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Simple Justice – Ballistics Evidence

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On Mother’s Day of 2006, Irvin Carter Jr. was shot in the stomach at close range during a barbeque at his grandma’s house. His injuries were not life threatening and he wouldn’t tell police who shot him.

Four months later his friend, Julius Williams, was shot and killed just blocks away at Bryant Elementary School in Tacoma’s Hilltop.

Police didn’t find a gun, but bullets recovered from the two separate shootings were analyzed by a forensic scientist at the Washington State Patrol Crime Lab, who determined they were fired from the same weapon.

Carter was arrested and charged with the murder: Prosecutors argued at trial that Carter had accidentally shot himself while cleaning the gun during the Mother’s Day barbecue, then used the same gun to kill Williams in September.

“All three bullets were determined by myself to have been fired from the same firearm,” Terry Franklin, the state’s forensic scientist, testified.

Based largely on Franklin’s testimony, Carter was convicted and sentenced to 39 years 8 months years in prison for the murder. He has always maintained his innocence.


The UWT Justice Project spent five months investigating the case, which included reviewing more than 2,500 pages of court and police documents and interviewing dozens of people—some of whom did not cooperate with police but agreed to be interviewed by UWT Justice Project reporters.


The student-led investigation found that while prosecutors told jurors that Carter shot himself with his own gun, witnesses say he was accidentally shot by a friend of his sister’s. And without a


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veapon, experts say it’s difficult to determine that two or more bullets were in fact fired from the same gun. What’s more, the understanding of ballistics analysis reliability has changed significantly over the past several decades, and some courts now limit the type of testimony that was used to convict Carter.



Irvin Carter Jr., the man serving a nearly 40-year sentence for the murder of Julius Williams in Sept. 2006.
PHOTO COURTESY OF THE WASHINGTON D.O.C.

“How do you know that there’s so much similarity that there has to be one gun? Their answer is that ‘we know it when we see it,’” said Adina Schwartz, a law professor at The City University of New York and former federal public defender. Schwartz said in an interview with the UWT Justice Project that the lack of rigorous scientific study of ballistics calls its credibility into question.

THE MOTHER’S DAY SHOOTING AND ALVENA PARKER

At 7:58 p.m. on May 14, 2006, the Tacoma Police Department received a call from a woman who identified herself as Alvena Parker. She said she had accidentally shot her friend in the stomach. By the time police arrived at the party with guns drawn, none of the more than one dozen adults said they saw who shot Carter. The most productive interview was with Carter’s mother, who told police that he had several women visiting him that day and that “if any of them shot him, he wouldn’t tell you.”

Parker was interviewed at the scene but denied telling dispatch that she accidentally shot Carter. She admitted that she had been drinking heavily that day: It had taken her three tries to dial 911, she said, and although she had heard the shot, she told police she wasn’t in the same room as Carter at the time.

Tacoma Police Department Officer Heather Miller asked dispatch to listen to the tapes again. They confirmed that Parker said she’d accidentally shot someone. Tacoma Police didn’t find a gun, Carter didn’t press charges, and police didn’t pursue an investigation.

Carter told the UWT Justice Project that Parker was afraid of losing her kids and he didn’t want to incriminate her in the shooting. Court documents obtained by the UWT Justice Project confirmed that Parker, who went by both Alvena and Alvira, was in the midst of a custody battle with her ex-husband, Ed Parker, at the time. The documents, which include statements from her parents and friends as well as Ed Parker’s coworkers and wife, allege that she was an unstable and abusive woman who was on the edge of homelessness.

Carter’s sister and Parker’s friend, Lisa Hubley, echoed his story, saying that Carter remained quiet in an effort to help Parker retain custody of her kids. Although the UWT Justice Project attempted to find Parker through her ex-husband, Hubley, court records, social media, a multi-state public records database, and voter registration records, we were unable to locate her.

The question of who shot Carter is critical to the case, as the gun was linked to Williams’ death in September of 2006 by state forensics experts.

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PHOTOS COURTESY OF THE WASHINGTON STATE PATROL CRIME LAB (Left) Shown is the orange shirt Carter wore when he was shot in the abdomen on Mother's Day in 2006. The state's forensic analyst, Terry Franklin, testified that the bullet was shot from no more than one inch away.

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PHOTOS COURTESY OF THE WASHINGTON STATE PATROL CRIME LAB

FORENSICS

Terry Franklin, with 32 years of experience and certifications in firearms, toolmarks, and gunshot residue through the Association of Firearm and Tool mark Examiners, testified that the three recovered bullets were fired from the same gun. The bullets were all .38 caliber, with the same “class characteristics”: ten raised “lands” and grooves with a right twist. These bullet types are specific to .357 or .38 special revolvers, he said. *(See definition box at right)*

He also looked at the bullets under a comparison microscope, determining that their individual, microscopic characteristics also matched.

The shirts Carter wore on Mother's Day were analyzed for gunshot residue. Franklin determined that the gun had been fired from less than an inch away from Carter's abdomen, leading prosecutors to argue that Carter had shot himself while cleaning his gun.

Bullets that police say they found in Carter's pocket on Mother's Day also matched the caliber and type of bullets found in Julius Williams' body five months later. Franklin testified that the bullets—a mix of flat-nosed bullets typically used in target practice with round-nosed bullets—contained the same blue and green lubricant in the cannellures, or ridges around the head of the bullet, indicating to him that they may be from the same manufacturer. Franklin said that no testing was done to verify whether the lubricant was chemically similar.

Carter told police that the bullets were not in his pocket but recovered from police elsewhere in the home and did not belong to him. He said the same to UWT Justice Project reporters, but Carter did not testify at trial.

CHANGING SCIENCE

Franklin, who testified but declined to comment on this case, told the jury that no two guns can be made exactly alike on a microscopic level “because each barrel has its own set of unique imperfections...I can evaluate those marks and make a decision whether they are fired from the same gun.”

But recent court rulings about ballistics science paint a different picture.

Since the early 2000s, some courts have limited the language that ballistics experts can use. In 2005, in *United States vs. Green*, the judge prohibited a ballistics expert from testifying that two shell casings were fired from a specific firearm “to the exclusion of every other firearm in the world.”

Instead, the judge ruled that the expert could only testify to the similarity of the casings. The judge wrote that without independent research regarding the scientific reliability of firearm identification, “sloppy practices will endure; we should require more.”

According to Schwartz, who wrote a peer-reviewed article criticizing the lack of scientific foundation for firearm identification, ballistics experts themselves concede that no two bullets are the same. Examiners are not looking for a perfect match; it's impossible.

However, she said there are no criteria for determining what constitutes a sufficient match and identification relies on an examiner's opinion.

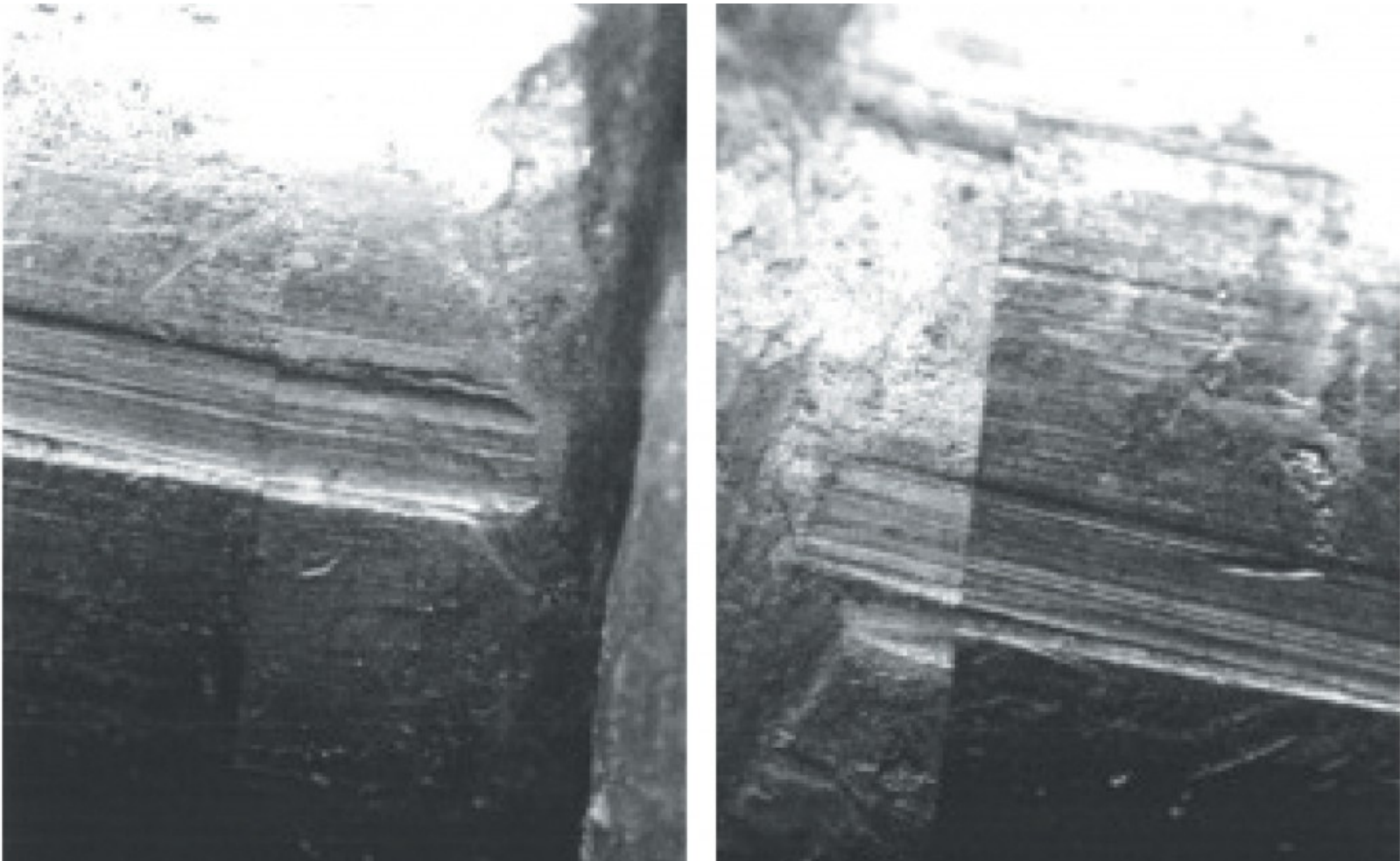
The Association of Firearm and Toolmark Examiners, or AFTE, of which Franklin is a member, has published studies that involved testing firearm examiners on making correct firearm identifications using bullets.

However, the studies aren't subject to peer review or scientific verification outside the AFTE, according to Schwartz.

"There's no independent review, they're not blind, not double blind," Schwartz said. "They give the easiest test," Schwartz continued, meaning they're not subjected to scientific scrutiny and it's unclear whether the findings are legitimate.

In 2008, The National Academy of Sciences, a nonprofit group tasked with advising Congress on science, engineering, and medicine, released a report critical of firearms identification practices and called for action. In the report, they wrote that, "Additional general research on the uniqueness and reproducibility of firearms-related toolmarks would have to be done if the basic premises of firearms identification are to be put on a more solid scientific footing." (*See sidebar below*)

PHOTOMICROGRAPHS



These microscopic photographs show markings on the bullets recovered from Williams and Carter. These show the rifling on each bullet matching up, but those "lands and grooves" are shared by a whole group of guns made by that manufacturer. Ballistics scientists are looking at the individual, microscopic marks when attempting to match bullets to a single gun. Critics say that without a weapon, it's impossible to determine which of the marks are unique to a specific weapon and which are broader characteristics shared by weapons made from the same machinery. These photomicrographs were not admitted as evidence.

PHOTO COURTESY OF THE WASHINGTON STATE PATROL CRIME LAB

During testimony, ballistics scientists can present photomicrographs, or microscopic photographs of a bullet's surface that show the jury the bullet's individual characteristics.

Schwartz described this as "best practice," however, no photomicrographs were submitted as evidence during trial, and Carter's public defender, Mary Kay High, did not request them from Franklin.

"Sometimes the aura of the photos makes it seem more scientific," High said. She didn't request photomicrographs because she said interpreting them is subjective and it's possible a jury would see a match where none exists.

The lack of photomicrographs was an issue in *United States v. Smallwood*, in which the judge wrote that without photos of the microscopic marks, defenders are unable to adequately cross-examine a ballistics scientist.

"The match determination was effectively insulated from any meaningful cross-examination by the inability to produce photographs representative of what an examiner sees under the actual

comparison microscope...the inability to conduct meaningful cross-examination weighs strongly against admissibility,” wrote Senior United States District Court Judge Thomas Russell.

SUBCLASS CHARACTERISTICS

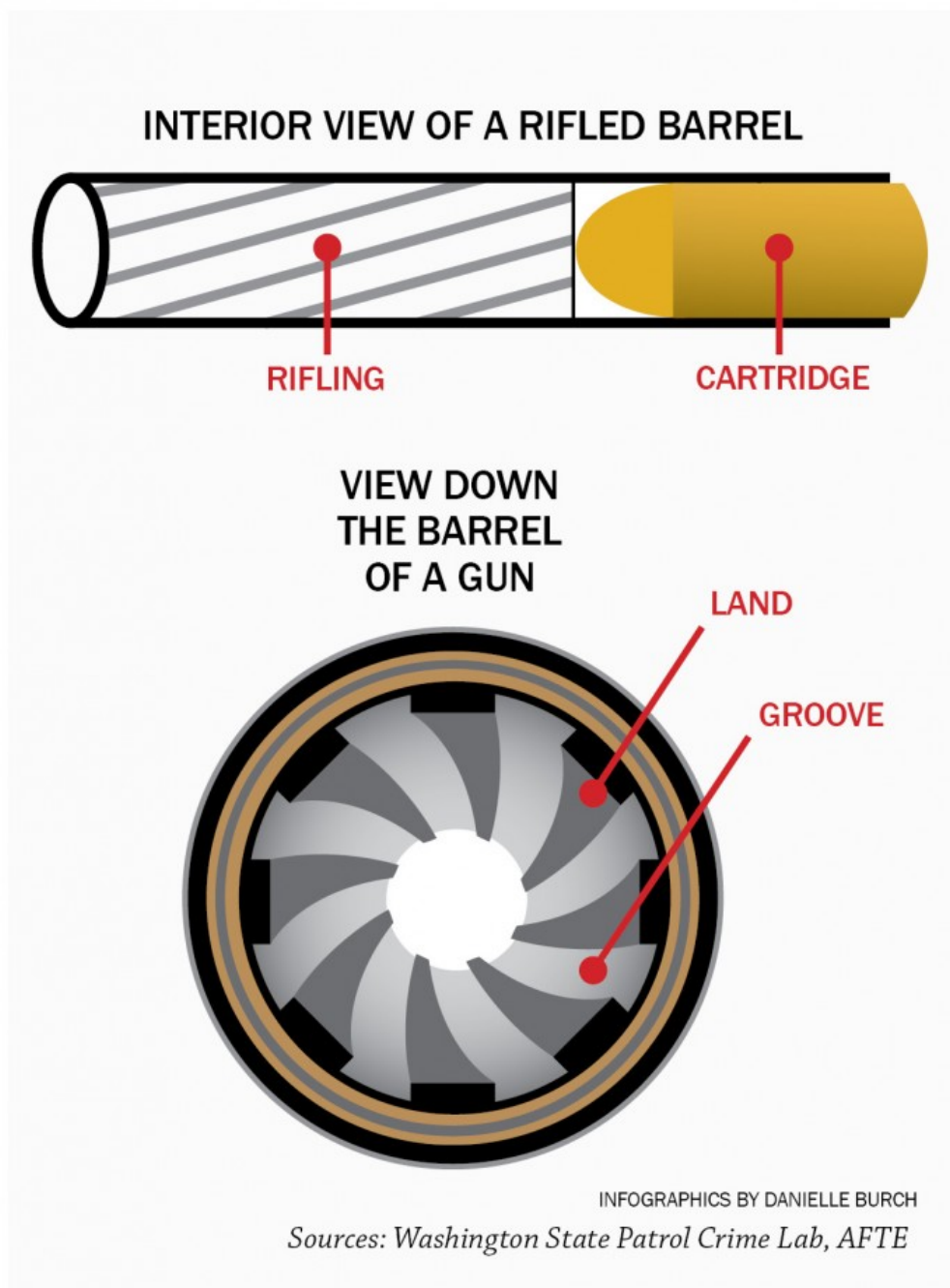
Each manufacturer’s guns have different “class characteristics”—for example, 6 lands and grooves in the barrel that are etched on the bullet when fired, in a left-twisting pattern. “Subclass characteristics,” however, include finer details, like microscopic imperfections inside the barrel that belong to a whole group of guns and are a result of the machinery used in the manufacturing process.

That’s where the “art” of ballistics examination comes in, and where Schwartz says the possibility of false matches increases. In Schwartz’s article, “Challenging Firearms and Toolmark Identification,” published in 2008 in a journal by the National Association of Criminal Defense Lawyers, she explains that without a weapon and clear criteria regarding subclass and individual characteristics, it’s possible to mix up the two—ultimately leading to incorrect firearm identifications.

According to Schwartz, the issue is that “they don’t have criteria for what’s a subclass characteristic and what’s an individual characteristic... The best way [to know] is to have the actual tool.”

Because ballistic scientists base their determinations on microscopic marks, that distinction is critical. “Sometimes they aren’t individual marks, they belong to a group of guns,” Schwartz told us. “Without a gun, it’s harder.”

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Ballistics examination began in the early 1900s, when police began looking at “rifling”—or the patterns of lands and grooves etched into a bullet as it spirals through a gun barrel.

The Bureau of Forensic Ballistics, comprised of four scientists, was formed in New York in 1915, according to *Science for Lawyers* by Lisa Steele, published by the American Bar Association. Philip Gravelle was among these men and soon after, he invented the comparison microscope that allowed examiners to look at two bullets simultaneously.

Beginning in the 1930s, ballistics evidence was regularly accepted in court. Firearm identification experts still use the techniques pioneered by Gravelle, including the comparison microscope.

However, today, guns are mass-produced at levels unseen in the last century. According to the ATF, close to 5.5 million guns were manufactured in the U.S. in 2010, the most recent statistics available, while about 3.2 million were imported the same year.

Firearm and toolmark identification: The process of linking marks on bullets, cartridges, projectiles, or other items to the tool or firearm that caused the marks using microscopic imperfections to identify similarities.

Rifling: The impressions inside of a firearm’s barrel that leave marks on a bullet as it travels through the barrel. The grooves can have either a left or right twist.

Lands and grooves: “Raised” lands and lowered “grooves” are a product of the barrel’s rifling. They are etched onto the bullet as it travels through the barrel.

Cannelure: An indentation around the cylinder of a bullet near the tip.

Photomicrograph: A photograph of an item taken at the microscopic level.

Sources: Merriam Webster Dictionary, AFTE, and the FBI

STRENGTHENING FORENSIC SCIENCE: A PATH FORWARD BY THE NATIONAL ACADEMY OF SCIENCES

In 2006, the federal government passed a law that required the National Academy of Sciences to investigate and report on the current state of forensic science within the United States. In response, the academy examined and identified forensic science shortcomings and made recommendations for improving reliability and avoiding wrongful convictions.

The report found several issues with the current state of forensic science. They pointed out that forensic testing and education varies significantly from state to state. The authors wrote, “Too often they have inadequate educational programs, and they typically lack mandatory and enforceable standards, founded on rigorous research and testing, certification requirements, and accreditation programs.”

While the Committee conceded that advances in forensic science have greatly helped law enforcement identify criminal suspects, they also pointed out, “Those advances, however, also have revealed that, in some cases, substantive information and testimony based on faulty forensic science analyses may have contributed to wrongful convictions of innocent people.”

The National Academy of Sciences recommended that forensic science be overhauled and put under the supervision of a governmental agency to streamline practices and ensure that findings are accurate. They wrote, “The forensic science enterprise lacks the necessary governance structure to pull itself up from its current weaknesses. Of the many professional societies that serve the enterprise, none is dominant, and none has clearly articulated the need for change or presented a vision for accomplishing it.”

—Brittany Hale

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