Vox

The science of human decay

Inside the world's largest body farm

By Joseph Stromberg | Updated Mar 13, 2015, 10:01am EDT

WARNING: THIS STORY CONTAINS GRAPHIC IMAGES

Seven miles northwest of San Marcos, Texas, 50 or so naked human bodies in varying stages of decomposition are strewn about in a 16-acre field.

Some are fully mummified, their flesh dried out by the harsh Texas sun. Others have been picked over so voraciously by vultures that their bones are frayed. The most lurid are the fresh ones: week-old bodies that have ballooned to twice their normal size and crawl with thousands of maggots.

This operation, at a place called **Freeman Ranch**, is part of the Forensic Anthropology Center at Texas State University. Colloquially, facilities like these — this is the largest of six worldwide, all in the US — are simply called body farms.

The bodies are donated and left out in the elements as part of research aimed at better understanding the process of decomposition, mainly to assist in criminal investigations. When an unidentified body turns up, the first question police typically ask is how long ago the person died — and the observations made at body farms have been crucial in allowing them to answer it. Researchers at Freeman Ranch are also using their knowledge of decay to help identify the bodies of hundreds of people who die of dehydration or heat stroke every year after they cross the border into Texas.

"What we really want to figure out is, at a basic level, how decomposition works," says Daniel Wescott, an anthropology professor at Texas State and the director of the body farm. "There's a whole little ecosystem going on right here." He gestures towards one body, with a leathery face that's stiffened into an opened-mouth yowl. "And we want to understand every part of it."

The vast majority of humans who have ever lived share the same fate after death: decomposition. Unless your body is frozen, cremated, or otherwise destroyed after you die, it will inevitably be consumed by bacteria, insects, and animals that recycle your organic substances into new forms of life. Even today, the protection of embalming fluid and wooden caskets doesn't stop the process — it only delays it slightly. Given how universal decomposition is, it's a bit surprising that until quite recently, our knowledge of it was fairly thin.

The first known study of human decomposition is ***Washing Away of Wrongs*** by a Chinese judge named Song Ci. It's a 13th-century treatise on basic autopsy principles: how to examine the body and determine the cause of death, for instance. This work was eventually followed by a series of European scientists who exhumed bodies in the 1800s and first observed the specific stages of decomposition that a body experiences as it decays.

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These studies made broad generalizations on decomposition based on just a few bodies. Through the 1970s, forensic scientists still largely relied on research involving pig carcasses when consulting on criminal cases and attempting to determine the all-important post-mortem interval — the time between when a person dies and when his or her body is found. No one had ever watched a human body decay in a controlled setting firsthand.

That changed in 1980 at the University of Tennessee, where the anthropologist William Bass founded the first body farm. Bass got the idea after being called on to help police in a local murder case: they'd found a disturbed Civil War-era grave and suspected that the body in it was a recent one, swapped in by the suspect to conceal the evidence. Bass analyzed the body's clothing and other factors and found that

wasn't the case. But he was troubled by our incomplete knowledge of human decomposition.

So he started collecting bodies. The very first one — a 73-year-old man who'd died of heart disease — was left to decay at an abandoned farm that had been donated to the university, just outside the town of Knoxville. Eventually, Bass and his students fenced in a 1.3-acre patch of woods on the property and began studying multiple bodies at once. Over the years, researchers at the Tennessee body farm (a group that would include both Wescott and Kate Spradley, another current professor at the Texas body farm) processed more than 650 bodies, legitimized the study of human decomposition, and established much of what we now know about it.

An aerial view of Freeman Ranch, showing bodies in cages. (Daniel Wescott)

But there's still a lot we don't know. "Heat and humidity really affect the rate of decomposition. That means that the process varies from region to region," says Wescott, a cheerful, gray-bearded forensic anthropology lifer who has textbooks, diplomas, and a human skull on his office bookshelf. A body decays at a much different rate in the Texas Hill Country than in Eastern Tennessee. This is why body farms were subsequently founded in North Carolina, Illinois, and here at Texas State. Because this sort of operation would be illegal under European law — and hasn't yet been attempted elsewhere — our current knowledge about human decomposition is

entirely dependent upon what goes on at these facilities.

Four full-time staff, along with dozens of graduate and undergraduate volunteers, now run the Texas State body farm, which is paid for with Texas State University funding and fees from various law enforcement agencies. The staff maintains an ever-growing collection of 200 or so human skeletons — the cleaned and catalogued results of a year or so of decomposition outside. These contemporary specimens are valuable, Wescott says, because the proportions of human bodies in general are always changing — nowadays, largely due to increasing rates of obesity, which alters the rate of joint wear — and most collections elsewhere are historical. Having a substantial collection of recent skeletons on hand helps in determining the age of an unidentified person who is found in mysterious circumstances.

At his previous job at the University of Missouri, for instance, Wescott was called on to help when a decapitated body was found near the town of Columbia in 2008. "The first thing I noticed were the thigh bones," Wescott says. "They were much thinner than normal, and joined the body at an unusual angle." Comparing them to specimens in the University of Tennessee's collection, he realized that they were the result of an extended period of time spent sitting — most likely, in a wheelchair. Police told the public that the remains were probably of a wheelchair-bound woman. The case was cracked open when a wheelchair salesman heard this and called in, saying he had one customer who'd uncharacteristically missed a recent fitting and had stopped returning his calls.

Why do people donate their remains to the body farm?

The number of people donating their bodies to the Texas State body farm and

others continues to grow — and many of the researchers themselves, including Daniel Wescott, have signed up to donate their bodies after they die. This **Oxford American profile** of donors explains some of the reasons why.

1) Many people want to make a **positive contribution to science** with their bodies after they die, and the body farm's requirements are much less restrictive than those of most medical schools or hospitals. The body farm accepts obese bodies, as well as those that have been autopsied or had organs removed to be donated. The only restrictions are that bodies must be under 500 pounds and can't have an infectious disease.

2) Other donors might disapprove of the ceremonial trappings and artificial processes that are part of the modern funeral. As part of the growing **natural burial movement**, thousands of people in the US are **opting out** of embalming, concrete burial vaults, and steel caskets, all of which slow down decomposition and put inert materials into the ground. Donating to the body farm accomplishes the same thing - allowing a body's nutrients to be quickly recycled into other organisms after death.

3) Finally, **there's the cost**: the price of the average US funeral **has surpassed $7,000**, and even cremation typically **costs a few thousand dollars**. The Texas State body farm offers free pickup of any bodies within 200 miles, as well as free pickup from the Austin airport nearby.

Looking at decomposing human bodies for the first time is difficult. Nowadays, most of us rarely see any sort of human remains at all. About **70 percent** of Americans now die at hospitals or other facilities, rather than at home, and the bodies that do go through a formal viewing are preserved with embalming fluid and covered with makeup, then sealed in caskets to decompose deep underground. There's been a curtain hung between life and death, and most of us seldom have the chance to peer behind it.

Moreover, says Antonius Robben — an anthropology professor who studies beliefs and practices involving death — "there is no culture on Earth that leaves a body without any ritual. It is one of the few universals. We have a very strong notion of the integrity of the body, and a great preoccupation with what happens to it, even though we know the person inside is gone."