

Forensics and Miscarriages of Justice: When Science Goes Wrong

Editorial

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In the minds of many, forensic science is the ultimate truth-teller in the criminal justice system. Television shows portray it as a flawless tool that can always find the real culprit and exonerate the innocent. But in the real world, things are far more complicated. While forensics can be incredibly powerful in solving crimes, it can also lead to tragic mistakes—sending innocent people to prison, or worse, to death row. This is the story of how even science can fail us when misused, misunderstood, or manipulated.

The Power and Promise of Forensics

Let's start with what forensic science does well. Forensics is the application of science to criminal investigations. It includes everything from analyzing fingerprints and DNA to examining digital devices, ballistics, and handwriting. When done right, forensics can uncover hidden truths. It can place a suspect at a crime scene, reveal a motive, or even establish innocence through techniques like DNA analysis.

The impact of modern forensic methods has been revolutionary. Thousands of cold cases have been reopened and solved. Innocent people have been freed after years behind bars. Victims have finally gotten justice. In many ways, forensics has been a gift to humanity—a powerful ally in the search for truth.

But like any tool, its effectiveness depends on how it's used.

The Dark Side of Forensics

For all its promise, forensic science is not immune to error. And those errors can have devastating consequences.

Innocent people can be wrongly convicted when forensic science is applied carelessly, or when experts overstate what their evidence can prove. Some forensic methods that were once widely accepted—like bite mark analysis or hair microscopy—have now been discredited, yet they have played a role in countless convictions. In many cases, flawed forensic testimony has been a deciding factor in courtrooms.

Consider the case of Cameron Todd Willingham, a man executed in Texas in 2004 for allegedly setting a fire that killed his three children. Fire investigators at the time used outdated methods and wrongly concluded it was arson. Years later, independent experts found no scientific basis for those conclusions. Willingham may have been innocent, but he never got another chance.

Or take Richard Glossip, a man on death row whose conviction rests largely on questionable forensic testimony and a co-defendant's plea bargain. Experts later challenged the

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forensic evidence used in his trial, calling it unreliable.

How Forensic Errors Happen

Miscarriages of justice linked to forensic science usually stem from one or more of the following:

1. Faulty Methods:

Some forensic disciplines lack scientific validity. Unlike DNA testing, which is backed by solid science and statistical rigor, methods like bite mark comparison, bloodstain pattern analysis, or even polygraph results are often based more on opinion than empirical proof.

2. Inadequate Training:

Not all forensic practitioners are scientists. Some lack proper training or accreditation. In smaller police departments, crime scene evidence may be handled by people with limited expertise, increasing the chances of contamination, loss, or misinterpretation.

3. Confirmation Bias:

This is a silent threat. A forensic expert who knows the police believe a certain person is guilty may (consciously or unconsciously) interpret evidence to support that theory.

4. Overstated Testimony:

Some forensic experts exaggerate their findings in court, presenting probabilities as certainties. Jurors, unfamiliar with the limits of forensic science, may be misled into believing

the evidence is stronger than it actually is.

5. Lab Scandals:

There have been shocking cases where forensic labs fabricated or manipulated results. In Massachusetts, forensic chemist Annie Dookhan admitted to falsifying evidence in tens of thousands of drug cases. Her actions sent many innocent people to prison.

Human Lives, Not Just Cases

Behind every forensic failure is a human story.

Imagine spending 20 years in prison for a crime you didn't commit, watching your family fall apart, losing your health, your job, your name—all because of a fingerprint that was misread, or a lab result that was wrong.

These are not hypothetical stories. The Innocence Project, a nonprofit that uses DNA to help free the wrongly convicted, has exonerated over 300 people in the United States alone—many of them convicted on the basis of flawed or misrepresented forensic evidence.

Each of those people had a life. A mother. A dream. A future. And all of it was stolen.

The Role of Courts and Lawyers

Courts rely heavily on expert testimony in forensic cases. Judges, who may not be trained in science, have to decide what expert evidence is “reliable.” But many courts have been slow to update their understanding of what counts as

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reliable science. This has allowed junk science into courtrooms, and let bad evidence ruin lives.

Defense lawyers also face challenges. Without the resources to hire independent experts, they often cannot effectively challenge flawed forensic testimony presented by the prosecution.

What Needs to Change

If we truly want justice to be served, we need to make some urgent changes:

1. **Scientific Validation:** All forensic methods must be subject to the same scientific standards as medical or pharmaceutical practices. If a technique hasn't been rigorously tested, it shouldn't be used in court.
2. **Independent Oversight:** Forensic labs must be independent from police departments to avoid conflicts of interest. Their only job should be to find the truth—not to help convict a suspect.
3. **Training and Certification:** Forensic analysts should meet minimum standards of education and training. Regular certification and peer reviews should be mandatory.
4. **Transparency:** All forensic evidence should be fully disclosed to both sides. Defense attorneys must have access to the same material and experts as the prosecution.
5. **Revisiting Old Cases:** Governments should establish

commissions to review old convictions where flawed forensic methods were used. Justice demands it.

Hope and Healing

Despite the damage, all is not lost. Many dedicated forensic professionals work tirelessly to uphold truth and integrity. Modern DNA analysis, when applied carefully, remains one of the most powerful tools for both solving and correcting wrongful convictions.

Technology is also offering new hope. Artificial intelligence, digital forensics, and more rigorous scientific testing are helping us improve accuracy. Universities are launching forensic programs rooted in real science. And public awareness about wrongful convictions is growing.

But we must never forget the lesson: forensic science is not infallible. It is a human endeavor, and like all human efforts, it can go wrong.

A Call to Justice

The courtroom should be a place of fairness, not a battleground of flawed science and pressured experts. Every piece of forensic evidence must be handled with the weight of a person's life in mind. Because behind every case file is a face, a family, and a future.

Forensics should serve justice—not create injustice.

And it is up to all of us—scientists, lawyers, judges, journalists, and citizens—to make sure that promise is kept.