The Amazing Teen Brain

Rapidly changing wiring leads to mental agility—and risky behavior
On June 28, 2012, a worker at La Cantina Ranch in Brooks County, Texas, was tending wild game feeders. On the ground, he found what he thought were bones scattered in an eight-foot-diameter area of mesquite-laden brush.

A deputy from the Brooks County Sheriff’s Office showed up later in the day. According to the report, animals had already been there and left teeth marks in the bones. There were tangled clumps of black hair, torn items of clothing and a few personal effects—a backpack, four chicken-flavored Ramen packages, bug spray, a toothbrush and an unopened bag of Salsa Verde Doritos.

A pauper’s burial took place soon afterward in the Sacred Heart Burial Park in the county seat of Falfurrias, about 10 miles away from where the body was discovered. The remains and personal items were transferred to a local funeral home and assigned a state death record number: 0425.

The remains appeared to be those of a migrant who had crossed the border illegally via Mexico. Along this 2,000-mile divide, the U.S. Border Patrol arrests hundreds of thousands of migrants every year, some of them children traveling alone. Many more than the numbers in the official record attempt the trip. They are fleeing chaos in their home countries—gang violence, drug trafficking, collapsed economies, and ineffectual and corrupt governments. In the flat, featureless terrain where the thermometer reaches triple digits in summer months, migrants often succumb to dehydration, exhaustion, sickness or injury, or else they often simply get lost in endless miles of scrub after being abandoned by human smugglers.

If 0425 had died in Arizona, authorities would have performed an autopsy, submitted a DNA sample to various government databases and, if a match were found, they would have passed along the identity to the consulate of the deceased’s presumed country of origin, which would then be responsible for notifying the family. Texas, however, has had trouble coping with the influx. As other states tighten controls, undocumented migrants have flocked to Texas. Between October 2011 and October 2014, about 685 perished in Texas, compared with some 540 in California, Arizona and New Mexico combined.

In Brooks County, where the body was found, one in three residents lives below the poverty line. The county has neither the infrastructure nor the financial resources to handle the inundation along the border. As a result, remains are often just thrown into the ground at Sacred Heart and other burial grounds without any attempt to figure out who the deceased were.

When Lori E. Baker, a forensic anthropologist at Baylor University, first heard about the haphazard way that burials were

More undocumented migrants died crossing into Texas in recent years than in any other state along the Mexican border. Overwhelmed county governments have at times put the remains in mass graves.

A team of three forensic scientists, along with a cadre of their students, have started to look for remains in cemeteries in South Texas to identify the deceased and return them to their families.

Case 0425, a migrant who died after reaching Texas, illustrates the challenges the scientists face in making a determination of sex, height, age and nationality from skeletal remains.
being carried out at Sacred Heart, she was appalled. Baker, who, in 2001, helped in Peru’s investigation of that country’s human-rights abuses, assembled a small team of forensic scientists and students to exhume the remains of border crossers at Sacred Heart and identify them.

The group set to work as though they were conducting an archaeological dig. Instead of excavating ruins, they started the precise and tedious task of digging up and documenting remains and personal effects.

One of the first cases they took up was 0425.

CONSTRUCTING A BIOLOGICAL PROFILE

AFTER WEEKS OF DIGGING in the late spring of 2013, the scientists had unearthed around 70 migrants, far more than expected. Some turned up in milk crates; others were commingled in a single body bag. Still others had no grave markers at all—even simple signs that might have read “unknown female” were missing. “We know that we must always expect the unexpected,” wrote Krista Latham of the group’s informal motto in a 2014 post on a blog called Beyond Borders. Latham directs the University of Indianapolis Molecular Anthropology Laboratory and had volunteered to be one of the team leaders.

Latham brought four graduate students with her to Brooks County. The working conditions were challenging. In addition to the heat and humidity—and the spiders, scorpions, snakes and fire ants—there was a complete absence of maps or notes of any kind documenting the number and nature of the burials. “We did not know if they were buried in a wooden box that would protect them or just in plastic,” Latham says. “So we had to go very slowly and use small hand tools in order to not potentially damage the remains.”

The team created a grid system at the cemetery using string. The scientists measured the distance from any point where excavations were taking place, aboveground or belowground, to a fixed point on the grid. In that way, they could make a record of everything that turned up in the various subsurface layers and eventually compile a comprehensive map of the site.

The remains of 0425 were assigned in July 2013 to Kate Spradley, a biological anthropologist at the Forensic Anthropology Center at Texas State University. Spradley, a youthful 42-year-old with a serious demeanor, says she was motivated to take on this work part-time because she felt it would imbue her teaching and research with a vital service mission.

In the initial cataloguing of the remains, 0425 looked like a relatively straightforward case. The official report on file linked the remains to Arely Noemy Blanco Sosa, a 39-year-old Salvadoran woman. The name came from a national ID card that lay not far from the skeleton scattered at La Cantina Ranch, which the Sheriff’s Office assumed was Blanco Sosa’s. Unlike others in which only a small number of bones could be found, the skeleton was nearly intact [see box on next page].

The Forensic Anthropology Center has rows of steel tables, one stacked atop another. Each one holds a skeleton laid out carefully to preserve the proper anatomical placement of bones—a radius must lie just next to the ulna on each table. Spradley began her work on 0425 by creating a photographic inventory of the skeleton and accompanying personal effects. Even with a nearly complete skeleton and cutting-edge forensic tools, a positive identification of 0425 became a surprisingly difficult endeavor.

During the inventory, Spradley’s team discovered another national identity card underneath the insole of the right shoe. It belonged to a 37-year-old woman of Honduran nationality, casting doubt on whether 0425 was really Blanco Sosa.

The forensic team then began to compile a biological profile of 0425—an analysis of sex, ancestry, age and stature and a dental record. The researchers proceeded to soak the remains in hot water and detergent—a process called maceration that speeds up natural decay by loosening cartilage, ligaments, tendons and other soft tissue. The skeleton was left to dry, invento-
ried and boxed—and held in a container for months.

Perhaps the biggest challenge in this line of work is finding sufficient funds to carry out a forensic analysis. Neither federal nor local governments provide money for identifying desperately poor migrants who are not U.S. citizens. The lack of money meant the various laboratory procedures required for a biological profile had to wait. The situation these volunteers faced was captured in a grant proposal drafted by Spradley that read like an impassioned plea for help. She compared the number of migrant remains recovered in Brooks County in 2012 with the passenger capacity of a Boeing 737. “If a 737 crashes, it is considered a mass disaster and state funding is spent to facilitate recovery and identification of the passengers,” she wrote. “Because these migrant deaths accumulate slowly, albeit in the same geographic location, they are not considered a mass disaster and no funding has been released to adequately process this particular mass fatality.”

A year and almost nine months after 0425’s bones were found, on March 20, 2014, Spradley and her students were able to return to their analysis of 0425’s profile. Preliminary identification of the most basic details of a person’s identity—sex and stature—is not always a simple matter in these cases, because the remains have degraded and critical bones are missing. The relatively intact skeleton meant that Spradley was able to perform a complete evaluation of the pelvis. The set of pelvic bones, including the ventral arc, the subpubic concavity and the medial ischiopubic of the left os coxa, enabled her team to confirm with “a probability of 100%” that 0425 was female, according to a report Spradley co-authored.

The scientists used another technique to estimate 0425’s stature. Known as the Fully anatomical method, it measures bones down the midline of the body from heel to head. The method was first developed for gauging the height of Frenchmen killed during World War II at the Mauthausen concentration camp in Austria. It showed that 0425 stood between four feet, eight inches, and five feet.

Estimating 0425’s age posed more of a difficulty. Some experts say it is virtually impossible to establish an individual’s exact age at the time of death by relying only on skeletal remains because some people experience more wear and tear to their bones than others. Spradley and her team looked at the structure of the bones to determine how old the deceased was. The analysis showed that 0425’s epiphyses—the end parts of the body’s longer bones—had not fully fused, suggesting that she had led a life with a high degree of physical stress or nutritional deprivation that could have retarded her growth as a child. “As individuals grow older,” Spradley explains, “the epiphyses fuse, so you know you are dealing with an adult at least in their mid-20s.” The unfused bones from 0425 yielded estimates ranging from 20 to 35 years in age.

**WHERE WAS SHE FROM?**

Spradley next tried to determine ancestry by analyzing 0425’s skull. She gained her expertise in what is known as cranometric analysis as a graduate student, when she studied the skulls of individuals of African ancestry, finding that physical stresses during childhood could bring about changes in bone structure. The team gathered data needed for the analysis by using a digitizer to create a three-dimensional computer model of the skull. This information then went into a program called FORDISC 3.1. The program enabled a comparison of 0425’s skull with existing digital reference data about skull shape for a group of a particular ancestry.

For Latin Americans, making these comparisons is arduous. No well-established collections of Hispanic bones exist as a refer-
ence source. Most of the data come from late 19th- and early 20th-century skeleton collections of European-Americans and African-Americans from the U.S. The lack of data means that the ancestry of Hispanics often stays a mystery in forensic investigations. In the worst cases, attempts to determine ancestry can lead to utter confusion. “Methods for a person considered white, when applied to an individual considered [a male] Hispanic, will usually provide a sex assessment of female,” Spradley says. “If sex isn’t right, no one will be identified.”

Whereas skull measurements Spradley took for 0425 revealed her ancestry as “probable Hispanic,” that designation failed to pin down whether the woman came from Mexico, Guatemala, El Salvador or Chile—or whether in the case of, say, a Mexican, her home was in Oaxaca or Veracruz. Also missing was any means of classifying ethnic or tribal groups—Maya, Zapotec, Mixtec, Lenca, Afro-Colombian, and so on. Spradley has been trying to address the need for better comparative data by documenting differences in bone structure and genetic markers of ancestry for immigrants of Central American origin who make up most of the fatalities in South Texas. She is bringing together records on border-crossing fatalities from the Pima County Office of the Medical Examiner in Tucson, Ariz., two documented cemetery collections from Mexico and records on victims of human-rights violations during Guatemala’s civil war.

Spradley uses this information to classify differences in skull size and shape—say, between Mexicans and Guatemalans. These specifics then go into the Forensic Anthropology Data Bank (FDB), co-founded in the 1980s by Spradley’s graduate adviser, Richard Jantz of the University of Tennessee Knoxville. The data will ultimately help make it easier to pin down where migrants such as 0425 began their journey.

A CHEEK SWAB, A POSITIVE ID

With the biological profile complete, Spradley and her team tried to identify the remains by matching the profile with a database of missing person reports. Spradley contacted the Tucson-based Colibrí Center for Human Rights, which has been building a repository of missing persons who are not U.S. citizens. The database is needed because the National Missing and Unidentified Persons System (NamUs) in the U.S. has significant gaps in information on foreign nationals.

In the Colibrí database, the biological profile for 0425 generated a possible match with a missing person document that had been filed in Honduras. As it turned out, a Honduran family had submitted the report to Colibrí. The information matched some of the details in the biological profile, including the sex, ancestry, stature and personal effects compiled during the investigation. It also corresponded to the name that had appeared on the identity card found in the shoe: Maria Albertina Iraheta Guardado. Now Spradley had to confirm it. Colibrí’s executive director, Robin Reineke, referred the Texas State researchers to the Argentine Forensic Anthropology Team, a human-rights group that had been collecting DNA samples of family members of missing migrants—family reference samples—to help confirm the identity of those who had died during border crossings.

DNA tests are performed only after the biological profile that has been meticulously compiled can be matched with a specific missing person report. The Texas State lab took a sample from the metatarsal bone in the foot and dispatched it to the lab used by the Argentine group for comparison with the family reference samples on file. The DNA from the metatarsal bone matched that of the family reference sample. On April 25, 2014, the scientists finally had the confirmation they needed. It took two years from the time Iraheta Guardado’s remains were found to establish her identity.

WAITING FOR CLOSURE

Maria Albertina Iraheta Guardado was 37 when she decided to leave the Dos Bocas community in Santa Rosa de Aguán, Honduras, and emigrate to the Bronx to meet up with her sister, who works as a house cleaner. She wanted to send money back to her mother and help support her six children. Some of them are already adults. But two—a nine-year-old and a 14-year-old—still live with Iraheta Guardado’s mother.

According to the mother and sister, who spoke with me on the phone, Iraheta Guardado also wanted to leave because of a growing weariness with the violence that plagues Honduras, the country with the highest murder rate in the world, as of 2012. Several years ago her husband was fatally shot by stray bullets in a cross fire, says Iraheta Guardado’s mother, Maria Amelia Guardado: “Like everyone else here, he was just murdered, because that’s what happens here.”

The mother learned from the Argentine Forensic Anthropology Team that her daughter crossed the border near Brownsville, Tex., on June 15, 2012, along with a group of other migrants and a human smuggler. She had walked for two days before fainting and being left behind near Falfurrias.

Identifying Iraheta Guardado took the combined efforts of forensic anthropologists, human-rights organizations, foreign consulates and law-enforcement agencies. Her mother then waited anxiously for her daughter’s remains to be returned; they had been delayed because of a bureaucratic snafu over a death certificate. Finally, in early April 2015, they arrived and were returned to the family for burial.

For the team who identified Iraheta Guardado, a positive outcome was a complicated victory. Team members were thrilled with their success, but the grueling effort exacted an emotional cost. As Latham geared up to travel back to Falfurrias for another two-week exhumation in June 2014, she wrote in a blog post: “I won’t be able to read [my son] bedtime stories for 13 nights or get his hugs and kisses for 14 days. But the thought that keeps me going is that I am temporarily leaving my family to reunite other families. I will get to hug and kiss my son again, but there are hundreds of mothers whose children are buried unidentified in the Sacred Heart Burial Park who cannot say the same thing.”

MORE TO EXPLORE

Northbound: What Happens after Crossing the Border. Ananda Rose in Foreign Affairs. Published online July 2, 2014.

FROM OUR ARCHIVES

Coming to America. Rodger Doyle; August 2005.