



## Unraveling the Mysteries of King Tut

Since the discovery of his tomb in 1922, Tutankhamun has fascinated the world. Northern Trust is proud to be a National Sponsor of the "Tutankhamun and the Golden Age of the Pharaohs" tour, scheduled to run through 2007. Here, in an excerpt from his book *Tutankhamun and the Golden Age of the Pharaohs*, **Zahi Hawass** details some of the history of the tomb's discovery and examines a few of the controversies surrounding the world's best-known "Boy King."

The first tantalizing traces of Tutankhamun emerged in the winter of 1906, with the discovery of a faience cup inscribed with the king's name. But despite the many fabulous finds made in the Valley of the Kings, both the tomb and the mummy of King Tut remained missing until 1922. That fall, George Edward Stanhope Molyneux Herbert, fifth earl of Carnarvon, agreed to finance archaeologist Howard Carter for one last season. Carter returned with a small team to the Valley of the Kings and began work in the only place still unexplored, a triangular area below the tomb of Ramses VI.

### Finding Tutankhamun

On the morning of November 4, 1922, a young boy arrived at the site with jars of water loaded on

the back of his donkey. These jars had rounded bases, and had to be set into the sand to stay upright. The boy was making a hole for the first jar when his hand brushed against stone. Investigating further, he found the top of a step cut into the bedrock.

Carter directed his workmen to clear away the sand. Working feverishly, the workmen had uncovered a flight of steps leading to a doorway blocked with stones and plaster. To the excavators' great delight, the name of Tutankhamun appeared, stamped on the lower part of the doorway.

The gilded shrines that surrounded Tutankhamun's mummy were opened and the lid taken off his huge sarcophagus of quartzite in the early months of 1924, then the tomb was shut for almost a year while Carter and the Egyptian government worked out differences



*Tutankhamun and the Golden Age of the Pharaohs* explores the history of the “Boy King” from his life in ancient Egypt to the dramatic 1922 discovery of his tomb and beyond. The exhibit examines new secrets through innovative technology, and a film by National Geographic reveals fresh images of Tutankhamun’s body made in search of answers to the actual cause of his death.

over who controlled access to the tombs and ownership of the artifacts.

In 1925, Carter returned to the Valley. The lid of the outermost coffin was lifted and a second coffin was revealed. When the lid of this was removed, a reddish linen drape and floral garlands covering yet another anthropoid container were revealed. After the shroud was stripped away, the astonished team realized that the third and final coffin was of solid gold.

In November 1925, the lid of the inner coffin was raised with great difficulty, and the mummy of Tutankhamun saw the light of day again, more than three thousand years after loving hands had anointed him and said the prayers for the dead. The young king’s head was hidden by a magnificent golden mask, the single most famous artifact to emerge from ancient Egypt.

**Examining the Mummy**

Unveiling the king was an elaborate process, more difficult than anyone had imagined. A black resin or unguent had been poured liberally over the royal body, and the mummy was stuck to the inside of the coffin, the head of the king held fast inside its golden helmet.

Carter and his staff, accompanied by officials of the Antiquities Service, began to carry out the first examination of the mummy.

Paraffin wax was poured over the linen shroud that was stuck fast to the mummy. After it hardened, Douglas Derry, an anthropologist and a forensic specialist on the team, took a knife and cut through the delicate material. The decayed outer wrappings came away in large pieces; the inner wrappings had been reduced to the consistency of soot.

Unraveling the delicate bandages took four days, as each of the objects wrapped inside was recorded. Finally, Carter and his team removed the mummy in pieces from the coffin: They cut the head off at the neck, used hot knives to extract the skull from the mask, separated the pelvis from the trunk, and detached the arms and legs. They reconstructed the dismembered body in a sand tray, arranging it carefully so that it looked intact.

Derry and Saleh Bey Hamdi, a professor on the Faculty of Medicine in Alexandria, examined the mummy, which was of a young man about 5’6”. Their report concluded, based on the degree of fusion of the epiphyses (the softer parts of the bone from which new bone grows during childhood and adolescence) and the partial eruption of the wisdom teeth, that he had died between the ages of 18 and 22. Carter rewrapped the body and laid it, in its tray of sand, back within the outermost coffin, which

was still inside the sarcophagus. A plate glass lid was laid on top to protect the coffin.

The mummy of Tutankhamun was examined for the second time in 1968 by a team from the University of Liverpool, led by professor of anatomy R.G. Harrison. The body was quite fragile, but Harrison’s team managed, with some difficulty, to X-ray the skull. They found that it was empty except for two thick deposits of opaque material, evidently solidified material that had collected during the mummification process, and a fragment of bone. Their X-rays also seem to show a thickened or fuzzy area on the back of the skull. Several theories have been put forth suggesting that one or the other of these skull anomalies constitute evidence that Tutankhamun was murdered by a blow to the head.

However, the X-rays are not very clear, and the bone fragment may well be postmortem — if it were antemortem, it would most likely have gotten stuck in the embalming material and would not be floating around loose. Based on their examination of the bones and teeth, Harrison’s team agreed with an age range of 18-22, more likely earlier than later.

The 1968 X-rays also revealed that the sternum and some of the king’s frontal ribs are missing. One scholar has suggested that the king was injured in a chariot accident that crushed the front of his rib cage. Another theory holds that Tutankhamun was “pigeon-chested,” and that this represents a birth defect.

**Scanning Tutankhamun**

I am the head of the Egyptian Mummy Project, designed to inventory and analyze all of the known mummies in Egypt. For this project, National Geographic Society and Siemens, Ltd., have donated to the Supreme Council of Antiquities (SCA) a state-of-the-art CT scanning machine. As part of this project, the SCA approved the scanning of Tutankhamun. The mummy is in such delicate condition that it was decided not to move it, but to do the examination in the Valley of the Kings.

We chose January 5, 2005, as the day to do the scan. We arrived at the Valley of the Kings as

the tourists were leaving for the day. At 5:30 PM we entered the tomb of Tutankhamun and began to prepare to move the mummy out of the tomb. This was to be the first investigation carried out solely by Egyptians.

The team moved the mummy, still in its tray of sand, slowly out of the coffin and sarcophagus. I could see clearly that it was in pieces, some of which lay in the sand like isolated stones. The only well-preserved parts of the mummy were the face, the feet, the legs and the hands. We continued out of the tomb, to the trailer containing the CT machine, and put it inside. When we left the Valley of the Kings, we took with us 1,700 images, stored on the scanner’s computer.

**The Results**

An Egyptian team spent January and February analyzing the images. On almost every point, the scientists were unanimous.

The team has fixed the king’s age at death at about 19. The overall health of the king was good, at least to judge from his bones. He was moderately tall, perhaps about five feet and a half, and slightly built.

The young king does have an extremely elongated skull, something that is particularly evident in the CT scan. His cranial sutures have not prematurely fused, however, allowing the team to rule out a pathological cause for this feature. Instead, they categorize this as a normal anthropological variation, one clearly depicted in Amarna art.

Tutankhamun was not murdered by a blow to the skull. There is no evidence for a partially healed injury to the back of the head. In fact, the team was able to match the bone fragments to their original sources: One is part of the topmost vertebra, and the other comes from the foramen magnum (the large opening at the base of the skull).

The sternum and much of the front rib cage is certainly missing. The CT scan reveals that the ends of the ribs were cut with a sharp instrument. Much of the chest wall is also gone. The scientific team thinks it possible that this area was removed by the ancient embalmers, but insists it cannot be evidence for a massive chest injury, as there is no associated trauma visible.

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— Zahi Hawass, Secretary General of the Supreme Council of Antiquities.



The *Tutankhamun and the Golden Age of the Pharaohs* tour collection features more than 130 treasures from King Tut's and other Valley of the Kings tombs and ancient Egyptian sites, some of which have never been viewed before. Museum visitors will be able to explore and experience the world of King Tut and the fascinating times in which he lived.

One of the most interesting theories to emerge from the analysis is that the king might have suffered an accident in which he broke his leg shortly before he died. He has a fracture of the lower left femur, at the level of the epiphyseal plate. There are many other fractures of the limbs, but most were probably caused by Carter's team. This fracture is different because it has ragged rather than sharp edges, and because two thin layers of embalming fluid have entered the fracture. The majority of the team believes that this fracture must have occurred either during the embalming or during the king's life, and more likely the latter.

The scientists note that this type of fracture is seen in young men in their late teens. If the leg was broken during life, it would have occurred a few days at the most before the king's death, as there is no evidence of extensive healing, and the associate skin wound cannot have had time to mend. Derry had noted that the left kneecap was loose, which the current team sees as possible evidence for fur-

ther damage to this area of the body. Although the theorized break would not itself have been life-threatening, infection might have set in.

The body of the king was not prepared hurriedly or sloppily, as has sometimes been suggested. There were several different types of embalming fluid used, and efforts were clearly made to give the young king the best possible care. This is in accordance with the wealth of treasure with which he was surrounded and laid to rest. ■

**About the author:** Zahi Hawass is Secretary General of the Supreme Council of Antiquities and a National Geographic Explorer-in-Residence. He is credited with such major discoveries as the tombs of the Giza pyramid builders and the Valley of the Golden Mummies. In 2000, Hawass received the Distinguished Scholar award from the Association of Egyptian-American Scholars.

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Northern Trust is proud to be National Sponsor of the "Tutankhamun and the Golden Age of the Pharaohs" tour. The treasures of King Tut can be seen at the following museums:

- Los Angeles County Museum of Art, Los Angeles, California – June 15, 2005 – November 15, 2005
- Museum of Art, Fort Lauderdale, Florida – December 15, 2005 – April 23, 2006
- Field Museum, Chicago, Illinois – May 19, 2006 – January 1, 2007

Tickets for *Tutankhamun and the Golden Age of the Pharaohs* can be ordered on-line at [www.kingtut.org](http://www.kingtut.org).