the more recently proposed internal ramp theory. The crane theory as explained by Bob Brier in an article from the Archeology Magazine is based on the theory by Herodotus who had visited the pyramids around 450 B. C. He had proposed that machines like cranes were could have been used to raise the stone blocks up the pyramid. In the article Bob Brier further explained that crane-like devices called the shadouf were used to draw water from the Nile for the purpose of irrigation. These devices have been depicted in tomb paintings which further confirm that these were available to the tomb builders. Herodotus proposed that several hundreds of these cranes could have been placed at various points of the pyramid as and when it was erected to facilitate the lifting of the stone blocks. However, manufacturing several hundreds of cranes would have required huge quantities of wood and timber was not available in abundance in ancient Egypt. While large amounts of timber were imported during that time for building ships it would have been an expensive task if timber were

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to be imported for manufacturing these cranes. Another flaw identified with the theory was the lack of space to accommodate the cranes higher up in the pyramid due to the decrease in its size. Thus the crane theory did not provide any substantial evidence on how the pyramids were built. In addition to the crane theory, several ramp theories have also been proposed to explain the construction of the pyramids. Of these the more recent theory on the use of internal ramps to build the top two-thirds of the pyramid has gained wide acceptance. This theory has been presented by Jean-Pierre Houdin who carried out an extensive study of the Great pyramids over the past seven years and has developed 3D images of the internal ramp model on the basis of his findings. From his research Houdin has concluded that an external ramp was used only to build the bottom one-third of the pyramid while subsequently as the pyramid was raised an internal ramp was built to haul the blocks of stone further up of the pyramid. He further added that as the internal ramp was narrower than the external ramp, heavy stones used to build the King and Queens chamber of the pyramid were maneuvered via the external ramp after which the ramp was dismantled and its stones were used to build the top portions of the pyramid whose stones are much smaller compared to the bottom part. According to Houdin the internal ramp still exists within the pyramid and this has been supported by micro gravimetric analysis carried out by a French team during their survey of the pyramid. The images obtained from the survey show less dense regions which correspond with the position of the internal ramp proposed by Houdin. Houdin also suggested that turning the stones around a 90-degree corner using the narrow internal ramp would have been difficult and this might have been facilitated by the presence of openings around each corner of the

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pyramid through which cranes were used to turn the blocks. A recent finding of a corner notch in the north-east corner of the pyramid has added further evidence to his claim. A further survey revealed that the notch lead to a small chamber which is believed to be the intersection between two flights of the internal ramp (Brier, 2009). Thus with enough evidence available to support the internal ramp theory Houdin and his team have forwarded an appeal to the Supreme Court of Antiquities to grant permission to survey the pyramid using non-destructive methods in order to confirm the theory postulates (Brier, 2007).

#### References

1. Brier, Bob. (2007). How to Build a Pyramid. *Archeology*, 60(3). Retrieved from <http://archive.archaeology.org/0705/etc/pyramid.html>
2. Brier, Bob. (2009). Update: Return to the Great Pyramid. *Archeology*, 62(4). Retrieved from [http://archive.archaeology.org/0907/etc/khufu\\_pyramid.html](http://archive.archaeology.org/0907/etc/khufu_pyramid.html)