

## **The History of Forensic-Science Evidence in Criminal Trials and the Role of Early “Successes” in Establishing its Putative Reliability**

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### **Abstract**

This Article posits that the history of forensic-science evidence plays a significant role in the unquestioning manner of its modern acceptance. It traces early high-profile forensic science “successes” and the public reactions to them. It argues that the public perception of the “advances” of forensic science continue to play a role in the lack of scrutiny given to these disciplines in admissibility decisions today. It concludes that, when it comes to forensic science, history should play a different role by serving as a critical warning rather than a congratulatory buttress.

**Key words:** criminal courts, evidence, police, investigatory tools, crimes.

### I. Introduction

There is an extensive literature regarding the failure of criminal courts critically to appraise the reliability of forensic-science evidence and their subsequent unquestioning admission of it – particularly with regard to the “pattern matching” disciplines<sup>(1)</sup>. One of the common critiques of these forensic disciplines is that they are not really sciences at all, in that they were not invented and validated in academic laboratories and then subject to peer review in scientific journals, but rather were developed by police, as an investigatory tool to solve crimes<sup>(2)</sup>.

There is also a robust literature on the effect that media coverage of criminal trials has on public attitudes toward the criminal justice system generally and juror decision making specifically<sup>(3)</sup>. For example, Edith Greene has documented the way that media coverage about wrongful convictions stemming from faulty eyewitness identifications temporarily caused test subjects to become more skeptical of eyewitness testimony<sup>(4)</sup>. Conversely, Lisa Kort-Butler and Kelley Hartshorn have documented how crime-related programming that focuses on the heroic role of police and prosecutors has entrenched public support for penal populism and law-and-order crime-control policies<sup>(5)</sup>.

This Article attempts to connect these two disparate concepts by exploring an uncanvassed piece of the failure of criminal courts adequately to scrutinize forensic-science evidence:

- Part One presents the role that the history of forensic science in high-profile investigations and its public image have played in enshrining false confidence in its soundness.
- Part Two profiles the beloved historical heroes of the forensic sciences like Francis Galton, Sherlock Holmes, and Edmond Locard. It documents the role that their cherished place in history plays in continuing to buttress the

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(1) See Lisa A. Kort-Butler & Kelley J. Sittner Hartshorn, *Watching the Detectives: Crime Programming, Fear of Crime, and Attitudes Toward the Criminal Justice System*, 52 *Sociological Quarterly* 36 (2011); See Also Carrie Leonetti, *The Innocence Checklist*, 58 *Amer. Crim. L. Rev.* 97, 101 (2021) (& Sources Cited Therein).

(2) See Radley Balko, *A Brief History of Forensics*, *Washington Post Weblog*, 21 April 2015, Available At: <https://www.washingtonpost.com/news/the-watch/wp/2015/04/21/A-Brief-History-Of-Forensics/> (Last Visited 23 August 2021).

(3) See, E.G., Edith Greene, *Media Effects on Jurors*, 14 *L. & Human Behav.* 439 (1990); Valerie P. Hans & Juliet L. Dee, *Media Coverage of Law*, 35 *Amer. Behav. Scientist* 136 (1991).

(4) See Greene, *Supra* Note Xxx.

(5) See Kort-Butler & Hartshorn, *Supra* Note Xxx, at 40.

perceived reliability of the forensic sciences today.

- Part Three explores the public perceptions of high-profile crimes, like those committed by Ted Bundy, that were “solved” by modern-day Sherlock Holmeses using forensic sciences.
- Part Four demonstrates the way that public perceptions and the “CSI effect” have contributed to the perceived infallibility of forensic science, even with modern scientific techniques of questionable validity.
- Part Five documents the way that this history and public perception plays into courts’ admissibility and reliability decisions around scientific evidence and weakens their gatekeeping role.
- Part Six concludes that history and public perception are barriers to courts critically evaluating and screening forensic-science evidence.

## II. Early Heroes

The image of the forensic detective is a longstanding one, and the public cherishes the stories of the real forensic detectives as much as the fictional ones. The oldest and best-known of the forensic pattern-matching disciplines is fingerprint comparison, which was developed originally by British police and was then exported around the globe.

### A. Francis Galton (1822-1911) & Sir Edward Henry (1850-1931)

Victorian naturalist Francis Galton was one of the earliest forensic detectives, and, despite his white supremacist ideology, he remains a hero in the forensic-science community. Galton was an enthusiastic eugenicist, who pioneered the field of forensic fingerprint comparison in his quest to quantify genetic superiority<sup>(6)</sup>.

Galton observed variations in the paths of individual friction ridges on the surface of human fingertips, which he termed “friction ridge events”<sup>(7)</sup>. His

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(6) See Angela Saini, In the Twisted Story of Eugenics, The Bad Guy Is All of Us, *The Guardian*, October 3, 2019, Available at: <https://www.theguardian.com/commentisfree/2019/Oct/03/Eugenics-Francis-Galton-Science-Ideas> (Last Visited August 11, 2021).

(7) See Andrew Anthony, Ucl Has a Racist Legacy, But Can It Move On? *The Guardian*, August 2, 2020, Available at: <https://www.theguardian.com/education/2020/Aug/02/Ucl-Has-A-Racist-Legacy-But-Can-It-Move-On> (Last Visited August 11, 2021); Phoebe Weston, Ucl May Rename Buildings Honouring Sir Francis Galton, Victorian Scientist Known as Father of Eugenics Who Coined Phrase “Nature Versus Nurture”, After Student Protest – But Fellow Academics Say Linking Him To Nazis Is A Slur, *Daily Mail*, December 6, 2018, Available at: <https://www.dailymail.co.uk/Sciencetech/Article-6466845/Ucl-Rename-Buildings-Honouring-Sir-Francis-Galton-Known-Father-Eugenics.html> (Last Visited August 11, 2021).

“Galton points” still form the basis of modern fingerprint identification<sup>(8)</sup>.

Sir Edward Henry was the British Inspector General of Police in Bengal, India<sup>(9)</sup>. He visited Galton’s laboratory in 1893, returned to India, and introduced what would become known as the Galton-Henry system of fingerprint identification in criminal investigations<sup>(10)</sup>. He later became the Commissioner of Scotland Yard (the London Metropolitan Police) and established the Yard’s Fingerprint Branch, which implemented the use of fingerprints as evidence in criminal trials in English criminal trials<sup>(11)</sup>.

Henry’s system resulted in the identification of 10,777 people in the first year after its implementation in 1912<sup>(12)</sup>. Henry would boast that he could search his file of 25 million print cards and match the correct person in under ten minutes<sup>(13)</sup>. Henry was made a Companion of the Order of the Star of India in 1898, a Commander of the Royal Victorian Order in 1906, Knight Commander of the Bath in 1910, and a Baronet upon his retirement in 1918<sup>(14)</sup>.

By the end of the Nineteenth Century, Galton and Henry’s system of fingerprint identification had been adopted by police agencies across Europe.<sup>15</sup> Officials from Scotland Yard introduced fingerprint matching to American law-enforcement agents at the 1904 World’s Fair in St. Louis, Missouri<sup>(16)</sup>. Fingerprint evidence was used for the first time in a criminal trial in the United States in the 1911 murder prosecution of Thomas Jennings by the State of Illinois<sup>(17)</sup>. The State of Illinois introduced expert testimony that a latent fingerprint found on the windowsill of the victim’s home matched Jennings’s fingerprint, through a process of analysis that the Illinois Supreme Court described as “[p]eculiar and specialized experience”<sup>(18)</sup>.

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(8) See *United States v. Llera-Plaza*, 188 F.Supp.2d 549, 555 (E.D. Penn. 2002); Weston, *Supra* Note Xxx.

(9) See *Llera-Plaza*, 188 F.Supp.2d at 554; Cyril John Polson, *Finger Prints And Finger Printing*, 41 *J. Crim. L. & Criminology* 690, 690 (1951).

(10) Polson, *Supra* Note Xxx, at 690-91; Sir Edward Henry, *Ex-Policehead*, *Dies*, *N.Y. Times*, February 21, 1911, at 13.

(11) See *Llera-Plaza*, 188 F.Supp.2d at 554; Polson, *Supra* Note Xxx, at 692; Sir Edward Henry, *Supra* Note Xxx, at 13.

(12) See Sir Edward Henry, *Supra* Note Xxx, at 13.

(13) See *Id.*

(14) See *Id.*

(15) See Balko, *Supra* Note Xxx.

(16) See *Id.*

(17) See *Id.*

(18) (*Id.*)

In litigation challenging the reliability of forensic fingerprint identification, fingerprint examiners continue to extol the virtues of Galton's and Henry's scientific inquiries to establish the bona fides of their discipline. For example, in 1918, in *State v. Kuhl*<sup>(19)</sup>, the Nevada Supreme Court was asked to review the admissibility of the State's palm-print identification in the context of Kuhl's trial for murdering a mail-stage driver during a stagecoach robbery<sup>(20)</sup>. In discussing the friction-ridge patterns on palm prints, the Court noted:

Galton first gave expression to this fact; and Sir E. R. Henry, commissioner of police of the metropolis of London, corroborates with the statement that the inner part of the hand and the sole of the foot are traversed in all directions by lines of varying length. He says that the most conspicuous [sic] are the creases caused by the folding of the skin; but the least conspicuous, but much more numerous lines, are the papillary ridges which exist over the whole palmar surface, giving it an appearance that may be likened to that of a newly plowed field with its ridges and furrows, or to sand which the water, in receding from, has left ribbed<sup>(21)</sup>.

The Court concluded that the trial court did not err in admitting the testimony<sup>(22)</sup>.

More recently, in *United States v. Llera-Plaza*, a case that for a while in the early 2000s made waves among federal criminal practitioners, Llera attempted to challenge courts' uncritical acceptance of the reliability of fingerprint examiners' conclusions regarding "matching" suspects fingerprints to crime-scene fingerprints to the exclusion of any other person's fingerprints. In the process, Llera had to overcome formidable psychological resistance stemming from the lengthy history of forensic fingerprint examination and the faith that criminal-justice practitioners had in it, despite surprisingly little evidence of its scientific validity.

Llera moved to exclude the Government's latent fingerprint evidence on the ground that it was not sufficiently reliable for admission<sup>(23)</sup>. In response, the

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(19) 175 P. 190 (Nev. 1918).

(20) See *Id.* at 190.

(21) *Id.* At 191.

(22) See *Id.* at 195-96.

(23) See *Llera-Plaza*, 188 F.Supp.2d at 550; See Generally F. R. Evid. 702; *Daubert V. Merrill Dow Pharmaceuticals*, 509 U.S. 579 (1993).

Government's leading fingerprint expert, Stephen Meager, a Latent Print Unit Chief at the Federal Bureau of Investigation ("FBI") Laboratory, relied heavily on the history of the "Galton points" and Sir Francis Galton's scientific genius in arguing for the reliable pedigree of fingerprint comparison<sup>(24)</sup>. In discussing (and accepting) Meager's testimony, the District Court noted: "'Galton points' take their name from Francis Galton, the multi-talented English scientist who was a cousin of Darwin's and a major figure in his own right"<sup>(25)</sup>.

Acknowledging Galton's "malign" history as the "high priest of eugenics", the Court nonetheless praised him as "versatile and indefatigably enterprising."<sup>(26)</sup> Galton's reputation as a scientific genius substituted for a critical examination of the validity of the field that he pioneered in pursuit of demonstrating white supremacy.

**B. Dr Joseph Bell (1837-1911), Sir Arthur Conan Doyle (1859-1930), & Sherlock Holmes**

"From close observation and deduction, gentlemen, you can make a correct diagnosis of any and every case." – Dr Joseph Bell, University of Edinburgh

Dr Joseph Emory Bell was a Scottish surgeon and a professor at the University of Edinburgh Medical School during the Nineteenth Century<sup>(27)</sup>. He was "known for his legendary diagnostic intuitions"<sup>(28)</sup>. Sir Arthur Conan Doyle was one of his students, and Bell is widely regarded as the inspiration for Doyle's character Sherlock Holmes<sup>(29)</sup>. Bell was notorious for his "astounding skills at observation"<sup>(30)</sup>. Modern doctors still cherish the idea of being medical

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(24) See Llera-Plaza, 188 F.Supp.2d at 554-55.

(25) *Id.* at 554.

(26) *Id.* at 554-55.

(27) See W. Jerry Chisum & Brent E. Turvey, *A History of Crime Scene Reconstruction*, In *Crime Reconstruction* (W. Jerry Chisum & Brent E. Turvey, Eds, 2007), at 3.

(28) Tracy M. Downs & Sutchin R. Patel, *Dr. Joseph Bell: Surgical Sleuth and The Inspiration Behind Sherlock Holmes*, 195 *J. Urology* E532 (Supp.) (2016).

(29) See Chisum & Turvey, *Supra* Note Xxx, At 4; Downs & Patel, *Supra* Note Xxx, At E532; Dean Jobb, *When A Murderous Doctor Met Edinburgh's Real-Life Sherlock Holmes*, *Scotsman*, July 23, 2021, Available at: <https://www.scotsman.com/Arts-And-Culture/Books/When-A-Murderous-Doctor-Met-Edinburghs-Real-Life-Sherlock-Holmes-3320957> (Last Visited August 15, 2021); Brandy McDonnell, 10 Must-See Highlights In "Sherlock Holmes: The Exhibition" At Science Museum Oklahoma, *Oklahoman*, July 18, 2021, Available at: <https://www.oklahoman.com/Story/Entertainment/2021/07/18/10-Must-See-Highlights-Sherlock-Holmes-Exhibition-Science-Museum-Oklahoma/7394534002/> (Last Visited August 21, 2021).

(30) McDonnell, *Supra* Note Xxx.

sleuths and “hanker for medicine as an art”<sup>(31)</sup>.

As his notoriety as the model for Sherlock Holmes grew, Bell began to take an interest in forensic cases, “assessing medical evidence and relating it to clues from the scene of the crime”<sup>(32)</sup>. Legend had it that Bell privately informed the editor of the Scotsman of the identity of London’s legendary Victorian serial killer Jack the Ripper in 1888<sup>(33)</sup>.

At the same time, as the Industrial Revolution solidified itself in urban London, Doyle’s iconic Holmes character captured the public imagination as the first famous crime-scene reconstructionist. Daily newspapers had just come into existence, allowing the widespread publication of news, including crime mysteries from the police blotters<sup>(34)</sup>. To this day, Doyle’s books are wildly popular, and films based on the Holmes character are Hollywood blockbusters.

The charm of Holmes’s character was his unique genius. He deployed deductive, logical inquiry and idiosyncratic “scientific” techniques “on bloodstains and fingerprints,” in the process outsmarting both the criminals that he pursued and the bumbling police who lacked his intellect and training<sup>(35)</sup>. As German historian Jürgen Thorwald notes:

Sherlock Holmes was the harbinger of a kind of criminological investigation which did not fit into any of these special disciplines, and which ultimately far surpassed them in range. What Holmes did was to avail himself of all the chemical, biological, physical, and technological methods which were springing up at the turn of the century<sup>(36)</sup>.

In 2012, the Guinness Book of World Records awarded Holmes the record for the most-portrayed literary character in film and television, noting that he had been portrayed on screen more than 250 times<sup>(37)</sup>. Holmes’s international popularity was unsurpassed, and his fictional techniques influenced the

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(31) Louis Appleby, Dr Louis Appleby on the 19th-Century Medical Sleuth Joseph Bell, *Guardian*, August 13, 1995.

(32) Id.

(33) See Id.

(34) See McDonnell, *Supra* Note Xxx.

(35) Appleby, *Supra* Note Xxx.

(36) Jürgen Thorwald, *Crime and Science* 234 (1966).

(37) See McDonnell, *Supra* Note Xxx.

development of the rudimentary real-life forensic sciences<sup>(38)</sup>.

Despite being a fictional character, Holmes is sometimes invoked by modern forensic scientists to add credibility to their craft. For example, one popular forensic-science textbook is titled *The Evidence Never Lies: The Casebook of a Modern Sherlock Holmes*<sup>(39)</sup>.

### **C. Dr. Edmond Locard (1872-1966)**

Edmond Locard was a French doctor and lawyer who directed the Lyons Institute of Forensic Medicine<sup>(40)</sup>. Inspired in part by Doyle, Locard founded what is largely regarded as the world's first police crime laboratory in Lyon<sup>(41)</sup>.

Locard was another trailblazer in the modern practice of fingerprinting, establishing the first rules for the minimum number of minutae necessary for identification and pioneering poroscopy – the analysis of pores as part of the individualization process<sup>(42)</sup>. He also systematized forensic dust analysis and pioneered an early form of bloodstain pattern analysis<sup>(43)</sup>. Locard helped establish the International Academy of Criminalistics in 1929<sup>(44)</sup>.

Locard has been called the “Sherlock Holmes of France,” with his ability to solve high-profile crimes dominating the news coverage of French crimes. Locard's first fingerprint case was the Boudet & Simonin case. Locard was investigating a burglary and theft of valuables from an apartment in central Lyons<sup>(45)</sup>.

There were no eyewitnesses, but a jewelry box from which jewelry had been taken was covered with fingerprints.<sup>46</sup> Police determined that the fingerprints of two known thieves named Boudet and Simonin matched those lifted from the jewelry box, but, due to the novel nature of fingerprint evidence at the

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(38) See Chisum & Turvey, *Supra* Note Xxx, at 11-12.

(39) Alfred Alan Lewis & Herbert Leon Macdonnell Lewis, *The Evidence Never Lies: The Casebook of A Modern Sherlock Holmes* (1984).

(40) See Chisum & Turvey, *Supra* Note Xxx, at 20.

(41) See *Id.* at 22.

(42) See Polson, *Supra* Note Xxx, at 696.

(43) See Harry Soderman, *Policeman's Lot 25* (1957); Chisum & Turvey, *Supra* Note Xxx, at 25; See Also Edmond Locard, *The Analysis of Dust Traces, Part I*, 1 *Amer. J. Police Sci.* 276 (1930); Edmond Locard, *The Analysis of Dust Traces, Part Iii*, 1 *Amer. J. Police Sci.* 496 (1930).

(44) See Chisum & Turvey, *Supra* Note Xxx, at 23.

(45) See David R. Ashbaugh, *Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology* 150 (1999).

(46) See *Id.*



time, they were not convinced that the expert testimony would be sufficient to convict Boudet and Simonin<sup>(47)</sup>.

They called in Locard, who performed a microscopic comparison of the pore locations between the suspect prints and the latent prints, which allowed a far higher level of detail (and therefore, presumably, far lower likelihood of a coincidental match)<sup>(48)</sup>. Locard's analysis was instrumental in convicting Boudet and Simonin<sup>(49)</sup>. Later, the "Affaire de la Rue Ravat," a burglary case, was the first French case to be decided entirely on Locard's fingerprint testimony, which identified the burglar based on latent prints lifted from a glass vase<sup>(50)</sup>.

Locard was most famous for his eponymous forensic axiom, the Locard Exchange Principle ("LEP"), which underlies the modern analysis of all trace evidence<sup>(51)</sup>. As Craig Cooley explains: "Forensic science is premised on Locard's theory of exchange, which states that every contact between individuals or objects results in a transfer of material between them"<sup>(52)</sup>.

Police and prosecutors often invoke Locard's name or the LEP to bolster the credibility of modern pattern-matching techniques. For example, in *United States v. Ausby*<sup>(53)</sup>, John Ausby was charged with felony murder for raping and murdering Deborah Noel in Washington, D.C. in 1971<sup>(54)</sup>. Ausby had originally been convicted of the rape and murder in 1972<sup>(55)</sup>. Ausby's first conviction was secured in part based on testimony relating to forensic hair comparison, a once-prolific FBI forensic technique that has subsequently been debunked as unreliable<sup>(56)</sup>.

In 2015, the FBI reviewed Ausby's case and concluded that the testimony that

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(47) See *Id.*

(48) See *Id.*

(49) See *Id.*

(50) See Polson, *Supra* Note Xxx, at 697.

(51) See Jürgen Thorwald, *The Century of The Detective* 9 (1965); Chisum & Turvey, *Supra* Note Xxx, At 23-24; John I. Thornton, *The General Assumptions and Rationale of Forensic Identification*, In *Modern Scientific Evidence: The Law and Science of Expert Testimony* (David L. Faigman, Et Al., Eds., 1997), at 29.

(52) Craig M. Cooley, *Forensic Science and Capital Punishment Reform: An "Intellectually Honest" Assessment*, 17 *G.M.U. Civ. Rights L.J.*, 299, 343 (2007).

(53) 436 F.Supp.3d 134 (D.D.C. 2019).

(54) See *Id.* at 140.

(55) See *Id.* at 141.

(56) See *Id.*; See Generally Leonetti, *Supra* Note Xxx, at 101.

its analyst offered at Ausby's trial relating to "microscopic hair comparison analysis" had "contained erroneous statements" and "exceeded the limits of science"<sup>(57)</sup>.

Ausby filed a petition for a writ of habeas corpus seeking to vacate his conviction based on the misleading expert hair-comparison testimony<sup>(58)</sup>. The district court denied the petition on the ground that the other evidence of Ausby's guilty was "overwhelming," including expert testimony matching Ausby's fingerprint to one found in Noel's apartment, forensic firearm evidence that the bullet that killed Noel could have been fired from Ausby's gun, and the testimony of an eyewitness who identified Ausby as having been near Noel's apartment near the time of her rape and murder<sup>(59)</sup>. The Court of Appeal overturned the district court's denial of the writ, finding that the unreliable hair-comparison testimony could have "affected the judgment of the jury"<sup>(60)</sup>.

Because it had been almost half a century since the original trial, many of the witnesses from the first trial were no longer available, and many of the trial exhibits, including all the physical evidence, had been lost or destroyed<sup>(61)</sup>. The Government sought to introduce the trial transcripts from the original trial<sup>(62)</sup>. Otherwise, it lacked legally sufficient evidence to retry Ausby<sup>(63)</sup>. Ausby challenged the prior testimony of the Government's three original expert witnesses, including fingerprint examiner Joseph Mullinax, on the ground that it was inadmissible under Rule 702 of the Federal Rules of Evidence, which had not yet been adopted at the time of Ausby's original trial, as interpreted in *Daubert v. Merrill Dow Pharmaceuticals*<sup>(64)</sup>.

At Ausby's original trial, Mullinax had testified that a latent fingerprint found in Noel's apartment matched a known fingerprint from Ausby without any "doubt"<sup>(65)</sup>. The fingerprints that Mullinax compared had been destroyed<sup>(66)</sup>. The primary issue with Mullinax's testimony is that he did not apply the

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(57) Ausby, 436 F.Supp.3d at 141.

(58) See Id. at 142; See Generally 18 U.S.C. § 2255.

(59) Ausby, 436 F.Supp.3d at 142-43.

(60) Id. at 142.

(61) See Id. at 143-44.

(62) See Id. at 144.

(63) See Id. at 144.

(64) 509 U.S. 579. See Ausby, 436 F.Supp.3d at 160-61.

(65) See Ausby, 436 F.Supp.3d at 161-62.

(66) Id. at 162.

ACE-V technique developed by David Ashbaugh and discussed in greater detail below<sup>(67)</sup>.

Instead, he employed an older technique involving a minimum number (ten) of “matching” points of comparison between the suspect print and the latent print<sup>(68)</sup>. In defending the reliability of this older, abandoned technique, the Government described it as “roughly consistent with Edmund Locard’s 1914 ‘tripartite rule’ for identification, which permitted identification on the basis of between 8 and 12 ‘concurring minutiae’ depending on the clarity of the print and rarity of the minutiae”<sup>(69)</sup>.

The Government’s defense of a 1970s fingerprint technique in the face of a challenge that claimed that it did not live up to the methodological standards of modern fingerprint comparison consisted, therefore, of a reference to its even older pedigree, even though, the farther back in time that one travels, the less that the forensic sciences have been validated. As Inman and Rudin explain: “As much as the Locard transfer theory has been invoked, no peer-reviewed literature exists that proffers it, tests it, or refutes it. It is axiomatic in forensic science; it is accepted as true without proof”<sup>(70)</sup>.

#### **D. Edward Oscar Heinrich (1881-1953)**

“In the test tube and crucible or through the lens of the microscope and camera I have found in my own practice the evidence of poison, the traces of the deadly bullet, the identity of a clot, the source of a fiber, the telltale fingerprint, the differing ink, the flaw in the typewriter, the slip of the pen upon which I have turned in dramatic scenes of our courts the rightful title to an estate, of the liberty, even the life, of an individual.” – Edward Heinrich<sup>(71)</sup>.

In the United States, Berkeley, California was the early epicenter of pattern-matching forensic disciplines. Early Twentieth Century Police Chief August Vollmer emphasized standardization, the adaptation of new technology, and specialization with law enforcement agencies, including in forensic science<sup>(72)</sup>.

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(67) See Id. at 163-64.

(68) See Id. at 164.

(69) See Id. at 164 N 8.

(70) Keith Inman & Norah Rudin, Principles and Practice of Criminalistics: The Profession of Forensic Science 123-24 (2000).

(71) Eugene B. Block, The Wizard of Berkeley 43-44 (1958).

(72) () See Balko, Supra Note Xxx.

Vollmer is credited with inventing the modern crime laboratory<sup>(73)</sup>.

Edward Heinrich was a chemist and criminologist in Berkeley and a prolific expert witness in various pattern-matching disciplines, including fired-bullet comparison, microscopic hair comparison, and forensic handwriting analysis<sup>(74)</sup>. He was known as the “Wizard of Berkeley” and the “Sherlock Holmes of America”<sup>(75)</sup>. The news media portrayed him as infallible<sup>(76)</sup>.

Heinrich’s most famous case involved the attempted robbery of a Southern Pacific Express train traveling from Oregon to California during the course of which several train employees were murdered<sup>(77)</sup>. The robbers had planted explosives as the train was traveling slowly in a tunnel to detach the mail car, which was carrying a large amount of cash, from the rest of the train<sup>(78)</sup>. At the wreckage of the train, investigators found a revolver, greasy denim overalls, and a knapsack soaked in creosote<sup>(79)</sup>. Police arrested a mechanic who worked nearby because he was wearing overalls similar to those found at the scene, but they could not find any concrete evidence linking him to the train heist<sup>(80)</sup>. They called in Heinrich, who concluded:

You are holding the wrong man. The overalls you sent me were worn by a left-handed lumberjack accustomed to working around fir trees. He is a white man between 21 and 25 years of age, not over five feet ten inches tall and he weighs about 165 pounds. He has medium light brown hair, a fair complexion, light brown eyebrows, small hands and feet, and he is rather fastidious in his personal habits. Apparently, he has lived and worked in the Pacific Northwest. Look for such a man<sup>(81)</sup>.

Heinrich continued to testify to the reliability of novel forensic techniques for

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(73) See *Id.*

(74) See Chisum & Turvey, *Supra* Note Xxx, at 25-26.

(75) See Jeff Teitelbaum, Edward Oscar Heinrich (1881-1953) – An American Pioneer in Forensic Science, 29 *Forensic Sci. Rev.* 16 (2017).

(76) See *Id.*

(77) See *Id.*

(78) See *Id.*

(79) See *Id.*

(80) See *Id.*

(81) *Id.*

years. For example, in *People v. Page*<sup>(82)</sup>, Page was charged with the murder of his business partner<sup>(83)</sup>. The State of California called Heinrich to testify that marks found on the inner sole of a shoe found at the scene of the crime matched the tacks in one of Page's shoes, to prove that the inner sole came out of Page's shoe<sup>(84)</sup>.

#### **E. Dr. Paul L. Kirk (1902-70)**

“Physical evidence cannot be wrong; it cannot perjure itself; it cannot be wholly absent. Only its interpretation can err.” – Paul Kirk<sup>(85)</sup>.

Kirk was a biochemist and the founding chair of the Department of Criminalistics at Berkeley<sup>(86)</sup>. In 1953, he published what remains one of the foundational forensic-science treatises, *Crime Investigation*. Kirk also published the first edition of *Fire Investigation*, which continues to be the seminal work on fire-scene investigation and reconstruction<sup>(87)</sup>. Kirk was probably best known for his involvement in the Sam Sheppard case, discussed in more detail *infra*<sup>(88)</sup>.

#### **F. David Ashbaugh**

Modern fingerprint examination is dominated by the systems for classification and analysis developed by David Ashbaugh of the Canadian Royal Mounted Police. Ashbaugh first developed the three-level system for classifying fingerprint details called “ridgeology” and played a pivotal role in developing the FBI's ACE-V (Analysis, Comparison, Evaluation, Verification) system of examination<sup>(89)</sup>. Ashbaugh's ridgeology is considered the gold-standard for fingerprint examination today.

Courts tend to rely heavily on the perception that Ashbaugh's method is both cutting edge and based on a long historical pedigree in finding testimony based on it to be sufficiently reliable for admission. For example, in *Llera*, in

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(82) 260 p. 591 (Cal. App. 1927).

(83) See *Id.* at 592.

(84) See *Id.* at 594.

(85) Paul L. Kirk, *Crime Investigation* 4 (1953).

(86) See Chisum & Turvey, *Supra* Note Xxx, at 29-30; Dr. Paul L. Kirk, *Criminologist*, 68, N.Y. Times, June 8, 1970, Available at: <https://www.nytimes.com/1970/06/08/Archives/Dr-Paul-L-Kirk-Criminologist-68-Berkeley-Teacher-Witness-In.html> (Last Visited August 14, 2021).

(87) See John D. Dehaan, *Kirk's Fire Investigation* (2002).

(88) See Chisum & Turvey, *Supra* Note Xxx, at 31; Dr. Paul L. Kirk, *Supra* Note Xxx.

(89) See David R. Ashbaugh, *Ridgeology*, 41 *J. Forensic Identification* 16 (1991); See Also Ashbaugh, *Supra* Note Xxx.

reaching its determination that the Government's fingerprint testimony was reliable, the district court relied heavily on the history of fingerprinting. The court noted: "English and American trial courts have accepted fingerprint identification testimony for almost a century"<sup>(90)</sup>.

The court specifically relied on Ashbaugh's testimony that "the techniques of North American fingerprint identification specialists appear to have reached a level of sophistication paralleling that of their English counterparts" at Scotland Yard<sup>(91)</sup>. The court explained that the North American procedure for fingerprint identification "correspond[ed] almost exactly" with "the fingerprint identification regime which Her Majesty's Government has now put into force"<sup>(92)</sup>. The Court concluded:

The ACE-V regime that is sufficiently reliable for an English court is, I conclude, a regime whose reliability should, subject to a similar measure of trial court oversight, be regarded by the federal courts of the United States as satisfying the requirements of Rule 702 as the Supreme Court has explicated that rule in *Daubert* and *Kumho Tire*<sup>(93)</sup>.

The court explained:

I had the opportunity to learn from Allan Bayle, a senior English fingerprint specialist, . . . that the ACE-V process employed by New Scotland Yard is essentially indistinguishable from the FBI's ACE-V process, and that this formidably knowledgeable and experienced veteran of the Yard—the legendary and actual source of the systematic and comprehensive utilization of fingerprint identification as an instrument of law enforcement—believes in ACE-V without reservation<sup>(94)</sup>.

Similarly, in *State v. Bickart*<sup>(95)</sup>, the Supreme Judicial Court of Maine (SJC) reviewed the trial court's admission of a palm-print identification at Bickart's trial for sexual offending against a toddler. Bickart challenged the testimony

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(90) Llera, 188 F.Supp.2d at 574.

(91) Id. at 575.

(92) Id.

(93) Id.

(94) Id. at 575-76.

(95) 963 A.2d 183 (Me. 2009).

as a novel application of fingerprint and palm print identification to analyze palm creases in a photograph and make an identification of a hand using only its creases<sup>(96)</sup>. She argued that the use of creases for identification purposes without accompanying ridge detail was not generally accepted and had not been subject to peer-reviewed research<sup>(97)</sup>.

The SJC upheld the trial court's admission of the testimony<sup>(98)</sup>. In defending the reliability of the testimony, the State's experts "referred repeatedly to what both consider the authoritative text on crease and ridge identification analysis, 'Quantitative and Qualitative Friction Ridge Analysis,' by David Ashbaugh," in which he opined that "palm creases can be utilized by themselves for identification purposes, and read a passage to the jury from the text to that effect"<sup>(99)</sup>.

"Both experts discussed in detail the formation of a person's palm creases in utero through birth, and also made reference to another study by Scotland Yard that seems to confirm Ashbaugh's findings on the use of creases"<sup>(100)</sup>. The court explained: "[W]hile there is not general acceptance of the identification analysis . . . , there is some scientific support, as found in the Ashbaugh text . . . ."<sup>(101)</sup>

### III. Early Victories

The techniques employed by these legendary sleuths became standard forensic practice over the course of the twentieth century. With the trends of urbanization and the nationalization (and even internationalization) of new media outlets, the public increasingly began to follow news reports of high-profile and sensational cases, particularly those involving grisly murders, which were solved by fledgling forensic sciences. These news reports of terrible crimes solved by the pattern-matching forensic sciences, and the concomitant sense of safety from otherwise undetectable and unsolvable crimes, further entrenched the idea of the forensic scientist as magician and hero in the public imagination.

Americans have a particular fascination with violent crime, especially serial killers. As David Schmid notes: "Sensational coverage of crime has

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(96) See Id. at 186-87.

(97) See Id. at 187.

(98) See Id. at 190.

(99) Id. at 189.

(100) Id. at 189-90.

(101) Id. at 190.

always had a prominent place in American popular culture, from the earliest forms of colonial popular literature, through the ‘yellow journalism’ of the nineteenth century, to the true-crime book and slasher movie of today”<sup>(102)</sup>. This fascination has been enhanced by the “tabloidization” of the mainstream media<sup>(103)</sup>.

As Schmid explains: “Instead of detailed, objective stories about the crime problems facing the United States, now the mass media provide their audience with ‘raw dispatches of the crime of the moment, the frightening – and often false – trend of the week, the prurient murder of the month, the sensational trial of the year’”<sup>(104)</sup>.

This love/hate fascination with crime and murderers has given rise to the phenomenon of the “crime myth.” Smith explains: “The social construction of crime myths follows a recurrent pattern, whereby a few isolated criminal events and issues receive brief but incredibly intense media coverage,” focusing on “the most bizarre or gruesome act a journalist or investigator can uncover”<sup>(105)</sup>. What follows are several of the most prominent murder cases in modern American history.

### **A. Leopold and Loeb**

In 1924, the corpse of fourteen-year-old Bobby Franks was found bludgeoned to death, mutilated, and stuffed into a culvert in a field outside of Chicago<sup>(106)</sup>. The case shocked Chicago because of its brutality and lack of obvious motivation and because of the age of its young victim. The case made national news when, a few days later, two young men, Nathan Leopold and Richard Loeb, were arrested and charged with kidnapping and murder<sup>(107)</sup>.

The public was particularly fascinated with and horrified by the case because Leopold and Loeb were the brilliant scions of two prominent, wealthy Jewish families, and their callous murder appeared to have sprung, at least in part,

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(102) David Schmid, *Natural Born Celebrities: Serial Killers in American Culture* 13 (2005).

(103) *Id.* at 13-14.

(104) *Id.* at 14 (Internal Citation Omitted).

(105) *Id.* at 14.

(106) See Peter I. Rose, *Revisiting the Story of “Leopold and Loeb,”* 46 *Sociology* 522, 522-23 (2009); See Simon Baatz, *Leopold and Loeb’s Criminal Minds*, *Smithsonian Mag.*, August 2008, Available at: <https://www.smithsonianmag.com/History/Leopold-And-Loebs-Criminal-Minds-996498/> (Last Visited August 15, 2021).

(107) See *Id.* at 522.



from their illicit sexual relationship with one another<sup>(108)</sup>. The case was the original “Crime of the Century”<sup>(109)</sup>.

While Leopold and Loeb ultimately confessed to the murder of Franks, who was Loeb’s cousin, as well as to the total absence of motive other than seeking the thrill of committing a heinous murder, they originally became suspects after criminalists traced a typewritten ransom note sent to Franks’s parents to a late-model Underwood typewriter with defective lowercase t’s and f’s<sup>(110)</sup>. The case is best known for the capital sentencing hearing that followed their arrests and confessions, but, at the time, its notoriety came in part because of the way that detectives were able quickly to “solve” the case and identify the unlikely perpetrators through scientific investigation.

The case became more famous when Leopold and Loeb hired legendary defense lawyer Clarence Darrow<sup>(111)</sup>. They pleaded guilty to avoid the death penalty, allowing Darrow to argue that their youth, admissions of guilt, traumatic childhoods, and impaired mental capacities warranted a sentence of imprisonment<sup>(112)</sup>. They were sentenced to life imprisonment, and the case is one of the most famous and controversial cases involving the death penalty<sup>(113)</sup>. Loeb died in prison in 1936, stabbed by another inmate<sup>(114)</sup>. Leopold was paroled in 1958 and granted clemency in 1963<sup>(115)</sup>. The case has subsequently been the subject of countless movies, novels, plays, and scholarly treatises, as well as two autobiographies<sup>(116)</sup>.

## B. Dr. Samuel Sheppard

In 1954, thirty-one-year-old Marilyn Reese Sheppard, four months pregnant, was discovered murdered in her bedroom in Bay Village, Ohio (an affluent

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(108) See Baatz, *Supra* Note Xxx.

(109) Rose, *Supra* Note Xxx, at 522; Christopher Borrelli, Would You Buy Leopold and Loeb’s Fingerprints? A Famous Murder Weapon? Chicago Museums Sometimes Face Similar Questions, *Chicago Tribune*, May 13, 2021, Available at: <https://www.chicagotribune.com/Entertainment/Ct-Ent-Leopold-Loeb-Memorabilia-Sale-20210513-Wsekojx35cynra4ezf7z7wv4-Story.Html> (Last Visited August 15, 2021).

(110) See Jeremy Lybarger, Reopening the Case Files of Leopold and Loeb, *Paris Rev.*, July 26, 2018, Available at: <https://www.theparisreview.org/Blog/2018/07/26/Reopening-The-Case-Files-Of-Leopold-And-Loeb/> (Last Visited August 15, 2021).

(111) See Baatz, *Supra* Note Xxx.

(112) See Rose, *Supra* Note Xxx, at 522; Baatz, *Supra* Note Xxx.

(113) See Rose, *Supra* Note Xxx, at 522.

(114) See *Id.* at 524; Baatz, *Supra* Note Xxx; Lyberger, *Supra* Note Xxx.

(115) See Rose, *Supra* Note Xxx, at 524; Baatz, *Supra* Note Xxx; Lyberger, *Supra* Note Xxx.

(116) See Rose, *Supra* Note Xxx, at 523.

suburb of Cleveland)<sup>(117)</sup>. Because of the victim's affluence, her pregnancy, and the perceived safety of Bay Village, the case was a sensational one. It became more sensational when Reese's husband, Sam Sheppard, was charged with and convicted of her murder<sup>(118)</sup>.

After the trial, Sheppard's defense team hired Paul Kirk to reexamine the crime scene to assist with the appeal of his conviction<sup>(119)</sup>. Kirk opined, based on his bloodstain pattern analysis at the scene, that there were two perpetrators present during Reese's murder<sup>(120)</sup>. He opined that the killer had been left handed, while Sheppard was right handed<sup>(121)</sup>. He also concluded from tooth fragments found under Reese's body that she had bitten the hand of her killer (and Sheppard lacked corresponding injuries)<sup>(122)</sup>.

Sheppard's conviction was overturned, and Kirk testified for the defense at the retrial, which resulted in Sheppard's acquittal<sup>(123)</sup>. At the time, Kirk's testimony was perceived by the forensic-science community as an act of disloyalty, contrary to the carefully cultivated image that most forensic scientists project as "speaking for the victims" who could not speak for themselves. As a direct result of his testimony for the defense in Sheppard, Kirk was barred from membership in the American Academy of Forensic Sciences (AAFS)<sup>(124)</sup>.

Over time, however, Kirk's image has been repaired, probably in part due to the fictionalization of the case in the public eye. The Harrison Ford movie *The Fugitive* was (loosely) based on Sam Sheppard's trial and conviction (although the real-life Sheppard never dramatically fled and evaded capture by the United States Marshals Service). Ford's depiction of the innocent victim of false accusations, a frameup, and police incompetence, no doubt in conjunction with the changing public perceptions around wrongful convictions, realigned Kirk's position in the real Sheppard case from the side of darkness to the side of light. AAFS now awards the Paul L. Kirk Award as the highest honor in its criminalistics section<sup>(125)</sup>.

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(117) See Chisum & Turvey, *Supra* Note Xxx, at 31.

(118) See *Id.* at 31-32.

(119) See *Id.* at 32.

(120) See *Id.* at 32.

(121) See Dr. Paul L. Kirk, *Supra* Note Xxx.

(122) See *Id.*

(123) See Chisum & Turvey, *Supra* Note Xxx, at 32.

(124) See *Id.* at 32-33.

(125) See *Id.* at 32-33.

Kirk's public rehabilitation, however, was not the result of a critical examination of the field of forensic science. Instead, it is a tale of the heroic forensic scientist who ignored the public's bloodlust for retribution and followed science to its rightful conclusion.

### C. Ted Bundy

Theodore Robert Bundy was "the exemplary American serial killer"<sup>(126)</sup>. He was responsible for a string of dozens of sexually motivated abductions, rapes, and murders of girls and young women across Washington, Colorado, Utah, and Florida in the 1970s<sup>(127)</sup>. He engaged in necrophilia with the corpses, often for days after he had killed them<sup>(128)</sup>.

Bundy was linked to the murder of Caryn Campbell in Colorado, the first murder with which he was charged, through a hair match between Campbell's hair and hairs found in Bundy's car<sup>(129)</sup>. He was linked to two of his last murders, two frenzied slayings at the Chi Omega sorority house at Florida State University after he escaped from jail in Colorado, through a forensic dental match between his teeth and bitemarks on the buttocks of one of his victims<sup>(130)</sup>. Florida prosecutors also presented forensic testimony that his hair matched hairs found inside a pantyhose mask left behind at the scene of the crime<sup>(131)</sup>. They used forensic fiber analysis to convict him of his final murder, that of twelve-year-old Kimberly Leach, committed after the Florida State murders but before his capture<sup>(132)</sup>.

(126) See Schmid, *Supra* Note Xxx, at 211.

(127) See *Id.* At 81. Bundy Confessed to Thirty Murders, But Hinted That Were Many More, And Many Commentators Believe That the Likely Number of His Victims Is Closer to One Hundred. See Erica Goode, F.B.I. Creates DNA Profile of Ted Bundy, Giving Fresh Hope on Unsolved Cases, *N.Y. Times*, August 10, 2011, At A13; Jeca Taudte, Et Al., Chi Omega Survivor of Ted Bundy Murders: "I Was Asleep" When Evil Opened Door "And Attacked Me," *Abc News*, February 14, 2019, Available at: <https://abcnews.go.com/Us/Chi-Omega-Survivor-Ted-Bundy-Murders-Asleep-Evil/Story?Id=60894306> (Last Visited August 17, 2021).

(128) See Katie Dowd, *Netflix's Ted Bundy Documentary Is Almost Everything That's Wrong with The True Crime Genre*, *S.F. Gate*, January 28, 2019, Available at: <https://www.sfgate.com/Crime/Article/Conversations-With-A-Killer-Review-Netflix-13567369.php> (Last Visited August 17, 2021).

(129) See Chad Abraham, *Ex-Sheriff Recalls Bundy, His Escape in Aspen, Manhunt*, *Aspen Daily News*, January 31, 2019, Available at: [https://www.aspendailynews.com/News/Ex-Sheriff-Recalls-Bundy-His-Escape-In-Aspen-Manhunt/Article\\_31f08b0e-250c-11e9-Afaf-Df3822fbaf0a.html](https://www.aspendailynews.com/News/Ex-Sheriff-Recalls-Bundy-His-Escape-In-Aspen-Manhunt/Article_31f08b0e-250c-11e9-Afaf-Df3822fbaf0a.html) (August 17, 2021); *Serial Killers Fast Facts*, *cnn*, February 11, 2021, Available at: <https://www.cnn.com/2013/07/09/Us/Serial-Killers-Fast-Facts/Index.html> (Last Visited August 17, 2021).

(130) See Goode, *Supra* Note Xxx, at A13; Taudte, Et Al., *Supra* Note Xxx.

(131) See Taudte, Et Al., *Supra* Note Xxx.

(132) See *Id.*

Ted Bundy is a celebrity, a staple of American popular culture, and the most famous American serial killer<sup>(133)</sup>. Ann Rule's 1980 best-selling true-crime book *The Stranger Beside Me* made Bundy a household name<sup>(134)</sup>. His fame was amplified by his brazen escape from the courthouse in Colorado after his first arrest, his insistence on representing himself in his murder trial in Florida, and his decision to refuse a plea bargain that would have spared him the death penalty<sup>(135)</sup>.

Bundy, invariably described as "handsome" and "charming," was a magnet for women known as "Ted groupies"<sup>(136)</sup>. He was also simultaneously the target of intense hatred<sup>(137)</sup>. When the State of Florida executed Bundy in 1989, there was a carnival of cheering, celebratory crowds outside the prison<sup>(138)</sup>.

In 2019, thirty years after Bundy's execution, Netflix released a documentary called *Conversations with a Killer: the Ted Bundy Tapes*, followed by a feature film starring Zac Efron called *Extremely Wicked, Shockingly Evil, and Vile*<sup>(139)</sup>. The Netflix documentary is based on the work of journalists Hugh Aynesworth and Stephen Michaud, who persuaded Bundy to engage in almost one hundred hours of taped interviews between his conviction and execution<sup>(140)</sup>. The Bundy case is still touted as an example of the crime-solving power of forensic bitemark evidence, even though bitemark matching as a forensic discipline has been largely discredited and abandoned even by forensic odontologists<sup>(141)</sup>.

#### **D. Jeffrey MacDonald**

In 1970, the pregnant partner and two young daughters of United States Army Captain and Green Beret doctor Jeffrey MacDonald were beaten and stabbed to death in their home on Fort Bragg, North Carolina<sup>(142)</sup>. When military

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(133) See Schmid, *Supra* Note Xxx, At 242.

(134) See *Id.* at 197.

(135) See *Id.* at 16-17, 212.

(136) *Id.* at 212.

(137) See *Id.* at 215.

(138) See *Id.* at 215-16; David Von Drehle, *Ted Bundy Is Still Fooling People*, *Washington Post*, February 5, 2019.

(139) See David Von Drehle, *Ted Bundy Is Still Fooling People*, *Washington Post*, February 5, 2019.

(140) See *Id.*

(141) See Michael J. Saks *Et Al.*, *Forensic Bitemark Identification: Weak Foundation, Exaggerated Claims*, 3 *J. L. & Biosciences* 538, 540-41 (2016).

(142) See Robert Sam Anson, *The Devil and Jeffrey Macdonald*, *Vanity Fair*, January 1, 2007, Available at: <https://www.vanityfair.com/magazine/1998/07/macdonald199807> (Last Visited August 17,

police responded, they discovered MacDonald, the sole survivor, with two stab wounds and a collapsed lung, but the wounds were relatively minor, particularly compared to those of the rest of his family<sup>(143)</sup>.

MacDonald has always insisted that he is innocent, claiming that he woke up to find three men and a woman, “drug-crazed hippies,” chanting “kill the pigs” and “acid is groovy”<sup>(144)</sup>. MacDonald told investigators in the Army Criminal Investigation Division that he had fallen asleep on the sofa in his living room when he awoke to screaming and saw three men and a woman in his home. He claimed that he confronted them, they attacked him with a club and an ice pick, and he lost consciousness<sup>(145)</sup>. Investigators did not believe MacDonald’s account because of the relatively minor nature of his injuries and the absence of evidence of the struggle that MacDonald described<sup>(146)</sup>.

There was some evidence to suggest that MacDonald’s account might be true. A neighbor of the MacDonalds reported seeing a suspicious vehicle in the vicinity around the time of the murders<sup>(147)</sup>. A woman named Helena Stoeckley initially made a series of inconsistent and damning admissions suggesting that she had been present in the MacDonald home during the killings, after a tip from a neighbor suggested that she may have been involved, but then later recanted her story<sup>(148)</sup>.

The military concluded that the evidence was too ambiguous either to try MacDonald for the murders or to exonerate him<sup>(149)</sup>. In 1979, almost ten years after the killings and in response to public pressure, civilian authorities charged MacDonald with the murders. Federal prosecutors claimed that he killed his family with an ice pick then stabbed himself to make it look like he

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2021); Daren Briscoe, *Crime: The Green Beret Murderer Hasn’t Given Up*, Newsweek, August 30, 2004; Rodger Mullen, *New Evidence? Fx Series Examines Jeffrey Macdonald Fort Bragg Murder Case*, Fayetteville Observer, September 17, 2020, Available at: <https://www.fayobserver.com/story/news/2020/09/17/Jeffrey-Macdonald-Murder-Cases-Subject-Fx-Series/5814669002/> (Last Visited August 19, 2021).

(143) See Anson, *Supra* Note Xxx.

(144) See Briscoe, *Supra* Note Xxx; Paul Woolverton, *Judge Rejects Release For “Fatal Vision” Murder Defendant Jeffrey Macdonald*, Fayetteville Observer, April 9, 2021, Available at: <https://www.fayobserver.com/story/news/2021/04/09/Judge-Rejects-Release-Fatal-Vision-Murder-Defendant-Jeffrey-Macdonald-Fort-Bragg-Fortbragg/7164248002/> (Last Visited August 18, 2021); Mullen, *Supra* Note Xxx.

(145) See Anson, *Supra* Note Xxx; Woolverton, *Supra* Note Xxx.

(146) See Anson, *Supra* Note Xxx; Woolverton, *Supra* Note Xxx.

(147) See Anson, *Supra* Note Xxx.

(148) See Id.

(149) See Mullen, *Supra* Note Xxx.

was attacked while trying to protect his family<sup>(150)</sup>.

By the time of MacDonald's trial, Stoeckley insisted that she could not remember where she had been on the night of the murders<sup>(151)</sup>.

The evidence against MacDonald included testimony that fibers from his pajamas were found in the wife's and two girls' rooms in locations that called into question his version of events<sup>(152)</sup>.

MacDonald was convicted of the murders<sup>(153)</sup>. In 1982, he was sentenced to three consecutive life sentences, but his case has never left the public eye, and the litigation either to exonerate him or to keep him in prison has been extensive<sup>(154)</sup>. The case has gone to the United States Supreme Court seven times<sup>(155)</sup>.

The evidence for and against MacDonald has also continued to fluctuate over time, partly because of vigorous private investigation attempts on his behalf. After MacDonald's trial, Stoeckley gave a full written confession to private investigators working for MacDonald, implicating herself and five other "cult" members in the "human sacrifice", but she did so under circumstances of duress<sup>(156)</sup>. Her confession, however, did not match MacDonald's account of the murders<sup>(157)</sup>.

The FBI was able to establish conclusive alibis for many of the individuals whom she named as accomplices<sup>(158)</sup>. Stoeckley later recanted the confession<sup>(159)</sup>. MacDonald insisted that the prosecution pressured her to recant her claim. Multiple other people have confessed to being the real killers, including Cathy Perry, whom Stoeckley had identified as one of her accomplices<sup>(160)</sup>. Perry's confession, however, was also wildly inconsistent with the facts of the

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(150) See Denise Lavoie, "Fatal Vision" Doctor Again Denied New Trial In '70 Slayings, Fayetteville Observer, December 21, 2018, Available at: <https://www.fayobserver.com/news/20181221/Fatal-Vision-Doctor-Again-Denied-New-Trial-In-70-Slayings> (Last Visited August 18, 2021).

(151) See Anson, *Supra* Note Xxx.

(152) See *Id.*

(153) See Greene, *Supra* Note Xxx, at 439; Briscoe, *Supra* Note Xxx.

(154) See Greene, *Supra* Note Xxx, at 439; Anson, *Supra* Note Xxx; Briscoe, *Supra* Note Xxx.

(155) See Anson, *Supra* Note Xxx.

(156) *Id.*

(157) See *Id.*

(158) See *Id.*

(159) See *Id.*

(160) See *Id.*

crime, which was perhaps unsurprising given that she had schizophrenia<sup>(161)</sup>. Stoeckley died in 1983, so any conclusive determination of whether she was involved is impossible<sup>(162)</sup>.

The case has been a divisive one ever since the investigation began, with sustained media focus<sup>(163)</sup>. It has been characterized as “the granddaddy of true crime”<sup>(164)</sup>. One camp believes that MacDonald was wrongfully convicted after a sloppy investigation and rush to judgment by army investigators who dismissed the true version of events and focused on the husband as the most likely killer. The other camp believes that MacDonald is a murderous psychopath who became the likely suspect because he was guilty and that his defense and subsequent protestations of innocence are cynical and dishonest.

The MacDonald case has captured the American public’s attention for decades. His “case has been the subject of countless articles, a best-selling book, and a top-rated TV movie . . . .”<sup>(165)</sup>. In 1983, Joe McGinnis published *Fatal Vision*, a popular book, later made into a television miniseries, which strongly suggested that MacDonald was guilty<sup>(166)</sup>. In 2012, Error Morris published *A Wilderness of Errors*, later made into a documentary, which suggested that MacDonald had been wrongfully convicted<sup>(167)</sup>.

After decades of countervailing portrayals in the media, subsequent DNA tests on hair samples retrieved from underneath the fingernail of one of the victims did not match MacDonald. MacDonald argued that it must, therefore, have come from one of the real killers. Once again, however, the value of the evidence depended on the viewpoint of observer as to MacDonald guilt. To MacDonald’s supporters, the presence of unexplained DNA on the victims was exoneration. To MacDonald’s condemners, the hair samples were a sensational smoke screen with no real relevance to the question of whether MacDonald killed his family.

In 2011, MacDonald filed a petition for a writ of habeas corpus on the ground of actual innocence based on the DNA test results<sup>(168)</sup>. In 2014, the District

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(161) See *Id.*

(162) See Mullen, *Supra* Note Xxx.

(163) See Anson, *Supra* Note Xxx.

(164) See Mullen, *Supra* Note Xxx.

(165) Anson, *Supra* Note Xxx.

(166) See Mullen, *Supra* Note Xxx.

(167) See *Id.*

(168) See *United States V. Macdonald*, 641 F.3d 596 (4th Cir. 2011).

Court denied the application, holding that the DNA results did not exculpate MacDonald<sup>(169)</sup>. In 2018, the United States Court of Appeals for the Fourth Circuit agreed, affirming the District Court’s denial of the application<sup>(170)</sup>.

#### IV. Public Reactions

Kort-Butler and Hartshorn have documented how documentary television programs that follow and report on police investigations “usually follow detectives or forensic analysts as they try to solve a mystery”<sup>(171)</sup>. They argue that this “infotainment” industry increasingly blurs the line between news media and fictional crime dramas like “CSI: Crime Scene Investigation” and “Law and Order”<sup>(172)</sup>.

Scholars have documented the idea of a “media loop”: the circular relationship of feedback between media coverage of criminal investigations and the public perception of them<sup>(173)</sup>. These high-profile cases being solved by modern-day Sherlock Holmeses feed into the public image of forensic scientists as genius superheroes. The public’s clamor for more magical sleuthing has driven the image and reputation of forensic scientists even higher. The feedback loop can be seen in several modern examples.

##### **A. Joseph James DeAngelo**

Between 1974 and 1986, a string of serial rapes and murders went unsolved across California<sup>(174)</sup>. At the time, law-enforcement agencies thought that they were the work of different offenders in different regions of California, most notably the Visalia Ransacker, Sacramento’s East Area Rapist, and the Los Angeles Night Stalker<sup>(175)</sup>. It was not until 2013 that journalist, Michelle McNamara suggested that all of thirteen murders and fifty rapes might have been committed by a single, prolific sex offender and serial killer, whom she named the Golden State Killer<sup>(176)</sup>.

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(169) See *United States V. Macdonald*, 32 F.Supp.3d 608 (E.D.N.C. 2014).

(170) See *United States V. Macdonald*, 911 F.3d 723, 724 (4th Cir. 2018).

(171) Kort-Butler & Hartshorn, *Supra* Note Xxx, at 36.

(172) See *Id.* at 39.

(173) Peter K. Manning, *Policing Contingencies* 76-77 (2003).

(174) See Ray Wickenheiser, *Forensic Genealogy, Bioethics, and the Golden State Killer Case*, 1 *Forensic Sci. Intl.: Synergy* 114, 115 (2019); National Public Radio, Hbo’s “I’ll Be Gone in The Dark” Brings the Golden State Killer to The Small Screen, *Morning Edition*, June 26, 2020, Available at: <https://www.npr.org/2020/06/26/883496022/Hbos-Ill-Be-Gone-In-The-Dark-Brings-The-Golden-State-Killer-To-The-Small-Screen> (Last Visited 6 August 2021).

(175) See Wickenheiser, *Supra* Note Xxx, at 115; National Public Radio, *Supra* Note Xxx.

(176) See National Public Radio, *Supra* Note Xxx.



Because the Golden State Killer's crimes occurred before the advent of forensic DNA analysis, he left his DNA at dozens of crime scenes<sup>(177)</sup>. The case was finally solved and the offender, former police officer Joseph DeAngelo, was identified in 2018, when police ran a DNA profile extracted from one of the crime scenes against the database of an open-source genealogical website called "GEDMatch"<sup>(178)</sup>.

The genealogical search revealed a partial match to the profile of a seventy-three-year-old man in a nursing home in Oregon, who was later determined to be a distant relative of DeAngelo<sup>(179)</sup>. Police obtained and compared samples of DeAngelo's DNA collected from his trash, which matched the crime-scene samples<sup>(180)</sup>. Last year, DeAngelo pleaded guilty to thirteen murders and thirteen sexual assaults<sup>(181)</sup>.

News media coverage of the investigation was intense, partly because of the prolific and horrible nature of the offending and partly because of the perception that the "familial DNA search" that the police performed to identify DeAngelo was cutting edge and controversial. Public interest in the case remains intense. Last year, Home Box Office announced that they were releasing a true-crime documentary about the Golden State Killer called "I'll Be Gone in the Dark"<sup>(182)</sup>.

## B. "CSI"

In the early 2000s, "CSI: Crime Scene Investigation" was the most popular television program in the world<sup>(183)</sup>. Its success was followed by spinoffs and dozens of other forensic-science themed shows<sup>(184)</sup>. The term "CSI effect" was coined by an article in Time magazine in 2002, which described "a growing

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(177) See Katie Dowd, *Why Has the Zodiac Killer Never Been Caught?* S.F. Gate, January 6, 2021, Available at: <https://www.sfgate.com/Sfhistory/Article/Why-Has-Zodiac-Killer-Never-Been-Caught-15847923.Php> (Last Visited August 17, 2021).

(178) See Rebecca Armitage, *The Golden State Killer: How It Took Four Decades to Catch the Serial Predator Who Terrorised California*, Abc News, August 22, 2020, Available at: <https://www.abc.net.au/News/2020-08-22/The-Forty-Year-Hunt-For-The-Golden-State-Killer/12579638> (Last Visited August 17, 2021); Wickenheiser, *Supra* Note Xxx, at 115.

(179) See Wickenheiser, *Supra* Note Xxx, at 115.

(180) See *Id.*; *Serial Killers Fast Facts*, *Supra* Note Xxx.

(181) See *Serial Killers Fast Facts*, *Supra* Note Xxx.

(182) National Public Radio, *Supra* Note Xxx.

(183) See Simon A. Cole & Rachel Dioso-Villa, *Investigating The "Csi Effect" Effect: Media and Litigation Crisis in Criminal Law*, 61 *Stanford L. Rev.* 1335, 1337 (2009).

(184) See *Id.* At 1338.

public expectation that police labs can do everything TV labs can”<sup>(185)</sup>. The CSI effect is the subject of countless media and academic articles on the relationship between public perception and jury decision making.<sup>(186)</sup> The CSI effect has been described as an offshoot of the media loop, which has led to an inability of the public to distinguish “fiction” and “reality”<sup>(187)</sup>.

## **V. The Impact of History on Modern Admissibility Practices**

The storied history of the forensic detectives continues to impact courts’ decisions around the reliability of forensic testimony. The case of Clemente Aguirre exemplifies the way that the forensic pattern-matching disciplines are allowed to self-corroborate their own reliability.

### **A. Case Study: Clemente Aguirre-Jarquín**

In 2004, Clemente Aguirre was convicted of the murders of his neighbors Cheryl Williams and Carol Bareis and sentenced to death<sup>(188)</sup>. Bareis was Williams’s mother<sup>(189)</sup>. She was partially paralyzed and spent most of her time in a wheelchair<sup>(190)</sup>. Williams was stabbed 129 times<sup>(191)</sup>. Bareis was stabbed twice<sup>(192)</sup>.

When the police came to Aguirre’s house and asked if he knew anything about the murders next door, he told the officers that he had gone inside the house and seen Williams dead, and he was able to describe the crime scene with particularity<sup>(193)</sup>. At trial, Aguirre explained that he did not call the police after discovering the bodies because he was undocumented and afraid of deportation<sup>(194)</sup>.

Forensic-science evidence played a pivotal role in the case, not only linking Aguirre to the crime scene (which he had already admitted that he had entered), but also to the murder weapon and the act of the murder itself. Sixty-seven

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(185) Jeffrey Kluger, *How Science Solves Crimes*, Time, October 21, 2002, At 36, 4.

(186) See Cooley, *Supra* Note Xxx, at 308-09.

(187) See Michael Mopas, *Examining The “Csi Effect” Through an Ant Lens*, 3 *Crime Media Culture* 110 (2007); See Also Glenn E. Rice, *Tv Is Making Jurors Suspicious About Evidence: Csi: Courtroom Stalemates Increase*, *Kansas City Star*, August 10, 2005, at A1.

(188) See *Aguirre-Jarquín V. State*, 9 So.3d 593, 598-600 (Fla. 2009).

(189) See *Id.* at 598.

(190) See *Id.*

(191) See *Id.* at 599.

(192) See *Id.*

(193) See *Id.*

(194) See *Id.* at 600.

bloody shoe impressions were found inside the victims' home<sup>(195)</sup>. A crime-scene analyst testified that sixty-four of the impressions were "comparable" and "consistent with" Aguirre's shoes<sup>(196)</sup>. DNA testing established that Williams's blood was found on the soles of Aguirre's shoes, and Bareis's blood and DNA were found on his t-shirt, shorts, and underwear<sup>(197)</sup>.

Aguirre was a prep cook<sup>(198)</sup>. A search of the crime scene revealed a ten-inch chef's knife on the ground between Aguirre's residence and Williams's residence<sup>(199)</sup>. A forensic analyst testified at Aguirre's trial that the knife was the same "make and model" of knife used at the restaurant where Aguirre worked and that all the victims' stab wounds were "consistent with" the recovered knife<sup>(200)</sup>. A fingerprint analyst testified that a palm print lifted from the murder weapon "matched" Aguirre's left palm print<sup>(201)</sup>.

Finally, a bloodstain-pattern analyst testified that Aguirre's shorts had contact stains on both the front and back and impact spatter on the back consistent with having been present during the murders<sup>(202)</sup>. The analyst also testified that Aguirre's socks had both contact stains and spots that were "consistent with dropped blood"<sup>(203)</sup>.

After Aguirre's conviction, new evidence came to light that called into question some of the State's forensic evidence. It was subsequently determined that the palm-print comparison, which the analyst had testified "matched" Aguirre's palm print to the one found on the murder weapon, had actually been "inconclusive"<sup>(204)</sup>.

Aguirre filed a motion for a new trial based on the newly discovered palm-print evidence, but the trial court denied his motion, and the denial was affirmed on appeal, due to the "vast amount of evidence linking Aguirre to the murders"<sup>(205)</sup>. Logically, the testimony of the palm-print analyst could have

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(195) See *Id.* at 599.

(196) *Id.*

(197) See *Id.*

(198) See *Id.* at 598.

(199) See *Id.*

(200) *Id.* at 598-99.

(201) *Id.* at 603.

(202) See *Id.*

(203) *Id.*

(204) *Id.*

(205) *Id.*

meant only one of two things. Best case scenario, the “science” of palm-print comparison was so subjective and standardless that there was no replicable protocol for distinguishing a “match” from an inconclusive comparison.

Worst case scenario, the forensic analyst had testified falsely, claiming dishonestly to have found a match where none existed. Either way, the discovery of the withheld information should have given the court pause when assessing the weight of the “vast amount” of other scientific evidence. “Matching” shoeprint impressions in blood to the soles of a suspect’s shoes, “matching” knife wounds to the blade of a particular knife, and “matching” bloodstain patterns to activities in a bloody crime scene all suffer from the same methodological flaws as testimony that a palm print could only have been left by a particular suspect’s palm.

The court nonetheless rejected Aguirre’s challenge to the admission of misleading evidence regarding the palm-print match because of the balance of the other pattern-matching forensic evidence in the case.

### **B. Analysis**

“Over the past century, little has changed with respect to how forensic identification examiners render identifications”<sup>(206)</sup>. Ordinarily, science is meant to be progressive, but the long, unchanged history of the pattern-matching forensic sciences is often used by forensic analysts, prosecutors, and courts to buttress their reliability. For example, in *Pettus v. United States*<sup>(207)</sup>, Pettus was charged with the rape and murder of an elderly woman in her home<sup>(208)</sup>.

To link Pettus to the victim, the Government introduced expert testimony from an FBI forensic document examiner that a handwritten note left on her body had been written by Pettus<sup>(209)</sup>. The testimony was based on two assumptions: “that no two people write exactly alike, and that a document examiner can determine if the writer of a known writing also wrote a questioned writing given sufficient samples for comparison”<sup>(210)</sup>. These assumptions are the same assumptions that underlie all the pattern-matching forensic disciplines, which have been the subject of a great deal of recent criticism.

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(206) Cooley, *Supra* Note Xxx, at 368.

(207) 37 A.3d 213 (D.C. 2012).

(208) See *Id.* at 215.

(209) See *Id.* at 215-16.

(210) *Id.* at 223.

Pettus challenged the admissibility of the testimony on the ground that the recent report by the National Academy of Sciences<sup>(211)</sup> demonstrated that the pattern-matching forensic sciences had not been scientifically validated<sup>(212)</sup>. In opposition to Pettus’s motion to exclude the testimony, the Government argued that the handwriting identification was reliable because it had “long been an acceptable practice”<sup>(213)</sup>. The longstanding perceived reliability of the forensic sciences became the lodestar of actual validity.

Craig Cooley explains the relationship between the history and role of forensic science in this way:

Criminal investigators and prosecutors had to somehow convert circumstantial physical evidence into “[u]n- impeachable physical evidence.” Similarly, they had to convince jurors that this evidence was presented by forensic experts whose veracity and perceptual acuity were beyond reproach. . . . To accomplish this, criminal investigators ingeniously crafted various purportedly scientific techniques, which were premised on the supposedly irrefutable scientific fact that nature never repeats itself. Investigators and prosecutors then went on an extensive public relations campaign, professing that these scientific techniques were impervious to error and doubt because they were based on objective science, which did not require probabilistic reasoning or interpretation<sup>(214)</sup>.

## VI. Conclusion

Philippa Gates has documented the rise of the “forensic scientist” and “contemporary criminalist” as a new cultural hero, the “protagonist with a higher education and a knowledge of the literary classics” and “the descendent of the classical sleuth”<sup>(215)</sup>. She explains:

From William Powell to Humphrey Bogart— or debonair to tough; from Bruce Willis to William Petersen— or wisecracking to wise: the celluloid detective has evolved

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(211) National Research Council, National Academy of Sciences, *Strengthening Forensic Science in The United States: A Path Forward* (2009).

(212) See Pettus, 37 A.3d at 215.

(213) Brief For Amicus Curiae Public Defender Service in Support of Appellant, *Pettus V. United States*, No. 08-Cf-1361, 2010 WL 8510644 (D.C.) (Appellate Brief), at \*2.

(214) Cooley, *Supra* Note Xxx, at 543-44.

(215) Philippa Gates, *Detecting Men: Masculinity and The Hollywood Detective Film* 159 (2006)

over time, processing society's fears about crime and articulating debates about law enforcement and justice. . . . The criminalist is a modern-day incarnation of the classical sleuth first envisioned by Edgar Allan Poe in the 1840s with C. Auguste Dupin, the hero of a handful of "tales of ratiocination," and popularized by Sir Arthur Conan Doyle's famous detective Sherlock Holmes in the late 1800s<sup>(216)</sup>.

This history and public perception matter because they are among the barriers to courts critically evaluating and screening evidence generated by the pattern-matching disciplines. When defendants challenge the prosecution's forensic evidence as scientifically invalid or unreliable in application, they are not just attempting to debunk questionable science. They are maligning more than a century of sleuths and heroes and destroying cherished cultural myths around the scientific investigator.

Take Bundy as an example. Much of the forensic evidence used to convict him – including microscopic hair comparison and forensic bite mark matching – have subsequently been debunked.<sup>(217)</sup> Although Bundy confessed to the killings and there was other evidence establishing his guilt, challenging these sciences still means, in some sense, challenging the strength of evidence against Bundy, and challenging the evidence in the Bundy trial would mean siding with the Devil.

When it comes to the pattern-matching forensic sciences, history should play a different role, by serving as a critical warning rather than a congratulatory buttress. The history of "sciences" that have been conclusively discredited should give courts more caution, not less, when they are asked to review their beloved cults of investigation. After all, the scientific "genius" who gave us the original myth of fingerprints was also a devotee of phrenology and white racial superiority, which seems to be a compelling argument for taking his other scientific contributions with at least a grain of salt. We are a living in a moment where we are finally having serious discussions about pulling down glorified monuments to the Great White Fathers of the past. Perhaps it is time for Francis Galton to take his place in history next to Robert E. Lee.

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(216) *Id.* at 4-5.

(217) See Leonetti, *Supra* Note Xxx, at 101; David Wilson, Forensic Science Can Be a Useful Tool to Discover the Real Tooth . . . , *Daily Record*, August 16, 2021, Available at: <https://www.dailyrecord.co.uk/News/Scottish-News/Forensic-Science-Can-Useful-Tool-24766065> (Last Visited August 17, 2021).

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