

## Answers to 3000-Yr-Old Murder Mystery Provided by Z-Corp

Vol 17, Issue 2

In the unusual investigation of the contents of a sealed mummy sarcophagus, an important breakthrough came from an unlikely source when an architectural visualisation agency used its ZCorp printing technology to replicate an exact representation of the occupant's head.

A team of Egyptologists at the Newcastle museum, headed up by Gill Scott, was working on the puzzling case of a sealed sarcophagus. During the investigation, the team had to undertake tricky detective work to try to decipher more about the person inside and why there were so many anomalies at the time of internment.

Theories were established early on about how and why the woman had died. The first indication that there was something strange about this case came from hieroglyphic experts who uncovered mistakes that had been made with the symbols used for the mummy's name and gender. According to Egyptian beliefs, this lack of clear identity meant that the person's spirit would have not been able to live on in the afterlife. If this mummy, nicknamed by the team as 'The Lady', had suffered an unnatural death, she would have also have been intended for death in her afterlife.



Without an opportunity to physically examine or view the mummy itself, the team of experts was working blind and could only hypothesise about what could have happened. In a typical investigation of this type, the mummified body would be examined and the rituals surrounding the death and embalming process would be revealed. However, when the sarcophagus of 'The Lady' was first discovered, significant damage had been done to the cask and the investigation team was consequently forbidden to open the coffin so as to avoid any further damage. Understanding why the Egyptian scribes had made such uncharacteristic mistakes was impossible unless the team could secure some kind of visual rendering of the mummy. To do so, Scott and her team turned to one of the few modern technological options available to them: a full set of CT (computed tomography) scans of the sarcophagus.

The CT scans were successful and revealed yet more evidence to support the theory that the mummy had not died of natural causes. However, it wasn't until architectural visualisation specialist Visual Impact UK got involved that the experts had their first look into the The Lady's eyes. Using a ZPrinter 310 and Mimics Z software, both from ZCorporation, Visual Impact was able to create an exact replica of the mummy's head using the CT scan data. Mimics Z software read the data from the CT scan and within minutes had transformed it into a digital 3D model of the skull. What soon became clear was that some of the skin tissue detail that still surrounded the skull could be seen and could, therefore, be reproduced in a model.

Mimics Z software was designed for the medical industry and is normally used by doctors, nurses and technicians to create 3D anatomical models from MRI and CT scans. It is specifically optimised for output using ZCorp's 3D printers and incorporates several software 'wizards' that allow users with very little training to produce models for pre-operative planning, as well as visual tools for consultation and medical education.

Once the 3D image of the head had been finalised, the file was then sent to the ZPrinter 310, which created a model. The head was printed by building up the form, layer-by-layer, to produce an incredibly accurate result — the ZPrinter 310 introduced Gill Scott and her team to the face of a woman who lived 3000 years ago.

The benefits of 3D printing include the speed with which a model can be produced and the relatively low cost when compared with alternative rapid prototyping techniques. From start to finish, the process of building a model of the mummy's face and head took less than six hours and cost approximately £100 to produce.

Once they had the model in their hands, the first thing the Egyptologists noticed was the condition of the mummy inside its sarcophagus. Ancient Egyptian embalming rituals were created to defy the affects of time, so that a body could continue to exist long after a person had died. The process would be carried out with meticulous care. "The Egyptians believed that without a body, a person could not 'walk' in the afterlife," says said David Moore, MD of Visual Impact UK. "The model of the head showed severe decay and it was this that helped to confirm that the burial of the mummy had been carried out in a hurried and careless manner."

Being able to see the head in this condition confirmed the theory that the woman had been murdered and whoever had done it had also wanted to kill her in her afterlife.

ZCorporation Mimics Z software and 3D printing technology were essential tools for drawing conclusions in what initially seemed like an impossible archaeological conundrum. Gill Scott and her team were given a valuable insight into an ancient crime, which otherwise might have remained a mystery.

---

Company: **Z Corporation**  
Telephone: **+ 1 781 852 5005**  
Fax: **+ 1 781 852 5100**  
Email: **klach@zcorp.com**  
Web: **www.zcorp.com**  
**View Company's Locator Entry**  
Category: **Reverse Eng./Metrology/CMM Equipment**

---

Print: 