



Secrets of the Mummies

Revealed in latest preliminary scientific study

by Ann Friou | Photographs by Michael Wright

Twenty-two mummies in central Mexico — including one believed to be the world's youngest embalmed mummified fetus — have revealed clues to their identities, thanks to research conducted by a team of scientists this summer.

The scientists said their investigation has given them new information about the health and lifestyles of people living in the silver-mining town of Guanajuato in the mid-19th to mid-20th centuries. The mummies, which were disinterred from a Guanajuato cemetery between 1870 and 1958, appear to have been common folk, rather than upper class people, who died between 1850 and 1950, the scientists said.

The mummies have been on display in a Guanajuato museum since 1969 and are being analyzed scientifically for the first time by a team that includes Texas State anthropology professor Jerry Melbye, one of the United States' leading forensic anthropologists. Also analyzing the mummies are Ron Beckett and Jerry Conlogue, co-directors of the Bio-Anthropology Research Institute at Quinnipiac University in Hamden, Conn. Beckett and Conlogue, who have conducted paleoimaging research on mummified remains throughout the world, have examined the mummies internally using X-ray and endoscopy. Melbye is performing external visual and biological analyses on the mummies that are part of a collection of 111 mummies, 59 of which are on display in Guanajuato's Museo de las Momias.

The team has completed a preliminary study of the 22 mummies as part of a larger study that seeks to understand the origins and development of the whole collection of mummies, which includes both children and adults. Melbye — who has studied ancient mummies in Egypt's Sahara Desert, Mesa Verde in the American Southwest, and Vancouver Island, British Columbia — said the team has identified what they believe to be the world's youngest processed (partially embalmed) mummified fetus, which Melbye has aged to be 24 fetal weeks. Another mummy, also partially embalmed, is that of a newborn male infant. Both probably died between 1850 and 1950, the youngest perhaps as a result of spontaneous abortion.

Melbye determined the mummies' ages by measuring arm and leg bones and comparing the measurements to modern growth tables.

Surgical incisions had been made in the torsos of the two infants, and internal organs had been removed, Melbye said. The torsos had been stuffed with what looks like

a cotton-string packing material and closed with surgical thread. The skull of the 24-week-old fetus also had been opened, and the brain was removed and replaced with the packing material, Melbye said.

The evidence of the infants' embalming raises questions, however, about why the bodies were embalmed in an area where mummification happens naturally. Because all of the bodies had been buried above ground in cement crypts, Melbye said mummification would have happened rapidly: the bodies would have released their moisture almost immediately into the dry air and cement or wooden coffins, and decomposition would have stopped very quickly.

"Other variables, like the time of year in which one was placed in the crypt, too, may have contributed to the mummification in Guanajuato. We plan to investigate this further when we return in January," Melbye said.

"We had no idea that embalming had been going on," he continued. "At first, I wondered whether this was a





Fifty-nine mummies have been on display in the Museo de las Momias in Guanajuato, Mexico, since 1969 and 22 are being scientifically examined for the first time by a trio of scientists that includes Texas State's Jerry Melbye.

purposeful step in mummification, like the process in Egypt that calls for removal of the internal organs to prevent decomposition. We have no evidence in Guanajuato of such a practice, so one wonders why both the fetus and the baby had been embalmed," Melbye continued.

"The abdominal incision in the older baby had been sewn closed with a 'whip stitch,' which suggests that a surgeon had made the incision, removed the organs, and sewn up the cavity," he said. "I can't imagine why a surgeon would have eviscerated an infant except to preserve it. So, I'm beginning to think that evisceration was an attempt at extending the preservation period before burial."

The team was told by Museo de las Momias Director Felipe Macias that in rural

Mexico, now as in the past, infant Catholic girls who die are often dressed as little angels or "angelitas," in lacy dresses and sometimes with angel wings, to represent their young souls' freedom from sin and their presence with God. Boys are dressed as little saints or "santitos," the color of their clothing corresponding to the saint representing the month in which the boy died. The dressed infants are displayed for a brief time and photographed alone or with their families as if they are still alive.

Melbye explained that because fetal and infant corpses decompose very quickly, the embalming of the two young mummies may have been done to preserve the bodies in order to carry out this and other death rituals. He said, "The two prepared mummies at Guanajuato are somewhat equivocal. What was the motivation for

the embalming? We will probably never be certain, but it did result in enhanced natural mummification."

The team has also analyzed the mummy of a woman who died in childbirth or miscarriage — dried placenta is present extruding from the mummy — but Melbye says that no records are available to tell him whether either of the infant mummies belonged to her. The museum also has a photo of a mother holding a dead baby dressed as an "angelita," but no records are present to connect the mother to one of the young mummies.

The 111 mummies have become the prime tourist attraction in Guanajuato. The mummies began to be exhumed from a local cemetery in 1870, when a law was enacted locally requiring families to pay a "burial



tax” to ensure the perpetual burial of a loved one. If the tax was not paid, the body was removed. Being naturally mummified, it was stored in a building above ground, and people began paying to see the bodies in the late 1800s. The law requiring the burial tax was abolished in 1958.

Hoping to increase scientific and historical knowledge about the mummies, Guanajuato’s mayor, Eduardo Hicks, initiated the Guanajuato Mummy Research Project in early 2007, inviting Melbye, Beckett and Conlogue to serve on the scientific team that will spend more than a year exploring the origins and development of the mummies. In 2001, Beckett and Conlogue conducted preliminary studies at the museum as part of a National Geographic Channel documentary series, “The Mummy Road Show,” which the duo

co-hosted. They surveyed 18 mummies for this program.

As paleoimagers, Beckett and Conlogue are conducting radiographic and endoscopic examinations on the mummies, providing data that is otherwise invisible. Melbye combines the information gained from these internal pictures with what he learns from surface autopsies to determine age, sex, race, stature, pathology and cause of death of the mummies. Other Texas State personnel aiding Melbye on the expedition are research associate Vicky Melbye and Grady Early, distinguished professor of computer science emeritus.

So far, the team has analyzed mummies that range in age from the processed fetus to a woman in her late 60s. The team’s examinations have revealed evidence of such diseases as rheumatoid arthritis, extreme anemia and tuberculosis, sometimes severe enough to cause death. They have also found evidence of smoke inhalation, either from smoking tobacco or from working in the local mines. A number of babies died at a very early age, possibly from “weanling diarrhea,” a bacterial infection that babies in pre-industrial societies often contract when adults begin to feed them solid food that they have softened by chewing.

Many local myths surround the mummies, so the team made special efforts to verify or debunk the tales. Melbye examined the body of one young man who had received a strong blow to the side of the head that displaced his face by 10 millimeters and probably caused death. He also looked at the case of a woman who was supposedly hanged by her husband but didn’t find any evidence to support the story.

Neither did he find evidence, after a preliminary investigation, to support the story that one woman had been buried alive. “She doesn’t have her hands together in the prayer position as a lot of the mummies do, and she doesn’t have her hands down by her side. Rather, she has her arms up over her head, sort of covering her face,” Melbye said. “Apparently she was found face down as if she were trying to put pressure on the coffin lid with her back by pushing up. I’m not sure whether having her arms up is an indication that she was buried alive, but on our next trip to Guanajuato, we will do a fingernail scraping to see if there is any material under her nails that matches the coffin she was in.”

The information that is surfacing from the mummies will provide Mayor Hicks and the museum with accurate stories that are scientifically based, said Melbye, who is pleased with the project’s progress.

“Unfortunately,” he added, “we can’t tell Mayor Hicks the precise years in which any



Melbye examines the youngest of the mummies, a partially embalmed fetus 24 fetal weeks old.

of the people died. Carbon 14 dating can’t help us because it will only give us a date of plus or minus 50 years — a 100-year range — and we already know that range is from the 1850s to the 1950s.”

The team plans two more trips to Guanajuato in 2008 before they give Mayor Hicks a final report. Melbye is hoping to involve a couple of Texas State graduate students in a paleodemographic study of all of the people in the Guanajuato cemetery, to get an idea of the population structure — the numbers of men and women — in past populations.

The Museo de las Momias is planning to send some of the mummies on a U.S. tour sometime in 2008. More about Guanajuato, the mummies, and the Museo de las Momias is available online at <http://www.guanajuato-capital.com/ingles/Amomia.htm>. ★