

## The Science of Injustice

### Capital murder case highlights Texas courts' resistance to physical evidence

BY JORDAN SMITH, FRI., AUG. 19, 2011

On Jan. 2, 1999, Daniel Raglind was searching a section of the Sam Houston National Forest with his son Todd and several others when he found the body.

The group had been looking for a pistol and a rifle that Todd had misplaced in this section of the forest, hugging the shore of Lake Conroe outside the East Texas town of Willis. Todd had been hunting several days earlier and had become disoriented; he spent the night in the forest, and when he awoke the next morning, he couldn't find his guns, Raglind told a jury in 2000. It was the second day in a row that Raglind and his son had come to this area to look for the missing weapons.

Walking through the woods that Saturday, Raglind made a grisly discovery. In a clearing not far from where a deer had recently been cleaned, there was a human body. "At first, I thought it was a mannequin," Raglind told then-Montgomery County prosecutor Michael Tiffin. "I don't know why that crossed my mind, but I mean ... you're not expecting to see a body," he testified. "I walked up to it ... I touched it. One foot had a shoe off, still it had the sock on. It felt like flesh to me."

It was indeed a body, that of 19-year-old Melissa Trotter, a Montgomery College student who had been missing since Dec. 8, 1998. That day, during finals week, she had been seen around the college by a number of people: She attended a science class review session, went to the cafeteria, and did some studying and other work on a school computer in the college library. Then she was gone. In fact, the section of woods where she was ultimately found had been searched by police several times before Raglind came along.

Although they had not yet found her body, police investigating her disappearance were fairly certain that Trotter was dead, and they believed they knew who was responsible: Larry Swearingen, a 27-year-old local electrician, married with two young children and a history of getting himself in trouble with the law. Swearingen had been seen talking with Trotter at the college the day she disappeared. The state maintains he was the last to see her alive.

Three days after Trotter disappeared, police arrested Swearingen on outstanding warrants. He's been behind bars ever since. After Trotter's body was found, he was charged with capital murder. The state charged that Swearingen kidnapped her from the college, raped her, and tied a single panty hose leg around her neck, strangling her before dumping her body in the national forest. There was no direct evidence – no DNA, for example – linking Swearingen to the crime, and there was no certain evidence that Trotter had been the victim of sexual assault.

But there was a good deal of circumstantial evidence linking Swearingen to the disappearance and death. He had been seen with her at the school the day she disappeared, several hairs matching Trotter were found in Swearingen's pickup truck (although he did not dispute that they were friends), and, most damning, during their third search of Swearingen's home, police said they were given a leg of panty hose that Swearingen's landlord had found while cleaning up Swearingen's rented trailer. A Department of Public Safety analyst later said it was a positive match to the leg found tied around Trotter's neck.

#### Time of Death

Swearingen maintains his innocence, but he was tried and convicted in the summer of 2000; after less than two hours of jury deliberation, he was sentenced to death. Since 2007, he's been scheduled for execution three times but has avoided lethal injection thanks to court-imposed stays – including one late

last month granted by the state's highest criminal court, the Austin-based Court of Criminal Appeals, which sent the case back to district court for further review. At issue is the forensic science of death and decomposition. More than a decade after Trotter's death, a growing number of scientists – including pathologists, forensic anthropologists, and entomologists – agree that Swearingen could not have been responsible for Trotter's death.

Specifically at issue is histological evidence (analysis of cell tissue) that nearly a half-dozen doctors have reviewed and that they say shows conclusively that Trotter had not been dead for 25 days at the time she was found in January 1999. Samples of cardiac, lung, and vascular tissues harvested from Trotter at autopsy, saved in a paraffin block and finally recovered from the Harris County Medical Examiner's Office by Swearingen's attorney in 2009, show tissue that is hardly decomposed at all and is most consistent with a person who has been dead less than a week.

If Trotter was dead less than a week when her body was discovered, Swearingen was in jail when she died and could not have killed her.

### **Melissa Trotter**

"[I]t is categorically impossible, beyond all reasonable doubt, that Ms. Trotter was killed and her body left at that location by ... Swearingen, who had been incarcerated ... 23 days before the body was found," Dr. Lloyd White, deputy medical examiner in Tarrant County, wrote in a June 2011 report detailing his most recent examination of the tissue samples.

Yet despite what appears to be clear and convincing medical evidence that Swearingen could not have killed Trotter, neither prosecutors nor the courts have been persuaded that he could be innocent. Swearingen's defense has been trying for four years to demonstrate to the courts – the trial court and the CCA as well as federal courts – the import of the new scientific findings. While the CCA has remanded the case to the trial court twice for further hearings, they've ultimately sided with prosecutors, ruling that the forensic evidence isn't convincing enough to outweigh what CCA Judge Cathy Cochran wrote in January 2009 is a "mountain" of circumstantial evidence pointing to Swearingen's guilt.

The case renews questions about the intersection of and tension between science and law – how courts and law enforcement professionals view and understand science, and how decisions are made about what kind of science is "good enough" to be deemed more telling or important than other compelling but decidedly nonscientific evidence. "When you have objective forensic evidence and testimonial evidence – which is subjective – [that testimonial evidence] must be questioned and take a backseat to the objective science," says Dr. Stephen Pustilnik, the chief medical examiner for Galveston County, who after reviewing the Trotter tissue samples also concluded that Trotter was killed within days of being found in the forest, not in early December, and therefore not by Swearingen. "It's not the convenient scenario, not the easy scenario" for the state, he says. "Just because [Swearingen] is the easy and convenient person, all of a sudden, if the science says he didn't do it, doesn't mean that you can ignore the science."

### **Contradictory Evidence**

Swearingen saw Trotter at least twice in the days just before she disappeared. On Dec. 6, 1998, he ran into her outside the North Shore Marina, a gas station and store on Lake Conroe, where they talked while standing by their cars in the parking lot. Two days later, he saw her again, around lunch time, at Montgomery College. Swearingen had gone to the school that day to talk with a friend, a campus cop – he had promised to attach a new set of lights to her truck. He ran into Trotter there, working at a computer in the college library and study area. Swearingen explained these two encounters as innocent – they talked about family members (Swearingen's younger sister had gone to school with Trotter, and Trotter wanted to reconnect with the girl, he said) and other mundane topics, he testified in court.

Yet at trial Swearingen was his own worst enemy. He ignored the strong advice of his attorneys and took the stand in his own defense, delivering a rambling and contradictory narrative to explain his relationship with Trotter, whom he maintains was merely an acquaintance. In so doing, he opened himself up to a lengthy cross-examination, during which prosecutor Tiffin was able to point out that Swearingen had lied to police on numerous occasions about his interactions with Trotter before she went missing.

He also could not explain the panty hose found at his home several weeks after he was arrested, nor could he explain why some of Trotter's school paperwork was found, nine days after her disappearance, ripped into pieces and scattered on the street near his parents' home. While in jail, Swearingen asked a friend to provide him with an alibi, and in another incident he wrote a letter – in Spanish, composed using a dictionary – that he tried to pass off as coming from a mystery woman who could exonerate him. Equally confounding, he testified that on two occasions prior to Trotter's disappearance, he saw her with a mystery man – but could not explain why he had never told police. In short, Swearingen did a host of things that painted him as suspicious.

Prosecutors elicited testimony from friends and acquaintances who said that Swearingen had planned to meet Trotter on Dec. 8, 1998, just before she disappeared. However, witnesses at the college – including one of Trotter's professors and a student working in the cafeteria – ultimately put Trotter at the school either after Swearingen left or with someone who did not look like Swearingen. In other words, the witness testimony putting Swearingen and Trotter together at the college was tenuous and contradictory. But to the prosecution, it still seemed far more cohesive than did Swearingen's muddled testimony. "As a matter of fact, when you stop and you look at all the evidence here ... you're going to see one thing. All roads lead to Larry Swearingen," Tiffin said during closing arguments.

Significantly, also supporting the state's case was the opinion and testimony of then-chief medical examiner for Harris County Joye Carter, who performed Trotter's autopsy on Jan. 3, 1999, the day after the body was discovered. According to Carter, "based on the appearance" of Trotter's body, she "arrived at the opinion of the body being dead for approximately 25 days or so," which dovetailed perfectly with the state's theory of the case. Partially, she arrived at that conclusion after finding "fungal organisms" that she said were growing on the body. These types of organisms are often found on bodies that have been out in an "environment where it's dark and dank and wet, and usually [when] several weeks' time have elapsed," she testified.

"Does that allow you to determine a time of death or assist you in determining a time of death?" the prosecutor asked.

"It does assist us in engaging a time of death."

### **Incontrovertible Evidence**

Although there was other unexplained evidence found on the body – importantly, male DNA found in fingernail scrapings that does not match Swearingen and has never been identified – the Montgomery County District Attorney's Office is still convinced that its handling of the case, and the science involved, remains solid. It's "one of the strongest cases I've seen," says veteran prosecutor William Delmore III. He's not convinced that the original prosecution of Swearingen is in any way flawed. The unexplained DNA evidence is "a little weird," he admits, but the evidence pointing to Swearingen's guilt, he says emphatically, "is just overwhelming."

Melissa Trotter's body was found in a section of Sam Houston National Forest near Lake Conroe.

Many scientists, however, now say that conclusion is simply inaccurate.

The tide of medical opinion began to change in 2007, after Swearingen's January execution was stayed in order to consider whether evidence of bug activity found on Trotter's body that did not begin until mid-

December meant that she had not been left in the forest on Dec. 8, 1998, as the state contended. After reviewing the basic pathology work done by Carter, Tarrant County's White and North Carolina pathologist G.M. Larkin concluded that Carter's autopsy results were actually inconsistent with Trotter having been dead for more than about 10 days before she was found – more than two weeks after Swearingen was arrested. Along with Carter's work, the doctors reviewed crime scene photos and temperature data from the National Oceanic and Atmospheric Administration for December 1998. "All pathological diagnoses are based on the fact that changes in death are predictable, cumulative and irreversible," Larkin wrote in his 2007 findings. "[U]ndisputed forensic evidence, namely, the external appearances and the description of the internal organs and tissues, and photographs of resected organs strongly support a date as late as December 30, 1998," for Trotter to have been deposited in the forest. Importantly, in her original autopsy report, Carter noted that Trotter's internal organs were fairly well intact: Carter was able to remove, section, and weigh each of them, including the brain.

Simply put, doctors who have reviewed the case say that had Trotter's body been left outside in the forest for some three weeks before being found, there would be little, if anything, left of her internal organs. "It is plain and simple and should be obvious to anybody," White told the *Chronicle* last month. "The body [could not have] been lying out there exposed on the ground for that period of time with the temperatures recorded by NOAA. [Her organs] would have liquefied to the point that the structures were not even visible. Or [the body] would have dried up and appeared [as] unrecognizable mummified material."

In fact, Carter has since retracted her trial testimony, signing an affidavit to that effect in October 2007. Carter wrote at that time that she was never asked at trial to "address the significance of my internal examination of Ms. Trotter's body," and that as Larkin and White initially noted, her descriptions of the internal state of Trotter's body "support a forensic opinion that the body had not been exposed more than two weeks in the forest environment." Moreover, she wrote that the fact that Trotter's body weighed on the autopsy table just four pounds less than she had weighed at a doctor's appointment two weeks before she disappeared would be inconsistent with her being left outside to decompose for nearly three weeks. (Why Carter did not make this connection at the time she performed the autopsy remains unclear; Carter did not return repeated phone calls from the *Chronicle* seeking clarification.)

The court remained unimpressed. In the end, trial Judge Fred Edwards concluded after a summer 2007 hearing (before receiving Carter's affidavit) that the science offered by Swearingen's defense was not compelling enough to outweigh the other circumstantial evidence. The CCA agreed, and Swearingen was set back on track toward execution.

But in the subsequent years, questions about the scientific evidence have only grown stronger. In 2009, Swearingen's appellate attorney James Rytting was able to access, for the first time, tissue samples that were taken from Trotter's body at autopsy but never previously examined – a circumstance White says he finds strange at best. Those tissues, doctors now say, not only confirm their initial questioning of Carter's autopsy, but have actually prompted them to further shorten their estimate of the time that Trotter was dead. Microscopic examinations of body tissues done in 2009 and then again in June this year show that she was likely dead just two or three days before her body was found. Put bluntly, "the way biological tissue reacts [during decomposition], there's no doubt about it. Period. End of story," says Galveston County Chief Medical Examiner Stephen Pustilnik, one of the doctors who has reviewed the work done by the state in the Trotter case and who has viewed the microscopic tissue evidence that wasn't turned over to the defense until 2009. With her tissues "looking as good as they do," Pustilnik concluded, "it's incontrovertible."

Indeed, after observing the tissue samples with a high-powered microscope this summer at the University of North Texas, White and his Tarrant County colleague Dr. Gary Sisler wrote in a report that they were able to see clearly the intact cellular structures of Trotter's body – including in her lungs and heart, basic structures that degrade quickly after death. The environment in the forest in December 1998 fluctuated widely in temperature, the doctors noted, so that it would be impossible to find a body left outside for nearly a month to be preserved as well as was Trotter's.

"Even when stored at the routine morgue cooler temperature of 40 degrees, bodies will decompose after only a few days to a degree much greater than that seen in these specimens," White and Sisler wrote in a June 20 report. "Any reasonable person can easily comprehend what would happen to a piece of meat if it were periodically removed from an ordinary kitchen refrigerator, usually kept at 40 degrees, and left outside on the ground in 70 degree weather for three weeks. In decomposing tissue ... nuclei themselves disappear entirely, along with all other details, leaving only ghosted outlines of normal architecture," they continued. "No decompositional changes of this sort are present in the autopsy slides from Melissa Trotter," they wrote. "It isn't possible that ... Trotter was killed and her body left at that location by ... Swearingen, who had been in jail for 23 days when the body was found."

That, they wrote, was certain "beyond a reasonable doubt."

Pustilnik makes the same argument, saying that it is simply impossible that Trotter was dead for as long as the state has claimed. "The way the heart looks microscopically, she was either dead a couple of days or someone left her in the refrigerator for 25 days" at a temperature much lower than the standard 40 degrees, a freezing that somehow left no visible signs on her tissue, "and [if that's the case] you're looking at a monumental conspiracy."

### **Comically Flawed**

Frankly, says Montgomery County Assistant D.A. Delmore, "I don't know anything about the science" at play in the Swearingen case. "The science is mystifying to me," he says, but he's "concerned that perhaps there is more being made of it than we should actually give it credit for." Delmore and elected District Attorney Brett Ligon inherited the Swearingen case in 2009, and so they had no "particular stake in it, and we tried to keep an open mind about it" while reviewing the case history and recent appeals filed by Rytting. As part of that review, Delmore said, he called a forensic anthropologist who told him that a pathologist – like Carter, Pustilnik, White, Sisler, and Larkin – would not be the best person to weigh in on time of death; that would be better determined, he said the office was told, by a forensic entomologist.

That's the route the office used during the 2007 evidentiary hearing, hiring Neal Haskell, a forensic entomologist and professor at Saint Joseph's College in Indiana, who has also become something of a celebrity bug man – he's one of the inspirations for the television show *CSI*, a biography posted to Saint Joseph's website notes, and he most recently caught national attention as a prosecution witness in the Casey Anthony trial. "I'm more inclined to believe that the one person looking at" bug evidence is correct about the "postmortem interval," Delmore concluded.

That, says Pustilnik, is preposterous, most particularly in this case, because the bug evidence was improperly collected and preserved. For example, there were deer carcasses found near the body, which could have contaminated the bug evidence found in or on Trotter's body and limited the usefulness of that evidence. (Indeed, although the state says Trotter's body was there since Dec. 8, 1998, no one noticed it until Raglind came along – even though there was evidence that others, including hunters, had been nearby.) The bug evidence, concludes Pustilnik, is "so flawed as to be comical." Among the evidence collected were "antagonist" species, including wasps, but none indicative of the "fauna that eats tissue." Moreover, Pustilnik points out that although the body was found in December, allegedly undisturbed for nearly a month, there was no leaf detritus found on top of it but "four inches of leaves under the body," he says. "That's not reasonable; that's ridiculous."

Delmore says his office remains confident in the expert opinions it has received, which confirm to him that Trotter died and had been in the woods since her disappearance in early December. Delmore maintains that the bulk of the evidence – the witness sightings of Swearingen and Trotter together at the college, the discovery of the panty hose leg at Swearingen's trailer, Trotter's school paperwork "floating on the breeze" near Swearingen's parents' house, and the various lies that Swearingen offered after Trotter's disappearance – are simply too compelling to disregard in favor of histological evidence.

## The Evidence Speaks?

Delmore and the Montgomery County D.A.'s Office appear to stand firmly with the Court of Criminal Appeals, or at least with Judge Cathy Cochran, who in a 2009 opinion wrote that the science could not explain the circumstances lending weight to Swearingen's guilt. "The hallmark of a scientifically sound hypothesis is that it is consistent with, and accounts for, the totality of the known facts," Cochran wrote. "If Melissa did not die until December 29th, where was she and what was she doing from her disappearance ... until 21 days later?" she continued. "When all of the other known facts and evidence are wholly inconsistent with a particular scientific hypothesis, the reasonably objective scientist revisits that original hypothesis, looking for a flaw. Although one does not doubt the honesty and sincerity of these medical examiners, their theory that Melissa did not die until December 29th or 30th because of the relatively intact state of some of her internal organs is flatly contradicted by an incredible wealth of other evidence. They have made no attempt to account for or explain this other evidence or provide an alternate hypothesis."

Cochran's opinion was delivered in January 2009, long before the pathologists had the opportunity to observe Trotter's preserved tissues. Nonetheless, Cochran's incredulity at the notion that the science of the small could replace the mass of the circumstantial isn't completely surprising, and it highlights a growing tension between science and the law. The problem in the Swearingen case, suggests Jordan Steiker, law professor and co-director of the University of Texas School of Law's Capital Punishment Center, is that "it's the science in tension with any plausible story." The problem, he says, "is dissonance between the science and any plausible conjecture about where [Trotter] was for three weeks." Ultimately, in criminal law, science often has to overcome deep-seated intuitions about how things happen: "It seems much more plausible, intuitively, that he was one of the last people seen with her" and that when she disappears that she is killed and that he is a good suspect for that killing – rather than that she simply disappears, no one hears from her, then she is killed and dumped some time later. "There's this deep intuition that when someone disappears and they're not heard from, that they're not out there," he says. "That's the hard thing that the science is running up against."

That does not mean that the science is not sound or that its story of Trotter's death is not correct, Steiker notes – only that the courts have not yet accepted this type of science as among those disciplines that become the "gold standard," such as DNA. In DNA cases, the science is so well accepted that it now overtakes all other evidence – including circumstantial and eyewitness testimony – requiring the narrative of guilt to be built around its results. "Revolution in science [in DNA knowledge] called into question convictions," says Steiker. "What other science has achieved that gold standard? With how much certainty can we tell how long a body has been decomposing? That's the issue."

The question of scientific certainty, of course, is an issue raised in more than DNA cases. In the capital case of Cameron Todd Willingham (executed in 2004), the courts, Gov. Rick Perry, and the Texas Forensic Science Commission have been asked to consider whether the state relied on outdated fire science to conclude that a fire at Willingham's home was intentionally set, killing his three young children. The circumstantial evidence reflects that Willingham was certainly no saint and may have behaved strangely during the fire – yet a dozen fire scientists have concluded that the Texas State Fire Marshal's Office relied on outdated and disproven science when it determined that the fire was intentional.

Yet prosecutors and courts are unmoved, and Perry, who has described Willingham as a "monster," has gone out of his way to thwart a Forensic Science Commission postmortem investigation into the integrity of the science used to convict and send Willingham to death. Consequently, if the Texas courts insist that the science in Swearingen's case is not more compelling than the circumstantial evidence, it is Perry and his Board of Pardons and Paroles – unless the U.S. Supreme Court steps in – who will have the final say on whether Larry Swearingen lives or dies.

The scientists involved in reviewing the evidence in the Trotter murder are confounded that the courts don't understand that the science involved in this case is basic stuff upon which the bulk of medicine relies. Indeed, notes Swearingen's attorney Rytting, histology and gross anatomy – the two basic areas

implicated in the Swearingen case – underpin all the work done by the state's medical examiners in their work to determine cause and manner of death in thousands of cases. "This is hardcore, basic science," he says. "The thing that gets me is that no one has said ... your description of the tissues is wrong ... the authorities you cite [for your conclusions] are wrong ... [or] your conclusions are wrong," he notes, only that the science doesn't move the courts or prosecution to reconsider the case. "They haven't taken any of the experts to task; they haven't taken exception to any [of the] conclusions."

The Texas courts – in Montgomery County and here at the CCA – will have another chance to consider the science involved in determining when, and perhaps by whom, Trotter was killed. On July 28, 2011, the CCA again stayed Swearingen's execution and returned it to the trial court to consider the import of the histological evidence detected under a high-powered marine biology scope, as well as related evidence.

"Who picked the time to die? Did Melissa Trotter pick the time for her death? Did she pick the circumstances for her death, or did he? She's talking to you the only way she can. She is talking to you through fibers and evidence," prosecutor Judith Shields said during closing arguments in 2000. "That's the only way she can talk to you now, and please, don't refuse to hear her voice."

The prosecutor was undoubtedly correct in her assertion that the physical evidence – as the victim's only available communication – should be carefully considered. And if it happens that certain, uncontradicted elements of that evidence point away from the prosecution's designated suspect and toward some other, unknown assailant, who will speak for Melissa Trotter?