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TURNING A BLIND EYE TO MISLEADING SCIENTIFIC TESTIMONY: FAILURE OF PROCEDURAL SAFEGUARDS IN A CAPITAL CASE

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ABSTRACT

In September 1999, Robin Lovitt was convicted and sentenced to death for the murder of a pool hall manager in Arlington, Virginia. The DNA evidence that was a key part of the government's case was presented in a misleading and unfair manner. In this case study, we first examine the way in which DNA evidence was misused. We then discuss the failure of the legal system at all levels to recognize and remedy this problem. Our goal is to explain how a system that supposedly leaves no stone unturned in capital trials managed to miss or ignore a crucial problem with the scientific evidence that supported the conviction. We argue that the *Lovitt* case is indicative of systemic problems with the use of scientific evidence that could affect the fairness of criminal trials nationwide, and we suggest legal and institutional reforms that may help minimize the risk of similar problems in the future.

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I. INTRODUCTION

Television dramas like the popular "CSI" series have highlighted the importance of forensic science in criminal investigations. These programs show forensic scientists solving crimes with unerring accuracy by examining and drawing conclusions from physical evidence. Ironically, while television has been glorifying crime labs, there has been growing skepticism about some of the claims that forensic scientists have been making in court.[1] For example, an article in the prominent journal *Science* argued that many areas of the "forensic identification science[s]" are "underresearched and oversold."[2] Instances in which forensic scientists have used shoddy methods, interpreted their results carelessly, and presented findings in a misleading manner have been widely documented.[3]

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[1] *See, e.g.,* Simon A. Cole, *Where the Rubber Meets the Road: Thinking about Expert Evidence as Expert Testimony,* 52 VILLANOVA L.REV. 803 (2007) (arguing that "over-claiming" by forensic scientists is a significant problem); *see also* Simon A. Cole, *More Than Zero: Accounting for Error in Latent Fingerprint Identification*, 95 J. CRIM. L. & CRIMINOLOGY 985 (2005) (questioning the validity and accuracy of fingerprint identification); *see also* Adina Schwartz, *A Systemic Challenge to the Reliability and Admissibility of Firearms and Toolmark Identification*, 6 COLUM. SCI. & TECH. L. REV. 1 (2005) (questioning the validity of toolmark identification); *see also* Lynn C. Hartfield, *Daubert/Kumho Challenges to Handwriting Analysis*, 26 THE CHAMPION 24 (2002) (questioning the validity of handwriting testimony and offering strategies to challenge it in court); *see also* Edward J. Imwinkelried & William A. Tobin, *Comparative Bullet Lead Analysis (CBLA) Evidence: Valid Inference or Ipse Dixit?*, 28 OKLA. CITY U. L. REV. 43, (2003) (questioning the accuracy of CBLA evidence); *see also* Michael J. Saks, *Banishing Ipse Dixit: The Impact of* Kumho Tire *on Forensic Identification Science*, 57 WASH. & LEE L. REV. 879 (2000) (discussing forensic identification science's growing lack of credibility); *see also* Clive Stafford Smith & Patrick D. Goodman, *Forensic Hair Comparison Analysis: Nineteenth Century Science or Twentieth Century Snake Oil?*, 27 COLUM. HUM. RTS. L. REV. 227 (1996) (evaluating the credibility of forensic hair comparison analysis).

[2] Michael J. Saks & Jonathan J. Koehler, *The Coming Paradigm Shift in Forensic Identification Science*, 309 SCIENCE 892, 892 (2005) (discussing changes in thought with regard to forensic identification sciences).

[3] *See* Paul C. Giannelli, *Wrongful Convictions and Forensic Science: The Need to Regulate Crime Labs*, 86 NO.CAROLINA L.REV 163 (2007); *See also* JOHN F. KELLY & PHILLIP K. WEARNE, TAINTING EVIDENCE: INSIDE THE SCANDALS AT THE F.B.I. CRIME LAB (1998); *see also* Paul C. Giannelli, *The Abuse of Scientific Evidence in Criminal Cases: The Need for Independent Crime Laboratories*, 4 VA. J. SOC. POL'Y & L. 439, 439, 441 (1997); Craig M. Cooley, *Reforming the Forensic Science Community to Avert the Ultimate Injustice*, 15 STAN. L. & POL'Y REV. 381, 395–97 (2004); *see also* William C. Thompson, *Tarnish on the "Gold Standard:" Understanding Recent Problems In Forensic DNA Testing*, 30 THE CHAMPION 10, 10–12 (2006) [hereinafter *Tarnish*]; The Office of the Independent

Concerns about problematic forensic evidence are supported by studies that look at the causes of false convictions. While eyewitness error is widely recognized as the leading cause, a recent review of 86 cases in which convicted defendants were exonerated by DNA evidence found that bad forensic science was a close second.[4] Eyewitness errors were a factor in 71% of these cases, but "forensic science testing errors" occurred in 63% of the cases and "false [or] misleading testimony by forensic scientists" occurred in 27% of the cases.[5]

In light of these findings, it is important to consider the ability of the justice system to detect and remedy problems with scientific evidence. We will argue that the system, at present, does a poor job of distinguishing strong from weak forensic science. As an illustration we will examine a capital case in Virginia[6] in which DNA evidence was presented to the jury in a highly misleading manner. Although this problem affected the fundamental fairness of the trial, it was never addressed during direct appeals nor was it addressed during collateral state and federal habeas proceedings.[7] We will explore this particular failure of the justice system in detail and seek to draw broader lessons about the ability of the system to detect and remedy problems in forensic science, and how that ability might be

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Investigator for the Houston Police Department Crime Laboratory and Property Room, http://www.hpdlabinvestigation.org (discussing the Houston crime laboratory scandal) (last visited Sept. 12, 2007); *see also* USDOJ/OIG SPECIAL REPORT, THE FBI LABORATORY: AN INVESTIGATION INTO LABORATORY PRACTICES AND ALLEGED MISCONDUCT IN EXPLOSIVES-RELATED AND OTHER CASES (April 1997), *available at* http://www.usdoj.gov/oig/special/9704a/ (outlining the investigation into the FBI crime lab scandal); *see also* Report of the Kaufman Commission on Proceedings Involving Guy Paul Morin, *available at* http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/morin/ (summarizing the Canadian scandal surrounding the false conviction of Guy Paul Morin); *see also* Scientific Testimony, An Online Journal, http://www.scientific.org (mentioning that Virginia Governor Warner commuted Robin Lovitt's death sentence due to improper destruction of biological evidence) (last visited March 9, 2008); *see also* Forensic Fraud, http://www.corpus-delicti.com/forensic_fraud.html (archiving news articles on fraudulent forensic science) (last visited March 9, 2008); Junk Science in the Courtroom, http://www.truthinjustice.org/junk.htm (providing materials on forensic error and fraud) (last visited March 9, 2008); *see also* David P. Beiter, *LABSCAM*, http://www.marijuanalibrary.org/LABSCAM.html (providing materials on forensic error and fraud) (last visited March 9, 2008).

[4] Saks & Koehler, *supra* note 2, at 893.

[5] *Id.* at 892.

[6] Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866 (Va. 2000), *cert. denied*, 534 U.S. 815 (2001).

[7] *See id.* at 873–81 (listing the arguments made by Lovitt on appeal).

improved.

Section I of the article will provide an overview of the case of *Robin Lovitt v. Commonwealth of Virginia*,[8] focusing on the nature of the state's DNA evidence, the misleading manner in which that evidence was presented to the jury, reasons this problem occurred, and why it was not caught at trial. Section II will discuss the extensive review of the case that occurred during direct appeal and during collateral state and federal habeas proceedings. This discussion will reveal that the problems with the DNA evidence, that we consider fundamental to the case, were never addressed. We will comment on possible reasons for this failure. Section III will discuss Lovitt's successful petition for clemency, which was granted on grounds unrelated to the problems with the presentation of DNA evidence at trial. Section IV will discuss unsuccessful efforts to have the *Lovitt* case reviewed by Virginia's new Forensic Science Board and Scientific Advisory Committee, which are state boards created for the purpose of overseeing and improving the work of the State Forensic Laboratory. Finally, Section V will draw lessons from the case-study analysis and make recommendations for improving the way in which the justice system handles scientific evidence.

II. ROBIN LOVITT V. COMMONWEALTH OF VIRGINIA

A. Facts of the Case as Presented at Trial

In the early morning hours of November 18, 1998, two men entered Champions Billiards Hall (hereinafter the pool hall) in Arlington, Virginia, and saw the night manager, Clayton Dicks, fighting with another man behind the bar.[9] The other man appeared to be an African-American.[10] When they saw the other man stab Dicks several times with a silver-colored weapon, they immediately left the pool hall and called the police.[11] When the police arrived, Dicks was lying on the floor, fatally wounded.[12] The pool hall cash register was broken and its cash drawer was

[8] *Id.* at 866.
[9] *Id.* at 870–71.
[10] *Id.* at 870.
[11] *Id.* at 871.
[12] *Lovitt I*, 537 S.E.2d at 871.

missing.[13] A police canine unit found a pair of bloodstained scissors "in the woods about 15 yards behind the pool hall."[14] The two eyewitnesses recalled seeing a light-colored Cadillac in the parking lot when they arrived at the pool hall that night, but the car was gone when they returned with the police.[15] The police issued a bulletin asking officers to be on the lookout for an "older white Cadillac."[16]

Robin Lovitt, a former employee of the pool hall, was arrested for the crime several days later.[17] Lovitt admitted to having stolen the cash drawer, but claimed he had no involvement in the murder.[18] According to his account, he was in the pool hall restroom and emerged to see another man fighting with Dicks.[19] When the assailant left, Lovitt approached Dicks, who appeared to be dead.[20] Needing money, Lovitt decided to take a locked cash drawer from the register.[21] He carried the cash drawer through the woods behind the pool hall to the home of his cousin, who helped him open it.[22] Lovitt's cousin, Warren Grant, who "lived about a quarter of a mile from the pool hall," testified at trial that Lovitt had brought the cash drawer to his home in the "early morning hours of November 18, 1998" and that the two had broken open the cash drawer and split the money.[23] Lovitt claimed that he left the pool hall on foot.[24] He did not own a Cadillac.[25]

During the preliminary hearing neither of the two eyewitnesses could identify Lovitt as the man they had seen stabbing Dicks, but at trial one of the two testified he was 80% certain Lovitt was that man.[26] Casal Lucas, an inmate who had

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[13] *Id.*

[14] *Id.*

[15] *Id.* at 872–73.

[16] *Id.* at 873.

[17] *Id.* at 870–71.

[18] *See Lovitt I,* 537 S.E.2d at 872 (stating that Lovitt told Lucas, his cellmate in Arlington County Jail, that he grabbed the cash drawer after seeing someone else stab Dicks).

[19] *Id.*

[20] *See id.*; Lovitt v. Warden (*Lovitt II*), 585 S.E.2d 801, 813 (Va. 2003).

[21] *See Lovitt I,* 537 S.E.2d at 870–73, 877.

[22] *Id.* at 871, 877.

[23] *Id.*

[24] *Lovitt II,* 585 S.E.2d at 812–13. *See also* Brief of the Commonwealth at *12, *33, *Lovitt I,* 537 S.E.2d 866 (Nos. 001015, 001420), 2000 WL 34613063.

[25] Opening Brief of Appellant at *5, *18, *Lovitt I,* 537 S.E.2d 866 (Nos. 001015, 001420), 2000 WL 34613062.

[26] *Lovitt I,* 537 S.E.2d at 871.

been housed with Lovitt in the Arlington jail, testified at the trial that Lovitt had confessed to killing Dicks in order to steal the money to buy drugs.[27]

Forensic examination found no fingerprints matching Lovitt on the bloodstained scissors.[28] The shirt and pants Lovitt was wearing when arrested matched the description provided by several witnesses of what Lovitt was wearing the night of the killing.[29] An examination of the shirt and pants found no bloodstains.[30] However, when he was arrested, Lovitt was also wearing a jacket.[31] A forensic analyst testified that there was a bloodstain on the front of this jacket, although DNA tests on that stain had produced inconclusive results.[32]

DNA tests were also conducted on two bloodstains on the scissors.[33] The state's DNA analyst testified that a stain near the pointed tip of one blade contained a DNA profile consistent with the victim, Clayton Dicks.[34] A second stain higher on the blade contained a mixture of DNA from more than one person.[35] The DNA profile[36] of the primary donor again matched Clayton Dicks.[37] However, the stain contained an additional genetic allele (allele 17 at locus vWA) that could not have come from Dicks, but could have come from Lovitt.[38] Because only a single allele was found, rather than a complete profile, the DNA analyst testified that she could not say conclusively whether Lovitt's profile was or was not consistent with that of the second

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[27] *See id.* at 872.

[28] *See id.* at 871–72.

[29] *See id.* at 870–72.

[30] Transcript of Record at 1214, 1216, *Lovitt I*, 537 S.E.2d 866 (Nos. 001015, 001420) [hereinafter Transcript of Record, *Lovitt I*].

[31] *Lovitt I*, 537 S.E.2d at 871.

[32] Transcript of Record, *Lovitt I*, *supra* note 30, at 1179.

[33] *Id.* at 1167.

[34] *Id.* at 1175–76.

[35] *Id.* at 1175–77.

[36] JOHN M. BUTLER, FORENSIC DNA TYPING: BIOLOGY, TECHNOLOGY AND GENETICS OF STR MARKERS, 23 (Mark Listewnik et al. eds., Elsevier Academic Press) (2d ed. 2005) ("DNA profiling is the process of determining the genotype present at specific locations along the DNA molecule. Multiple loci are typically examined in human identity testing to reduce the possibility of a random match between unrelated individuals.").

[37] Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866, 872 (Va. 2000).

[38] *See* Transcript of Record, *Lovitt I*, *supra* note 30, at 1177–78. Brief of the Commonwealth, *supra* note 24, at *10–12. An allele is "[a]ny one of a series of two or more different genes that occupy the same position (locus) on a chromosome." Biology-Online, http://www.biology-online.org/dictionary/Allele (last visited March 9, 2008).

contributor to the DNA mixture.[39] Nevertheless, Lovitt possessed the additional allele and therefore could not be eliminated as a possible contributor.[40] A DNA expert called by the defendant testified that approximately 19% of African-Americans have the allele in question, and 81% do not have that allele.[41]

In closing arguments the prosecutor noted that Warren Grant (Lovitt's cousin) and a woman who lived with Grant had both testified that Lovitt was sweating when he arrived at their house with the cash drawer.[42] The prosecutor suggested Lovitt's sweat was the source of the extra allele on the scissors:

> [W]e know that it is a mixture, and we know that mixtures frequently are made by fluids. So there is the blood from the victim, and then there is some other body fluid. It could well be sweat, for instance.
>
> But what you know is that when the defendant arrived at Warren Grant's house, both Warren Grant and Delores Harris noticed he was sweating, and that was just minutes before he would have discarded those scissors, which was just minutes before he had stabbed Clayton Dicks with them.
>
> Now, nobody could say yes, this is definitely the defendant's DNA. But you will remember—and this is why it is important—that the goal of DNA analysis is to exclude people from being the contributors of the DNA . . . [a]nd what you know is that the defendant has an allele number 17.
>
> Robin Lovitt cannot be excluded as the person who left the sweat on those scissors.[43]

The prosecutor went on to argue that the blood on Lovitt's jacket came from the victim and that Lovitt was aware of that fact and tried to cover it up by claiming he had not been wearing the jacket the night of the crime.[44]

> Blood on the jacket, that's another circumstance for you to consider. [The eyewitnesses] both told you the murderer had on a jacket. They said it was a blue jacket, a dark jacket. And you can see [defendant's] jacket in the Polaroid.
>
> You know the defendant had on this jacket on the 24th of November. You know it's his jacket. And he had told Detective

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[39] Transcript of Record, *Lovitt I*, *supra* note 30, at 1178.
[40] *See id.*; Brief of the Commonwealth, *supra* note 24, at *10–12.
[41] Transcript of Record, *Lovitt I*, *supra* note 30, at 1438–39.
[42] *Id.* at 1530.
[43] Transcript of Record, *Lovitt I*, *supra* note 30, at 1530–31.
[44] *Id.* at 1531–33.

> Hanula that he had been wearing all of those clothes except for the shoes for the past few days.
>
> Now, he told Officer Ferrone, I wasn't wearing that jacket at the time it occurred, and that gets to be another matter of significance.
>
> The defendant was concerned obviously about blood on his clothing. He told [the jailhouse informant] that he was concerned about blood on his clothing, that he changed some of his clothing, and he mentioned particularly a T-shirt. And he said that there was blood on the stomach area.
>
> I'm not going to pick up the jacket again, but if you want to look at it, you will notice that there were cut out pieces of where the DNA was on the jacket, and that is where the blood spots were. And it was right there on the stomach area.
>
> But of course it's a dark jacket. He probably didn't notice it in the beginning. . .
>
> Now, I realize [the DNA expert] can't tell you much about the blood, and she told you why, because somehow the dye or whatever was masking it. But you do know that it fact there was blood on it.[45]

In sum, the prosecution presented what appeared to be a credible and convincing case. The key difficulty for the prosecution was proving that Lovitt actually committed the murder, rather than merely stealing the cash box after the crime as Lovitt claimed.[46] Had the prosecution relied solely on the 80%-certain eyewitness and the jailhouse informant,[47] the case would have been weak, as problems with the reliability of eyewitnesses and "jailhouse snitches" are well known.[48] In that regard, the loose end concerning the Cadillac[49] might well have troubled the jury.

What bolstered the case, and made it credible, was the scientific evidence that appeared to link Lovitt directly to the stabbing through a classic double-transfer.[50] Forensic investigators found DNA consistent with Lovitt on the murder weapon, while they also found blood (possibly from the victim) on

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[45] *Id.*

[46] Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866, 872 (Va. 2000).

[47] *Id.* at 871–72, 877.

[48] *See* BARRY SCHECK, PETER NEUFELD & JIM DWYER, ACTUAL INNOCENCE: FIVE DAYS TO EXECUTION AND OTHER DISPATCHES FROM THE WRONGLY CONVICTED 127–30 (2000) (discussing, anecdotally, the pervasive nature of errors in jail house snitching, as known to lawyers, police officers, and the media).

[49] *Lovitt I*, 537 S.E.2d at 872–73, 877.

[50] *See id.* at 872.

Lovitt's jacket, a fact Lovitt tried to cover up.[51] The DNA tests were hardly definitive, but they appeared to provide convincing circumstantial evidence. Based on the expert testimony about the DNA evidence, jurors could reasonably infer that there was better than an 80% chance that an innocent person, chosen at random, would be eliminated as the source of the extra allele on the scissors; yet Lovitt was not eliminated.[52] The DNA tests on the jacket were "inconclusive," but the location of the blood fit neatly with the prosecution's theory that Lovitt was the murderer.[53] The blood was on the front of the jacket—right where one would expect there to be blood splatter from the stabbing victim (and right where the informant had claimed Lovitt found blood on a t-shirt that he discarded).[54] The DNA tests, as reported to the jury, made a weak and problematic case appear solid and credible.

On September 20, 1999, after less than two hours of deliberation, the jury found Lovitt guilty of capital murder of Clayton Dicks during the commission of a robbery.[55] The trial then entered a penalty phase, which culminated in a sentence of death.[56]

B. A Closer Look at the DNA Evidence

Carol Palmer, of the Virginia Division of Forensic Science (DFS) Northern Laboratory in Fairfax Virginia, conducted the DNA testing in this case.[57] Palmer used a testing kit known as Promega PowerPlex that examines short tandem repeats (STR's) at eight genetic locations (loci) on the human genome.[58] At each locus there are several possible markers (called "alleles") that a

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[51] *See id.* at 871–72.

[52] *See id.* at 872, 877; *see also* Transcript of Record, *Lovitt I*, *supra* note 30, at 1153, 1167, 1176–78.

[53] *Lovitt I,* 537 S.E.2d at 872; Transcript of Record, *Lovitt I*, *supra* note 30, at 1531–34.

[54] *Id.* at 1531–32.

[55] *Lovitt I,* 537 S.E.2d at 879 (jury deliberated for one and one-half hours); Brief of the Commonwealth, *supra* note 24, at *1 (date of trial and jury verdict).

[56] *Lovitt I*, 537 S.E.2d at 870.

[57] Transcript of Record, *Lovitt I*, *supra* note 30, at 1154. Palmer has a Masters Degree in Forensic Science from Virginia Commonwealth University. *Id.* at 1155.

[58] *See id.* at 1161–63 (describing the PowerPlex system). *See generally* BUTLER, *supra* note 36, at 85–91, 126 (offering background information on STR testing).

person might have.[59] To identify those alleles, the DNA from the eight loci is amplified (replicated) and then separated by length on a gel.[60] The alleles produce fluorescent "bands" that are detected by a computer-operated scanning device.[61] The position of the bands on the gel indicates which of the various alleles have been detected.[62] The darkness or intensity of a "band," which the computer measures in units of optical density ("OD"), indicates roughly how much DNA is present from the individual who was the source of the band.[63] Each individual has two alleles at each locus—one allele is inherited from each parent.[64] Numbers are used to designate the alleles.[65]

The bands detected by the computer are displayed on a printout called a STaRCall spreadsheet.[66] However, the analyst may sometimes decide to ignore or override the computer's determinations when deciding whether to report bands.[67] Based on visual examination of a "band," the analyst may decide, for example, that the band is spurious or unreliable, and therefore decide not to report it or to call the results "inconclusive."[68] Under the DFS protocol, the decision to call a band "inconclusive" rests entirely upon the subjective judgment of the analyst.[69] There is no objective standard. In the *Lovitt* case, analyst

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[59] BUTLER, *supra* note 36, at 23.

[60] *See id.* at 361–67 (providing a complete description of the system). At the time of the *Lovitt I* trial, analysts in the Virginia DFS used the Hitachi/FM-Bio system, which uses gel electrophoresis, to separate the amplified DNA by length and detect the resulting "bands;" *see DNA Typing in Action: Databasing in the Commonwealth of Virginia*, 3 PROFILES IN DNA 3, 5 (1999), *available at* https://www.promega.de/profiles/301/ProfilesinDNA_301_03.pdf.

[61] BUTLER, *supra* note 36, at 363.

[62] *Id.*

[63] *Id.*

[64] *Id.* at 23.

[65] *See id.* at 106–113 (describing the numbers assigned to different alleles).

[66] *Id.* at 363. STaRCall is a trademark of the company that produced the software used by DFS for band detection. VA. DEP'T OF FORENSIC SCI., *Fluorescent Detection PCR-Based STR DNA Protocol: PowerPlex 16 Bio System,* FORENSIC BIO. SEC. PROC. MANUAL, SEC. III, Apr. 18, 2006, at 6, *available at* http://www.dfs.state.va.us/services/forensicBiology/manuals/procedures/03%20-%20III-PP16%20BIO%202003/15%20-%20Chapter%209%20-%20Interpretation.pdf [hereinafter MANUAL].

[67] *See* BUTLER, *supra* note 36, at 376.

[68] *See generally* MANUAL, *supra* note 66, at 4–6 (discussing how the analyst decides based on examination of the band whether the results are inclusive).

[69] *See* BUTLER, *supra* note 36, at 376 (noting how an analyst makes the difficult calls based on his/her experience); *see also* MANUAL, *supra* note 66, at 4–6 (discussing how the analyst visually inspects each gel and deems if they are interpretable).

Palmer declared a number of bands that were detected by the computer to be "inconclusive."[70] Her decision to disregard bands detected by the computer, which was never reported to the jury, is part of what makes the DNA evidence in the case problematic.[71]

Table 1: Alleles Detected in DNA Testing—*Lovitt v. Commonwealth*[72]

(Numbers in parentheses show the optical densities of the underlying bands as shown in the StaRCall Spreadsheet)

Genetic Locus

Sample	CSF1PO	TPOX	THO1	vWA	D16S539	D7S820	D13S317	D5S818
Clayton Dicks	8, 13	8, 9	7, 7	11, 14	12, 13	8, 11	10, 14	8, 12
Robin Lovitt	10, 12	8, 11	7, 9.3	16, 17	9, 12	8, 12	11, 12	10, 12
Scissors Stain B	8 (271), 13 (121)	8 (296), 9 (272)	7 (2314)	11(2553) 14(2508) 17 (131)	12 (75) 13 (61)	8 (146) 11 (129)	10 (140) 14 (101)	8 (456) 12 (483)
Jacket—Cert. of Analysis	-INC-	***	-INC-	-INC-	-INC-	-INC-	-INC-	-INC-
Jacket—StaRCall Spread-sheet	10 (102) 12 (62)	***	***	16 (15), 17 (85)	***	8 (3), 12 (32)	11 (51), 12 (5)	10 (25), 11 (24), 12 (26)

Note: *** indicates no bands were detected; INC indicates that the analyst deemed the results "inconclusive."

Table 1 shows the DNA profiles (sets of alleles) of the key samples in the *Lovitt* case. There is no controversy about the DNA profiles of victim Clayton Dicks or defendant Lovitt, which are shown in the first two rows of the table. The third row of the

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[70] Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866, 872 (Va. 2000); Transcript of Record, *Lovitt I*, *supra* note 30, at 1179, 1181; COMMONWEALTH OF VA. DEP'T OF CRIM. JUSTICE SERVICES, DIV. OF FORENSIC SCI., *Certificate of Analysis*, Feb. 26, 1999, at 2120, *available at* http://www.scientific.org/news-notes/DNA%20testing%20results.pdf [hereinafter *Certificate of Analysis*].

[71] *See Lovitt I*, 537 S.E.2d at 872 (discussing how the DNA test results on the jacket were inconclusive); Transcript of Record, *Lovitt I*, *supra* note 30, at 1179, 1181; *Certificate of Analysis*, *supra* note 70, at 2120.

[72] *Certificate of Analysis*, *supra* note 70, at 2118–21; STaRCall Spreadsheet (on file with author).

table shows the alleles (bands) that were detected on the mixed stain on the scissors. The numbers in parentheses are the optical density (OD) values for each band as shown on the STaRCall spreadsheet.[73] Analyst Palmer reported all of the bands that the computer detected in the scissors stain.[74] The bands that she elected not to report were all found in the stain on Lovitt's jacket.[75] The fourth row of the table shows what Palmer reported regarding the jacket stain in the laboratory's Certificate of Analysis (formal report) on the case. At each locus she reported either that no results were obtained (designated by "***") or that the results obtained were "inconclusive" (designated "-INC-").[76] However, examination of the STaRCall spreadsheet above shows that the computer detected a total of eleven bands in this sample at five different loci. The last row (row 5) shows the alleles that the computer detected (with their corresponding optical densities).

During the trial, analyst Palmer testified that the DNA test results on the jacket were inconclusive, and the defense lawyers never challenged this characterization.[77] The prosecutor then argued that the blood on the jacket was from the victim, Clayton Dicks.[78] But the STaRCall results, shown in the last row of Table 1, tell a different story. The computer detected bands at five of the eight loci examined by the test.[79] This five-locus DNA profile does *not* match Clayton Dicks—it matches Robin Lovitt. At all five loci the alleles (bands) that the computer detected are exactly those that would be expected if Lovitt rather than Dicks

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[73] *See generally* BUTLER, *supra* note 36, at 363 (noting that a table includes optical density (OD) units); MANUAL, *supra* note 66, at 4, 8, 12. The authors received a copy of the spreadsheets (along with other information DFS had produced in discovery) in 2005 from journalist Margaret Edds of the VIRGINIAN PILOT. Edds was seeking the first author's opinion on the DNA testing in the Lovitt case. DFS had provided a copy of the STaRCall Spreadsheets to Lovitt's lawyer shortly before the trial. Letter from Deanne F. Dabbs, Program Manager, Forensic Biology Section, DFS, to Denman A. Rucker, Esq., counsel for Robin Lovitt (Sept. 8, 1999) (on file with author).

[74] *See Lovitt I*, 537 S.E.2d at 872; *Certificate of Analysis*, *supra* note 70, at 2120.

[75] *See Lovitt I*, 537 S.E.2d at 872; Transcript of Record, *Lovitt I*, *supra* note 30, at 1179; *Certificate of Analysis*, *supra* note 70, at 2120.

[76] Transcript of Record, *Lovitt I*, *supra* note 30, at 1179; *Certificate of Analysis*, *supra* note 70, at 2120–21.

[77] *Lovitt I*, 537 S.E.2d at 872; Transcript of Record, *Lovitt I*, *supra* note 30, at 1179, 1185, 1208.

[78] Transcript of Record, *Lovitt I*, *supra* note 30, at 1528–29, 1531–34.

[79] STaRCall spreadsheet, *supra* note 72.

was the source of the bloodstain. At one locus (D5S818) there is an additional allele (allele 11) that cannot be accounted for by Lovitt, but it could not have come from Dicks either.[80]

These results provide strong evidence that the bloodstain on Lovitt's jacket came from Lovitt himself, not from the victim. The probability that a randomly chosen person would happen to have a five-locus DNA profile that corresponds with the bands that the computer detected on the jacket is approximately 1 in 10,000 among Caucasians, and 1 in 20,000 among African-Americans.[81]

The optical density (OD) values of these bands were relatively low compared with the bands detected on the scissors, which indicates that these bands were relatively faint.[82] The faintness of the bands may be the reason that Palmer decided to characterize them as inconclusive. Extremely faint bands can sometimes be spurious—the product of random "noise" in the system—and therefore may be unreliable data. [83] However, if these jacket results are "random noise" how did they happen to match up so nicely with the profile of Robin Lovitt, the owner of the jacket? Monkeys playing with typewriters do not produce sonnets, and random noise in a DNA test does not produce a five-locus, one-in-10,000 DNA match.

As noted earlier, the DFS laboratory protocol leaves the decision to call a band "inconclusive" entirely to the analyst.[84] It is a subjective judgment. There is no objective standard. Moreover, analysts are not "blind" to the consequences of their judgment. Palmer was undoubtedly aware of how her determination would affect the prosecution's case. Under these

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[80] *See generally* MANUAL, *supra* note 66, at 4 (noting that because each person can contribute at most two alleles at a given locus, finding three alleles at a locus is generally taken as evidence of a mixture of DNA from more than one person. On the other hand, given the low OD value it might be a spurious result).

[81] The first author of this article computed these random match probabilities based on published FBI data on the frequency of the matching alleles among Caucasians and African-Americans in the United States. Bruce Budowle et al., *Population Data on the Thirteen CODIS-Core Short Tandem Repeat Loci in African Americans, U.S. Caucasians, Hispanics, Bahamians, Jamaicans, and Trinidadians,* 44 J. FORENSIC SCI. 1277, 1278–84 (1999) (presenting population data compiled by the FBI). Details of the computations are available from the authors.

[82] *See generally* MANUAL, *supra* note 66, at 14, 17 (noting the relativity weak intensity of the bands).

[83] *See* BUTLER, *supra* note 36, at 363; *see* MANUAL, *supra* note 66, at 10–12.

[84] *See supra* text accompanying note 69.

circumstances there is a real possibility that she was influenced, perhaps entirely unconsciously, to shape her conclusions in a direction helpful to the state.[85] Palmer could not have been relying solely on the optical density of the bands, as measured objectively by the computer. Three of the jacket bands (CSF1PO alleles 10 and 12, and vWA allele 17) have higher OD values than the weakest band on the scissors (allele 13 at locus D16S539).[86] Yet all of the jacket bands were deemed "inconclusive" and all of the scissors bands were reported.[87]

In sum, the DNA test results on the jacket have strong probative value for showing that the bloodstain came from Lovitt rather than Dicks. The failure to report these findings deprived the jury of an important piece of evidence that would have undermined a key point in the prosecution's case.

Next, let's consider the DNA test results on the scissors. While the jury heard nothing about the ten alleles that link Lovitt to the stain on the jacket, they heard a great deal about the single allele (allele 17 at locus vWA) that reportedly linked him to the scissors.[88] The presence of three alleles at locus vWA indicates that the stain on the scissors contains a mixture of DNA from more than one person.[89] Every allele in the profile except for the 17 allele at locus vWA corresponds with the profile of the victim, Clayton Dicks.[90] So the stain on the scissors appears to be a mixture of DNA from Dicks and another person who has vWA allele 17.

During the trial, much was made of the fact that Lovitt has

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[85] *See* Transcript of Record, *Lovitt I*, *supra* note 30, at 1209 (noting that Ms. Palmer knew it was a homicide); *see also* D. Michael Risinger, Michael J. Saks, William C. Thompson & Robert Rosenthal, *The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion,* 90 CAL. L. REV. 1, 9, 11, 19 (2002) (discussing how an examiner can be influenced by outside factors).

[86] *See supra* Table 1.

[87] In the absence of objective standards for interpretation, the failure of the lab to use blind procedures leaves the analyst open to the charge that her judgment was influenced by observer effects, also known as examiner bias. *See* Risinger, et al., *supra* note 85, at 9–10. In other words, the failure to use procedures that are either objective or blind, promotes suspicion that the analyst either consciously or unconsciously shaped her conclusions to fit the government's theory of the case. It is reasonable to wonder, for example, whether the analyst would have chosen to report the weak results on the jacket had they matched Clayton Dicks rather than Robin Lovitt.

[88] Transcript of Record, *Lovitt I*, *supra* note 30, at 1530–31.

[89] *Id.* at 1432.

[90] *Id.* at 1177.

vWA allele 17.[91] Palmer initially stated that she could "make no conclusion" as to whether Lovitt was included or excluded as a possible contributor to the DNA on the scissors.[92] When pressed by the prosecutor, however, she testified that she *could* have eliminated Lovitt had he not possessed the 17 allele.[93] This led to the following exchange:

> Q: So you were not able to eliminate him in doing this process totally?
>
> A: I was not able to draw a conclusion, therefore, not able to eliminate him either.[94]

An expert called by the defendant also conceded that because Lovitt possesses the "extra" 17 allele he could not be eliminated as a possible contributor to the scissors stain.[95] The defense expert testified that only 19% of African-Americans possess this particular allele and hence that 81% of that population could be eliminated as possible contributors.[96]

There are several problems with the evidence that was used to link Lovitt to the scissors. First, the defense expert provided an incorrect statistic about the percentage of the population who possess the 17 allele at locus vWA. Based on population data published by the FBI, it can be determined that about 33% of African-Americans, 46% of Caucasians and 40% of Hispanics possess that allele.[97] In other words, the defense expert significantly understated the frequency of this allele, making the fact that Lovitt happened to have the allele appear more significant than it actually was.[98]

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[91] *Id.* at 1178.

[92] *Id.*

[93] *Id.* at 1182–83.

[94] Transcript of Record, *Lovitt I*, *supra* note 30, at 1183.

[95] *Id.* at 1432, 1437.

[96] *See id.* at 1438.

[97] *See* Budowle, *supra* note 81, at 1277–85 (providing statistics on allele distribution).

[98] The defense expert appears to have made an elementary error in Genetics. The figure that he reported appears to have come directly from a table of data on the "allele frequency" of the vWA 17 allele. Transcript of Record, *Lovitt I*, *supra* note 30, at 1438. However, the "allele frequency" represents the percentage of all vWA alleles that are 17. As any student of genetics should know, the "allele frequency" is not the same as the percentage of people in a population who possess the allele. Because each person inherits two alleles, one from each parent, the proportion of a population that will possess a particular allele is $1-(1-f)^2$, where f represents the allele frequency. *See* BUTLER, *supra* note 36, at 468. According to the FBI data, , the *allele frequency* of vWA 17 is 0.1833 among African-Americans, 0.26276 among U.S. Caucasians, and 0.22167 among

A second problem with the theory that Lovitt's DNA was on the scissors is that Lovitt possesses *eleven* alleles that were *not* found on the scissors.[99] The experts who testified assumed that Lovitt might have contributed too little DNA for these other alleles to be detected.[100] It is generally understood that when the quantity of DNA from a contributor is extremely limited, DNA tests sometimes fail to detect a complete profile.[101] Most commonly the test fails to detect *any* alleles from a contributor at a particular locus, a phenomenon known as locus dropout.[102] This phenomenon probably explains the failure of the test to detect Lovitt's alleles on the jacket at locus TPOX, THO1 and D16S539. This phenomenon could possibly explain the failure to detect any of Lovitt's alleles on the scissors at any locus other than vWA, although there is no particular reason to expect vWA (rather than some other locus) to be the last or only locus at which a contributor's alleles are detected.

A further problem with the theory that Lovitt's DNA is on the scissors is that only one of Lovitt's two alleles at locus vWA was detected.[103] Generally, if a contributor has two alleles at a locus, a DNA test may detect both of them, one of them, or neither of them.[104] Finding one of two alleles, a phenomenon known as "allelic dropout" or "within locus dropout" is less common, although it sometimes happens.[105] When allelic dropout occurs, a random process controls which of the two alleles is lost.[106]

U.S. Hispanics. Accordingly, the 17 allele would be found in approximately 33% of African-Americans, 46% of U.S. Caucasians, and 40% of U.S. Hispanics. *See* Budowle, *supra* note 81.

[99] *See supra* Table 1.

[100] *See* Transcript of Record, *Lovitt I*, *supra* note 30, at 1438–39.

[101] *See* BUTLER, *supra* note 36, at 168–70.

[102] MANUAL, *supra* note 66, at 5.

[103] *See supra* Table 1 (noting that allele 17 was detected, while allele 16 was not).

[104] *See* Transcript of Record, *Lovitt I*, *supra* note 30, at 1433–34.

[105] As a point of comparison, notice that there is no evidence of allelic dropout on the jacket stain, only locus dropout. *See* Transcript of Record, *Lovitt I*, *supra* note 30, at 1435–36.

[106] As BUTLER, *supra* note 36, at 68, explains, "When amplifying very low levels of DNA template, a phenomenon known as *stochastic fluctuation* can occur. Stochastic effects, which are an unequal sampling of the two alleles present from a heterozygous individual, result when only a few DNA molecules are used to initiate PCR" (citation omitted).

In summary, while it is conceivable that Lovitt's DNA could account for the "extra allele" at locus vWA, this theory requires the occurrence of a series of unlikely underlying events: there must have been allelic dropout at locus vWA; the allelic dropout must have caused the loss of Lovitt's 16 allele rather than the 17 allele; and Lovitt's alleles must also have dropped out at every locus except vWA. So the theory that the secondary contributor is Lovitt is rather implausible. The alternative theory—that the secondary contributor is someone else—may actually be more plausible given that the 17 allele at locus vWA is found in over one third of the human population.[107] The alternative theory does not require that there have been allelic drop-out at locus vWA because the secondary contributor could have genotype 11,17 or 14,17 or 17,17.[108]

For readers who are interested in further discussion of the probative value of the DNA evidence linking Lovitt to the scissors we have provided a technical appendix.

C. Did Robin Lovitt Receive a Fair Trial?

When they retired to the deliberation room to decide Robin Lovitt's fate, the jurors undoubtedly had mistaken impressions about two key facts in the case. They surely thought it likely that DNA from Lovitt was on the scissors and that the victim's blood was on Lovitt's jacket. In fact, as we have shown, the evidence provides little or no support for the theory that Lovitt's DNA was on the scissors—it may actually show the opposite.

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[107] Approximately 5.8% of African-Americans, 12% of Caucasians and 7.5% of Hispanics have at least one of the 11, 14, or 17 genotypes. The frequency of people with one of the three genotypes in the general population, taking no account of race, is about 11%. *See* BUTLER *supra* note 36 at 579.

[108] Transcript of Dr. George Riley Aff. at ¶ 10, 2664, Post-Conviction Habeas Proceeding, Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866 (Va. 2000), *available at* http://www.scientific.org/news-notes/Riley%20Habeas%20affidavit.pdf. If the secondary contributor had one of these genotypes, only a single "extra allele" (allele 17) would be apparent beyond the two alleles of the primary contributor. The primary contributor's alleles (11 and 14) would mask (cover) the other allele of a secondary contributor with genotype 11,17 or 14,17. If the secondary contributor had genotype 17,17 (a homozygote) only a single 17 allele would appear. *See* Transcript of Record, *Lovitt I, supra* note 30, at 1433–34. As noted above, approximately 5.8% of African-Americans, 12% of Caucasians and 7.5% of Hispanics have one of these three genotypes. The frequency of people with one of the three genotypes in the general population, taking no account of race, is about 11%.

Furthermore, there is strong evidence (that the jury never heard) that the blood on Lovitt's jacket came from Lovitt himself, and not from the murder victim. Given the weakness of the other evidence in the case, it is by no means clear that the jury would have convicted Lovitt, had they known the truth about the DNA evidence.

Did Lovitt receive a fair trial? We think most people viewing this trial through the lens of everyday morality would conclude that he did not. Indeed, we think our analysis raises serious concerns about whether the jury reached the correct verdict. Consequently, we think that an effective system of post-trial review should have recognized the problems with the DNA evidence and provided a remedy. At a minimum, the issue should have been identified and its implications should have been carefully considered and discussed. As we will show in the next section, however, that did not happen. Although Lovitt was represented by able counsel and received the full panoply of post-conviction consideration afforded to those who are sentenced to death, the courts that participated in this process of review never directly recognized or acknowledged the problems that we have identified.

III. DIRECT APPEAL AND HABEAS CORPUS PROCEEDINGS

A. Direct Appeal

The Virginia Supreme Court heard Lovitt's direct appeal of the capital murder conviction and death sentence in 2000.[109] In the appeal Lovitt raised a plethora of issues,[110] but made no claim of any unfairness in the presentation of DNA evidence.[111] The

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[109] Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866, 870 (Va. 2000). Lovitt was represented at this stage by his trial counsel and another Virginia lawyer. *Id.* at 869.

[110] Lovitt raised a number of procedural challenges to Virginia's capital trial procedures that the court dismissed in a pro forma manner by citing to previous cases in which the same challenges had been denied. *Id.* at 873. The court gave more attention to a few issues, such as Lovitt's claims that the trial judge had erred in failing to strike a prospective juror for bias and in allowing police officers to vouch for the good reputation for truthfulness of the jailhouse informant, but ultimately found no merit to any of these arguments. *Id.* at 875–76.

[111] Lovitt raised only one issue on direct appeal that related in any way to DNA analyst Carol Palmer. When cross-examining Palmer, Lovitt's trial

Supreme Court found no reversible error in any judgments of the trial court and therefore affirmed the conviction and death sentence.[112]

Lovitt next petitioned the United States Supreme Court for a Writ of Certiorari.[113] At this stage, Kirkland and Ellis—one of the nation's premier law firms—which had taken the case *pro bono,* was representing Lovitt.[114] The petition focused on the trial judge's decision to admit evidence of Lovitt's prior criminal behavior during the sentencing phase of the trial, including alleged criminal acts for which he had not been convicted (unadjudicated criminal conduct).[115] The petition raised no claim of any unfairness related to the presentation of DNA evidence.[116] The United States Supreme Court denied the petition.[117]

B. State Habeas Proceedings

After the denial of Lovitt's direct appeal, the law firm of Kirkland and Ellis continued to represent him.[118] His counsel included prominent lawyers, most notably former United States Solicitor General and Watergate Special Prosecutor Kenneth Starr, a senior partner at the firm.[119] Robert E. Lee, an experienced appellate lawyer with the Virginia Capital

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lawyer asked whether she would have expected to find blood from the victim on Lovitt's clothing, if Lovitt had stabbed the victim. After Palmer responded that she would not necessarily have expected to find blood, Lovitt's lawyer sought permission of the court to impeach her by taking the stand himself and testifying that she had given a different answer when he had asked her the same question before trial. The trial judge refused to allow the lawyer to testify. Opening Brief of Appellant, supra note 25, at *21.

[112] *Lovitt I*, 537 S.E.2d at 881.

[113] Petition for Writ of Certiorari at *ii, *Lovitt I*, 537 S.E. 2d 866 (No. 00-1703), 2001 WL 34125025.

[114] *Id.*; *see also* Donna St. George, *Starr, in New Role, Gives Hope to a Needy Death Row Inmate*, WASH. POST, Mar. 14, 2005, at A01, *available at* http://www.washingtonpost.com/wp-dyn/articles/A32443-2005Mar13.html.

[115] Petition for Writ of Certiorari, *supra* note 113, at *9–23.

[116] *See id.* at *9–28 (raising no argument of unfairness related to the presentation of DNA evidence at trial).

[117] *Lovitt I*, 537 S.E.2d 866, *cert. denied*, 534 U.S. 815 (2001) (No. 00-1703).

[118] Lovitt v. Warden (*Lovitt II*), 585 S.E.2d 801, 805 (Va. 2003) (listing the names of appellant's counsel).

[119] *Lovitt II*, 585 S.E.2d at 805; St. George, *supra* note 114, at A01.

Representation Resource Center, also assisted on the case.[120] Lovitt's legal team devoted considerable energy and resources to investigating the case and, in November 2001, filed a state petition for a writ of habeas corpus.[121]

The petition alleged three general violations of Lovitt's due process rights: the state had destroyed the remaining biological evidence from the case, preventing any further DNA testing; the prosecution had suppressed exculpatory evidence; and Lovitt had received inadequate assistance of counsel at trial.[122] The Virginia Supreme Court "entered an order directing that the Circuit Court of Arlington County. . .conduct an evidentiary hearing" on these issues.[123]

The circuit court conducted a two-day evidentiary hearing in June 2002.[124] During this hearing, Lovitt's lawyers called two witnesses to testify about the DNA evidence.[125] Based on his review of the laboratory report, laboratory notes, gel images, and STaRCall Worksheets, Dr. George Riley—an expert in forensic DNA testing—expressed opinions about the evidence that are largely consistent with the views expressed in this article.[126] With regard to the scissors, he expressed the opinion that additional testing "could have demonstrated that the genetic material on those scissors could not have come from Mr. Lovitt. .

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[120] *Lovitt II*, 585 S.E.2d at 805. *See generally* Home Page for Robert E. Lee, http://www.law.virginia.edu/lawweb/Faculty.nsf/FHPbI/6108 (listing multiple positions held in appellate litigation) (last visited March 9, 2008).

[121] *Lovitt II*, 585 S.E.2d 801, *appeal docketed*, No. 012663 (Va. Sept. 12, 2003) (listing that the petition for writ of habeas corpus was filed on Nov. 30, 2001).

[122] *Lovitt II*, 585 S.E.2d at 808, 810, 813.

[123] *Id.* at 805.

[124] Lovitt v. True, 330 F. Supp. 2d 603, 610 (E.D. Va., 2004); Transcript of Record at 30, Lovitt v. Warden (*Lovitt II*), 585 S.E.2d 801 (Va. 2003) *available at* http://www.scientific.org/news-notes/riley%20and%20neufeld%20habeas%20testimony.pdf [hereinafter Transcript of Record, *Lovitt II*].

[125] *See* Transcript of Dr. George Riley Aff., *supra* note 108, at ¶ 3, 2661–62 (showing that Dr. Riley was called as a witness for the Defendant during the evidentiary hearing); *see also* Transcript of Peter Neufeld Aff. ¶ 4, 2109, Post-Conviction Habeas Proceeding, *Lovitt II*, 537 S.E.2d 866, *available at* http://www.scientific.org/news-notes/Neufeld%20Habeas%20affidavit.pdf (showing that Mr. Neufeld was called as a witness for the Defendant during the evidentiary hearing).

[126] Transcript of Record, *Lovitt II*, *supra* note 124, at 33–35.

."[127] Concerning the statistical frequency of the vWA 17 allele, Riley testified that it is found in 48% of Caucasians, 29% of Blacks, and 43% of Hispanics.[128]

With regard to the bloodstain on the jacket, Dr. Riley concluded, based on the data in the STaRCall worksheet, that it "almost certainly came from Mr. Lovitt himself."[129] When asked about the prosecutor's suggestion, in the closing argument, that there was blood from the victim on Lovitt's jacket, Riley said "that's completely inconsistent with the DNA results seen."[130] Riley did not testify about the statistical frequency of the DNA profile found on the jacket—i.e., the one-in-10,000 match with Lovitt. As noted below, this omission may have been important.[131]

The second DNA witness was Peter Neufeld, co-founder and co-director of the Innocence Project at the Cardozo Law School in New York City.[132] Neufeld was called primarily as an expert in post-conviction DNA testing to testify that the biological evidence that the state had destroyed was relevant and material to Lovitt's case.[133] However, Neufeld also testified that the DNA results from the scissors had been presented at trial in a manner "that is grossly misleading [to] the jury."[134] He expressed the opinion that it was unethical for the prosecutor to suggest during closing arguments that the bloodstain on Lovitt's jacket came from the victim when the prosecutor had "raw data in [his] hands. . .that the profile of that bloodstain matche[d] Mr. Lovitt."[135] Thus, the record created during the post-conviction

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[127] *Id.* at 34. Dr. Riley was clearly skeptical of the allelic dropout theory and thought the absence of Lovitt's 16 allele was strong evidence that Lovitt could *not* have been the secondary contributor; his views on this point appear to be more favorable to Lovitt than the views of the authors of this article. *See id.* at 46–56.

[128] *Id.* at 45–46. Unlike the defense witness who testified at trial, Dr. Riley computed these frequencies correctly. The numbers he presented differ slightly from the numbers presented in this article because he relied on a Commonwealth of Virginia database rather than the FBI database used by the authors. *Id.* at 46. *See also supra* note 97 and accompanying text (providing statistics on allele distribution from FBI database).

[129] Transcript of Record, *Lovitt II*, *supra* note 124, at 34–35.

[130] *Id.* at 54.

[131] *See infra* Part III.B.3.

[132] Transcript of Record, *Lovitt II*, *supra* note 124, at 72.

[133] *Id.* at 77, 83–88.

[134] *Id.* at 85.

[135] *Id.* at 123.

evidentiary hearing established the basic facts from which one could reasonably conclude that the jury was misled about the value of the DNA evidence, and that therefore Lovitt did not get a fair trial.

Although this evidence was in the record, it was not directly acknowledged or discussed in any subsequent court opinion. Following the evidentiary hearing, the circuit judge submitted to the state Supreme Court "a written report stating its findings of fact and recommended conclusions of law."[136] On September 12, 2003, the Supreme Court of Virginia accepted the circuit judge's recommendations and dismissed Lovitt's habeas petition.[137] The Supreme Court's lengthy opinion said very little about the DNA evidence and did not directly address any of the issues we have raised here about the way it was presented. Instead, the opinion focused on the three major legal challenges that Lovitt's counsel had raised in their briefs.[138]

1. Destruction of Evidence

It was undisputed that the Chief Deputy Clerk of the Circuit Court of Arlington County (hereafter "Clerk") had drafted an order authorizing the destruction of all the exhibits received in evidence in the *Lovitt* trial, including the scissors and Lovitt's jacket.[139] A circuit judge signed the order and the evidence was destroyed in late May of 2001.[140] This destruction of evidence violated a Virginia statute that took effect on May 2, 2001 that specifically requires in capital cases that the state "stor[e],

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136 Lovitt v. Warden (*Lovitt II*), 585 S.E.2d 801, 805 (Va. 2003).

137 *Id.* at 827.

138 *See id.* at 808, 810, 813.

139 *Id.* at 808.

140 *Id.* The Chief Deputy Clerk testified that he was unaware of the statute and thought he was authorized to destroy trial exhibits after the conviction was affirmed. *Id.* at 808–09. At the time the evidence was destroyed, however, Lovitt's direct appeal had not been affirmed. *Id.* (indicating that the evidence was destroyed on May 21, 2001, while Lovitt's petition for writ of certiorari to the U.S. Supreme Court was still pending). The Clerk testified that he sought to destroy the evidence in order to create additional space in the clerk's office evidence room. *Id.* at 808. Two deputy court clerks testified that they had advised the Clerk, "who was their immediate superior, that he should not destroy the evidence in Lovitt's case because it was a 'capital case' and Lovitt had not been executed." *Id.* at 809. The destruction of evidence violated a state policy that no evidence is destroyed in a capital case before the sentence is executed. *Id.* at 808–09.

preserv[e] and ret[ain]" any "human biological evidence" until the sentence is executed.[141]

Lovitt's lawyers argued that the state's intentional destruction of the biological evidence violated Lovitt's right of due process by depriving him of the opportunity for a meaningful habeas review.[142] Interestingly, Lovitt's lawyers did not argue that the biological evidence was exculpatory, only that it was *potentially* exculpatory because further testing might have helped Lovitt to prove his claim of actual innocence.[143] They also argued that destruction of the evidence undermined Lovitt's ability to prove his claim that his trial counsel was ineffective for failing to order "additional DNA testing."[144]

The Virginia Supreme Court found these arguments unconvincing, saying that Lovitt had "fail[ed] to present authority to support his claim that habeas corpus relief is the proper remedy for his inability to obtain this further testing."[145] The major authority Lovitt presented was *Arizona v. Youngblood,*[146] which established the principle that a state's bad faith destruction of potentially exculpatory evidence violates due process.[147] The Virginia Supreme Court questioned whether the principle established in *Youngblood* applies to post-conviction (rather than pre-trial) destruction of evidence and found the case inapplicable anyway because "the record lacks any evidence that an agent of the Commonwealth acted in bad faith."[148] As the Court conceived the issue, "[t]he presence or absence of bad faith

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141 VA. CODE ANN. § 19.2-270.4:1 (2004); *Lovitt II*, 585 S.E.2d at 809.

142 *Lovitt II*, 585 S.E.2d at 808–09.

143 This is an important distinction because, as explained below, it is a clear violation of due process for a state to destroy "exculpatory" evidence, regardless of whether the state's agents act in good or bad faith. Arizona v. Youngblood, 488 U.S. 51, 57 (1988) (citing Brady v. Maryland, 373 U.S. 83 (1963)). With respect to *potentially* exculpatory evidence, the defendant must show the state's agents acted in "bad faith" to establish a due process violation. *Id.* at 57–58. Potentially exculpatory evidence includes evidence "of which no more can be said than that it could have been subjected to tests, the results of which might have exonerated the defendant . . ." *Id.* at 67. Based on the analysis presented in this article, the DNA evidence on the jacket was not just *potentially* exculpatory, it was *actually* exculpatory.

144 *Lovitt II*, 585 S.E.2d at 813–14.

145 *Id.* at 814.

146 *Id.*; *Youngblood*, 488 U.S. at 51; *see also* California v. Trombetta, 467 U.S. 479 (1984).

147 *Youngblood*, 488 U.S. at 57–58.

148 *Lovitt II*, 585 S.E.2d at 816.

by the state depends on whether agents of the state had knowledge of the exculpatory value of the evidence when it was lost or destroyed."[149] Although Lovitt had presented evidence that the Chief Deputy Clerk acted illegally and in violation of longstanding policy, and that the Clerk knew he was ordering the destruction of biological evidence from a capital case, according to the Court, Lovitt had "not establish[ed] that an agent of the Commonwealth had knowledge of any exculpatory value of the trial exhibits at the time they were destroyed."[150] The Court went on to say that even if the Clerk had known that the exhibits contained biological evidence that could have been subject to additional testing, "such awareness would not have met the constitutional standard of materiality under *Youngblood*, because Lovitt can assert no more than the mere possibility that further testing could have exculpated him."[151]

2. Suppression of Exculpatory Evidence

Lovitt's second line of attack on his conviction concerned alleged *Brady* violations[152] — i.e., the failure of prosecutors to disclose exculpatory evidence. None of the alleged violations concerned DNA evidence. However, these claims are worth a quick review here because they highlight the weakness of the state's case against Lovitt. During the evidentiary hearing, Lovitt's lawyers presented evidence that prosecutors had failed to disclose three pieces of evidence: (1) that the medical examiner had concluded that the fatal wounds to the victim could not have been caused by scissors as small as those that were introduced at

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[149] *Id.* at 815.

[150] *Id.* at 809, 815–16.

[151] *Id.* at 816. In fact, Lovitt had asserted considerably more than the *mere possibility* that further testing would be exculpatory. *See* Opening Brief of Appellant at 13, *Lovitt II*, 585 S.E.2d 801 (No. 012663) (stating ". . . because the evidence was destroyed, Mr. Lovitt has been clearly prejudiced in his attempts to prove that his trial counsel was ineffective for failing to order additional DNA testing. DNA expert Dr. George Riley has testified that such testing would likely prove conclusively that blood on Mr. Lovitt's jacket was Mr. Lovitt's, not the victim's, as the Commonwealth argued at trial."). The Virginia Supreme Court did not mention or acknowledge Dr. Riley's testimony.

[152] *Lovitt II*, 585 S.E.2d at 805. For other examples of *Brady* violations, *see, e.g.*, Brady v. Maryland, 373 U.S. 83, 87 (1963); Kyles v. Whitley 514 U.S. 419, 421 (1995); Stickler v. Greene, 527 U.S. 263, 281 (1999).

trial as the murder weapon; [153] (2) that the jailhouse informant who testified against Lovitt had been a police informant in several previous cases;[154] and (3) that the jailhouse informant had made statements to prosecutors before trial that were inconsistent with his trial testimony.[155] The Court ultimately concluded that the withheld evidence, with one exception, was not actually exculpatory (within the meaning of *Brady*).[156] The exception was evidence that the jailhouse informant had received a benefit for acting as an informant in one previous case.[157] However, the Court concluded that the failure to disclose that one item of exculpatory evidence was not material because the jurors' ignorance of that evidence "did not place Lovitt's trial in a posture that would undermine confidence in the verdict."[158]

Once again, our main point in recounting these arguments is to note that they miss what we see as the major flaw in the trial. The Court never considered whether the misleading and inaccurate presentation of the DNA evidence might have "place[d] Lovitt's trial in a posture that would undermine confidence in the verdict."[159]

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[153] *Lovitt II,* 585 S.E.2d at 810, 817 (noting that the medical examiner was shown two pairs of scissors found in the pool hall with the victim's wounds; the medical examiner concluded that some of the victim's wounds were too deep to be accounted for by either pair of scissors); Lovitt v. True (*Lovitt III*), 330 F. Supp. 2d 603, 614–15 (E.D. Va. 2004) (discussing the fact that Lovitt's lawyers contended that the prosecutors were aware of this conclusion and were also aware that one of the pairs of scissors shown to the medical examiner was identical in size to the bloody scissors that were presented to the jury as the murder weapon, but had failed to disclose this information to the defense).

[154] *Lovitt II,* 585 S.E.2d at 817. The state acknowledged this fact, but argued that there was only one previous case in which the prosecutors actually *knew* the informant had cooperated and the informant had received a benefit or inducement from the state for doing so. *Id.* at 818. The state argued successfully that prosecutors were not obligated to disclose information about prior cooperation that they did not know about and that, in the absence of an inducement, the fact that the informant had previously assisted the police was not exculpatory evidence. *Id.* at 819.

[155] *Id.* at 817. Lovitt's lawyers produced a sworn affidavit from the informant to support this claim, but the state called the informant to testify in the evidentiary hearing, at which time he recanted and disavowed his statements in the affidavit. *Id.* at 812–13, 819.

[156] *Id.* at 818–19.

[157] *Lovitt II,* 585 S.E.2d at 819.

[158] *Id.*

[159] *Id.*

3. Ineffective Assistance of Counsel

Finally, Lovitt's lawyers sought to establish that trial counsel had provided ineffective assistance.[160] In the Petition for Habeas Corpus, Lovitt's lawyers alleged that trial counsel had been ineffective during both the guilt and penalty phases of the trial.[161] They alleged that trial counsel had been deficient on a number of dimensions, including failure to adequately investigate and expose weaknesses in the DNA evidence and failure to pursue additional testing of the bloody scissors and Lovitt's jacket.[162]

During the hearing, one of Lovitt's trial lawyers, Denman Rucker, testified that he had made a strategic decision not to question the "inconclusive" DNA test results on the scissors and jacket.[163] In his view, this strategy had the advantage of allowing defense counsel to question the adequacy of the state's proof that "Lovitt [w]as the perpetrator. . .while avoiding the possibility that further testing of the scissors and jacket would yield results further implicating Lovitt in the murder."[164]

In light of our review of the DNA evidence, Rucker's position seems nonsensical. He did not need to do additional testing (with the attendant risk of adverse results) in order to look for exculpatory evidence. He already had powerful exculpatory evidence in his hands (in the form of the STaRCall worksheets). His failure to recognize and use that exculpatory evidence on behalf of his client was the root of the problem. The jury should have been told about the 1-in-10,000 match between the blood on the jacket and the defendant. That fact would have undermined a key element of the prosecution's case. Moreover, had Rucker realized that the existing DNA test on the jacket pointed strongly toward Lovitt he would have had little reason to fear that additional testing of the jacket would incriminate Lovitt, and

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[160] *Id.* at 819–21 (noting that "[t]o prevail on a claim of ineffective assistance of counsel, a petitioner must ordinarily satisfy both parts of the two-part test set forth in *Strickland*." (citing Strickland v. Washington, 466 U.S. 668, 687 (1984))). The two-part test requires a showing that (1) the "counsel's performance was deficient" relative to reasonable professional standards and (2) "that the deficient performance prejudiced the defense." *Strickland*, 466 U.S. at 687.

[161] *Lovitt II*, 585 S.E.2d. at 819.

[162] *Id.*

[163] *Id.* at 822.

[164] *Id.*

hence no "strategic" reason to eschew further testing.

Nevertheless, Rucker's claim to have acted "strateg[ically]" appears to have been viewed as a sufficient explanation or excuse for his inept handling of the DNA evidence.[165] After the evidentiary hearing, Lovitt's habeas counsel seemed to lose interest in the claim that trial counsel's handling of the DNA evidence was deficient—although they did not formally abandon this claim, they no longer actively argued for it.[166] Instead, they focused their attention entirely on the alleged failure of trial counsel to perform adequately during the penalty phase of the trial.[167] The Virginia Supreme Court addressed counsel's handling of the DNA evidence in a single paragraph that simply recounted Rucker's claim that his approach was the product of a purposeful strategy and found that this strategy was "objectively reasonable."[168]

The Court analyzed Lovitt's other allegations concerning inadequate assistance of counsel at much greater length but ultimately found no merit in any of them.[169] Having thus disposed of all three of Lovitt's challenges to his conviction, the Court dismissed the petition for habeas corpus.[170]

C. Federal Habeas Proceedings

On March 8, 2004, Lovitt's lawyers filed a petition for habeas corpus in the Federal District Court for the Eastern District of Virginia, seeking what is known as collateral review of the case.[171] Under standards established by the Antiterrorism and Effective Death Penalty Act of 1996 ("AEDPA"), a federal court can grant relief on habeas claims that a state supreme court has

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165 *Id.*

166 *See id.*

167 *See id.* at 819–23; Opening Brief of Appellant, *supra* note 151 (including a major section on ineffective assistance of counsel that focused entirely on penalty-phase issues, without mentioning counsel's handling of the DNA evidence).

168 *Lovitt II,* 585 S.E.2d at 822.

169 *Id.* at 822–27.

170 *Id.* at 827.

171 Lovitt v. True (*Lovitt III*), 330 F. Supp. 2d 603, 611 (E.D. Va. 2004) (essentially asking the federal court to determine that the Virginia Supreme Court's resolution of the habeas petition had violated Lovitt's rights under the United States Constitution); Petition for Writ of Habeas Corpus, *Lovitt III*, 330 F. Supp. 2d 603 (No. 3:03CV01061) (confirming that the habeas petition was scheduled to be filed on Mar. 8, 2004).

dismissed on the merits only if the federal court finds that the state court's decision was "contrary to, or involved an unreasonable application of, clearly established Federal law, as determined by the Supreme Court of the United States."[172]

Lovitt's lawyers claimed that the Virginia Supreme Court had applied federal law unreasonably on four major issues.[173] We will review these claims and the court's resolution of them briefly. We note at the outset, however, that as with the state habeas petition, none of these claims addressed the misleading presentation of DNA evidence in Lovitt's trial.

Lovitt's lawyers first argued that the Virginia Supreme Court had misapplied *Brady v. Maryland* when it analyzed the prosecution's failure to disclose the medical examiner's opinion about the murder weapon[174] and the jailhouse informant's history of cooperation with police.[175] The federal district court reviewed the record on these issues and declined to find the Virginia

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[172] 28 U.S.C. § 2254(d)(1) (2000); *Lovitt III*, 330 F. Supp. 2d at 611.

[173] *Lovitt III*, 330 F. Supp. 2d at 611.

[174] *Id.* at 613. The Virginia Supreme Court found that prosecutors had failed to disclose the medical examiner's opinion that the victim's fatal wounds could not have been caused by either of two pairs of scissors from the pool hall. Lovitt v. Warden (*Lovitt II*), 585 S.E.2d 801, 818 (Va. 2003). However, the Court concluded this evidence was not exculpatory "because that opinion related to scissors that were not introduced into evidence, were not the alleged murder weapon, and were not shown to be the same size as the alleged murder weapon." *Id.* Lovitt's lawyers argued that this conclusion was unreasonable because the evidentiary record had shown that one of the two pairs of scissors was in fact identical in size to the scissors that were the alleged murder weapon, and that these scissors had been given to the medical examiner for the very purpose of determining whether the identical bloody scissors found behind that pool hall could have been the murder weapon. *Lovitt III*, 330 F. Supp. 2d at 614–15. However Lovitt was not able to persuade the federal district court that the scissors were identical. *Id.* at 615. Because the bloody scissors that were presented at trial as the murder weapon had been destroyed, Lovitt had to rely on a photograph of those scissors, taken next to a ruler, for purposes of size estimation. *Id.* at 615 n.6. Although the medical examiner was shown this photograph during the evidentiary hearing, and had testified that the scissors in the photograph were the same size as one of the two pairs of scissors she had compared to the victim's wounds, and were too small to have caused all of those wounds, the federal district court noted that the medical examiner could measure only one of the two blades of these scissors, and could not measure "[t]he other blade . . . due to its positioning in the photograph." *Id.* Thus Lovitt's constitutional challenge faltered due to his inability to prove that the two blades of the destroyed scissors were the same length.

[175] *Lovitt III*, 330 F. Supp. 2d at 618.

Supreme Court had acted unreasonably.[176] The federal district court went on to find that the suppressed evidence, even if viewed collectively, was not sufficiently material to have affected the verdict, declaring that: "in this Court's opinion, the Commonwealth's evidence was strong enough that neither the medical examiner's initial scissors opinion nor [the informant's] prior history of law enforcement cooperation would substantially have affected its weight or value," and hence that "suppression of such evidence still would not undermine confidence in the jury's verdict."[177]

Second, Lovitt's lawyers argued that the prosecutors had engaged in misconduct by arguing to the jury that the bloody scissors were the murder weapon when they knew the medical examiner had concluded that the scissors could not have been the weapon.[178] They cited *Miller v. Pate*, a case in which the United States Supreme Court "vacated the sentence of a state prisoner because the prosecution had described a pair of stained under[wear] as the *'bloody shorts'*" and had repeatedly stated that the shorts were " *'stained with blood,'* even though the prosecutor knew that the shorts were stained with paint. . .not blood."[179] However, the federal district court held the situation in *Lovitt* was distinguishable because Lovitt's prosecutors had good reason to believe the bloody scissors were the murder weapon, notwithstanding the contrary opinion of the medical examiner.[180]

Lovitt's third argument was that the Virginia Supreme Court had "unreasonably applied *Arizona v. Youngblood*" and related cases when it excused the state's destruction of the remaining biological evidence.[181] Lovitt's lawyers argued strenuously that the Clerk's illegal destruction of the biological evidence went beyond mere negligence and constituted "bad faith" within the meaning of the *Youngblood* standard.[182] They also emphasized the "materiality" of the destroyed evidence, again citing Dr. Riley's statement that additional testing "would likely prove, conclusively," that the blood of the jacket was from Lovitt rather

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176 *Id.* at 625.
177 *Id.*
178 *Id.*
179 *Id.* at 627 (emphasis added) (citing Miller v. Pate, 386 U.S. 1, 3 (1967)).
180 *Lovitt III*, 330 F. Supp. 2d at 628.
181 *Id.* at 611.
182 *Id.*

than the victim.[183] But the federal district court found that the Virginia Supreme Court had "reasonably construed" the *Youngblood* standard when it found no evidence of "bad faith."[184] The court made dismissive comments about the value of the destroyed evidence, saying:

> Petitioner's current, unsubstantiated assertion—that further testing would likely prove, conclusively, that some of the blood stains identified on certain items of evidence actually originated from him and not from the victim—adds gloss to his argument but little texture to the analysis. Such an argument is analogous to that rejected in *Illinois v. Fisher*, . . . wherein the contested evidence provided the defendant's 'only hope for exoneration.' To meet the *Youngblood* standard, more particularity is required.[185]

Although it was not part of the record before the federal district court, our analysis of the DNA test results on the jacket revealed a 1-in-10,000 DNA match with Robin Lovitt. One can only wonder whether the federal judge would have found that evidence sufficiently "particular" (or sufficiently "textured") to meet the *Youngblood* standard had he been told about it.

Lovitt's fourth and final argument was that the Virginia Supreme Court had "unreasonably applied *Strickland v. Washington*" when it rejected Lovitt's claim that his trial counsel had been ineffective.[186] Once again, the brief filed by Lovitt's lawyers focused largely on the alleged ineffectiveness of trial counsel during the penalty phase of the capital trial.[187] They offered no arguments about trial counsel's investigation or presentation of DNA evidence.[188] The federal district court found that the Supreme Court of Virginia had acted reasonably in denying Lovitt's claims of ineffective assistance.[189]

Having found no merit in any of Lovitt's claims, the federal district court dismissed the petition for habeas corpus.[190]

Lovitt next appealed the dismissal of his petition to the United States Circuit Court of Appeals for the Fourth Circuit, which

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[183] *Id.* at 633; Transcript of Record, *Lovitt II*, *supra* note 124, at 34–35.

[184] *Lovitt III*, 330 F. Supp. 2d at 633.

[185] *Id.*

[186] *Id.* at 611.

[187] *See id.* at 642–43.

[188] *See id.* at 603 (not addressing any arguments made by Lovitt's lawyers on trial counsel's investigation or presentation of DNA evidence).

[189] *Id.* at 645.

[190] *Lovitt III*, 330 F. Supp. 2d at 647.

issued an opinion affirming the District Court's ruling on April 6, 2005.[191] Lovitt's lawyers argued that the district court had erred in its determination of fact and law on the four issues that Lovitt raised. [192] The Fourth Circuit responded by reiterating the conclusions of the federal district court and expressing agreement with them.[193]

The Circuit Court's opinion adopts a rather weary tone, suggesting that the case has been reviewed so thoroughly already that no important issues could possibly be left:

> [Lovitt's] challenges to his conviction and sentence . . . have been heard by many courts. The Supreme Court of Virginia rendered two thorough and conscientious opinions in his case—one on direct appeal and one on habeas. The state habeas court in Arlington also treated Lovitt's claims with care, holding a two-day evidentiary hearing and authoring detailed findings of fact and conclusions of law. Finally, the federal district court again reviewed Lovitt's claims, and dismissed them in a meticulous and lengthy opinion.
>
> This case is a good example of the care with which state courts should treat capital cases. We think the Virginia Supreme Court properly resolved Lovitt's claims. Even if that were not the case, however, we could not begin to say that it unreasonably applied clearly established Supreme Court law.[194]

From our perspective, having seen that there were major problems with the presentation of DNA evidence at trial that were never addressed by any of these reviewing courts, these statements ring hollow. Indeed, this passage seems ironic. If this case is a good example of the care with the state of Virginia tries capital defendants, one can only wonder how many other capital defendants received unfair trials.

After obtaining a favorable ruling from the Fourth Circuit, the state wasted little time scheduling Lovitt for execution. The execution date was set for July 11, 2005.[195] However, on June 28, 2005 Lovitt's lawyers filed a Petition for Writ of Certiorari with

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191 Lovitt v. True (*Lovitt IV*), 403 F.3d 171, 171 (4th Cir. 2005).

192 *See id.*

193 *See id.*

194 *Id.* at 175.

195 *Chief Justice Stays Execution for Death Row Inmate in Virginia*, N.Y. TIMES, July 12, 2005, at A16, *available at* http://www.nytimes.com/2005/07/12/national/12virginia.html?_r=1&oref=slogin.

the United States Supreme Court.[196] This Petition raised only three issues: trial counsel's allegedly inadequate investigation of penalty phase issue, the state's destruction of the trial exhibits, and the prosecution's failure to disclose the medical examiner's opinion about the scissors.[197] In each instance, Lovitt argued that the Fourth Circuit had applied the law incorrectly.[198] Lovitt's lawyers also asked for a stay of execution to allow the petition to be heard.[199] The U.S. Supreme Court issued the stay less than five hours before the execution was scheduled.[200] However, the Supreme Court later declined to hear the case, summarily denying Lovitt's petition on October 3, 2005.[201] The state thereupon rescheduled Lovitt's execution for November 30, 2005.[202]

IV. THE CLEMENCY PETITION AND EXPERT REVIEW PANEL

Having exhausted all judicial remedies, Lovitt's final option was a petition for clemency to the governor of Virginia. In early July 2005, Lovitt's lawyers filed a petition asking Governor Mark Warner to commute Lovitt's sentence to life in prison.[203] The clemency petition largely focused on the same issues raised in the state and federal habeas petitions, but it included some new elements.[204]

The destruction of biological samples was given special emphasis because the quality of DNA testing by the Virginia Department of Forensic Science (DFS) had recently been called into question after serious errors came to light in another capital

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196 Lovitt v. True (*Lovitt V*), 545 U.S. 1152 (2005), *petition for cert. filed*, 74 U.S.L.W. 3049 (June 28, 2005) (No. 05-5044).

197 Petition for Writ of Certiorari, *Lovitt V*, 545 U.S. 1152 (No. 05-5044).

198 *Id.*

199 *Lovitt V*, 545 U.S. at 1152.

200 *Chief Justice Stays Execution for Death Row Inmate in Virginia*, *supra* note 195, at A16.

201 Lovitt v. True (*Lovitt VI*), 546 U.S. 929 (2005).

202 *See* Michael D. Shear & Maria Glod, *Warner Commutes Death Sentence*, WASH. POST, Nov. 30, 2005, at A01, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2005/11/29/AR2005112901054.html.

203 *Id.; see also Scissor Killer-DNA*, WFLS NEWS, June 27, 2005, http://www.wfls.com/News/FLS/2005/062005/06272005/1119869317.

204 *See* Shear, *supra* note 202, at A01; Death Penalty News & Updates, http://www.vadp.org/lovitt.html (last visited March 9, 2008).

case, that of Earl Washington, Jr.[205] In April 2005, a professional organization known as the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) had issued a scathing report finding serious errors in the DFS work in the Washington case and calling for a broader review to determine whether these DNA testing problems were endemic.[206] Governor Warner thereafter appointed a panel of experts to conduct a broader review of DFS DNA testing, including a review of all DNA testing that had been performed in capital cases (including the *Lovitt* case).[207] On July 8, 2005, three days before Lovitt's scheduled execution, one of the members of the expert panel, Arthur J. Eisenberg, wrote a letter to the governor that stated:

> Please be advised that all members of the scientific review team have now completed our review of the [DFS] file, data and laboratory notes involved in [the *Lovitt*] case. We conclude that the case contains no technical procedural errors or deviations from accepted protocol that may have substantially affected the integrity of the results in that case. Similarly, in our view, the case contains no interpretive conclusions that are not

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[205] *Experts Blister State's DNA Results*, PILOT-STAR (Norfolk, VA), June 20, 2004, at J4. An independent DNA laboratory in California had contradicted the findings of the DFS after retesting samples from the Washington case. *Id.* Although the director of the DFS laboratory denied there was any problem with the DFS work, a panel of experts assembled by the *Virginian Pilot & Ledger-Star* newspaper to look into the matter had sided with the independent lab, and had declared the DFS results to be faulty. *Id.* Thereafter, the governor of Virginia asked a professional association called the American Society of Crime Laboratory Directors-Laboratory Accreditation Board (ASCLD-LAB) to conduct a detailed review. Christina Nuckols, *DNA lab review finds only one major error*, PILOT-STAR, Sept. 17, 2005, at 3. *See also* Dave Reynolds, *Virginia Governor Orders Review of DNA Lab Following Errors in Earl Washington Case*, INCLUSION DAILY EXPRESS, May 12, 2005, *available at* http://www.inclusiondaily.com/archives/05/05/12/051205vawashington.htm.

[206] ASCLD/LAB LIMITED SCOPE INTERIM INSPECTION REPORT, VA. DIV. OF FORENSIC SCI. CENTRAL LABORATORY, April 9, 2005, at 16–18, *available at* http://www.scientific.org/archive/VirginiaProblems/ASCLDLAB-AuditReport.pdf.

[207] Nuckols, *supra* note 205, at 3; Reynolds, *supra* note 205; Frank Green, *Review of VA. DNA Testing Begins,* RICHMOND TIMES-DISPATCH, June 14, 2005, at B4. The expert panel was supervised by appellate court judge Robert Humphreys, acting as a special master. *Id.* Humphreys said the review of the Lovitt case was "urgent" because Lovitt's execution was, at that time, scheduled for July 11, 2005. *Id.*

scientifically supported.[208]

At the time Eisenberg wrote this letter, however, neither he nor any other member of the expert panel had reviewed transcripts of the expert testimony in the *Lovitt* case.[209] They were basing their conclusion solely on the DFS laboratory reports, which had stated that the results of the DNA testing were "inconclusive."[210] As already discussed, the problem with the DNA evidence in this case does not lie in the laboratory report but in the way the test results were presented in court. The laboratory report does not say that Lovitt's DNA was found on the murder weapon.[211] It quite properly expressed no conclusion on this point.[212] Yet the jury heard testimony and argument that the DNA results did show DNA consistent with Lovitt's on the murder weapon.[213] The expert panel was also unaware of the double standard applied by the government in telling the jury about "inconclusive" results that supported Lovitt's guilt while failing to present the more convincing "inconclusive" results that supported his innocence.[214] Reasonable people can differ about what standards are appropriate for distinguishing "conclusive" from "inconclusive" DNA test results, but no reasonable person can believe that different standards should apply depending on whether the results support or contradict the government's position in a criminal prosecution. Because the expert panel viewed the test results in isolation, without considering how those results were presented and used in the trial, they failed to see the whole picture and their report is of little value in assessing the fairness of Lovitt's trial. Nevertheless, the expert report was apparently

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[208] Frank Green, *Lovitt Evidence is Still an Issue,* RICHMOND TIMES-DISPATCH, July 9, 2005, *available at* http://www.scientific.org/news-notes/Richmond%20Times-Dispatch7-9.htm.

[209] E-mail from Arthur Eisenberg, member of the expert panel that conducted a review of DFS DNA testing, to William C. Thompson, Professor and Chair, Department of Criminology, Law & Society, University of California (July 9, 2005) (on file with authors).

[210] *Id.*; *Certificate of Analysis*, *supra* note 70, at 2120.

[211] *Certificate of Analysis*, *supra* note 70, at 2121.

[212] *Id.*

[213] Transcript of Record, *Lovitt I*, *supra* note 30, at 1167, 1176–78, 1182–83, 1531.

[214] *Id.* at 1182–83, 1531, 1534; *see* E-mail from Arthur Eisenberg to William C. Thompson, *supra* note 209.

taken as the final word on this issue by the governor's office.[215]

An issue raised for the first time during the clemency proceedings was whether the "inconclusive" results reported by the state DFS might be clarified through examination of DFS computer files.[216] As noted earlier, a computer-operated scanning device detected the "bands" produced by the DNA tests in the *Lovitt* case.[217] The scanned images of the bands, and the computer files showing the optical density ("OD") of the bands, had been maintained by the laboratory, and thus presumably were available for further analysis.[218] Lovitt's lawyers submitted a declaration (prepared by one of the authors of this article) that explained that new analytic techniques are now available that might allow a more definitive assessment of which bands constitute reliable data.[219] Lovitt's lawyers had asked the state to provide copies of the electronic files, but the state had refused.[220] When asked about the state's unwillingness to disclose these potentially enlightening computer files, a spokesperson for the governor cited the findings of the expert panel and said their review of the case was sufficient.[221]

The stay of execution issued by the U.S. Supreme Court on July 11, 2005,[222] gave his advocates additional time to rally public support for clemency. Groups including the American Civil Liberties Union of Virginia, the National Coalition to Abolish the Death Penalty, Amnesty International, the Innocence Project and other civil liberty and religious leaders petitioned to

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215 *See* Green, *supra* note 208.

216 *See id.*

217 *See supra* text accompanying notes 61–71.

218 *Certificate of Analysis*, *supra* note 70, at 2129–30; Declaration of William C. Thompson, J.D., Ph.D. (June 30, 2005), *available at* http://www.scientific.org/news-notes/Lovitt%20Declaration.pdf.

219 Declaration of William C. Thompson, *supra* note 218 (discussing problems with the DNA evidence used against Lovitt and new techniques to analyze the DNA evidence.); *see* Green, *supra* note 208_(quoting author, William C. Thompson, "I can't say for sure that that analysis would clarify matters, but there is certainly a good chance that it might . . . It just seems to me as a citizen that is something you would want to know before proceeding with an execution."). The new analytic techniques provide an objective basis for distinguishing signal from noise in computerized genetic data. *See* Jason R. Gilder et al., *Run-Specific Limits of Detection and Quantitation for STR-based DNA Testing,* 52 J.FORENSIC SCI. 97 (2007).

220 Green, *supra* note 208.

221 *Id.*

222 Lovitt v. True (*Lovitt V*), 545 U.S. 1152 (2005).

Warner for clemency in Lovitt's case.[223]

Additionally, one of the nation's most prominent forensic DNA scientists, Dr. Mitchell Holland of Pennsylvania State University, sent a letter to the governor offering an extensive critique of the DNA evidence that had been used to convict Lovitt.[224] Holland's critique was entirely consistent with the analysis of the DNA evidence offered in this article.[225] He argued that it is "quite possible that the jury was misled" by the testimony and argument that linked Lovitt to the bloody scissors, he identified the error in the defense expert's statistical computations, and he criticized the DFS for failing to report the low level alleles on the jacket, saying "it is important that any information available to the laboratory be used to benefit the defendant."[226] He argued that the conclusions of Arthur Eisenberg and the expert panel were irrelevant because the expert panel had not examined the manner in which the DNA evidence was presented in court.[227] Finally, Holland asked for an opportunity to review the "original electronic data" collected by DFS in the case, agreeing that review of the computer files might

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[223] *See* American Civil Liberties Union: Virginia Governor Grants Death Row Inmate Clemency, Commutes Sentence to Life in Prison, http://www.aclu.org/capital/general/22110prs20051129.html (last visited March 10, 2008); *see also* The National Coalition to Abolish the Death Penalty, http://www.democracyinaction.org/dia/organizations/ncadp/campaign.jsp?campaign_KEY=1470&t (last visited March 10, 2008); *see also* USA (Virginia): Death Penalty: Robin Lovitt (m) – Amnesty International, http://web.amnesty.org/library/Index/ENGAMR511792005?open&of=ENG-382 (last visited March 10, 2008); *see also* The Innocence Project – News and Information, Case in Point: Robin Lovitt - Virginia Death Row Inmate, http://www.innocenceproject.org/Content/253.php (last visited March 10, 2008); *see also* Angela E. Pometto, *Governor Warner Grants Robin Lovitt Clemency*, CATHOLIC HERALD (Arlington, VA), Dec. 8, 2005, *available at* http://www.catholicherald.com/articles/05articles/lovitt1208.htm.

[224] Letter from Mitchell M. Holland, Associate Professor of Forensic Science, Penn. State Univ., to Hon. Mark R. Warner, Governor of Virginia (Nov. 18, 2005) (on file with authors). Holland was the scientific laboratory director of the Armed Forces DNA Laboratory in Rockville, Maryland before becoming Laboratory Director at Bode Technology Group, a major independent laboratory. Faculty Directory, Penn. State Univ., http://www.science.psu.edu/forensics/faculty/holland.html (last visited March 10, 2008). In June 2005, Holland moved to Pennsylvania State University as Associate Director of the Forensic Science Program. *See id.*

[225] Letter from Mitchell M. Holland to Hon. Mark R. Warner, *supra* note 224.

[226] *Id.*

[227] *Id.*

help clarify whether the test results on the jacket should really have been deemed "inconclusive."[228] He offered to travel to the DFS laboratory at his own expense in order to do so.[229]

On November 29, 2005, one day before Lovitt's scheduled execution, Governor Warner commuted his death sentence to life imprisonment without the possibility of parole.[230] According to the governor's press release, he granted clemency because the Clerk's improper destruction of evidence had prevented post-conviction re-testing of the biological evidence.[231] He considered the destruction of the physical evidence an "extraordinary circumstance[]. . .that. . .require[s] executive intervention to reaffirm public confidence in our justice system."[232] According to the governor,

> [I]n this case, the actions of an agent of the Commonwealth, in a manner contrary to the express direction of the law, comes at the expense of a defendant facing society's most severe and final sanction. The Commonwealth must ensure that every time this ultimate sanction is carried out, it is done fairly.[233]

One would hope, of course, that every time a *life sentence* is carried out it is also "done fairly." If Lovitt's conviction was unfair, the appropriate remedy is a new trial, not a reduction in sentence. An unfair legal process that leads to a life sentence might be somewhat less offensive than one that leads to an execution, but it is still offensive.

The governor's press release, which was his only public statement on the matter, did not specifically address the claim that Lovitt received an unfair trial on the issue of guilt or innocence due to biased and misleading testimony about "inconclusive" DNA tests.[234] However, the governor stated that he "found no fault with the judgment of the jury, or with prosecutors and defense counsel."[235] By implication, then, the governor considered Lovitt's trial fair enough (at least for a life sentence), notwithstanding the loss of the biological evidence.

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228 *Id.*

229 *Id.*

230 Press Release, Office of the Governor of Virginia, Scientific Testimony: An Online Journal (Nov. 29, 2005), *available at* http://www.scientific.org/archive/Press-release-Lovitt-commutation.htm.

231 *Id.*

232 *Id.*

233 *Id.*

234 *See id.*

235 *Id.*

V. VIRGINIA'S FORENSIC SCIENCE BOARD AND SCIENTIFIC ADVISORY COMMITTEE

In response to the scandal over the mistyping of DNA evidence in the Earl Washington case, the Virginia Assembly passed legislation in 2005 creating a Forensic Science Board and a Scientific Advisory Committee to oversee operations of the state's Department of Forensic Science.[236] The Scientific Advisory Committee is composed of experts in relevant scientific disciplines.[237] Among its duties are to "review and make recommendations as necessary to the Director of the Department and the Forensic Science Board concerning. . .guidelines for the presentation of results in court."[238] The statute also provides that "[u]pon request of the Director of the Department, the Forensic Science Board, or the Governor, the Committee shall review analytical work, reports, and conclusions of scientists employed by the Department."[239]

Virginia is one of several states that have created oversight bodies to monitor the operation of state forensic laboratories.[240] This administrative oversight function potentially creates an independent mechanism for examining problems with the use of scientific evidence, such as those that occurred in the *Lovitt* case.[241] As with judicial oversight, however, the ability of such bodies to deal with these problems may be less than ideal. As it turned out, the *Lovitt* case provided an early test on the ability of the Virginia Forensic Science Board to deal forthrightly with problems in scientific evidence in the state.

In January 2006, the Virginia Forensic Science Board received a request to have the Scientific Advisory Committee examine the DNA evidence in the *Lovitt* case and the way that evidence was presented to the jury.[242] However, the Board refused to have the

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[236] VA. CODE ANN. § 9.1-1113 (2007); *Challenges Greet Panel Overseeing State Lab*, PILOT-STAR (Norfolk, VA), Nov. 28, 2005, at 8.

[237] § 9.1-1111.

[238] § 9.1-1113.

[239] *Id.*

[240] *Id.*; § 9.1-1111. *See generally,* Giannelli, *supra* note 3.

[241] § 9.1-1113; *see also DNA Typing in Action: Databasing in the Commonwealth of Virginia, supra* note 60, at 5.

[242] The request came in a letter from Richmond lawyer, Betty Layne DesPortes, and William C. Thompson (one of the authors of this article) to Joseph Bono, Chair of the Virginia Scientific Advisory Committee. *See* Letter from Betty Layne DesPortes and William C. Thompson to Joseph Bono (Jan. 27,

Committee examine the case.[243] In a letter explaining this decision, the Chair of the Board, S. Randolph Sengel, contended that the manner in which scientific evidence was presented in court is not within the purview of the Scientific Advisory Committee.[244] Specifically,

> The manner in which counsel can present and argue from evidence at trial is not within the statutory scope of Committee review, which includes the 'analytical work, reports, and conclusions of scientists employed by the Department.' Accordingly, I cannot find that the review authority of the Scientific Advisory Committee extends to encompass a review of the manner in which prosecutors and defense attorneys attempt to present evidence at trial, or to [the] assessment of the objectivity or propriety of arguments made from such evidence by trial counsel. For these reasons I find that your request for the review of the case *Commonwealth v. Robin Lovitt* does not fall within the scope of the review authority of the Committee.[245]

The Board's refusal to consider the *Lovitt* case seems wrongheaded for several reasons. First, as should be obvious to readers of this article, the problems with the DNA evidence in the *Lovitt* case went well beyond the manner in which counsel presented and argued from the evidence in court. Second, it raises a number of important issues about the interpretation and reporting of DNA test results, such as the appropriate standards for declaring a finding "inconclusive," whether (as Professor Holland argued) the laboratory has an obligation to disclose "inconclusive" results that are helpful to a defendant, and whether, having declared a result "inconclusive," the analyst should nevertheless testify in court in a manner that links the

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2006) (on file with authors) (describing the problems with the DNA evidence that have been discussed in this article and asking that the Scientific Advisory Committee examine the case).

[243] Letter from S. Randolph Sengel to Betty Layne DesPortes and William C. Thompson (Feb. 14, 2006) (on file with the authors).

[244] *Id.* S. Randolph Sengel, who chairs the Forensic Science Board, is also the elected Commonwealth Attorney for the City of Alexandria, Virginia. *See* Commonwealth's Attorneys' Services Council: Meetings, Compensation Board Conference Room (Feb. 16, 2006), http://www.cas.state.va.us/february1606min.htm (last visited March 10, 2008). Robin Lovitt was tried in the adjacent jurisdiction of Arlington County. Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866, 866 (Va. 2000).

[245] Letter from S. Randolph Sengel to Betty Layne DesPortes and William C. Thompson, *supra* note 243.

defendant to the evidence. [246] Surely these matters fall within the statutory authority of the Scientific Advisory Committee.

Additionally, Mr. Sengel sidestepped the Board's responsibility to review these important matters by construing the question presented purely as a legal one:

> While it is certainly true that ineffective assistance of counsel or improper use of evidence by the government may deprive a defendant of a fair trial, determination of such a question requires legal, not scientific, analysis of all the evidence in the case by a court of competent jurisdiction. Such matters are within the province of appellate courts.[247]

Clearly, this narrow construction of the issues presented is wrong. Moreover, like the Fourth Circuit's world-weary suggestion that all possible issues in the *Lovitt* case had been "exhausted"[248] (and therefore that further review was pointless and tiresome), this argument rings hollow in light of our knowledge of the underlying problems in the case and the failure of the judicial system to deal with them. It is ironic that the Forensic Science Board would declare the issues in the *Lovitt* case appropriate matters for the appellate courts when, as we have seen, the appellate courts utterly failed to address or even consider those issues.

By passing the buck in this manner, the Forensic Science Board effectively ended Lovitt's last hope of having an official body review the evidence in his case. This refusal to look at the evidence is all the more disappointing in light of the fact that electronic files may still exist that have never been reviewed using modern techniques and could still prove enlightening on the key issues. Moreover, the decision of the Board shut the door on any further examination of the evidence in the case. That door is likely to stay closed.

VI. LESSONS FROM *LOVITT*

The jury that convicted Robin Lovitt of capital murder was misinformed about key facts of the case. It was a conviction obtained under false scientific pretenses. Whether Lovitt is actually guilty or not can be debated, but it seems quite clear

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[246] *See supra* text accompanying notes 224–28.

[247] Letter from S. Randolph Sengel to Betty Layne DesPortes and William C. Thompson, *supra* note 243.

[248] Lovitt v. True (*Lovitt IV*), 403 F.3d 171, 177 (4th Cir. 2005).

that his trial was unfair. Close examination of this case suggests that we have a trial system where scientific findings can be misrepresented. Perhaps equally important, it shows us that our system of appellate and habeas review can fail to recognize these problems. Although the problems with the *Lovitt* case were readily apparent to several outside observers who happened to review the evidence and testimony, the judicial system has turned a blind eye to the matter, as has the state board assigned to oversee forensic science in Virginia. The governor of Virginia commuted the death sentence to life imprisonment, but according to his official statement, the commutation had nothing to do with the fairness of the trial.[249] Despite the reduction in sentence, the case should properly be viewed as an embarrassing failure of our system of justice.

The problems began in the laboratory, which failed to have objective standards for distinguishing conclusive from inconclusive DNA test results. This allowed a state laboratory analyst to report that the results of the DNA testing on Lovitt's jacket were "inconclusive."[250] However, the results actually undermined the prosecution's case by showing that the blood on Lovitt's jacket came from Lovitt himself, and not (as the prosecutor had claimed) from the murder victim.[251] The problems continued at trial, where a prosecutor used the laboratory analyst's testimony to improperly link Lovitt to the blood on the murder weapon and incorrectly imply that the victim's blood was found on Lovitt's jacket.[252] The defense lawyers were also deficient: they apparently failed to investigate the case sufficiently to realize that the DNA evidence from the jacket was actually exculpatory and they failed to make an effective challenge to the weak DNA evidence that was used to

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[249] *See* Press Release, Office of the Governor of Virginia, *supra* note 230.

[250] Lovitt v. Warden (*Lovitt II*), 585 S.E.2d 801, 807 (2003).

[251] *See* Transcript of Record, *Lovitt I*, *supra* note 30, at 1531–33; *see also supra* text accompanying notes 77–81.

[252] The analyst testified that both the blood on the jacket and the DNA on the murder weapon was inconclusive, meaning that Lovitt could not be included or excluded as a contributor on the murder weapon and the victim could not be included or excluded as a contributor on the jacket. Transcript of Record, *Lovitt I*, *supra* note 30, at 1177–79. Through the analyst's testimony, the prosecution inferred that these inconclusive results linked Lovitt to the murder weapon and the victim to the jacket. Transcript of Record, *Lovitt I*, *supra* note 30, at 1182–83.

link their client to the murder weapon.[253] Part of the defense lawyers' problem appears to have been an incompetent defense expert who botched his genetic frequency calculations and presented statistical estimates to the jury that significantly overstated the value of the evidence linking Lovitt to the murder weapon.[254]

During the appellate process these problems went unrecognized. Lovitt's direct appeal was handled by one of his trial lawyers with the assistance of another lawyer.[255] It is unclear whether these lawyers even recognized the problems that are the focus of this article. Even if they had recognized these problems, it is doubtful that they could have raised them on direct appeal. The focus of the direct appeal is on procedural error[256] and it would have been difficult if not impossible to link the problems that occurred in Lovitt's trial to specific procedural faults, such as incorrect evidentiary rulings by the trial judge.

The failure of appellate counsel to raise these problems during the state and federal habeas proceedings requires a more extensive explanation. The testimony of Dr. Riley during the state habeas hearing provided all the basic facts that we have relied upon to show the unfairness of Lovitt's trial.[257] Although this information was available in the record, appellate counsel may not have fully appreciated its significance. In particular, they apparently failed to appreciate that the "inconclusive" results on the jacket actually constituted exculpatory data in

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[253] One explanation for these failings lies in the cognitive biases of the legal actors. Tunnel vision may lead police, "investigators, prosecutors, judges, . . . defense lawyers," jurors and laboratory analysts to place increased significance on evidence that is consistent with a pre-existing theory about the case and dismiss evidence that is not. Keith A. Findley & Michael S. Scott, *The Multiple Dimensions of Tunnel Vision in Criminal Cases,* 2006 WIS. L. REV. 291, 292 (2006). Bias of this nature is common and unconscious in even well-meaning criminal justice actors. *See id.* In the *Lovitt* case, tunnel vision may have led the lawyers (and even the defense expert) to focus on evidence that appeared to confirm the theory of Lovitt's guilt (such as the extra allele from the blood on the scissors included as evidence) rather than looking for evidence that could disconfirm the theory.

[254] *See* Transcript of Record, *Lovitt I, supra* note 30, at 1426, 1438–39.

[255] Lovitt v. Commonwealth (*Lovitt I*), 537 S.E.2d 866, 869 (Va. 2000) (listing Denman A. Rucker along with Janell M. Wolfe as counsel for appellant); Lovitt v. Warden (*Lovitt II*), 585 S.E.2d 801, 821–22 (Va. 2003) (discussing strategies of and actions taken by Rucker as Lovitt's attorney at the trial level).

[256] *See, e.g., Lovitt I*, 537 S.E.2d at 875–80.

[257] *See generally* Transcript of Record, *Lovitt II, supra* note 124, at 30–71.

their own right.[258] Dr. Riley opined that the DNA profile on the jacket was consistent with Lovitt's DNA, but Dr. Riley did not calculate the rarity of matching this profile.[259] Hence, counsel apparently did not know that there was a highly specific, 1-in-10,000 match with Lovitt—a fact that might have supported defense counsel's claim of a due process violation.

Although it is possible in hindsight to critique the performance of Lovitt's lawyers, it would be foolish to lay responsibility for this unfortunate case solely on their shoulders. Lovitt had far better legal representation at the appellate stage than most capital defendants.[260] If his lawyers were not good enough to achieve fairness for their client, then there is little hope for any defendant. To find solutions to the problems seen in the appellate process in this case, we must look more broadly at the justice system.

Part of the problem was a poor fit between the specific problems associated with the scientific evidence in Lovitt's trial and the standard doctrinal framework that courts employ for habeas review. In order to establish ineffective assistance of counsel, for example, Lovitt's habeas counsel needed to establish

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[258] At a recent conference at UCLA, Professor Kenneth Starr, lead counsel for Lovitt during the habeas proceedings, appeared on a panel with the authors of this article. The Faces of Wrongful Conviction: A Conference Examining California Justice Gone Wrong, http://facesofwrongfulconviction.org/images/FWC_PROGRAM_new.pdf, at 5 (last visited March 10, 2008) (providing a schedule and overview of the April 7-9, 2006 conference held at UCLA); Lovitt v. True (*Lovitt III*), 330 F. Supp. 2d 603, 605 (E.D. Va. 2004). After hearing the authors' analysis of the DNA evidence in the Lovitt case, Professor Starr candidly acknowledged that Lovitt's lawyers, although aware of the deficiencies in the DNA evidence noted by Dr. Riley, may not have fully appreciated its significance. To the extent that is true, we believe it reflects the inherent difficulty of the subject matter and not any lack of diligence or professionalism by the habeas counsel which, as already noted, consisted of superb lawyers. If these lawyers had difficulty fully understanding the scientific evidence then any lawyer would have.

[259] *See* Transcript of Record, *Lovitt II*, *supra* note 124, at 34–35.

[260] *See Lovitt I*, 537 S.E.2d at 869 (listing Janell M. Wolfe and Denman A. Rucker as counsel for appellant); *Lovitt II*, 585 S.E.2d at 805 (listing Ashley C. Parrish, Thomas D. Yannucci, Kenneth W. Starr, Jennifer Gardner Levy, and Robert E. Lee as counsel for appellant); *Lovitt III*, 330 F. Supp.2d at 606 (listing Robert Edward Lee, Jr., Steven Engel, Kenneth W. Starr, Thomas D. Yannucci, Sookyoung Shin, John Caviness O'Quinn, and Ashley C. Parrish as counsel for appellant); Lovitt v. True (*Lovitt IV*), 403 F.3d 171, 174 (4th Cir. 2005) (listing Kenneth Winston Starr, Robert E. Lee, Thomas D. Yannucci, Ashley C. Parrish, Steven A. Engel, and Sookyoung Shin as counsel for appellant).

that his trial lawyers performed below "reasonable professional" standards.[261] But Lovitt's trial lawyers obtained an independent expert and at least made an effort to challenge the evidence that allegedly connected Lovitt to the murder weapon. Those steps alone probably met or even exceeded the constitutional standard of effectiveness.[262] Nor is it clear that defense counsel's performance fell below reasonable professional standards by virtue of its failure to look beyond the "inconclusive" findings reported on the jacket and to realize the results were actually exculpatory. It is plausible that most defense lawyers would have accepted the conclusions of that report without further inquiry.

Similar problems of fit arise when considering whether there was prosecutorial misconduct with regard to the DNA evidence. There is no reason to believe that the prosecutors suppressed any DNA test results. Although we can now recognize that their arguments to the jury were misleading, there is no reason to believe that the prosecutors were knowingly or intentionally misrepresenting facts. Hence it is difficult to make a case that these arguments violated Lovitt's constitutional rights.

In sum, it is difficult to trace the problems with the presentation of DNA evidence in the *Lovitt* case to any particular error or misconduct by prosecutor, defense counsel or judge that would constitute a violation of Lovitt's constitutional rights. Although we believe that most reasonable people applying standards of everyday morality would consider his trial unfair due to the misleading presentation of key scientific evidence, it was not the kind of unfairness that is easily recognized as a constitutional violation in the context of post-conviction habeas review. Recognizing that fact, Lovitt's habeas counsel may have simply concluded that arguments about the presentation of DNA evidence were not as promising as the other arguments that they chose to present instead.

Viewed in this light, the failure of the judicial system to recognize or remedy the problems with the DNA evidence in the *Lovitt* case reflects broader problems with the legal standards

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[261] *Lovitt II*, 585 S.E.2d at 820.

[262] *See id.* Under the constitutional standard, defense counsel cannot be faulted for failure to recognize the statistical errors of their own expert because few if any defense lawyers would have had that ability. Although the jury heard incorrect and misleading testimony, that problem cannot be traced to the defense counsel's failure to meet reasonable professional standards.

under which courts conduct habeas review. As a number of scholars have pointed out, our system's focus on procedural error and misconduct can allow questionable verdicts to stand in cases where there are defects in the evidence that cannot be traced to these factors.[263]

In recognition of this problem, Professor D. Michael Risinger has recently proposed that claims of factual innocence, such as Lovitt's claim, should be reviewed under reformed standards, similar to those applied in British courts of appeal, that call for overturning convictions that for any reason are deemed "unsafe."[264] In our view, the *Lovitt* case is an example of an "unsafe verdict."[265] The failure of our current system to recognize and remedy that problem, by granting a new trial, is a case-in-point illustration of the wisdom and desirability of Professor Risinger's proposal.

VII. CONCLUSION

There is a longstanding public perception that innocent people have little to fear in the American justice system. The system offers a variety of procedural protections that are designed to work to the advantage of the accused, making convictions difficult to obtain in any but the strongest cases. This perception is reflected in a famous observation of Judge Learned Hand:

> Under our criminal procedure the accused has every advantage . . . . He is immune from question or comment on his silence; he cannot be convicted when there is the least fair doubt in the minds of any one of the twelve. . . Our dangers do not lie in too little tenderness to the accused. Our procedure has been always haunted by the ghost of the innocent man convicted. It is

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[263] *See, e.g.,* D. Michael Risinger, *Unsafe Verdicts: The Need for Reformed Standards for the Trial and Review of Factual Innocence Claims,* 41 HOUS. L. REV. 1281, 1282, 1314–15, 1335 (2004) (stating that verdicts are rarely overturned due to insufficient evidence, because the United States system is more focused on technical requirements); Findley & Scott, *supra* note 253, at 348–49; Brandon L. Garrett, *Innocence, Harmless Error, and Federal Wrongful Conviction Law*, 2005 WIS. L. REV. 35, 42, 53–54, 111 (2005). Brandon L.Garrett, *Judging Innocence*, 100 COLUMBIA L.REV 101, 107 (2007)(finding "courts did not effectively review the unreliable and false evidence that supported [the conviction of 200 men who were later exonerated through DNA testing]").

[264] Risinger, *supra* note 263, at 1282–83.

[265] *Id.* at 1283.

an unreal dream.[266]

If false convictions are generally an "unreal dream" in criminal cases, they should be even less likely in capital cases. Because "death is different," capital defendants are afforded procedural protections at every stage that go beyond those offered to other defendants.[267] During their trials, capital defendants typically are represented by more experienced and better-funded lawyers than other defendants and have greater access to the services of investigators and experts.[268] After conviction, capital cases are typically reviewed more thoroughly and at higher appellate levels than other criminal cases.[269] Once direct appeals are exhausted, capital defendants can pursue collateral review through state and federal habeas actions.[270] Since the lawyers handling the capital case are generally better funded than other lawyers, they have resources that can be used to reinvestigate or further investigate the underlying case, review the adequacy of the initial legal representation, and otherwise ferret out problems. By the time the collateral review is concluded, any possible problem with the fairness of the conviction should have been fully exposed and thoroughly vetted.[271] Because capital cases receive such "intense scrutiny,"[272] no stone should be left unturned, no issue ignored, no problem neglected.

Our study of the case of Robin Lovitt offers a striking counter-example that challenges this common perception. We have shown that serious problems with the key scientific evidence in a

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[266] United States v. Garsson, 291 F. 646, 649 (S.D.N.Y. 1923); *accord* Herrera v. Collins, 506 U.S. 390, 420 (1993)(O'Connor, J., concurring)(arguing that the U.S. Constitution provides "unparalleled protections against convicting the innocent.").

[267] Samuel R. Gross, *Lost Lives: Miscarriages of Justice in Capital Cases*, 61 LAW & CONTEMP. PROBS. 125, 143 (1998). *See also* Tara L. Swafford, *Responding to Herrera v. Collins: Ensuring that Innocents Are Not Executed*, 45 CASE W. RES. L. REV. 603, 603 (1995) (noting that capital cases differ because "the American system of capital punishment has been held to a higher standard of reliability.").

[268] *See* Rory K. Little, *Why a Federal Death Penalty Moratorium?*, 33 CONN. L. REV. 791, 799–800 (2001).

[269] H. Patrick Furman, *Wrongful Convictions and the Accuracy of the Criminal Justice System*, 32 COLO. LAW. 11, 17 (2003).

[270] Adam L. VanGrack, *Serious Error with "Serious Error": Repairing* A Broken System *Of Capital Punishment*, 79 WASH. U. L.Q. 973, 1004 (2001).

[271] *Id.* at 1003–05 (enumerating many of the protections capital defendants are afforded by the review process).

[272] *Id.* at 1004 n.240.

capital case, problems that raise doubts about the accuracy of the verdict, went unrecognized and unremedied. Without careful attention to this failure of the justice system, and meaningful reform, the danger exists that Judge Hand's unreal dream could become a waking nightmare for a falsely convicted capital defendant.

VIII. TECHNICAL APPENDIX

The DNA evidence that linked Robin Lovitt to the scissors (the murder weapon) was problematic because only one of Lovitt's distinct alleles[273] was found on the scissors. Eleven other distinct alleles were not found.[274] The failure to detect those alleles might possibly have been due to "allelic dropout," a phenomenon that is known to occur when the quantity of DNA from a particular contributor is minimal.[275] However, the observed findings could also have arisen if someone other than Lovitt was the second contributor. How, then, should we evaluate the probative value of this evidence for linking Lovitt to the scissors?

One approach recently proposed by a prominent group of forensic scientists involves the use of likelihood ratios.[276] In 2006, the DNA Commission of the International Society of Forensic Genetics published recommendations for interpretation of DNA mixtures.[277] Although this commission did not reach consensus on all aspects of "this difficult subject," its article was among the first to discuss the probative value of DNA evidence in

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[273] We use the term *distinct allele* to refer to alleles possessed by Lovitt that were *not* possessed by the victim, Clayton Dicks. Because Dicks was the primary donor to the mixture, the presence of Dicks's DNA accounts for the observation of certain alleles that Lovitt also has. If Lovitt is a contributor, the *distinct alleles* should also be present in the mixture. *See* William C. Thompson & Simon Ford, *DNA Typing: Acceptance and Weight of the New Genetic Identification Tests,* 75 VA. L. REV. 45, 82 (1989) (explaining the differences in probability of identical versus distinct alleles).

[274] *Certificate of Analysis*, *supra* note 70, at 2120.

[275] *See supra* text accompanying notes 104–06.

[276] A likelihood ratio is the ratio of two conditional probabilities: the probability of the evidence given that one hypothesis is true and the probability of the evidence given that the other hypothesis is true. *See* Richard O. Lempert, *Modeling Relevance,* 75 MICH. L. REV. 1021, 1026 (1977). There is a long tradition in evidence scholarship of using the likelihood ratio to describe the probative value of evidence. *See id.* at 1025–27; D.H. Kaye & Jonathan J. Koehler, *The Misquantification of Probative Value*, 27 LAW & HUM. BEHAV. 645, 649 (2003); BERNARD ROBERTSON & G.A. VIGNAUX, INTERPRETING EVIDENCE: EVALUATING FORENSIC SCIENCE IN THE COURTROOM 17 (1995); C. G. G. AITKEN, STATISTICS AND THE EVALUATION OF EVIDENCE FOR FORENSIC SCIENTISTS 42 (1995). One need not know which of two hypotheses is true to compute a likelihood ratio. One need only be able to estimate how much more probable the evidence would be under one of the hypotheses than the other.

[277] P.Gill et al., *DNA Commission of the International Society of Forensic Genetics: Recommendations on the Interpretation of Mixtures,* 160 FORENSIC SCI. INT'L 90, 90 (2006) [hereinafter *DNA Commission*].

cases where there may have been "allelic dropout."[278] The article acknowledges that the probative value of DNA evidence for linking a suspect to an evidentiary sample in such cases depends on the plausibility of the "dropout" theory.[279] As the theory becomes less plausible, the DNA evidence can become valueless or even exculpatory.[280]

The Commission recommended that a separate likelihood ratio, LR, be computed for each locus reflecting the probability of the observed test result, E, under two alternative hypotheses: the "prosecution hypothesis," H_p (that the suspect is a contributor to the mixture), and the "defen[s]e hypothesis," H_d (that someone other than the suspect contributed to the mixture).[281] Thus,

$$\mathrm{LR} = \frac{\Pr(E \mid H_p)}{\Pr(E \mid H_d)}$$

To the extent this likelihood ratio exceeds 1.00, the evidence, E, supports H_p; to the extent the LR is less than 1.00, the evidence, E, supports H_d.[282]

With respect to the *Lovitt* case, the Commission's analysis indicates that this likelihood ratio will support the defense hypothesis for every locus with the possible exception of vWA.[283] To illustrate why this is so, consider the explanations that must be invoked for the observed data at each of the eight loci where no alleles other than those of Clayton Dicks were detected. Under H_p, Lovitt is the second contributor. At each locus, Lovitt has one or two distinct alleles that were not detected. Consequently, under H_p the only explanation is allelic dropout. Under H_d, by contrast, someone other than Lovitt is the second

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[278] *Id.* at 90, 95–96. The issue of dropout was also addressed in a similar manner by John Buckleton & Christopher Triggs, *Is the 2p Rule Always Conservative?*, 159 FORENSIC SCI. INT'L 206 (2005). *See also* John Buckleton & Peter Gill, *Low Copy Number*, *in* FORENSIC DNA EVIDENCE INTERPRETATION 275, 279–80 (John Buckleton, Christopher.M. Triggs & Simon J. Walsh eds., 2005) (differentiating allelic dropout from other phenomena that can affect results, such as heterozygote balance).

[279] *See DNA Commission*, *supra* note 277, at 97.

[280] As the probability of dropout decreases, "the net evidential value of the locus must be in favour of the suspect, i.e. LR is less than one." *Id.* at 95.

[281] *Id.* at 90–91.

[282] *Id.* at 91.

[283] *See supra* text accompanying note 38.

contributor. The failure to detect distinct alleles from this other person might be due to allelic dropout, and the probability of allelic dropout is presumably the same under H_d and H_p. But there is also another possible explanation—the second person's alleles at a given locus might happen to overlap with those of Clayton Dicks. Because there is another possible explanation for the observed data under H_d, in addition to the explanation available under H_p, the probability of the observed results would be lower under H_p than under H_d, which means that the evidence favors H_d. In other words, the evidence from each of these eight loci is exculpatory.[284]

For locus vWA the analysis is more complicated because a 17 allele was detected that could not have come from the primary contributor.[285] According to the prosecution hypothesis, H_p, the 17 allele came from Lovitt.[286] In order to determine the numerator of the likelihood ratio, $\Pr(E \mid H_p)$, for this locus we must consider the probability of detecting a 17 allele if Lovitt was the second contributor. A complicating factor is that Lovitt also has a 16 allele that was not detected.[287] Hence, the prosecution hypothesis requires not only that allelic dropout have occurred but that it affected the 16 allele rather than the 17 allele.

Following the analytic framework suggested by the DNA Commission, we will use the term $\Pr(D)$ to designate the probability that one of the second contributor's alleles dropped out.[288] Because a stochastic (random) process determines which of two alleles will drop out,[289] the conditional probability of detecting a 17 allele at vWA *if* Lovitt was the second contributor *and* dropout occurred would be 0.50. Hence, $\Pr(E \mid H_p) = 0.5$

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[284] For the eight loci where none of Lovitt's distinct alleles was detected, the situation is similar to that discussed as *Example 3* in Appendix B of the DNA Commission Report. *See DNA Commission*, *supra* note 277, at 99. The report notes that in these circumstances where none of the suspect's alleles are detected, "[t]he [LR] strongly favours H_d." *Id.* at 100. Because the LR for the Lovitt case loci will depend on the probability of allelic dropout as well as the frequency of Clayton Dicks' alleles, computation of exact LR values is complex and will not be attempted here. We estimate the values for each locus will range from about 0.50 to 0.98 depending on the locus and the assumed dropout probability.

[285] *See supra* text accompanying note 38.

[286] *See id.*

[287] *See supra* note 127.

[288] *DNA Commission*, *supra* note 277, at 97.

[289] BUTLER, *supra* note 36, at 68.

Pr(D).

To compute $\Pr(E \mid H_d)$, we must consider the probability of getting a 17 allele if the secondary contributor was a random person other than Robin Lovitt. This probability also depends in part on whether allelic dropout occurred. If allelic dropout *did* occur, then only one of the secondary contributor's alleles would be detected. The probability that this detected allele would be a 17 is equal to the "allele frequenc[y]," which is approximately 0.24 in the general population.[290] If allelic dropout did *not* occur, an event we designate $\overline{D}$, then the secondary contributor must have one of three possible genotypes: 11,17, 14,17, or 17,17. As noted earlier, the probability that a randomly chosen person would have one of these genotypes is about 0.11.[291]

From this analysis we can restate the likelihood ratio for locus vWA as:

$$LR = \frac{\Pr(E \mid H_p)}{\Pr(E \mid H_d)} = \frac{0.5 \Pr(D)}{0.24 \Pr(D) + 0.11 \Pr(\overline{D})}$$

Based on this formula, Table 2 shows the value of the LR for various values of Pr(D).[292] In other words, this table shows how the probative value of the DNA evidence from locus vWA is affected by different assumptions concerning the probability that one of two alleles from the second contributor dropped out.

Table 2: LR*s* for Locus vWA Under Varying Assumptions About the Dropout Probability, Pr(D)

Pr(D)	Pr($E \mid H_p$)	Pr($E \mid H_d$)	LR
0.1	0.05	0.123	0.41

[290] According to FBI population studies, the "allele frequenc[y]" of the 17 allele at locus vWA is approximately 18% among African-Americans, 26% among Caucasians, and 22% among Hispanics. Budowle et al., *supra* note 81, at 1279, 1284.

[291] *See supra* note 108.

[292] The authors derived this formula. Although it is similar to the formulae presented by the DNA Commission, it has been adapted by the authors to fit the circumstances of locus vWA in the Lovitt case. *See DNA Commission, supra* note 279, at 91, 97–98. *See also infra* Table 2.

0.2	0.1	0.136	0.73
0.3	0.15	0.149	1.01
0.4	0.2	0.162	1.23
0.5	0.25	0.175	1.42
0.6	0.3	0.188	1.59
0.7	0.35	0.201	1.74
0.8	0.4	0.214	1.86
0.9	0.45	0.227	1.98
1.0	0.5	0.240	2.08

Based on the LR values in Table 2, it appears that the probative value of the DNA evidence from locus vWA ranges from slightly incriminating to slightly exculpatory depending on what one assumes about the probability of single-allele dropout. If the dropout probability is less than about 0.30, then the DNA evidence is exculpatory (LR less than one). As the dropout probability increases above about 0.30, the evidence becomes incriminating (LR greater than one). If one assumes that the probability of a single-allele dropout is 100%, then the LR is slightly more than 2, which means the DNA evidence is comparable to the value of a "match" between Lovitt and the bloodstain on a genetic characteristic found in approximately half of the human population.[293] But it seems unrealistic that the dropout probability could be so high. If a contributor has two alleles, the test will typically either detect both of them or neither of them.[294] We think the probability of single-allele dropout could be well under 0.30,[295] which would mean that the evidence from this locus is exculpatory.

Even if the evidence from locus vWA is slightly incriminating,

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[293] The jury was undoubtedly left with the impression that the value of the DNA evidence for incriminating Lovitt was much greater than this. The defendant's own expert testified (incorrectly) that 81% of the population could be eliminated as a possible source of the vWA 17 allele, and that Lovitt could not. Brief of the Commonwealth, *supra* note 24, at *13.

[294] *See supra* text accompanying note 104. As an illustration, consider the DNA profile shown in Table 1 for the sample from Lovitt's jacket (based on the StaRCall worksheet). At five loci, the test detected *both* of Lovitt's alleles. At three loci the test detected *neither* of Lovitt's alleles. However, there is no locus at which the test detected just one of Lovitt's two alleles. *See supra* Table 1.

[295] If the frequency of single-allele drop-out were 30% or higher, it seems likely that we would see an example of it in the jacket sample where the lab was clearly working at the very threshold of its ability to detect limited quantities of DNA.

however, the incriminating impact of this locus must be balanced against the exculpatory value of the other eight loci. In light of the overall analysis presented here, we think it is difficult to argue that the DNA evidence taken as a whole incriminates Lovitt. A fair assessment would be that the DNA evidence, as a whole, is mildly exculpatory.