

CSAFE 2020 All Hands Meeting

Lessons from Texas

Lynn R. Garcia
General Counsel
Texas Forensic Science Commission
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New Doubt Cast on Testing in Houston Police Crime Lab

By Adam Liptak and Ralph Blumenthal

Aug. 5, 2004



The police crime laboratory in Houston, already reeling from a scandal that has led to retesting of evidence in 360 cases, now faces a much larger crisis that could involve many thousands of cases over 25 years.

Six independent forensic scientists, in a report to be filed in a Houston state court today, said that a crime laboratory official -- because he either lacked basic knowledge of blood typing or gave false testimony -- helped convict an innocent man of rape in 1987.



*TFSC Created in 2005:
HPD Scandal*



Who We Are & What We Do

- Nine commissioners appointed by the Governor: 7 scientists and 2 attorneys
- Accreditation of laboratories (existing AB's PLUS)
- Investigations into professional negligence and misconduct
- Licensing of forensic analysts
- Training and education



The Texas Commission



Filling Gaps & Solving Problems

VS.



NOT Reinventing the Wheel

Shared Goal Among Criminal Justice Stakeholders

- To ensure the forensic science used in criminal proceedings is reliable, valid & delivered efficiently.



BLOODSTAIN PATTERN ANALYSIS





Blood Will Tell, Part 1: Who Killed Mickey Bryan?

When a fourth-grade teacher was murdered in 1985, her husband, the beloved high school principal, was arrested for the crime. Could he have done it?

[nytimes.com](https://www.nytimes.com)



CASE FACTS

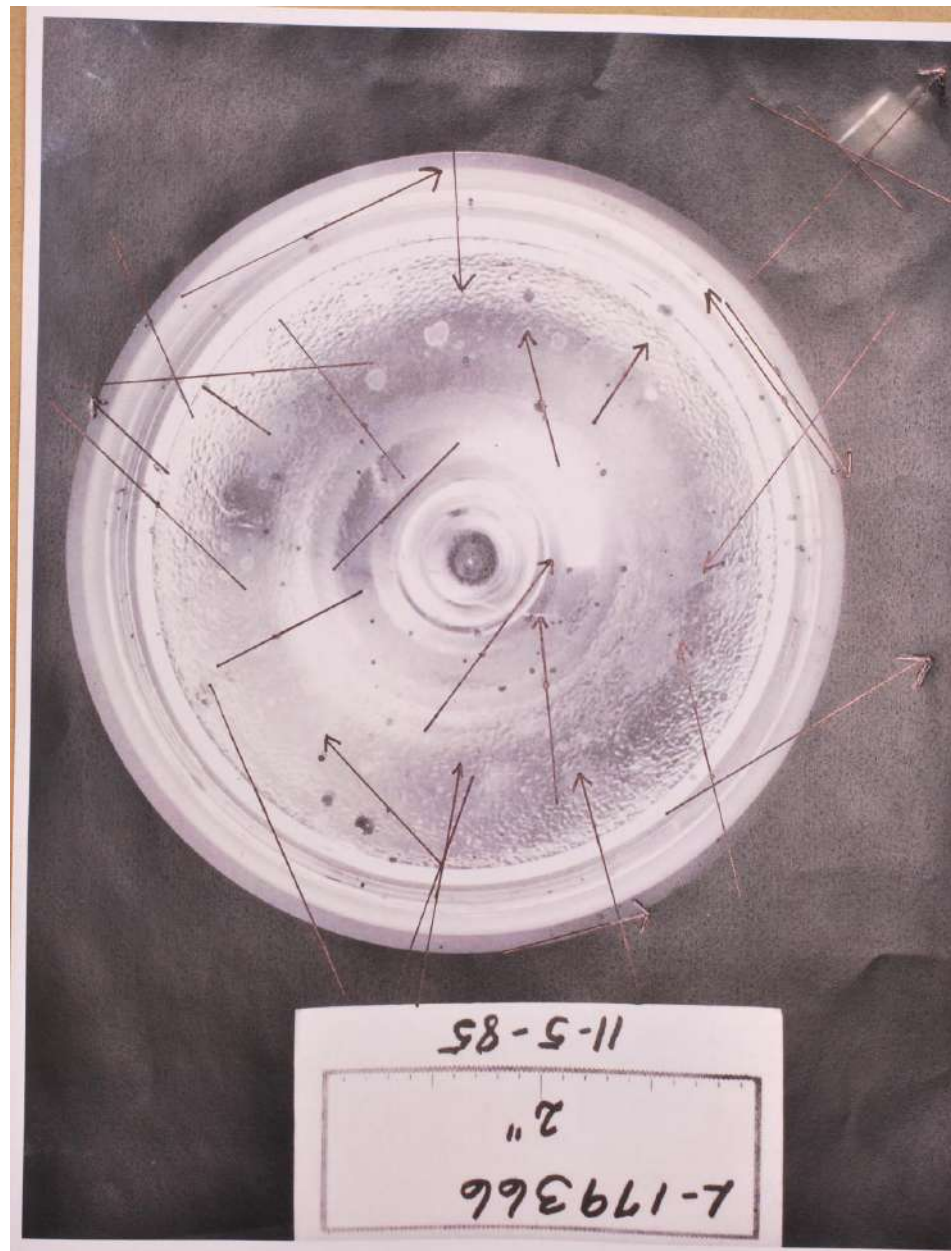
- Mickey Bryan was an elementary school teacher in Clifton, Texas (100 miles SW of Dallas).
- Joe Bryan was the principal at the local high school.
- On the night Mickey was murdered, Joe was out of town at a conference for secondary school principals in Austin.
- They last spoke at 9pm on the night she was murdered; hotel phone records confirmed this.
- He was seen at the conference in the morning around 8am.
- Mickey was shot four times.
- Crime scene was extremely bloody.



CASE FACTS

- Mickey's brother, who lived in Florida, flew to Texas after hearing of his sister's death.
- He contacted a former FBI agent turned private investigator, after local authorities were unable to turn up many leads.
- They borrowed Joe Bryan's car and drove around the area. At some point they stopped to "relieve themselves" and got mud on their boots.
- They opened the car trunk to find something to wipe the mud off with, and found a flashlight.
- The flashlight had what appeared to be specks of blood on it.
- The flashlight was sent to the state crime laboratory and the specks were tested using ABO blood typing. Results were positive for human blood, Type O (Mickey's blood type, also the most common blood type in the population).





OFFICE *of* COURT ADMINISTRATION



THE BLOODSTAIN EXPERT

- Local authorities contacted Robert Thorman, a police officer from a nearby county who had taken a 40-hour course on bloodstain pattern analysis. This was his first case.
- Thorman claimed the particular pattern on the flashlight was “back spatter.”
- Backspatter is blood that traveled backward, at a high velocity, from a target.
- Typical of a close-range shooting, which was consistent with the ME’s evaluation.
- Back spatter “usually travels no further than 46 inches,” according to Thorman.
- Also testified the lack of spatter on the flashlight’s handle indicated that someone had been holding it when it was sprayed with blood.
- It had been both present at the crime and held by the killer during the shooting.



THE BLOODSTAIN EXPERT



THE COMMISSION'S CASE REVIEW

- Important: we do not weigh in on guilt or innocence.
- Worked with two different experts who concluded there were many problematic aspects to Mr. Thorman's testimony.
- His "stringing procedure" revealed several sources of error.
- He used an inadequate sample of bloodstains to determine area of origin.
- He testified outside his area of expertise (regarding whether the killer cleaned up and changed clothes)



THE COMMISSION'S CASE REVIEW

- His testimony re: position of victim's body unsupportable.
- Inappropriate to classify the specks of blood as back spatter given the small amount of blood involved and the fact that it was disconnected from the scene, no way to assess chain of custody.
- Inappropriate to conclude the killer was carrying the flashlight in his hand.
- The distance airborne blood can travel is highly variable, not 46 inches.
- Tom Bevel testified re: training; Mr. Thorman issued recantation.





March 31, 2020: Mr. Bryan released on parole

LEFT WITH THE QUESTION: WHAT SHOULD BE DONE?

- Scientific studies support some aspects of bloodstain pattern analysis. For example, whether blood spattered quickly or slowly.
- Some experts extrapolate far beyond, even with a 40-hr course.
- Opinions are subjective at this point (training and experience).
- Most analysts lack formal education in fluid dynamics, physics, etc.
- Complex patterns fluids make when exiting wounds are highly variable.
- Published papers were not very helpful.



Reliability Assessment of Current Methods in Bloodstain

Pattern Analysis

Final Report for the National Institute of Justice

Award # 2010-DN-BX-K213

Grant Period: 1 October 2010 – 31 March 2014

Principal Investigators:

Terry Laber
Minnesota Bureau of Criminal Apprehension
1430 Maryland Avenue East
St. Paul, MN 55106
Ph. (651) 492-9910 Fax: (651) 793-2901
terry.laber@state.mn.us

Paul E. Kish
Forensic Consultant & Associates
P. O. Box 814, Corning, New York 14830
Ph. (607) 962-8092 Fax: 607-962-2093
paulkish@stny.rr.com

Dr. Michael C. Taylor
Institute of Environmental Science and Research
27 Creyke Rd, Christchurch 8031
New Zealand
Ph. (64) 3 351-6814, Fax (64) 3 351-0046
michael.taylor@esr.cri.nz

Professor G Owens
Department of Psychology
University of Auckland
Private Bag 92019, Auckland
New Zealand
Ph. (64) 9 373-7599 Fax (64) 9 373 7902
g.owens@auckland.ac.nz

Co-authors:

Dr. Nikola Osborne (Research Associate)
Institute of Environmental Science and Research
27 Creyke Rd, Christchurch 8031
New Zealand
niki.osborne@esr.cri.nz

Professor James Curran
Department of Statistics
University of Auckland
Private Bag 92019, Auckland
New Zealand
Ph. (64) 9 373-7599 Fax (64) 9 373 7902
j.curran@auckland.ac.nz



Paper

Automatic Classification of Bloodstain Patterns Caused by Gunshot and Blunt Impact at Various Distances

Yu Liu Ph.D. , Daniel Attinger Ph.D., Kris De Brabanter Ph.D.

First published: 16 January 2020 | <https://doi.org/10.1111/1556-4029.14262>

[Correction added 16 January 2020. The Acknowledgments section was omitted from original publication, but has now been added.]

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RELIABILITY ASSESSMENT OF METHODS

- Panel of experienced bloodstain pattern analysts (27 from NA, Australasia, Europe) examined over 730 patterns in two phases of the study, one focusing on three rigid non-absorbent surfaces (painted wood, wallpaper and chipboard) representing commonly encountered crime scene surfaces and the other on three fabric surfaces (cotton sweatpants, polyester trousers and denim jeans) representing clothing.
- Six different pattern types, blunt force impact spatter, firearms (back and forward) spatter, cast-off, satellite stains from a drip pattern, transfer and exhaled, were used over the two studies.



RELIABILITY ASSESSMENT

- Where a bloodstain pattern classification was made, either by choosing a single pattern or by nominating more than one, 13.1% of these classifications did not include the correct pattern type for the rigid surfaces and 23.4% for fabric surfaces. These can be considered the first approximations of overall error rates for the method.
- Study results showed that where a scenario was offered that deliberately pointed analysts towards the correct classification, the proportion of misclassifications that resulted was significantly lower. Where a scenario was offered that deliberately pointed analysts towards an incorrect classification, the proportion of misclassifications that resulted was significantly higher.



WHAT SHOULD BE DONE?

- It seems prudent for practitioners and agencies to take steps to minimize the effects of contextual information in the practice of BPA.
- It would also be advantageous for the BPA community to agree on a standard methodology for the analysis of bloodstain patterns which includes a better distinction between classification and reconstruction and relies less on mechanistic descriptions of patterns.
- It is recommended that these steps be under-pinned by further research into an understanding the cognitive steps taken by BPA analysts during pattern classification and the development of objective methods to classify patterns.



WHAT SHOULD BE DONE AND HOW?

- OSAC?
- Accreditation (and its impact on admissibility)?
- Other form of credentialing (individual)?



PRACTICAL CONCERNS OF LAW ENFORCEMENT



FIRST BAPTIST CHURCH, SUTHERLAND SPRINGS, TEXAS

PRACTICAL CONCERNS OF LAW ENFORCEMENT



OFFICE *of* COURT ADMINISTRATION



CSAFE: BLOODSTAIN PATTERN ANALYSIS

Research

Collecting and organizing a database of high-quality blood spatter videos and images.

Developing a physics-based algorithm to predict the region of origin of bloodstains by inspection of a blood spatter. Applying software tools to automatically recognize blood stains from a blood spatter image and extract image features to reconstruct trajectory.

Developing software tools that can be used to study the trajectory of a blood drop. CSAFE tools break down a segment of blood spatter video into frames and give a mathematical description to both the drop of blood and to its location in the image.

Benefits of Research

The high resolution blood spatter database has been built by using controlled and carefully documented experiments. This databased will be shared with researchers worldwide so that every group can test their backward trajectory reconstruction methods, to identify the region of origin of the blood spatter, and to determine the blood pattern generation mechanism with greater ease and accuracy.



Forensic Science Is Often Referred to as a Tool



How to Ensure We Have a Reliable, Helpful Tool??

- We need to move from subjective to objective approaches.
- We need well-designed experiments and objective measurements.
- We need transparent, validated and tested methods.
- We must understand how to express the limits of a comparison; when we say two items are “indistinguishable” based on certain criteria, it does not necessarily mean they originated from the same source.
- We need the help of resources like CSAFE and NIST.
- And those resources must be *accessible on the ground*.



QUESTIONS?

Lynn Garcia

Texas Forensic Science Commission

(512) 936-0649 (direct)

Lynn.Garcia@fsc.texas.gov

