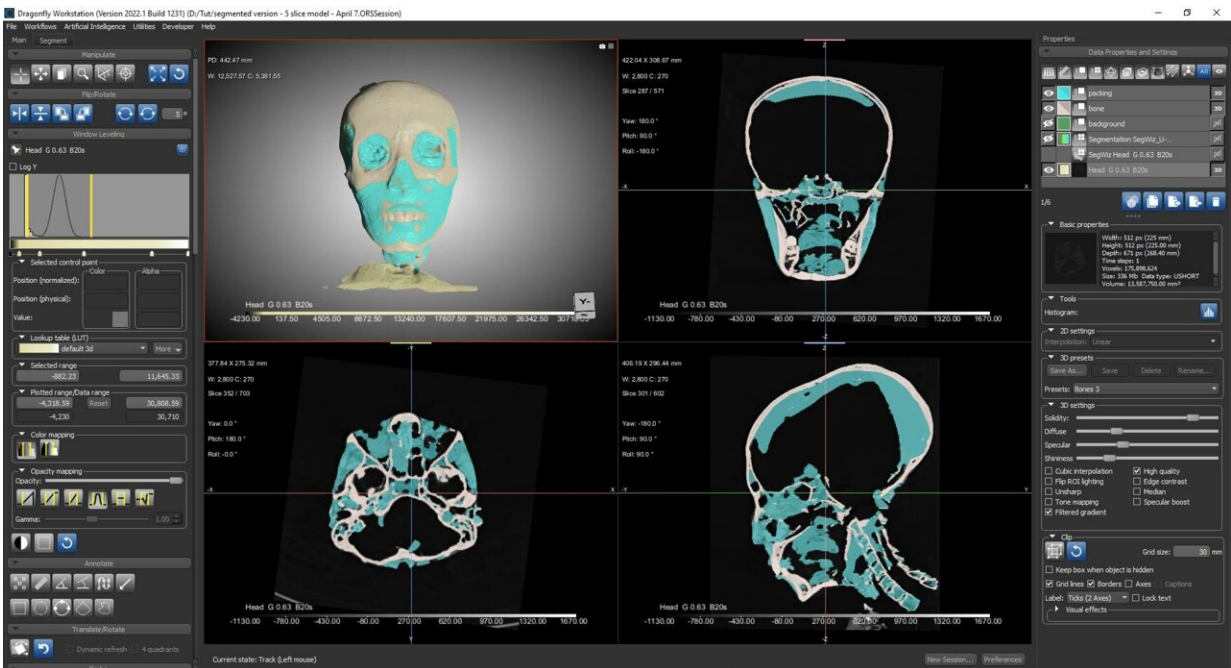


# Bioarchaeologist comes face-to-face with King Tut

November 25 2022, by Jeff Renaud



A screenshot of the computed tomography (CT) scans and 3D bioimaging software used to create a virtual model of King Tut’s skull. Credit: University of Western Ontario

Andrew Nelson studies bioarchaeology, in part, because it allows him to understand how people lived thousands of years ago. And while he has traveled the world investigating ancient mummies, his latest adventure with King Tut is one for the ages.

"The best way to know about people of the past is to study mummies, skeletons, and burial artifacts. Working on a mummy tells us what an individual was like as a person," said Nelson, chair and professor of anthropology.

This week—marking the centennial of Howard Carter's opening of King Tutankhamun's tomb—American national public broadcaster PBS aired a two-part documentary titled Tutankhamun: Allies & Enemies, and Nelson is a featured player.

"I've worked with a lot of mummies, in Peru, Egypt and elsewhere and each one is special. Each one was a person who deserves our respect—and that's important and it's important to tell their stories—but but, there's only one King Tut," said Nelson.

At the production company's request, following a recommendation by Western-trained Sahar Saleem, a professor of radiology at Cairo University's Kasr AlAiny Faculty of Medicine, Nelson was commissioned to participate in a new facial reconstruction of King Tut. The process involved using computed tomography (CT) scans and 3D bioimaging software Dragonfly, to create a virtual model of the King's skull.

"I have lots of scans of other Egyptian mummies, but it's really difficult to get a scan of a pharaoh, so working with King Tut is the ultimate experience," said Nelson, a member of Western's Bone and Joint Institute. "It was only through the involvement of Sahar that we could get permission from the Egyptian authorities to examine the data."

Before mummification of King Tut was complete in 1323 B.C., resin was poured into his emptied cranial cavity (the space in the skull that holds the brain) and his cheeks were packed with strips of resin-coated linen. This technique was used to give shape to his face after it was dried

out during the [mummification process](#), but it made Nelson's virtual dissection extremely difficult.

"They put packing underneath the cheeks and in the mouth to try and maintain the shape of the face. But it's still not his original face. There was no [muscle tissue](#) so it's a sort of a shrunken version of his actual face," said Nelson. "Our work was to try and conserve the face, and essentially reanimate it."

Once the digital reconstruction of the skull was complete, Nelson worked with Toronto's Objex Unlimited to produce a 3D print of the skull. He then teamed up with Sackville, NB artist Christian Corbet who first made a forensic representation of King Tut's bust with no ears and no expression, and followed it up with his final artistic version, inspired by Egyptology and Egyptian art, which appeared in the documentary.

"We worked from the 3D model of the skull, and then we added the layers of muscle and actually built up the face," said Nelson. "The anatomy of his skull guided the facial reconstruction, so I think it's a much more realistic appearance than any of the ones we've seen in the past."



KING TUTANKHAMUN BY CHRISTIAN CORBET 2022

The final facial reconstruction of King Tut, complete with a khepresh atop his head. Credit: Christian Corbet



Digital reconstruction of King Tut's skull. Credit: Andrew Nelson



Andrew Nelson's bioarchaeological research is focused on the study of human remains from ancient cultures. Credit: Darryl Lahteenmaa

The final touch, which has not been a part of previous King Tut facial reconstructions, was the inclusion of a khepresh atop his head.

The khepresh, which is King Tut's battle crown, really elevates the reconstruction," said Nelson. "There are many illustrations and depictions in Egyptian art with King Tut wearing his crown, with the serpent on the front, so that's why we opted to go with it."

In the documentary, Egyptian archaeologist Yasmin El Shazly and

photographer Mahmoud Rashad inspect historical inconsistencies by exploring the mysteries of King Tut's life and burial.

"The goal of the production is to actually tell that story of King Tut as a person and who he was as boy king," said Nelson. "The hosts visited ancient sites and really explored his friends and his enemies. As part of this exploration, they wanted to look him in the face, and I think Sahar, Christian and I have nailed the assignment. We can now actually see the face of King Tut and bring that aspect of him to life."

Provided by University of Western Ontario

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