

Bioarchaeologist studies dental remains to explore the ancient people and culture of Oaxaca's Lower Río Verde Valley

July 28 2016



Dental remains document ancient lives for those who know how to interpret them. Credit: San Diego State University

Papyrus molders, stone etchings erode, memories wither and histories are rewritten. Teeth remain. Several thousand years from now, our teeth may document our lives more faithfully than any recording technology.

Teeth tell the story of Burial 97-Individual 107, as he's known academically, who lived some 1,400 years ago (600-800 AD) at the Río Viejo archaeological site in the Lower Río Verde Valley, approximately 10 kilometers from the Pacific Ocean in the modern state of Oaxaca, Mexico.

That B97-I107 was buried in a communal cemetery suggests he wasn't a member of his society's ruling elite. That he was entombed within a giant ceramic vessel in the central acropolis before the surrounding buildings were constructed, and with [teeth](#) decoratively filed and inlaid with flashy, mirror-like hematite, suggests he was something more than a commoner.

Such elaborate dental modification can signify the literal embodiment of one's culture, explained San Diego State University bioarchaeologist Arion Mayes, who has spent more than a decade poring over the ancient bones left behind in the Lower Río Verde Valley. In this region of Mexico, cutting, shaping and putting inlays into teeth is a dramatic gesture that in life likely conferred special status, and in death provides a window into the symbolism vital to B97-I107's society.

"No matter who he was in life, he seems to have been given a special status in death," Mayes said. "Everything about him was symbolic. He's simply amazing."

Uncovering history

Mayes has studied everything from 18,000-year-old human remains in Africa to modern forensic anthropology cases. She has investigated

population movement and peopling of the New World, as well as the forced migration of enslaved people through her work with the New York African Burial Ground. She first traveled to Oaxaca in 2003 while working at the Smithsonian Institution. She joined SDSU in 2005 and began taking students to help with excavation and cataloguing, data recording and skeletal analysis.



Credit: San Diego State University

So far, she and her students have worked with five archaeological sites near or along the Pacific coast of Oaxaca. They collect demographic information such as sex and age at death, and document skeletal

evidence of nutrition, disease, or trauma. Their goal is, ultimately, to reconstruct the biological history of the region.

Mayes and her colleagues consult with local villagers in these excavations. It's more than an academic interest for them, she said. As they work on and learn about the [archaeological sites](#) and remains around them, they become invested in the history of their area.

"We couldn't do the work we do if we didn't work with the local communities," Mayes said. "Some of the best archaeologists I know aren't formally trained."

Primarily, Mayes' research adds to a growing body of work on population health before and after societies' transition to agriculture, as well as variations due to cultural and environmental factors.

"There are trade-offs in that transition," she explained. "In the short-term, agriculture lets you feed more individuals. In the long-term, though, you see some health shake-ups related to a diet with a heavy reliance on corn."

Dental diaries

Teeth, more so than any other human remains, are the keys to unlocking how this transition played out in any given society. Bones are good, too, but thousands of years of alternating rainy and dry seasons leave many skeletons too delicate and precarious to work with. Teeth, on the other hand, are hardy and can stand the test of time.



Credit: San Diego State University

"Teeth have the greatest archaeological sturdiness," Mayes said. "Enamel is the strongest tissue in the human body."

Mayes' trained eye can tell a lot by a person's teeth. She knows several of the individuals uncovered in the Lower Río Verde Valley worked as weavers. They wove reed baskets, straw containers and cotton fishing nets, holding the strands in their teeth as they worked and leaving behind telltale tooth impressions.

She also knows syphilis existed in the New World before Europeans arrived on the scene. Mayes was the first researcher to definitively identify the developmental hallmarks of congenital syphilis in teeth found in the Lower Río Verde Valley.

Telling the story

Related questions Mayes and her colleagues are still investigating include whether there are trends in the population's age and season of death, and whether there's evidence of population movement due to sociopolitical and economic factors and changes to the environmental landscape, which in turn can be related to various diseases that have been identified.

And then there are the unsolved existential questions: Just who were these people in the Lower Río Verde Valley? Where did they come from? What is their relationship to the better-known highland peoples, the Zapotecs and Mixtecs? And what was their relationship with farther regions of Mexico?

Mayes and her colleagues' work is ongoing. This summer, she and her collaborators will be analyzing data accumulated over previous field seasons, assembling their strands of knowledge into a cohesive account. Yet many more questions lay buried, awaiting their return to the valley.

Provided by San Diego State University

Citation: Bioarchaeologist studies dental remains to explore the ancient people and culture of Oaxaca's Lower Río Verde Valley (2016, July 28) retrieved 17 July 2024 from <https://phys.org/news/2016-07-bioarchaeologist-dental-explore-ancient-people.html>

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