

FRAMED BY FORENSICS: FULFILLING *DAUBERT*'S
GATEKEEPING FUNCTION BY SEGREGATING SCIENCE
FROM THE ADVERSARIAL MODEL

Kayla Marie Mannucci[†]

“They weren’t looking for the truth. They were looking for a conviction”
—Keith Harward (falsely imprisoned for thirty-three years)¹

TABLE OF CONTENTS

INTRODUCTION	1948
I. BACKGROUND.....	1951
A. <i>The Rules Governing Experts in Federal Court</i>	1951
1. Rule 702 Partisan Experts	1952
a. Judicial Interpretation of Rule 702.....	1952
b. The Gatekeeping Judge	1954
2. Rule 706 Court-Appointed Experts	1956
B. <i>Partisan Expert Bias</i>	1958

[†] Articles Editor, *Cardozo Law Review*; J.D. Candidate (May 2018), Benjamin N. Cardozo School of Law; B.A., McGill University, 2015. I would like to thank Professor Julie Interdonato for her thoughtful feedback. For bringing to light some of the issues discussed in this Note, for having confidence in me, and for teaching me more than she knows, my thanks and admiration go to Seema Saifee, staff attorney at the Innocence Project. Thank you to the Volume 38 Note Editors for their invaluable guidance and the Volume 39 Editors for diligently preparing this Note for publication. Most importantly, I am forever grateful to my parents, Venilde Macedo and Daniel Mannucci, for their endless love, patience, support, and so much more. Thank you for everything you do for me.

¹ Tom Jackman, *Calls for Limits on ‘Flawed Science’ in Court Are Well-Founded: A Guest Post*, WASH. POST (Sept. 20, 2016), https://www.washingtonpost.com/news/true-crime/wp/2016/09/20/calls-for-limits-on-flawed-science-in-court-are-well-founded-a-guest-post/?utm_term=.70bc9efd3d51. Harward was wrongfully convicted after two forensic dentists testified that Harward’s teeth matched bite marks on the rape victim. During the course of his prosecution, a total of six forensic dentists came to the same false conclusion. Years later, new DNA evidence definitively proved Harward’s innocence and revealed the real assailant to be Jerry Crotty. On April 8, 2016, Harward was exonerated; narrowly escaping the death penalty after serving more than thirty-three years of a life sentence for a crime he did not commit. *Keith Allen Harward*, INNOCENCE PROJECT, <http://www.innocenceproject.org/cases/keith-allen-harward> (last visited Apr. 17, 2018).

C. <i>Expert Use in Criminal Trials</i>	1960
II. CASE STUDIES: FLAWED PARTISAN EXPERT TESTIMONY CONTRIBUTES TO WRONGFUL CONVICTIONS.....	1962
A. <i>Timothy Edward Durham</i>	1965
B. <i>Stephan Cowans</i>	1966
III. PROBLEM: THE INHERENT CONFLICTS BETWEEN <i>DAUBERT</i> , EXPERT BIAS, AND FORENSIC SCIENTIFIC EVIDENCE	1968
A. <i>The Failure of the Judiciary to Implement Daubert in Criminal Proceedings</i>	1968
B. <i>The Implications of Science in an Adversarial System</i>	1973
1. Science Is Fundamentally at Odds with an Adversarial System.....	1973
2. Science Is Incompatible with Partisan Experts.....	1974
3. Lack of Jury Competence to Evaluate Science.....	1975
IV. PROPOSAL: SEGREGATING BIAS FROM THE SCIENTIFIC EXPERT	1976
A. <i>Rule 706 Is Not Enough to Prevent Flawed Forensic Testimony</i>	1977
B. <i>Key Features of the Proposed Rule</i>	1978
1. Scope.....	1978
2. Appointment Process.....	1979
3. No Partisan Experts.....	1980
4. Cross-Examination.....	1980
5. Court Directions	1981
C. <i>Concerns About the Proposed Rule</i>	1981
1. Implementation	1981
2. Due Process	1983
3. Affordability	1986
CONCLUSION.....	1987

INTRODUCTION

Joyce Gilchrist, a forensic scientist, participated in over three thousand criminal cases over twenty-one years while working for the Oklahoma City police department.² Gilchrist was known as “Black Magic” for her ability to obtain convictions by matching evidence to defendants, when other forensic examiners could not.³ Gilchrist’s

² Jim Yardley, *Inquiry Focuses on Scientist Employed by Prosecutors*, N.Y. TIMES (May 2, 2001), <http://www.nytimes.com/2001/05/02/us/inquiry-focuses-on-scientist-employed-by-prosecutors.html>.

³ Paul C. Giannelli & Kevin C. McMunigal, *Prosecutors, Ethics, and Expert Witnesses*, 76 FORDHAM L. REV. 1493, 1500–01 (2007).

testimony helped sentence twenty-three people to death, eleven of whom have been executed.⁴

Concerns about Gilchrist's expert testimony were first raised when a court questioned her testimony in a death penalty case,⁵ finding that she had overstated her scientific conclusions at trial.⁶ A year later, the court reversed another conviction in which Gilchrist had testified, noting that she had omitted critical conclusions from her report.⁷ Another suspect, whom Gilchrist had previously excluded from her analysis, was later convicted for the crime.⁸ In 2001, Jeffrey Pierce, who was also convicted with the help of Gilchrist's testimony, was proven innocent by new DNA evidence.⁹

After having been condemned in several judicial opinions and criticized by other forensic scientists, Gilchrist's career as an expert witness should have been over.¹⁰ Prosecutors, having been alerted to her corrupted testimony, should have stopped using her.¹¹ Yet, she continued to work for another decade while receiving commendations and promotions.¹² She was, after all, a "prosecution superstar."¹³

Flawed testimony, like Gilchrist's, is not as rare as one might think.¹⁴ In 2015, the Justice Department and FBI reported that almost all

⁴ Simone Seiver, *Why Three Counties That Loved the Death Penalty Have Almost Stopped Pursuing It*, HUFFINGTON POST (Aug. 11, 2015, 1:29 PM), https://www.huffingtonpost.com/entry/highest-death-penalty-counties_us_55ca2f6fe4b0f1cbf1e65c87.

⁵ *Fox v. State*, 779 P.2d 562 (Okla. Crim. App. 1989) (ultimately upholding a murder conviction and the death penalty despite flawed expert testimony).

⁶ *See id.* at 571 ("The lack of scientific weight of such a conclusion is apparent on reflection by those dealing with similar evidence on a regular basis. But to a lay jury, usually ill-equipped to assimilate hair analysis findings on their own, such an opinion may appear too substantial.").

⁷ *Miller v. State*, 809 P.2d 1317, 1320 (Okla. Crim. App. 1991) ("What is even more disturbing . . . is the fact that Ms. Gilchrist's pretrial forensic report made absolutely no mention of her finding of a 'unique characteristic' concerning appellant's pubic hairs. However, in his opening argument, the prosecutor alerted the jury to the State's expert's finding of the 'unique characteristic.'").

⁸ *See Lott v. State*, 98 P.3d 318 (Okla. Crim. App. 2004).

⁹ *Pierce v. State*, 786 P.2d 1255, 1261 (Okla. Crim. App. 1990). *See generally* Giannelli & McMunigal, *supra* note 3, at 1499 n.37 (a review by the Federal Bureau of Investigation (FBI) of Gilchrist's "laboratory notes revealed that they were often incomplete or inadequate to support the conclusions" she reached. There was no indication that "confirmation or review by another [forensic scientist] was [ever] undertaken, especially in the cases where hair evidence linked the suspect and victim").

¹⁰ Giannelli & McMunigal, *supra* note 3, at 1500 (discussing Gilchrist's career of corrupting expert testimony).

¹¹ *Id.* *See generally infra* Section I.B.

¹² Giannelli & McMunigal, *supra* note 3, at 1500–01 (discussing that the prosecutor's office knew what was going on but "loved having her as a witness").

¹³ Paul C. Giannelli, *Wrongful Convictions and Forensic Science: The Need to Regulate Crime Labs*, 86 N.C. L. REV. 163, 174 (2007).

¹⁴ *See* Brandon L. Garrett, *Judging Innocence*, 108 COLUM. L. REV. 55, 81 n.99 (2008) (discussing a study of 113 DNA exonerations that found that expert testimony (present in fifty-seven percent of the cases) was the second leading type of evidence used in wrongful conviction cases).

examiners in an elite FBI forensic unit gave flawed testimony in nearly all trials in which they offered evidence against criminal defendants for more than a two-decade period.¹⁵ Twelve of the defendants in those cases have been executed.¹⁶

The misuse of forensic expert testimony is a significant contributor to wrongful convictions.¹⁷ Almost a third of wrongful convictions have included false or misleading testimony by forensic experts.¹⁸ These exonerations have triggered immense controversy over the use of forensic sciences.¹⁹ However, little has been considered about the ways in which expert testimony is presented at trial.²⁰ Customarily, there has been no oversight over what forensic scientists can actually say once inside the courtroom.²¹

The content of an expert's testimony is significant because juries attach heightened value to scientific evidence, incorrectly believing it is infallible.²² Recognizing this danger, the Supreme Court cautioned that expert evidence can be both powerful and misleading because it is difficult to evaluate.²³ To ensure that scientific expert testimony does not violate a defendant's due process right to a fair trial, it is critical that forensic science is presented objectively at trial.²⁴ Today, expert testimony is admitted to trial once a judge determines that the scientific evidence is reliable and relevant.²⁵

Unfortunately, the United States's justice system may not be well-positioned to prevent unscientific testimony.²⁶ Current standards are

¹⁵ Spencer S. Hsu, *FBI Admits Flaws in Hair Analysis over Decades*, WASH. POST (Apr. 18, 2015), https://www.washingtonpost.com/local/crime/fbi-overstated-forensic-hair-matches-in-nearly-all-criminal-trials-for-decades/2015/04/18/39c8d8c6-e515-11e4-b510-962fcfab310_story.html?utm_term=.d1ff2857c1ca.

¹⁶ *Elite FBI Forensic Unit Gave Flawed Testimony*, CBS NEWS (Apr. 20, 2015, 7:03 AM), <http://www.cbsnews.com/news/fbi-hair-analysis-errors-led-to-convictions-new-report-finds>.

¹⁷ Garrett, *supra* note 14; *see infra* Part II.

¹⁸ Michael J. Saks & Jonathan J. Koehler, Review, *The Coming Paradigm Shift in Forensic Identification Science*, 309 SCI. 892, 892 fig.1 (2005) (study reviewing eighty-six DNA exonerations attributes sixty-three percent of wrongful convictions to forensic testing errors and twenty-seven percent to false or misleading testimony by forensic experts). For a more recent study, see Brandon L. Garrett & Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1 (study evaluating 232 innocent persons exonerated by post-conviction DNA testing, found that 156 of the exonerees had testimony by forensic analysts called by the prosecution at their trials; in sixty percent of those cases, the prosecution's expert provided invalid testimony).

¹⁹ For a count of U.S. post-conviction DNA exonerations visit the Innocence Project's home page. INNOCENCE PROJECT, <http://www.innocenceproject.org> (last visited Apr. 6, 2018). The number of DNA exonerations as of February 12, 2018 is 354. *Id.*

²⁰ *See infra* Part III; *see also* Garrett, *supra* note 14.

²¹ Garrett & Neufeld, *supra* note 18, at 6.

²² *See infra* Section III.B.3.

²³ *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579, 595 (1993).

²⁴ *See infra* Part II.

²⁵ *Daubert*, 509 U.S. at 583; *see infra* Section I.A.

²⁶ *Infra* Part II, Section III.A. *See generally* Garrett & Neufeld, *supra* note 18; Saks &

not being enforced in criminal trials.²⁷ Yet, flawed forensic testimony compromises the very objective of the criminal justice system—to acquit the innocent and convict the guilty.²⁸

Part I of this Note will explain the current legal standards for admitting forensic expert testimony and how scientific expert testimony is treated by actors in an adversarial system. Part II presents case studies to illuminate how current standards governing expert testimony do not prevent flawed testimony from being heard by a jury. Part III will address the inherent conflicts between the current standards, expert bias, and scientific evidence. Part IV proposes a new rule to balance the treatment of scientific evidence in an adversarial system. This new rule requires neutral experts to testify in cases using specific forensic procedures that identify the defendant as the perpetrator of a crime. One of the benefits of this rule will be that experts who have shown a history of bias, like Gilchrist, will not be able to testify before a jury.

I. BACKGROUND

A. *The Rules Governing Experts in Federal Court*

Expert testimony in federal courts must be admissible under the Federal Rules of Evidence.²⁹ Once a trial court determines that proffered scientific evidence is admissible and that an expert is necessary,³⁰ there are two procedures by which an expert may testify. Rule 702 allows parties to present their own expert testimony.³¹ Rule 706 allows the court to appoint an expert of its own choosing.³²

Koehler, *supra* note 18.

²⁷ *Infra* Section III.A.

²⁸ See generally Selvidge v. United States, 160 F.R.D. 153, 156 (D. Kan. 1995) (“An expert witness should be an advocate of the truth with testimony to help the court and the jury reach the ultimate truth in a case, which should be the basis of any verdict.”).

²⁹ For a history of the Rules, see Fraust F. Rossi, *The Federal Rules of Evidence—Past, Present, and Future: A Twenty-Year Perspective*, 28 LOY. L.A. L. REV. 1271, 1271 (1995) (explaining that the Federal Rules of Evidence significantly expanded the admissibility of expert testimony by eliminating common law restrictions).

³⁰ Rule 702 provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if . . . the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue

FED. R. EVID. 702.

³¹ *Id.*

³² FED. R. EVID. 706.

1. Rule 702 Partisan Experts

Rule 702 is the evidentiary basis for all expert testimony.³³ Nearly all experts that testify in criminal trials do so at the request of one of the parties, as authorized by Rule 702.³⁴ This Note refers to a party-retained expert as a “partisan expert.”

Rule 702 allows an expert to testify about scientific knowledge when an expert’s testimony will help the factfinder understand the evidence or to determine a fact at issue.³⁵ Helpfulness to the factfinder is generally regarded as the benchmark for admissibility under Rule 702.³⁶ Expert testimony is presumed to be helpful unless it concerns matters within the average factfinder’s everyday knowledge and experience.³⁷

Rule 702 authorizes an expert’s testimony in two separate instances.³⁸ First, an expert may give a dissertation of the scientific principles relevant to the case to help educate the factfinder.³⁹ Second, an expert may testify to help the factfinder determine a fact at issue; the expert may testify in a way similar to a lay witness, except that an expert may present an opinion and may base their opinion on inadmissible evidence.⁴⁰ This Note is primarily concerned with this second type of testimony.

a. Judicial Interpretation of Rule 702

Before the Federal Rules of Evidence were enacted in 1975, common law governed the admissibility of expert testimony in federal

³³ For a history of Rule 702, see Douglas R. Richmond, *Regulating Expert Testimony*, 62 MO. L. REV. 485, 493–510 (1997).

³⁴ See generally *infra* Section I.B.

³⁵ See FED. R. EVID. 702.

³⁶ *Hardin v. Ski Venture, Inc.*, 50 F.3d 1291, 1296 (4th Cir. 1995) (“The touchstone of whether a witness may testify as an expert under Fed. R. Evid. 702 is . . . whether he would be ‘helpful’ . . .”); *Thompson v. State Farm Fire & Cas. Co.*, 34 F.3d 932, 941 (10th Cir. 1994); *Werth v. Makita Elec. Works, Ltd.*, 950 F.2d 643, 648 (10th Cir. 1991) (“[T]he ‘touchstone’ of admissibility is helpfulness to the trier of fact.” (quoting *Breidor v. Sears, Roebuck & Co.*, 722 F.2d 1134, 1139 (3d Cir. 1983))). Another court has taken a slightly different route, holding that the benchmark of admissibility under Rule 702 is “reliability” instead of helpfulness. See *United States v. Rouse*, 100 F.3d 560, 567, 570–72, 575 (8th Cir. 1996) (“The touchstone under Rule 702 is reliability.”), *reh’g en banc granted, vacated*, 107 F.3d 557 (8th Cir. 1997).

³⁷ *Kopf v. Skyrm*, 993 F.2d 374, 377 (4th Cir. 1993).

³⁸ See Daniel S. Fridman & J. Scott Janoe, *Procedural Issues Surrounding Judicial Gatekeeping*, JUD. GATEKEEPING PROJECT, <https://cyber.harvard.edu/daubert/ch8.htm> (last visited Apr. 6, 2018) (“[E]xperts take two basic forms: a formal expert witness or an informal technical advisor.”); Pamela Louise Johnston, *Court-Appointed Scientific Expert Witnesses: Unfettering Expertise*, 2 HIGH TECH. L.J. 249, 260 (1987) (explaining when an expert may testify under Rule 702).

³⁹ FED. R. EVID. 702 advisory committee’s note.

⁴⁰ FED. R. EVID. 703. However, if the expert bases his opinion on inadmissible evidence it must be of the type in which “experts in the particular field would reasonably rely on . . . forming an opinion on the subject . . .” *Id.*

courts.⁴¹ Courts encountering expert testimony evaluated it with a test derived by the D.C. Circuit in 1923 in *Frye v. United States*.⁴² The *Frye* standard requires that the scientific principle or theory supporting the expert testimony have “general acceptance” in the particular field in which the science belongs.⁴³

In 1975, when Congress enacted the Federal Rules of Evidence, some courts began rejecting the *Frye* “general acceptance” standard.⁴⁴ Rule 702 required that expert testimony assist the trier of fact, but it was silent on whether the expert testimony must be generally accepted by the relevant community.⁴⁵ Critics argued that because the *Frye* limitation was not expressed in Rule 702, the general acceptance standard no longer applied.⁴⁶ On the other hand, proponents of the general acceptance standard asserted that Rule 702’s silence signaled *Frye*’s incorporation.⁴⁷

In 1993, the Supreme Court finally addressed the *Frye* standard in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁴⁸ The Court held that *Frye*’s general acceptance standard had not survived the Federal Rules of Evidence.⁴⁹ The Court went on to explain, however, that *Frye*’s displacement by Rule 702 did not mean that the Rules do not limit the admissibility of scientific evidence.⁵⁰ To the contrary, in *Daubert* the Court set forth a reliability standard that scientific evidence must

⁴¹ See generally Tal Golan, *Revisiting the History of Scientific Expert Testimony*, 73 BROOK. L. REV. 879 (2008) (providing a history of scientific expert testimony).

⁴² *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

⁴³ *Id.* at 1014 (the expert testimony must be “sufficiently established to have gained general acceptance in the particular field in which it belongs”).

⁴⁴ See, e.g., *United States v. Downing*, 753 F.2d 1224, 1233–37 (3d Cir. 1985); *United States v. Jakobetz*, 955 F.2d 786, 794 (2d Cir. 1992) (noting that numerous jurisdictions abandoned the *Frye* rule after the enactment of the Federal Rules of Evidence and abandoning it itself).

⁴⁵ FED. R. EVID. 702.

⁴⁶ See Richmond, *supra* note 33, at 495. Critics argued that the *Frye* standard was “remarkably vague” and that the “general acceptance” standard could be attacked for both excluding reliable evidence and admitting unreliable evidence. Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later*, 80 COLUM. L. REV. 1197, 1223 (1980).

⁴⁷ See Richmond, *supra* note 33, at 495–96. Proponents defend the standard as one that “assures that those most qualified to assess the general validity of a scientific method will have the determinative voice.” *United States v. Addison*, 498 F.2d 741, 743–44 (D.C. Cir. 1974). They argue that it also “‘assures uniformity in evidentiary rulings, [and] shields juries from any tendency to treat novel scientific evidence as infallible’ . . .” *Washington v. Copeland*, 922 P.2d 1304, 1313 (Wash. 1996) (quoting 1 JOHN W. STRONG ET AL., MCCORMICK ON EVIDENCE § 203 (4th ed. 1992)).

⁴⁸ *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 597 (1993).

⁴⁹ *Id.* (“‘General acceptance’ is not a necessary precondition to the admissibility of scientific evidence under the Federal Rules of Evidence . . .”).

⁵⁰ *Id.* at 589 (“[This holding] does not mean . . . that the Rules themselves place no limits on the admissibility of purportedly scientific evidence. Nor is the trial judge disabled from screening such evidence.” (footnote omitted)).

satisfy.⁵¹ *Daubert* also entrusted trial judges with a gatekeeping function to remove unreliable expert testimony from the courtroom.⁵²

The *Daubert* Court identified four factors judges can use to determine whether an expert's testimony is reliable: (1) whether the subject of the testimony is testable; (2) whether the theory or study has been published or subjected to peer review; (3) whether there is an acceptable "known or potential rate of error"; and (4) whether the method is generally accepted in the scientific community.⁵³ The Court, however, was explicit that it did not intend this list of factors to be exhaustive nor applicable to every case, and cautioned that the judge's discretion should remain flexible.⁵⁴

b. The Gatekeeping Judge

In a trilogy of Supreme Court cases beginning with *Daubert*, the Supreme Court specifically entrusted trial judges to screen expert testimony to ensure that unreliable evidence is kept away from jurors.⁵⁵ Moreover, the Supreme Court held that trial judges have discretionary authority in deciding how to determine whether expert testimony is reliable and relevant to the particular facts of a case.⁵⁶ As part of their gatekeeping role, trial judges are relied on to assess the relevance and reliability of partisan expert evidence and reject misleading or "junk"

⁵¹ *Id.* ("[U]nder the Rules the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.").

⁵² *Id.* at 597 (recognizing "a gatekeeping role for the judge"); see also FED. R. EVID. 702 advisory committee's note to 2000 amendment. This is a significant difference from *Frye*. Trial judges, instead of scientists as in *Frye*, are the gatekeepers of reliable scientific testimony. See Craig Lee Montz, *Trial Judges as Scientific Gatekeepers After Daubert, Joiner, Kumho Tire, and Amended Rule 702: Is Anyone Still Seriously Buying This?*, 33 U. WEST. L.A. L. REV. 87, 105 (2001) ("[T]rial judges play a much larger role. Instead of merely asking what other scientists think of a particular technique or method, the judge now determines whether the proponent of the evidence has demonstrated that the evidence is good evidence, perhaps in spite of what other experts think about it." (internal quotation marks omitted)).

⁵³ *Daubert*, 509 U.S. at 593–94; see also FED. R. EVID. 702 advisory committee's note to 2000 amendment (discussing how amendments to Rule 702 in 2000 incorporate *Daubert* factors).

⁵⁴ *Daubert*, 509 U.S. at 593–95 (explicitly recognizing that the relevant reliability inquiry should be "flexible" and that "[i]ts overarching subject [should be] . . . validity . . . and reliability" (footnote omitted)); see also *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 158 (1999) ("*Daubert* was intended neither to be exhaustive nor to apply in every case." (citation omitted)).

⁵⁵ *Daubert*, 509 U.S. at 597; *Kumho*, 526 U.S. at 158 ("In sum, Rule 702 grants the district judge the discretionary authority, reviewable for its abuse, to determine reliability in light of the particular facts and circumstances of the particular case."); *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 142 (1997) (noting that the Federal Rules of Evidence left the gatekeeping role to the trial judge); *Fridman & Janoe*, *supra* note 38 ("The Supreme Court in *Daubert* expressed its confidence that judges possess the capacity to undertake the review of expert scientific testimony. It also indicated that they could use neutral experts such as scientists to help them perform their task."). After the 2000 amendments, Rule 702 now includes a reliability screening. FED. R. EVID. 702.

⁵⁶ *Kumho*, 526 U.S. at 158.

science.⁵⁷ Underlying the *Daubert* gatekeeping structure is an idealistic presumption about judicial skill in handling complex scientific evidence.⁵⁸ Whether judges have the capacity to distinguish between reliable and unreliable scientific testimony has been the focus of major debate.⁵⁹ Most judges lack scientific training.⁶⁰ Yet, *Daubert* expects judges to have knowledge about the scientific methods being presented to them and to apply that knowledge on a case-by-case basis.⁶¹

Concerns about the interaction between judges and science are not unfounded.⁶² Research suggests that judges generally lack the skills that are necessary to adequately evaluate the science presented at trial.⁶³ Judges themselves express discomfort with having to review methodologies and techniques that underlie scientific evidence.⁶⁴

⁵⁷ See *Joiner*, 522 U.S. at 142.

⁵⁸ See Andrew W. Jurs, *Balancing Legal Process with Scientific Expertise: Expert Witness Methodology in Five Nations and Suggestions for Reform of Post-Daubert U.S. Reliability Determinations*, 95 MARQ. L. REV. 1329, 1344–45 (2012) (explaining it is presumptuous to believe judges have the requisite skills to assess scientific evidence).

⁵⁹ In deciding *Daubert*, the Justices disagreed about whether judges have the ability to assess the reliability of an expert's scientific methods. Justice Blackmun, in his majority opinion, expressed confidence in the judiciary's capacity to evaluate different methods of science. *Daubert*, 509 U.S. at 593. In dissent, however, Chief Justice Rehnquist was skeptical about whether judges would be able to apply *Daubert's* ambiguous standard and was concerned that judges were being asked to be "amateur scientists." *Id.* at 600–01 (Rehnquist, C.J., dissenting).

⁶⁰ Valerie P. Hans, *Judges, Juries, and Scientific Evidence*, 16 J.L. & POL'Y 19, 19–20, 30–31 (2007); see also DAVID L. FAIGMAN, *LEGAL ALCHEMY: THE USE AND MISUSE OF SCIENCE IN THE LAW* 53–54 (1999) ("In most areas of the law, those using science have little or no training in the subject. This is true for judges . . .").

⁶¹ *Joiner*, 78 F.3d 524, 529–30 (11th Cir. 1996) (holding that *Daubert's* "'gatekeeping' role calls for the trial judge to make a 'preliminary assessment of whether the reasoning or methodology underlying the testimony . . . can be applied to the facts in issue'" (quoting *Daubert*, 509 U.S. at 592–93)), *rev'd*, 522 U.S. 136 (1997).

⁶² See CARL F. CRANOR, *TOXIC TORTS: SCIENCE, LAW, AND THE POSSIBILITY OF JUSTICE* 291–92 (2006) (stating that judges are not trained and lack the correct background to assess science done by the experts in the area); Jennifer K. Robbennolt, *Evaluating Empirical Research Methods: Using Empirical Research in Law and Policy*, 81 NEB. L. REV. 777, 797 (2002) ("Those without a basic understanding of methods will be less likely to be able to identify the benefits of a particular methodological approach and will not be attuned to the drawbacks of the approach.").

⁶³ See, e.g., THE EVOLVING ROLE OF STATISTICAL ASSESSMENTS AS EVIDENCE IN THE COURTS 72 (Stephen E. Fienberg ed., 1989); Richard Lempert, *Befuddled Judges: Statistical Evidence in Title VII Cases*, in LEGACIES OF THE 1964 CIVIL RIGHTS ACT 263, 278 (Bernard Grofman ed., 2000); Sophia I. Gatowski et al., *Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-Daubert World*, 25 LAW & HUM. BEHAV. 433, 453–54 (2001) (survey demonstrating that "although judges overwhelmingly endorse the active gatekeeping role defined by *Daubert*, many may lack the scientific literacy necessitated by *Daubert*"); Hans, *supra* note 60, at 19–20.

⁶⁴ See Gatowski et al., *supra* note 63, at 442 (study illustrating that judges are divided on whether they believe they have the requisite skills needed to adequately evaluate the science presented to them in the courtroom; concluding that fifty-two percent of surveyed judges believed that their background adequately prepared them for the range of scientific evidence in court and forty-eight percent believed that their background inadequately prepared them); see

Considering the variety and range of scientific theories, opinions, and results offered at trials, these concerns are amply justified.⁶⁵

Forensic expert testimony tends to be highly technical and very persuasive.⁶⁶ If judges are not ensuring that expert testimony is reliable because they lack the necessary skills to do so, the outcome of the trial may be affected.⁶⁷ In the context of criminal cases, since jurors see scientific testimony as “infallible,” unreliable testimony contributes to wrongful convictions.⁶⁸

2. Rule 706 Court-Appointed Experts

Rule 706 of the Federal Rules of Evidence (and similarly drafted state rules⁶⁹) expressly extend the right of a court to appoint scientific experts to provide assistance and advice on scientific and technical matters.⁷⁰ The court may ask the parties for candidates and appoint an expert the parties agree upon, or the court may opt to select its own expert.⁷¹ Ultimately, the Rule grants exclusive authority to the judge to

also Daubert, 509 U.S. at 600–01 (Rehnquist, C.J., dissenting) (questioning whether judges are able to assess reliability).

⁶⁵ See generally THE FORENSIC LABORATORY HANDBOOK PROCEDURES AND PRACTICE (Ashraf Mozayani & Carla Noziglia eds., 2011) (describing various research and technology that are applied in forensic laboratory contexts).

⁶⁶ See generally Paul Roberts, *Paradigms of Forensic Science and Legal Process: A Critical Diagnosis*, PHIL. TRANSACTIONS ROYAL SOC'Y B (June 22, 2015), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4581001/#> (explaining that “[p]recisely because scientific evidence often provides the best and most reliable proof of an offender’s identity and has won for itself an aura of credibility verging—in some minds—on infallibility, flawed expert evidence can be a potent source of injustice”). See *infra* Section III.B.3.

⁶⁷ See *infra* Part II.

⁶⁸ Mark Joseph Stern, *Forensic Science Isn’t Science: Why Juries Hear—and Trust—So Much Biased, Unreliable, Inaccurate Evidence*, SLATE (June 11, 2014, 7:11 AM), http://www.slate.com/articles/health_and_science/science/2014/06/forensic_science_is_biased_and_inaccurate_but_juries_believe_it_and_convict.html.

“Once a jury hears something scientific, there’s a kind of mythical infallibility to [forensic science] That’s the association when a person in [a] white lab coat takes the witness stand. By that point—once the jury’s heard it—it’s too late to convince them that maybe the science isn’t so infallible.”

Id. (quoting Peter Neufeld, co-founder of the Innocence Project); see also *infra* Part II.

⁶⁹ See, e.g., CAL. EVID. CODE §§ 730–33 (West 2017); ILL. SUP. CT. R. 215(d). For a list of state rule versions of Rule 706, see *Rules of Evidence on Expert Testimony*, NCSTL, <http://www.ncstl.org/resources/702> (last visited Mar. 4, 2018).

⁷⁰ Rule 706 provides: a “court may appoint any expert that the parties agree on and any of its own choosing.” FED. R. EVID. 706. Note also that in 1946, prior to the Federal Rules of Evidence, a comprehensive scheme was initiated permitting trial courts to appoint a neutral expert in criminal trials. FED. R. CRIM. P. 28 advisory committee’s note to 1944 adoption. See generally John M. Sink, *The Unused Power of a Federal Judge to Call His Own Expert Witnesses*, 29 S. CAL. L. REV. 195 (1956).

⁷¹ FED. R. EVID. 706(a) (a “court may appoint any expert that the parties agree on and any of its own choosing”).

select an expert.⁷²

According to Rule 706, the court-appointed expert must advise the parties of all findings the expert makes, the expert may be deposed by either party, the expert may be called to testify, and the expert may be cross-examined.⁷³ The court-appointed expert receives reasonable compensation as authorized by the court.⁷⁴ The court has discretion in notifying the jury that an expert is court-appointed.⁷⁵ Most importantly, Rule 706 does not prevent the parties from calling their own expert witnesses.⁷⁶ The court-appointed expert therefore acts as a supplement, not a replacement, to the partisan expert.⁷⁷

Rule 706 arose from concerns about the use of partisan experts.⁷⁸ The Rule provides courts with a useful tool for when partisan expert scientific testimony may not be helpful in solving a factual issue due to the expert's relationship to the parties.⁷⁹ When drafting the Federal Rules of Evidence, the Advisory Committee assumed that the threat of a court-appointed expert would prevent the problems posed by partisan experts.⁸⁰ Unfortunately, the issues that the Advisory Committee hoped to address with Rule 706 remain today and continue to threaten the integrity of the criminal justice system.⁸¹

Rule 706 is an option rarely utilized.⁸² A survey revealed that eighty

⁷² *Id.*; *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 595 (1993) (“Rule 706 allows the court at its discretion to procure the assistance of an expert of its own choosing.”); *see also Carranza v. Fraas*, 471 F. Supp. 2d 8, 11 (D.D.C. 2007) (“Rule 706 allows the court to appoint an expert witness to assist the court, not to assist a party.”).

⁷³ FED. R. EVID. 706(b).

⁷⁴ FED. R. EVID. 706(c).

⁷⁵ FED. R. EVID. 706(d).

⁷⁶ FED. R. EVID. 706(e).

⁷⁷ Sven Timmerbeil, *The Role of Expert Witnesses in German and U.S. Civil Litigation*, 9 ANN. SURV. INT'L & COMP. L. 163, 167 n.19 (2003) (“The court-appointed expert should not replace the experts which are hired by the parties but should complement them.” (citing Samuel R. Gross, *Expert Evidence*, 1991 WIS. L. REV. 1113, 1190 (1991))); *see also* FED. R. EVID. 706(d).

⁷⁸ Concerns about partisan experts included “[t]he practice of shopping for experts, the venality of some experts, and the reluctance of many reputable experts to involve themselves in litigation . . .” FED. R. EVID. 706 advisory committee’s note to 1972 proposed rules. *See generally* Timmerbeil, *supra* note 77, at 170 (“Congress enacted, FRE 706 in the hope that the common law rule regarding court-appointed experts would be applied more frequently if written down in a statute.” (footnote omitted)).

⁷⁹ *See, e.g., Benitez v. Mailloux*, No. 05-CV-1160, 2007 WL 836873, at *1 (N.D.N.Y. Mar. 15, 2007) (“The appointment of an expert pursuant to Rule 706 is not intended to further partisan interests of any party, but to aid the Court, through the services of an impartial expert, in its assessment of technical issues.”).

⁸⁰ FED. R. EVID. 706 advisory committee’s note to 1972 proposed rules (“[T]he availability of the procedure in itself decreases the need for resorting to it. The ever-present possibility that the judge may appoint an expert in a given case must inevitably exert a sobering effect on the expert witness of a party . . .”).

⁸¹ The advantages of using court-appointed experts have not been realized because, in practice, judges rarely exercise their Rule 706 power. *See infra* Section IV.A.

⁸² CHRISTOPHER B. MUELLER & LAIRD C. KIRKPATRICK, *EVIDENCE UNDER THE RULES: TEXT, CASES, AND PROBLEMS* 645 (8th ed. 2015) (explaining that the appointment power under Rule

percent of federal judges never appointed an expert under Rule 706 and only approximately ten percent appointed a court expert more than once.⁸³ Several reasons suggest why judges are reluctant to appoint independent experts, even though they find them helpful.⁸⁴

When court-appointed experts are utilized, an overwhelming majority of judges view them as helpful in assessing cases and report satisfaction with the result.⁸⁵ Thus, court-appointed experts are an often-suggested solution to the problem of judicial inexperience with complex sciences.⁸⁶

B. *Partisan Expert Bias*

Expert testimony is especially susceptible to “adversarial bias.”⁸⁷ Adversarial bias arises when a party to an adversarial proceeding retains an expert to advance their own cause.⁸⁸ Rather than procure the most

706 is “rarely used”); 1 JACK B. WEINSTEIN & MARGARET A. BERGER, WEINSTEIN’S EVIDENCE MANUAL § 13.06[2] (2018) (asserting that federal judges have appointed experts in remarkably few cases); Carol Krafka et al., *Judge and Attorney Experiences, Practices, and Concerns Regarding Expert Testimony in Federal Civil Trials*, 8 PSYCHOL. PUB. POL’Y & L. 309, 326 tbl.5 (2002) (noting that only twenty-six percent of judges surveyed had ever used independent experts).

⁸³ JOE S. CECIL & THOMAS E. WILLGING, FED. JUDICIAL CTR., COURT-APPOINTED EXPERTS: DEFINING THE ROLE OF EXPERTS APPOINTED UNDER FEDERAL RULE OF EVIDENCE 706, 7–8 (1993), <https://www.fjc.gov/sites/default/files/2012/Experts.pdf>. Noteworthy is the fact that the judges surveyed were mainly involved in large civil cases, not criminal cases. Given that judges are even less likely to appoint an expert in jury cases, it is likely that these statistics are even higher for criminal judges. See sources cited *infra* note 241.

⁸⁴ See Joe S. Cecil & Thomas E. Willging, *Accepting Daubert’s Invitation: Defining a Role for Court-Appointed Experts in Assessing Scientific Validity*, 43 EMORY L.J. 995, 1015 (1994) (explaining that reasons for judicial reluctance to appoint include adherence to the adversarial tradition, desiring to limit Rule 706 for use in extraordinary cases only, and inability to identify an expert). Compare Edward K. Cheng, *Independent Judicial Research in the Daubert Age*, 56 DUKE L.J. 1263, 1271–72 (2007) (listing reasons for judicial reluctance to appoint relate to judicial inability to find the right expert, concerns about maintaining adversarial procedures, and a desire to avoid case management delays), with CECIL & WILLGING, *supra* note 83, and Christopher Tarver Robertson, *Blind Expertise*, 85 N.Y.U. L. REV. 174, 200 (2010) (explaining that reasons for judicial reluctance to appoint include inability or difficulty in selecting and preparing proper experts, and adversarial norms).

⁸⁵ See *Judges’ Opinions on Procedural Issues: A Survey of State and Federal Trial Judges Who Spend at Least Half Their Time on General Civil Cases*, 69 B.U. L. REV. 731, 741 (1989) (concluding that seventy-six percent of federal judges and seventy percent of state judges support the use of court-appointed experts); Cecil & Willging, *supra* note 84, at 1009 (finding that eighty-seven percent of judges responded that independent experts would be helpful).

⁸⁶ See, e.g., *Gen. Elec. v. Joiner*, 522 U.S. 136, 147–48 (1997) (Breyer, J., concurring) (suggesting that Rule 706 may be necessary to assist judges evaluating complex scientific evidence in the most difficult cases).

⁸⁷ See David E. Bernstein, *Expert Witnesses, Adversarial Bias, and the (Partial) Failure of the Daubert Revolution*, 93 IOWA L. REV. 451, 453 (2008).

⁸⁸ There are three types of adversarial biases: “(1) conscious bias, (2) unconscious bias, and (3) selection bias.” *Id.* at 454. Conscious bias occurs when hired experts, who are paid for their

qualified or knowledgeable experts, “the adversarial system implicitly encourages parties to seek experts whose views fall at the extreme ends of the scientific continuum of any given issue.”⁸⁹

When experts testify on behalf of adversaries, the factfinder may hear two significantly different viewpoints of a complex scientific issue resulting in a “battle-of-the-experts” problem.⁹⁰ Jurors, who are entrusted to resolve the dispute on their own, generally give credence to the expert who was most persuasive, not necessarily most accurate.⁹¹ The contradictory testimonies in a battle-of-the-experts problem have significant practical concerns⁹²; the value of the expert testimony may cancel out or the factfinder may mistakenly place too much merit on the expert whose forensic skills are more persuasive.⁹³

Currently, experts are privately retained by the parties themselves.⁹⁴ Since experts are retained, they tend to function as “hired guns.”⁹⁵ Thus, typically when an expert testifies, the expert repeats their

testimony, “adapt their opinions to the needs of the attorney who hires them.” *Id.* at 454–55. Unconscious bias occurs when well-intentioned experts are influenced by their surroundings in a biased way. *Id.* at 455–56. Selection bias occurs when experts are retained by a party, not because they represent “a random sampling of expert opinions,” but because they represent the perspective that the attorney wants. *Id.* at 456–57.

⁸⁹ See Stephanie Domitrovich, *Fulfilling Daubert’s Gatekeeping Mandate Through Court-Appointed Experts*, 106 J. CRIM. L. & CRIMINOLOGY 35, 44 (2016); Jennifer L. Mnookin, *Expert Evidence, Partisanship, and Epistemic Competence*, 73 BROOK. L. REV. 1009, 1010–11 (2008) (noting that the experts most likely to be repeatedly retained “will often not be those with the most knowledge or actual expertise in a particular area, but rather those whom parties believe will succeed in persuading the factfinder”). This situation may occur even when a scientific question is considered well-settled by the scientific community, but there are some outlier experts with reservations on the matter that remain available to hire. Susan Haack, *Of Truth, in Science and in Law*, 73 BROOK. L. REV. 985, 1002 (2008).

⁹⁰ See Jennifer L. Mnookin, *Idealizing Science and Demonizing Experts: An Intellectual History of Expert Evidence*, 52 VILL. L. REV. 763, 775 (2007) (defining battle-of-the-experts as “warring witnesses who disagree[] vehemently with one another, under oath, about matters on which it [is] thought that there ought to be only one right answer” and explaining that experts, as representatives of a party, “routinely [give] testimony that [is] fundamentally contradictory”).

⁹¹ See Haack, *supra* note 89; Mnookin, *supra* note 89; see, e.g., *supra* text accompanying notes 2–13 (providing an example of a forensic scientist that continued to be hired for her persuasiveness, not the accuracy of her testimony).

⁹² See Bernstein, *supra* note 87, at 457 (noting that “[t]he jury will receive a false sense that the issue is a very close one”); see also Mnookin, *supra* note 89, at 1012 (noting that “[t]he marketplace for experts cannot . . . be trusted to produce reliable information”); Haack, *supra* note 89, at 1002 (stating that the adversarial process may create “artificial scientific certainty. . . [or] artificial scientific doubt”). Observers have two diagnoses for the battle-of-the-experts problem: outright dishonesty or the product of excessive partisan enthusiasm. Either way the experts are testifying improperly. *Id.*

⁹³ See sources cited *supra* note 89.

⁹⁴ By engaging in “expert shopping,” the party has the choice and opportunity to hire an expert that best supports the party’s theory of the case. FED. R. EVID. 706(e), 706 advisory committee’s notes.

⁹⁵ Andrew Blum, *Experts: How Good Are They?; Lawyers for Plaintiffs, Defense Try to Decide*, NAT’L L.J., July 24, 1989, at 2 (calling professional experts “hired guns”); see Jurs, *supra*

party's theory and supplements it with scientific knowledge.⁹⁶ As a result, the jury frequently only hears opinions favorable to the party that hired the expert.⁹⁷ Not surprisingly, forensic experts are routinely accused of distorting science in their party's favor.⁹⁸

C. *Expert Use in Criminal Trials*

Daubert does not work well in criminal trials due to resource inequalities.⁹⁹ Forensic experts can be expensive.¹⁰⁰ However, the majority of felony defendants are indigent and are represented by public defenders with limited resources.¹⁰¹ Thus, the majority of criminal defendants cannot present their own expert testimony at trial.¹⁰²

On the other hand, the prosecution, who has access to state crime laboratories, can easily retain the assistance of forensic experts.¹⁰³ Moreover, federal forensic laboratories also provide services to states¹⁰⁴

note 58, at 1339 (noting that “the mere fact of payment alone could also result in expert bias”).

⁹⁶ See KENNETH S. BROUN ET AL., MCCORMICK ON EVIDENCE § 17 (6th ed. 2006) (stating that parties are not interested in finding “the best scientist, but the best witness”); Timmerbeil, *supra* note 77, at 165 n.8 (“[I]t is natural that the plaintiff will choose an expert from one polar end of the spectrum of scientific opinions, and the defense will choose an expert from the other.” (citation omitted)).

⁹⁷ See John H. Langbein, *Trashing the German Advantage*, 82 NW. U. L. REV. 763, 775 (1988) (“An expert hired to buttress a preordained position is engaged more in advocacy than in truth-seeking.”). This is hugely problematic in the context of this Note because defendants accused of serious crimes—like rape and murder—usually cannot afford their own experts; the jury will only hear from an expert whose objectivity may be compromised by the prosecution's theory. See *infra* Section III.B.

⁹⁸ See Liliana Segura & Jordan Smith, *VIVA 4N6: In Las Vegas, Embattled Forensic Experts Respond to Scandals and Flawed Convictions*, INTERCEPT_ (Mar. 25, 2016, 11:25 AM), <https://theintercept.com/2016/03/25/in-las-vegas-embattled-forensics-experts-respond-to-scandals-and-flawed-convictions>.

⁹⁹ See Jack B. Weinstein, *Science, and the Challenges of Expert Testimony in the Courtroom*, 77 OR. L. REV. 1005, 1008 (1998) (“Courts, as gatekeepers, must be aware of how difficult it can be for some parties—particularly indigent criminal defendants—to obtain an expert to testify. The fact that one side may lack adequate resources with which to fully develop its case is a constant problem.”).

¹⁰⁰ See Brandon L. Garrett, *Judging Innocence*, 108 COLUM. L. REV. 55, 126 (2008) (“[O]btaining experts to challenge forensic evidence . . . requires substantial resources and time.”).

¹⁰¹ Approximately two-thirds of felony federal defendants and more than eighty percent of felony defendants in the country's seventy-five largest counties were represented by publicly funded counsel. In the large state courts, 68.3% were represented by public defenders and 13.7% were represented by assigned counsel. See CAROLINE WOLF HARLOW, U.S. DEP'T OF JUSTICE, OFFICE OF JUSTICE PROGRAMS, DEFENSE COUNSEL IN CRIMINAL CASES 1 (Nov. 2000), <https://www.bjs.gov/content/pub/pdf/dccc.pdf>.

¹⁰² See Garrett & Neufeld, *supra* note 18, at 33.

¹⁰³ Paul C. Giannelli, “Junk Science”: *The Criminal Cases*, 84 J. CRIM. L. & CRIMINOLOGY 105, 118 (1993).

¹⁰⁴ *Id.* For example, the FBI laboratory is available to state, county, and municipal law enforcement agencies in the United States. *Id.*; FED. BUREAU OF INVESTIGATION, U.S. DEP'T OF

free of charge, including both the examination of evidence and the expert's court appearance.¹⁰⁵ However, forensic laboratories are usually not available to criminal defendants.¹⁰⁶

Some federal and state statutes attempt to provide criminal defendant's with expert assistance; however, the scope of these laws are generally limiting.¹⁰⁷ Some of these statutes are limited to the type of offense the defendant is charged with.¹⁰⁸ Others impose unrealistic caps on the amount that can be spent to retain a forensic scientist.¹⁰⁹ Most states, however, do not provide any funding to indigent defendants for forensic testimony.¹¹⁰ Thus, indigent defendants are routinely denied funding to hire their own forensic expert.¹¹¹

As a result, in criminal trials, the prosecution is usually the only party to present the jury with expert testimony.¹¹² Because defendants do not typically have their own experts with which to effectively counter prosecution-proffered testimony, the defense attorney is often relied upon to use cross-examination to expose any faults with the scientific testimony or evidence. Relying on the lawyer's ability to cross-examine is problematic because lawyers, like judges, generally lack the necessary skills to assess the reliability of scientific evidence.¹¹³

JUSTICE, HANDBOOK OF FORENSIC SERVICES 1 (Jennifer Coleman, rev. ed. 2013); see Paul C. Giannelli, *Independent Crime Laboratories: The Problem of Motivational and Cognitive Bias*, 2010 UTAH L. REV. 247, 250 (“[S]eventy-nine percent of all [forensic] laboratories [surveyed were] located within law enforcement/public safety agencies . . .” (internal quotation marks omitted) (quoting Joseph L. Peterson et al., *The Capabilities, Uses, and Effects of the Nations’ Criminalistics Laboratories*, 30 J. FORENSIC SCI. 10, 11 (1985))).

¹⁰⁵ Giannelli, *supra* note 103, at 118.

¹⁰⁶ *Id.*; see also Giannelli, note 104, at 250 (“A survey of approximately three hundred crime laboratories revealed that ‘fifty-seven percent . . . would only examine evidence submitted by law enforcement officials’” (quoting Joseph L. Peterson et al., *The Capabilities, Uses, and Effects of the Nations’ Criminalistics Laboratories*, 30 J. FORENSIC SCI. 10, 13 (1985))).

¹⁰⁷ Giannelli, *supra* note 103, at 119; see, e.g., VA. CODE ANN. § 19.2-264.3:1.3 (West 2017); sources cited *infra* notes 108–09.

¹⁰⁸ See, e.g., ARIZ. REV. STAT. ANN. § 13-4013(B) (2018) (applying solely to felony offenses); TENN. CODE ANN. § 40-14-207(b) (West 2018) (applying solely to capital cases).

¹⁰⁹ See, e.g., N.Y. COUNTY LAW § 722-c (McKinney 2018) (providing \$1000 maximum for indigent defendant to fund an expert).

¹¹⁰ Garrett, *supra* note 18, at 33.

¹¹¹ *Id.* at 33–34 (explaining that “of the analysts testing in the 137 exonerees’ trials . . . only [nineteen] exonerees retained experts”).

¹¹² *Id.*

¹¹³ The same issues that exist when a scientifically illiterate judge screens for reliability exist when a scientifically illiterate lawyer cross-examines an expert to assess reliability. See *supra* Section I.A.1.b; see also COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIS. CMTY., NAT’L RESEARCH COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 27 (2009) [hereinafter NAS REPORT], <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> (concluding that “lawyers . . . often have insufficient training and background in scientific methodology, and they often fail to fully comprehend the approaches employed by different forensic science disciplines and the reliability of forensic science evidence that is offered in trial”).

II. CASE STUDIES: FLAWED PARTISAN EXPERT TESTIMONY CONTRIBUTES TO WRONGFUL CONVICTIONS

The following case studies represent instances where flawed scientific expert testimony played a critical role in convicting innocent defendants. Each case study in this Note was tried in a jurisdiction that had already adopted the *Daubert* standard at the time of trial, thus demonstrating the limits of current standards to regulate expert testimony.¹¹⁴

In the following case studies, the forensic scientists used invalid¹¹⁵ forensic individualization techniques¹¹⁶ to conclude that evidence taken from the crime scene came from the defendant, to the exclusion of all others. In 2009, the National Academy of Sciences released its report on forensic sciences (NAS Report).¹¹⁷ The NAS Report concluded that, with the exception of DNA, no forensic discipline has been shown to be scientifically valid in claims of “individualization.”¹¹⁸ The NAS Report went on to voice its concerns that the courts have been “utterly ineffective” in addressing this problem since *Daubert*.¹¹⁹ A more recent article by Professor Jules Epstein argues that courts continue to remain passive in remedying the problem of unreliable forensic identification procedures.¹²⁰

¹¹⁴ For a list of states using the *Daubert* “reliability” standard and those using the *Frye* “general acceptance” standard, see Michael Morgenstern, *Daubert v. Frye—a State-by-State Comparison*, EXPERT INST. (Apr. 3, 2017), <https://www.theexpertinstitute.com/daubert-v-frye-a-state-by-state-comparison>.

¹¹⁵ For purposes of this Note, note that reliability does not necessarily establish the validity or accuracy of a result. A procedure or technique consistently giving an incorrect result can be reproducible. Techniques and protocols must be both reliable and valid. Martyn Shuttleworth, *Validity and Reliability*, EXPLORABLE.COM (Oct. 20, 2008), <https://explorable.com/validity-and-reliability> (defining “validity” as a measurement of accuracy; validity proves that one is doing what they are intending to do; defining “reliability” as the repeatability of findings). With the exception of DNA testing, “no [forensic] method has been shown to be able to consistently and accurately link a piece of evidence to an individual or single source.” *How Accurate Is Forensic Analysis?*, WASH. POST, <http://www.washingtonpost.com/wp-srv/special/local/forensic-analysis-methods> (last visited Apr. 17, 2018).

¹¹⁶ “Individualization” is the technique of tracing crime scene evidence to a unique source (i.e., the defendant). See HANDBOOK OF CRIMINAL INVESTIGATION 308 (Tim Newburn, Tom Williamson & Alan Wright eds., 2007). “[N]o scientific basis exists for the proposition that forensic scientists can ‘individualize’ an unknown marking (such as a fingerprint, tire track, or handwriting sample) to a particular person or object to the exclusion of all others in the world.” Jonathan J. Koehler & Michael J. Saks, *Individualization Claims in Forensic Science: Still Unwarranted*, 75 BROOK. L. REV. 1187, 1187 (2010).

¹¹⁷ NAS REPORT, *supra* note 113.

¹¹⁸ *Id.* at 7 (“With the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.”); see also *infra* Section III.A.

¹¹⁹ NAS REPORT, *supra* note 113, at 109.

¹²⁰ Jules Epstein, *Preferring the “Wise Man” to Science: The Failure of Courts and Non-*

Though the case studies below are relatively old, the problems with scientific expert testimony presented in this Note continue to plague the criminal justice system.¹²¹ Flawed testimony continues to be routinely accepted. However, what the flaws are and how they contribute to jury decisions have only been studied in the context of wrongful convictions, which limits the cases that can be discussed in this Note to older ones.¹²²

Moreover, it is important to note that although these cases took place before DNA revolutionized the criminal justice system—and even though the forensic methodologies used in these cases (hair microscopy and fingerprint analysis) have been highly scrutinized since these trials took place—there has been a recent emergence of caution and skepticism relating to the aura of infallibility surrounding DNA analysis.¹²³

Unlike the other forensic methodologies, which were developed by police departments, DNA typing arose as an academic discipline in the field of biology.¹²⁴ Before ever being used in criminal investigations, DNA typing was subjected to extensive experimentation and validation—as opposed to the other forensic techniques that evolved in response to law enforcement needs, and that were never closely researched and scrutinized by the scientific community.¹²⁵ Now, as a tool introduced in crime laboratories, DNA evidence can be used to link a perpetrator to a crime using minute amounts of blood, saliva, semen, skin cells, and other biological material.¹²⁶ DNA evidence has also become an invaluable tool for exonerating those who have been wrongfully

Litigation Mechanisms to Demand Validity in Forensic Matching Testimony, 20 WIDENER L. REV. 81, 83 (2014).

¹²¹ See, e.g., *Elite FBI Forensic Unit Gave Flawed Testimony*, CBS NEWS (Apr. 20, 2015, 7:30 AM), <http://www.cbsnews.com/news/fbi-hair-analysis-errors-led-to-convictions-new-report-finds>; Eric S. Lander, Opinion, *Fix the Flaws in Forensic Science*, N.Y. TIMES (Apr. 21, 2015), <https://www.nytimes.com/2015/04/21/opinion/fix-the-flaws-in-forensic-science.html>; Eric Lichtblau, *Justice Dept. to Tighten Rules on Testimony by Scientists*, N.Y. TIMES (June 3, 2016), <https://www.nytimes.com/2016/06/04/us/justice-dept-fbi-scientist-forensic-test.html>.

¹²² In this Note, the use of wrongful convictions as case studies to study the issues of flawed forensic testimony serve a second purpose. Movement towards a scientifically validated and reliable method of presenting forensic testimony will likely be in response to public pressure generated by wrongful convictions. Wrongful convictions cast doubt on both the discipline of forensic science and the current regulation of expert testimony. DNA exonerations may provide continued momentum for these necessary and long overdue changes.

¹²³ See generally Matthew Shaer, *The False Promise of DNA Testing*, ATLANTIC (June 2016), <https://www.theatlantic.com/magazine/archive/2016/06/a-reasonable-doubt/480747>.

¹²⁴ *Id.*

¹²⁵ Nat'l Acad. of Scis., *'Badly Fragmented' Forensic Science System Needs Overhaul*, SCI. DAILY (Feb. 19, 2009), <https://www.sciencedaily.com/releases/2009/02/090218135119.htm>.

¹²⁶ NAT'L FORENSIC SCI. TECH. CTR., A SIMPLIFIED GUIDE TO DNA EVIDENCE, <http://www.forensicsciencesimplified.org/dna/DNA.pdf> (last visited Apr. 2, 2018); see NAS REPORT, *supra* note 113, at 7 (“[N]o [other] forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.”).

convicted.¹²⁷

However, DNA typing is not perfect and, as the technology develops, there is growing potential for mistakes.¹²⁸ DNA samples and mixtures are complex and their interpretation involves subjective estimations by experts.¹²⁹ In addition, DNA technology is becoming remarkably sensitive. For example, nowadays investigators can sometimes generate DNA profiles from skin cells left behind when someone touched something at a crime scene, no longer needing a blood or semen stain to generate a DNA profile.¹³⁰ However, when using such small amounts of DNA, the data collected can also include meaningless information that becomes difficult to interpret.¹³¹ Thus, it is becoming clear that the subjectivity and bias that may affect an expert's analysis, as illustrated by the cases below, have not been completely eliminated by the evolution of DNA analysis in the criminal justice system.¹³² Further, the older forensic disciplines will continue to play a role in criminal investigations since only twenty percent of violent crime investigations include evidence suitable for DNA testing.¹³³

¹²⁷ NAS REPORT, *supra* note 113.

¹²⁸ Linda Geddes, *Fallible DNA Evidence Can Mean Prison or Freedom*, NEW SCIENTIST (Aug. 11, 2010), <https://www.newscientist.com/article/mg20727733.500-fallible-dna-evidence-can-mean-prison-or-freedom>. See generally ERIN E. MURPHY, *INSIDE THE CELL: THE DARK SIDE OF FORENSIC DNA* (2015) (detailing cases where DNA typing has gone wrong and cautioning how quickly a trace of DNA can now become the foundation of a case).

¹²⁹ MURPHY, *supra* note 128. In 2011, a groundbreaking study showed how subjective the reading of complex DNA mixtures can be. Seventeen lab technicians were given DNA evidence from a rape case that hinged on DNA typing, however, facts about the case were withheld from them to prevent biased results. The technicians, who as a group had an average of nine years of experience in the field, were asked to determine whether the mixture included DNA from the defendant. One technician said the defendant could not be excluded as a contributor, twelve technicians said the DNA excluded the defendant, and four technicians said that the DNA profile was inconclusive. The two original trial DNA analysts had concluded that the defendant was a possible match. Meaning that had any of the sixteen technicians used in the study been responsible for the original DNA analysis, the rape trial could have had a completely different outcome. Itiel E. Dror & Greg Hampikian, *Subjectivity and Bias in Forensic DNA Mixture Interpretation*, 51 SCI. & JUST. 204 (2011).

¹³⁰ NIST to Assess the Reliability of Forensic Methods for Analyzing DNA Mixtures, NIST (Oct. 3, 2017), <https://www.nist.gov/news-events/news/2017/10/nist-assess-reliability-forensic-methods-analyzing-dna-mixtures>.

A new technique . . . can derive a full DNA profile from as little as 10 trillionths of a gram of genetic material, by copying DNA fragments into a sample large enough for testing. The technique not only carries a higher risk of sample contamination and allele dropout, but could also implicate someone who never came close to the crime scene.

Shaer, *supra* note 123.

¹³¹ *Id.*

¹³² See Section II.A–B. See generally Part III; Shaer, *supra* note 123 (“The problem with . . . DNA profiling is that there isn’t skepticism . . . [J]ust because we’re moving forward doesn’t mean mistakes aren’t still being made.” (quoting Susan Friedman)).

¹³³ KELLY M. PYREK, *FORENSIC SCIENCE UNDER SIEGE: THE CHALLENGES OF FORENSIC LABORATORIES AND THE MEDICO-LEGAL INVESTIGATION SYSTEM* 451 (2007).

A. *Timothy Edward Durham*

In 1993, an Oklahoma jury wrongfully convicted Timothy Durham of sexual assault.¹³⁴ The prosecution's theory relied on forensic testimony stating that Durham's hair microscopically "matched" hair recovered from the victim.¹³⁵ The State's expert, Carol English Cox of the Tulsa police laboratory, testified that she had compared hairs from the crime scene with Durham's hair and found similar reddish-yellow characteristics found in only five percent of the population.¹³⁶

The expert's testimony effectively included Durham in a small percentage of the population that could have committed the crime. The expert did not provide scientific support for that statistic, because none existed.¹³⁷ Therefore, in cases of microscopic hair analysis, an expert can never correctly testify whether a characteristic that "matches" the defendant is a rare or common event.¹³⁸

Due to a lack of empirical data within the forensic discipline, the strongest statement of association the expert could have made was that the hair was "consistent" with the defendant or "could have" come from the defendant.¹³⁹ Expert testimony stating that the hair "highly likely," "very probably," or "did come from the defendant violates the . . . scientific [principle] that expressions of probability must be supported by data."¹⁴⁰ Testifying as to probability, frequency, or making any other individualizing statements, as the expert did in Durham's

¹³⁴ In 1991, "an eleven-year-old girl was violently raped and sodomized by the pool of her Tulsa, Oklahoma residence. Investigators had only inconclusive hair and semen evidence found at the scene of the crime and the victim's vague description of her attacker." With no other leads, police focused their investigation on Durham, a local resident. *Timothy Durham*, INNOCENCE PROJECT, <http://www.innocenceproject.org/cases/timothy-durham> (last visited Apr. 17, 2018).

¹³⁵ The forensic expert based her results on a unique "straightening" characteristic she observed in one of the Caucasian head hairs she examined. The forensic expert observed the same characteristic in Durham's head hair. The expert told the jury that because she had never seen hair exhibit that characteristic the hairs matched one another. On cross-examination, the forensic expert conceded that no literature or research existed regarding this "straightening" characteristic in hairs. The expert added that for all she knew, the humidity in the laboratory where she examined the hair could have caused the straightening characteristic. Craig M. Cooley & Gabriel S. Oberfield, *Increasing Forensic Evidence's Reliability and Minimizing Wrongful Convictions: Applying Daubert Isn't the Only Problem*, 43 TULSA L. REV. 285, 309 n.203 (2007).

¹³⁶ Garrett & Neufeld, *supra* note 18, at 54.

¹³⁷ There is a lack of empirical data on the frequency of various class characteristics in human hair. Consequently, it is invalid for an analyst to tell a jury that consistency is a rare or common event. *Id.* at 19, 55.

¹³⁸ *Id.* at 19 n.166.

¹³⁹ *But see id.* at 19. "To say that two items are 'consistent' without being able to tell the jury that consistency is rare or common, renders the evidence potentially misleading and hence raises questions regarding whether it is inadmissible as both irrelevant and unduly prejudicial." *Id.*

¹⁴⁰ *Id.*

case, is unsupported scientific testimony.¹⁴¹

Durham, like the majority of criminal defendants, was denied funding for expert testimony.¹⁴² However, the defense did present testimony from eleven lay witnesses placing Durham in another state when the assault occurred. Despite Durham's very strong alibi, the jury convicted him anyway and sentenced him to 3200 years in prison¹⁴³; this supports the theories and research that claim jurors tend to believe that scientific evidence is infallible, valuing it above all other forms of testimony.¹⁴⁴

In 1997, post-conviction DNA testing definitively proved Durham's innocence when semen found on the victim's swimsuit was analyzed, revealing that it could not have come from Durham.¹⁴⁵ Timothy Durham spent over three and a half years in prison before he was exonerated.¹⁴⁶

B. *Stephan Cowans*

In 1998, Stephan Cowans was wrongfully convicted of attempted homicide for shooting a police officer in Massachusetts.¹⁴⁷ In the course of the perpetrator's escape, the perpetrator picked up a mug, drank from it, and put it back down.¹⁴⁸ Investigators lifted two latent fingerprints from the mug.¹⁴⁹ The State's expert, Dennis LeBlanc, compared Cowans's fingerprint to the lifted fingerprints and concluded that they were a match.¹⁵⁰ At trial, the expert testified that one of the fingerprints found on the mug was left by Cowans.¹⁵¹ The jury sentenced Cowans to

¹⁴¹ See Richard E. Bisbing, *The Forensic Identification and Association of Human Hair*, in 1 FORENSIC SCIENCE HANDBOOK 390, 419 (Richard Saferstein ed., 2002) (“[O]ne can never say with absolute certainty that a particular hair originated from one individual to the exclusion of all others.”).

¹⁴² See *supra* Section I.C.

¹⁴³ *Timothy Durham*, *supra* note 134.

¹⁴⁴ See *infra* Section III.B.

¹⁴⁵ *Timothy Durham*, *supra* note 134.

¹⁴⁶ *Id.* Note, however, that the average time spent in prison by those who have, through post-conviction DNA testing, been proven to have been wrongfully convicted is fourteen years. *Compensating the Wrongly Convicted*, INNOCENCE PROJECT, <https://www.innocenceproject.org/compensating-wrongly-convicted> (last visited Apr. 17, 2018).

¹⁴⁷ *Commonwealth v. Cowans*, 756 N.E.2d 622 (Mass. App. Ct. 2001); *Stephan Cowans*, CONVICTING INNOCENT, <https://www.convictingtheinnocent.com/exoneree/stephan-cowans> (last visited Apr. 17, 2018).

¹⁴⁸ *Stephan Cowans*, *supra* note 147.

¹⁴⁹ *Id.* “Lifting” fingerprints is the process by which investigators remove fingerprints from a crime scene.

¹⁵⁰ *Id.*

¹⁵¹ *Cowans*, 756 N.E.2d at 625 (“A fingerprint left on the glass mug was matched to the defendant.”).

forty-five years in prison.¹⁵² Post-conviction DNA testing of a sweatshirt worn by the true perpetrator eventually excluded Cowans and proved his innocence.¹⁵³ He was exonerated in 2004.¹⁵⁴

Following Cowans's exoneration, the District Attorney asked the Massachusetts State Police to re-examine the fingerprint match used to convict Cowans.¹⁵⁵ Police concluded that the expert's results were false and that the fingerprint clearly excluded Cowans.¹⁵⁶ An external audit of the State's expert revealed that he had discovered his mistake—that Cowans was not the source of the print—during his examinations, yet concealed that fact at trial.¹⁵⁷ A grand jury refused to indict the expert and he was never prosecuted.¹⁵⁸

The expert testimony in Cowans's case illustrates how adversarial biases contribute to flawed testimony.¹⁵⁹ Flaws in the expert's testimony included: a false positive match to the defendant despite a lack of validation in the field of fingerprint comparisons¹⁶⁰; statements that Cowans was the source of the crime scene fingerprint to the exclusion of all others¹⁶¹; individualizing language that could have profoundly affected how jurors evaluated the evidence¹⁶²; multiple discrepancies in the testimony¹⁶³; the intentional use of a method to present fingerprint evidence to the jury that was contrary to the preferred methods of fingerprint examiners, contrary to the method the expert used for the

¹⁵² *Id.*; *Stephan Cowans*, *supra* note 147.

¹⁵³ *Stephan Cowans*, *supra* note 147. The government "initially opposed post-conviction DNA testing, partly because it failed to see how Cowans could prove his innocence, given the fact he was linked to the offense by fingerprint evidence. The New England Innocence Project, however, persuaded the Commonwealth to allow the DNA testing." Cooley & Oberfield, *supra* note 135, at 320 n.295 (2007).

¹⁵⁴ Cooley & Oberfield, *supra* note 135, at 321.

¹⁵⁵ See Jonathan Saltzman & Mac Daniel, *Man Freed in 1997 Shooting of Officer*, BOS. GLOBE (Jan. 24, 2004), <https://truthinjustice.org/cowans2.htm>.

¹⁵⁶ Maurice Possley et al., *Scandal Touches Even Elite Labs*, CHI. TRIB. (Oct. 21, 2004), <http://www.chicagotribune.com/news/watchdog/chi-041021forensics-story.html>.

¹⁵⁷ Flynn McRoberts & Steve Mills, *U.S. Seeks Review of Fingerprint Techniques*, CHI. TRIB. (Feb. 21, 2005), <http://www.chicagotribune.com/news/watchdog/chi-0502210062feb21-story.html> (reporting that LeBlanc "discovered his mistake" well before he testified at trial, yet "concealed it all the way through the trial").

¹⁵⁸ See Maggie Mulvihill, *No Charges vs. Hub Cops in Frame Case*, BOS. HERALD (June 24, 2004), http://www.nodp.org/ma/stacks/herald_062404.html.

¹⁵⁹ See Section III.B.

¹⁶⁰ See NAS REPORT, *supra* note 113; see also *infra* Section III.A (detailing a history of judicial acceptance of fingerprint identifications).

¹⁶¹ This kind of testimony is common of fingerprint examiners. See Brandon Garrett & Gregory Mitchell, *How Jurors Evaluate Fingerprint Evidence: The Relative Importance of Match Language, Method Information, and Error Acknowledgment*, 10 J. EMPIRICAL LEGAL STUD. 484, 486 (2013) ("Despite the lack of an objective method for quantifying uncertainty and the dearth of data on error rates, fingerprint examiners often testify that a positive match excludes all others in the world as the source of the crime scene print and that their method is a form of rigorous science that leads to infallible or nearly infallible conclusions . . ." (citation omitted)).

¹⁶² See *supra* text accompanying notes 116–19.

¹⁶³ Garrett & Neufeld, *supra* note 18, at 74.

other prints in the same case, and more confusing to the jury¹⁶⁴; and the knowing concealment of evidence from the jury that Cowans was excluded from the evidence, which could have possibly exculpated him.¹⁶⁵

Based largely on this testimony, Cowans served nearly six years of a forty-five year sentence for a crime he did not commit before he was exonerated by DNA testing.¹⁶⁶

III. PROBLEM: THE INHERENT CONFLICTS BETWEEN *DAUBERT*, EXPERT BIAS, AND FORENSIC SCIENTIFIC EVIDENCE

A. *The Failure of the Judiciary to Implement Daubert in Criminal Proceedings*

Despite what the Supreme Court may have intended, *Daubert* failed to revolutionize the judicial tolerance of unsupported forensic disciplines.¹⁶⁷ *Daubert* has largely been ignored in the field of forensic sciences¹⁶⁸ such that some scholars argue that, if the *Daubert* standard were stringently applied, most of what we consider forensic science would not be admissible at trial.¹⁶⁹

Judges argue that they do not need to reinvent the wheel every time a *Daubert* objection is raised to a contested item of forensic evidence.¹⁷⁰ They reason that courts have considered the scientific merits of this type of evidence many times before.¹⁷¹ Since judges have difficulty engaging

¹⁶⁴ *Id.*

¹⁶⁵ *Id.*

¹⁶⁶ *Stephan Cowans, supra note 147.*

¹⁶⁷ See Rachel Kaufman, *Forensic Science Controversies: Are Courts Relying Too Much on "Junk Science"?*, CQ PRESS (Feb. 10, 2017), <http://library.cqpress.com/cqresearcher/document.php?id=cqresre2017021000> ("*Daubert* doesn't really apply in criminal cases Judges don't use it. They may use the words of the standard, but they don't really demand that forensic evidence adhere to *Daubert*. . . . Disallowing expert testimony, at least in criminal cases, is still the exception rather than the rule." (internal quotation marks omitted)).

¹⁶⁸ *Id.* See generally D. Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?*, 64 ALB. L. REV. 99 (2000). *Daubert* has not had the same effect on criminal and civil cases. Civil cases have enjoyed stricter admissibility standards than criminal cases have. *Id.*

¹⁶⁹ Cooley & Oberfield, *supra note 135.*

¹⁷⁰ Domitrovich, *supra note 89*; see also Jane Campbell Moriarty, *Will History Be Servitude?: The NAS Report on Forensic Science and the Role of the Judiciary*, 2010 UTAH L. REV. 299, 300 (2010).

¹⁷¹ See Nathan Benedict, Note, *Fingerprints and the Daubert Standard for Admission of Scientific Evidence: Why Fingerprints Fail and a Proposed Remedy*, 46 ARIZ. L. REV. 519, 538 (2004) ("[J]udges have generally relied on their instincts and the long history of judicial acceptance . . . to admit [forensic evidence] without serious consideration of the science behind it.").

with scientific evidence, they refer to past case law.¹⁷² Opinions discussing complex science often serve as precedent for other judges reviewing the same issue.¹⁷³ The problem, of course, is that science is constantly evolving, and thus, inherently conflicts with the legal doctrine of precedent.¹⁷⁴

For example, courts have taken judicial notice of the uniqueness of each person's fingerprints and its potential use to identify perpetrators.¹⁷⁵ The underlying theory behind fingerprint analysis is that a fingerprint on an inculpatory piece of evidence at a crime scene can be traced to the perpetrator.¹⁷⁶ Since 1911, when fingerprint evidence was first offered into evidence, fingerprint identifications have enjoyed practically unwavering judicial acceptance in the United States.¹⁷⁷

The first *Daubert* challenge to a fingerprint identification was in *United States v. Mitchell*.¹⁷⁸ The prosecution alleged that the defendant's fingerprint was found on the getaway car used in an armed car robbery.¹⁷⁹ The defense contested the fingerprint evidence in a *Daubert*

¹⁷² See, e.g., Christopher Onstott, *Judicial Notice and the Law's "Scientific" Search for Truth*, 40 AKRON L. REV. 465, 467 (2007).

¹⁷³ See e.g., *United States v. Martinez*, 3 F.3d 1191, 1197 (8th Cir. 1993) (concluding that taking judicial notice of the validity determination regarding DNA "fingerprinting" in a pre-*Daubert* case, *United States v. Jakobetz*, 955 F.2d 786 (2d Cir. 1992), is still valid after *Daubert*); *Moore v. State*, 109 S.W.3d 537, 541-42 (Tex. Ct. App. 2001) ("Once a particular type of scientific evidence is well established as reliable, a court may take judicial notice of that fact, thereby relieving the proponent of the burden of producing evidence on that question. . . . This Court, as well as the trial court, may take judicial notice of the validity of fingerprint identification.").

¹⁷⁴ See generally Joseph Sanders, *Science, Law, and the Expert Witness*, 72 LAW & CONTEMP. PROBS. 63, 70-73 (2009) (noting that scientific inquiry lacks a timetable: "the law's need for relatively prompt closure stands in direct conflict with the scientific convention that closure should only occur when a consensus forms, however long that might be").

¹⁷⁵ See, e.g., *Grice v. State*, 151 S.W.2d 211, 221 (Tex. Crim. App. 1941) ("It has occurred to us that instead of the State being called upon to offer proof that no two finger prints are alike, it may now be considered in order for those taking the opposite view to assume the burden of proving their position."); see also Margaret A. Berger, *Procedural Paradigms for Applying the Daubert Test*, 78 MINN. L. REV. 1345, 1354 (1994) ("Considerable forensic evidence [such as fingerprinting] made its way into the courtroom without empirical validation of the underlying theory and/or its particular application."); Jennifer L. Mnookin, *Fingerprint Evidence in an Age of DNA Profiling*, 67 BROOK. L. REV. 13, 17 (2001) ("[F]ingerprints were accepted as an evidentiary tool without a great deal of scrutiny or skepticism.").

¹⁷⁶ For a history of the use of fingerprint analysis in criminal cases, see COLIN BEAVAN, *FINGERPRINTS: THE ORIGINS OF CRIME DETECTION AND THE MURDER CASE THAT LAUNCHED FORENSIC SCIENCE* (2001); see also SIMON A. COLE, *SUSPECT IDENTITIES: A HISTORY OF FINGERPRINTING AND CRIMINAL IDENTIFICATION* (2001).

¹⁷⁷ See *People v. Jennings*, 96 N.E. 1077 (Ill. 1911) (marking the first case in which fingerprint evidence was admitted in).

¹⁷⁸ *United States v. Mitchell*, 365 F.3d 215 (3d Cir. 2004); see also Michael Specter, *Do Fingerprints Lie?*, NEW YORKER (May 27, 2002), <https://www.newyorker.com/magazine/2002/05/27/do-fingerprints-lie>. See generally GARY W. JONES, *COURTROOM TESTIMONY FOR THE FINGERPRINT EXPERT* (2007).

¹⁷⁹ *Mitchell*, 365 F.3d at 220.

hearing,¹⁸⁰ claiming that fingerprint identifications were scientifically unsupported under *Daubert*.¹⁸¹ The prosecution presented fingerprint experts and scientists who testified that fingerprint identifications were established as a legitimate technique to identify defendants.¹⁸² After the hearing, the *Mitchell* court rejected the challenge to exclude the contested fingerprint evidence.¹⁸³ To date, there have been dozens of *Daubert* challenges to fingerprint evidence.¹⁸⁴ None have been successful.¹⁸⁵

The *Mitchell* court reasoned that a “long history of implicit [judicial] testing” was sufficient for admitting evidence under Rule 702.¹⁸⁶ However, “implicit [judicial] testing” is not empirical testing.¹⁸⁷ The holding in *Mitchell* is an example of judges’ tendencies to erroneously equate a seemingly useful history of a forensic discipline with scientific methods that have been adequately tested, have known error rates, and are reliable.¹⁸⁸

¹⁸⁰ *Id.* at 219; see also Simon A. Cole, *Does “Yes” Really Mean Yes? The Attempt to Close Debate on the Admissibility of Fingerprint Testimony*, 45 JURIMETRICS J. 449, 464 (2005) (“[T]he assumption that the defendant was the source of the very prints at issue in the admissibility hearing at his own trial undermine the persuasiveness of the [*Mitchell*] opinion.”).

¹⁸¹ *Mitchell*, 365 F.3d at 226–28.

¹⁸² *Id.* at 223.

¹⁸³ *Id.* at 229–30. This case was troublesome in another respect. In 2000, the Department of Justice released a solicitation for fingerprint research. The solicitation stated that *Daubert* “require[d] scientists to address the reliability and validity of the methods used in their analysis. Therefore, the purpose of this solicitation is to . . . provide greater scientific foundation for forensic . . . identification.” The solicitation was postponed until after the *Mitchell* case, arguably so it could not be used in *Mitchell* to support the defense challenge. Paul C. Giannelli, *Daubert Challenges to Fingerprints*, 42 CRIM. L. BULL. 624, 634–35 (2006) (quoting NAT’L INST. OF JUSTICE, SOLICITATION: FORENSIC FRICTION RIDGE (FINGERPRINT) EXAMINATION VALIDATION STUDIES (Mar. 2000)).

¹⁸⁴ See, e.g., *United States v. Baines*, 573 F.3d 979, 990–92 (10th Cir. 2009); *Mitchell*, 365 F.3d at 220; *United States v. George*, 363 F.3d 666, 673 (7th Cir. 2004); *United States v. Crisp*, 324 F.3d 261, 269 (4th Cir. 2003); *United States v. Havvard*, 260 F.3d 597, 600 (7th Cir. 2001).

¹⁸⁵ See cases cited *supra* note 184. However, in *United States v. Plaza*, Judge Pollak held that a fingerprint expert could not testify that the fingerprints “matched” the defendant nor could the expert make a positive identification to the exclusion of all others. *United States v. Llera Plaza*, 179 F. Supp. 2d 492, 516–18 (E.D. Pa. 2002). He then reversed himself: “In short, I have changed my mind.” *United States v. Llera Plaza*, 188 F. Supp. 2d 549, 576 (E.D. Pa. 2002); see Andy Newman, *Judge Who Ruled out Matching Fingerprints Changes His Mind*, N.Y. TIMES (Mar. 14, 2002), <http://www.nytimes.com/2002/03/14/us/judge-who-ruled-out-matching-fingerprints-changes-his-mind.html>.

¹⁸⁶ *Mitchell*, 365 F.3d at 238. The court did concede, however, that “if directed, specific actual testing were the requirement of *Daubert*, we might be hesitant to find this factor weighing in favor of the government.” *Id.*

¹⁸⁷ Empirical testing can be defined as “testing a hypothesis using experimentation . . . or . . . observation” Lyndsay T. Wilson, *Empirical Research*, EXPLORABLE.COM (Sept. 21, 2009), <https://explorable.com/empirical-research>; see also WAYNE K. HOY & CURT M. ADAMS, *QUANTITATIVE RESEARCH IN EDUCATION: A PRIMER* 5 (2016) (“*Empirical* refers to evidence based on observations, especially evidence obtained by systematic and controlled scientific research” (citation omitted)).

¹⁸⁸ See Giannelli, *supra* note 183, at 633, 641 (criticizing judicial treatment of forensics

Despite a century's worth of investigatory use, the underlying theories of fingerprint identification have yet to be verified or tested.¹⁸⁹ However, it is precisely this long history that courts rely on to justify admitting methodology that remains unexamined.¹⁹⁰ This paradox, perpetuated by *Daubert's* application, continues to undermine the important need for empirical research to justify these disciplines.¹⁹¹

While judges continue to rely on "implicit testing," scholars have pointed to a pervasive "lack of standards, research, and established error rates" in the forensic sciences.¹⁹² Concerns about the use of the forensic sciences in criminal prosecutions are detailed in the 2009 NAS Report.¹⁹³

The NAS Report maintains that many theories and principles underlying the field of forensic sciences have not been demonstrated as reliable.¹⁹⁴ Further, the NAS Report concluded that although there may be skilled and well-intentioned forensic scientists, the quality of work varies widely and conclusions are not always reliable.¹⁹⁵ Subsequently, in 2016, the President's Council of Advisors on Science and Technology (PCAST) issued its own report suggesting additional steps to ensure the validity of forensic science in the criminal justice system.¹⁹⁶

because judicial testing is not empirical testing).

¹⁸⁹ See Sandy L. Zabell, *Fingerprint Evidence*, 13 J.L. & POL'Y 143, 164 (2005) ("Although there is a substantial literature on the uniqueness of fingerprints, it is surprising how little true scientific support for the proposition exists." (footnote omitted)).

¹⁹⁰ See *supra* text accompanying notes 170–74 (courts look to past judicial acceptance to admit forensic evidence).

¹⁹¹ See *supra* text accompanying notes 185–88.

¹⁹² Moriarty, *supra* note 170, at 300. See generally Michael J. Saks & Jonathan J. Koehler, *The Individualization Fallacy in Forensic Science Evidence*, 61 VAND. L. REV. 199 (2008).

¹⁹³ NAS REPORT, *supra* note 113, at 4–7.

¹⁹⁴ *Id.* at 7–8. See generally Jules Epstein, *The NAS Report: An Evidence Professor's Perspective*, NCSTL (July 2009), <http://www.ncstl.org/evident/July,%202009%20Epstein%20spotlight> ("Nonetheless, the [NAS] Report's findings call into question the degree of certainty testified to by practitioners of 'soft' forensic disciplines, the subjective pattern matching of fingerprints, ballistics, handwriting, tool marks, and tire and shoe print treads. In particular, the [NAS] Report found an across-the-board inability to validate claims that a correspondence of features between crime scene evidence and a known (e.g., between a latent print left at a burglary and the print of a suspect) proves that the suspect was the sole possible contributor.").

¹⁹⁵ Epstein, *supra* note 194; see HARRY T. EDWARDS, NAT'L ACAD. OF SCIS., THE NATIONAL ACADEMY OF SCIENCES REPORT ON FORENSIC SCIENCES: WHAT IT MEANS FOR THE BENCH AND BAR 194 (May 6, 2010), https://www.americanbar.org/content/dam/aba/administrative/legal_aid_indigent_defendants/ls_sclaid_def_train_natl_academy_sciences_edwards.authcheckdam.pdf.

¹⁹⁶ See generally PRESIDENT'S COUNCIL OF ADVISORS ON SCI. & TECH., EXEC. OFFICE OF THE PRESIDENT, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE-COMPARISON METHODS (Sept. 2016), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf; see also Harry T. Edwards & Jennifer L. Mnookin, *A Wake-up Call on the Junk Science Infesting Our Courtrooms*, WASH. POST (Sept. 20, 2016), https://www.washingtonpost.com/opinions/a-wake-up-call-on-the-junk-science-infesting-our-courtrooms/2016/09/19/85b6eb22-7e90-11e6-8d13-d7c704ef9fd9_story.html (discussing that the PCAST Report "persuasively explains that expert

Not surprisingly, criminal defense attorneys have used the NAS Report to try to exclude forensic evidence from being presented at trial through motions in limine.¹⁹⁷ However, when defense attorneys challenge the evidence, trial judges simultaneously hear from the prosecution's well-credentialed forensic scientist who confidently ensures the judge that their forensic discipline rests on sound science; signaling to the judge that "precedent supports admission, and that the technique at issue easily meets the *Daubert* standard."¹⁹⁸

The result is that when defense attorneys raise *Daubert* challenges to scientific evidence, courts generally side with the prosecution.¹⁹⁹ Despite what is at stake in these criminal cases—life and liberty—courts apply a diluted version of *Daubert* or ignore it altogether.²⁰⁰ Yet, when prosecutors raise a *Daubert* challenge to exclude a defendant's forensic expert or evidence, courts tend to side with the prosecution and exclude the evidence.²⁰¹

Judges prefer to take judicial notice of scientific evidence and depend on cross-examination to showcase flaws or bias in the prosecution's expert testimony.²⁰² The adversarial system uses cross-examination as a means to safeguard the accuracy and completeness of witness testimony.²⁰³ However, scientific testimony is not like other forms of testimony.²⁰⁴ Because of the complexity of applying scientific

evidence based on a number of forensic methods . . . lacks adequate scientific validation").

¹⁹⁷ Domitrovich, *supra* note 89, at 40–41; Tresa Baldas, *Defense Counsel View Report as New Weapon*, LAW.COM (May 11, 2009, 12:00 AM), <http://www.nationallawjournal.com/id=1202430604696/Defense-Counsel-View-Report-as-New-Weapon>.

¹⁹⁸ Domitrovich, *supra* note 89, at 41.

¹⁹⁹ Cooley & Oberfield, *supra* note 135, at 291 ("[P]rosecutors enjoyed a success rate of ninety-two percent in trial courts and ninety-eight percent in appellate courts. No other litigant, civil or criminal, comes close to matching the prosecution's success rate." (footnote omitted)).

²⁰⁰ Risinger, *supra* note 168, at 149 ("[T]he heightened standards of dependability imposed on expertise proffered in civil cases has continued to expand, but . . . expertise proffered by the prosecution in criminal cases has been largely insulated from any change in pre-*Daubert* standards or approach.").

²⁰¹ See Cooley & Oberfield, *supra* note 135, at 291.

²⁰² See *California v. Green*, 399 U.S. 149, 158 (1970) (discussing the common assumption that "cross-examination [is the] 'greatest legal engine ever invented for the discovery of truth'" (quoting 5 J. WIGMORE, EVIDENCE § 1367 (3d ed. 1940))).

²⁰³ RALPH ADAM FINE, WIS. COURT OF APPEALS, ALI-ABA COURSE OF STUDY: OPINION AND EXPERT TESTIMONY IN FEDERAL AND STATE COURTS I (2006), http://files.ali-aba.org/thumbs/datastorage/skoobesruoc/pdf/CL084-CH04_thumb.pdf ("Wigmore called cross-examination the 'great engine' for getting at the truth. And so it is. It is a powerful tool because the witness understands that the jury is answering the questions before he or she answers.").

²⁰⁴ Judge Learned Hand succinctly commented on the paradox of expert testimony. Learned Hand, *Historical and Practical Considerations Regarding Expert Testimony*, 15 HARV. L. REV. 40, 54 (1901) ("The whole object of the expert is to tell the jury, not facts . . . but general truths derived from his specialized experience. But how can the jury judge between two statements each founded upon an experience confessedly foreign in kind to their own? It is just because they are incompetent for such a task that the expert is necessary at all."); see *infra* Section III.B.1.

principles to evaluate an expert's methodology, judges cannot simply delegate to the jury the task of deciphering scientific evidence despite the traditional role of cross-examination in the adversarial process.²⁰⁵ Therefore, trial judges need to acquire the requisite tools and knowledge to assess the reliability of the methods used by forensic scientists. To do so, they need independent guidance.²⁰⁶

B. *The Implications of Science in an Adversarial System*

1. Science Is Fundamentally at Odds with an Adversarial System

The current system is failing to protect defendants against false forensic testimony, because science is fundamentally irreconcilable with the bias inherent in partisan experts.²⁰⁷ Scientific evidence should be treated differently from other types of evidence, because science is objective and guided by meaningful and consistent standards.²⁰⁸ Precisely because forensic evidence is presented as a “science,” juries do not question it.²⁰⁹ Therefore, when scientific experts report on a subject-matter grounded in science, their findings and conclusions, by implication, should be objective and repeatable.²¹⁰ Yet, prosecution-proffered forensic scientists consistently present testimony that is subjective and presented under the guise of objective science.²¹¹ When science is presented according to partisan logic to intentionally support

²⁰⁵ See *supra* Section I.A (discussing the judge's gatekeeping function in *Daubert*).

²⁰⁶ See *infra* Part IV.

²⁰⁷ See Mark R. Patterson, *Conflicts of Interest in Scientific Expert Testimony*, 40 WM. & MARY L. REV. 1313, 1364–66 (1998) (explaining the difference between the fact-finding of law and the fact-finding of science, and why science needs its own approach).

²⁰⁸ It was the acknowledgment that science is fundamentally different from other types of evidence that paved the way for the Supreme Court's opinion in *Daubert*—when DNA testing was just emerging. DNA testing was the first validated science to be applied in the criminal justice system. See *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 590 n.9 (“[E]videntiary reliability [of scientific expert testimony] will be based on *scientific validity*.”); Randy James, *DNA Testing*, TIME (June 19, 2009), <http://content.time.com/time/nation/article/0,8599,1905706,00.html>.

²⁰⁹ See generally Stern, *supra* note 68 (explaining that jurors continue to “expect a constant parade of forensic evidence during trials [and] refuse to believe that this evidence might ever be faulty”); see also Haack, *supra* note 89, at 1002 (stating that the adversarial process may create “artificial scientific certainty[] and . . . artificial scientific doubt”).

²¹⁰ See generally NAS REPORT, *supra* note 113, at 19–30 (providing recommendations to reform the field of forensic sciences).

²¹¹ See generally Jessica Gabel Cino, *Forensic Evidence Largely Not Supported by Sound Science—Now What?*, CONVERSATION (Dec. 6, 2016, 9:09 PM), <http://theconversation.com/forensic-evidence-largely-not-supported-by-sound-science-now-what-67413>; *supra* Part II. See, e.g., Mark Hansen, *Out of the Blue*, A.B.A. J. (Feb. 1996), http://www.abajournal.com/magazine/article/out_of_the_blue (describing an expert witness “willing to testify at the drop of a theory . . . prove[s] that ‘science’ can be stranger than fiction”).

one side over the other, science no longer follows scientific principles.²¹²

2. Science Is Incompatible with Partisan Experts

Scientific testimony is arguably the most difficult testimony for the average factfinder to understand.²¹³ The very purpose of introducing an expert witness is to help the factfinder make a fully informed decision by providing them with knowledge about scientific or technical topics they would not have otherwise understood.²¹⁴ The same scientific illiteracy which makes it difficult for the jury to assess scientific evidence in the first place, simultaneously makes it difficult for a jury to appreciate how adversarial biases can slant and corrupt that evidence.²¹⁵ When scientific experts testify according to partisan logic, they no longer fulfill their role of assisting the factfinder.²¹⁶ Unfortunately, the adversarial process itself often negates the value of their expertise.²¹⁷

²¹² See sources cited *supra* note 211; see also Chris Asplen, *The Cost of Serving Justice*, FORENSIC MAG. (Aug. 01, 2009, 4:00 AM), <http://www.forensicmag.com/article/2009/08/cost-serving-justice>.

²¹³ Rebecca K. Helm & James P. Dunlea, *Motivated Cognition and Juror Interpretation of Scientific Evidence: Applying Cultural Cognition to Interpretation of Forensic Testimony*, 120 PENN ST. L. REV. PENN STATIM 1, 15 (2016) (explaining that scientific evidence is difficult for jurors to understand and that the problem is exacerbated by the current system in which partisan experts present conflicting interpretations of the evidence: “[t]his may be why jurors are finding defendants guilty based on invalid testimony by forensic analysts”); see also Richard A. Posner, *What Is Obviously Wrong with the Federal Judiciary, Yet Eminently Curable*, 19 GREEN BAG 2D 187, 190 (2016) (“A big problem with jury trials is that often they involve [scientific] issues that few jurors understand (not many judges understand them either) and that the lawyers and witnesses are unable or unwilling to dumb down to a level that the jurors would understand.”).

²¹⁴ See FED. R. EVID. 702(a) (permitting an expert to testify about that expert’s “scientific, technical, or other specialized knowledge” if the expert’s testimony “will help the trier of fact to understand the evidence or to determine a fact in issue”).

²¹⁵ Joseph Sanders, *From Science to Evidence: The Testimony on Causation in the Bendectin Cases*, 46 STAN. L. REV. 1, 41 (1993) (criticizing current use of adversarial experts by declaring that they “might as well have been designed to confuse, to leave the audience staring at an unresolved and apparently unresolvable conflict”); see also Domitrovich, *supra* note 89, at 44 (“The end result is that in many cases, inexperienced judges and factfinders hear two very different sides of a complex scientific matter and are left to resolve a dispute that, apparently, the scientific community itself has not resolved.”); John H. Langbein, *The German Advantage in Civil Procedure*, 52 U. CHI. L. REV. 823, 836 (1985) (discussing the troubling result that the factfinder inadvertently places too much credence on the expert “whose forensic skills are the more enticing”).

²¹⁶ Johnston, *supra* note 38, at 263–66 (discussing how in the current system expert witnesses lose the characteristics that makes them experts).

²¹⁷ See Langbein, *supra* note 215, at 836 (“[T]he systematic incentive in our procedure to distort expertise leads to a systematic distrust and devaluation of expertise. Short of forbidding the use of experts altogether, we probably could not have designed a procedure better suited to minimize the influence of expertise.”).

3. Lack of Jury Competence to Evaluate Science

Jurors have a poor understanding of the science that is presented to them in the courtroom.²¹⁸ Of great concern is whether jurors comprehend the scientific evidence being brought forth for their consideration.²¹⁹ Research confirms that jurors lack the appropriate training necessary to assess the merits of an expert's testimony on forensic sciences.²²⁰ As a result, jurors are inclined to attach significant value to scientific testimony.²²¹ Forensic sciences are precisely the type of scientific evidence that juries are likely to consider as objective and infallible.²²² Yet, since the majority of forensic sciences have not been validated, this type of expert testimony invites jurors to reach conclusions that are unsupported by sound science.²²³

The jury's weakness in evaluating the merits of scientific testimony is exacerbated by the "CSI Effect," a phenomenon that results from viewing forensic and crime-based television shows.²²⁴ Theorists claim that jurors are misled by the idealized portrayal of forensic science on television and confuse the actual merits of scientific evidence produced at a trial.²²⁵ Crime shows convey the impression that forensic sciences

²¹⁸ See Michael Bromby, *Juries and Their Understanding of Forensic Science: Are Jurors Equipped?*, 2 INT'L J. SCI. SOC'Y 247, 247 (2011).

²¹⁹ *Id.*

²²⁰ Research confirms that juries do not understand the fundamentals of scientific evidence and lack the ability to reason about statistics, probability, and methodologies. See Bradley D. McAuliff et al., *Juror Decision-Making in the Twenty-First Century: Confronting Science and Technology in Court*, in HANDBOOK OF PSYCHOLOGY IN LEGAL CONTEXTS 303 (David Carson & Ray Bull eds., 2d ed. 2003). In a nationwide survey of people who served on civil and criminal juries, eighty-nine percent reported that paid experts were believable. Furthermore, sixty-eight percent of the jurors in criminal cases found experts to be very believable. Jay P. Kesan, Note, *An Autopsy of Scientific Evidence in a Post-Daubert World*, 84 GEO. L.J. 1985, 1988 (1996).

²²¹ JOSEPH L. PETERSON, NAT'L INST. OF JUSTICE, USE OF FORENSIC EVIDENCE BY THE POLICE AND COURTS 4 (1987), <https://www.ncjrs.gov/pdffiles1/pr/107206.pdf> (basing report on criminal cases and finding that experts were ranked by jurors as "the most persuasive of all witnesses").

²²² See Stern, *supra* note 68.

²²³ See Karen Kafadar & Anne-Marie Mazza, Op-ed, *Using Faulty Forensic Science, Courts Fail the Innocent*, LIVE SCI. (Feb. 24, 2015, 2:08 PM), <http://www.livescience.com/49929-faulty-forensic-science-failing-united-states-court-system.html> ("[M]ost forms of forensic evidence . . . have been characterized by much subjectivity, human observer bias, error and variability in processing and interpreting the evidence, lack of standardized procedures and accreditation programs in crime laboratories, inconsistent validation and unknown error rates . . .").

²²⁴ See John Alldredge, *The "CSI Effect" and Its Potential Impact on Juror Decisions*, 3 RES. J. JUST. STUD. & FORENSIC SCI. 114, 115-17 (2015); see also Andrew P. Thomas, *The CSI Effect: Fact or Fiction*, 115 YALE L.J. F. 70 (2006), <http://yalelawjournal.org/forum/the-csi-effect-fact-or-fiction>.

²²⁵ See *The "CSI Effect"*, ECONOMIST (Apr. 22, 2010), <http://www.economist.com/node/15949089>.

are always reliable, easy to interpret, and difficult to contaminate.²²⁶ This is far from the truth.²²⁷ Accordingly, jurors overestimate the probative value of forensic evidence, thus affecting their decision to convict.²²⁸

Whether or not the CSI Effect actually exists, prosecutors make strategic decisions as if it is a real influence—potentially further exacerbating the problem of flawed scientific testimony.²²⁹ Believing that juries will not convict without forensic evidence, prosecutors order unnecessary forensic tests to include some aspect of forensic evidence at trial.²³⁰ Therefore, prosecutors are inclined to introduce forensic evidence so that the jury believes the evidence is more probative than it really is.²³¹

Scientific expert testimony can be the most influential testimony the factfinder hears.²³² This is especially troublesome because the current regime does not adequately prevent the jury from listening to flawed and biased scientific testimony.²³³ When the prosecution's forensic expert identifies the defendant as the source of evidence left at a crime scene, that sends a potent signal to the jury that the defendant is guilty.²³⁴

IV. PROPOSAL: SEGREGATING BIAS FROM THE SCIENTIFIC EXPERT

Given the failures of the application of *Daubert* to keep flawed inculpatory scientific testimony from being heard by juries and contributing to wrongful convictions, paired with the inability of science to remain scientific in an adversarial process, this Note proposes that courts should be required to appoint an impartial expert when

²²⁶ Jeffrey Toobin, *The CSI Effect: The Truth About Forensic Science*, NEW YORKER (May 7, 2007), <http://www.newyorker.com/magazine/2007/05/07/the-csi-effect> (explaining that forensic scientists on crime shows make forensic science seem infallible).

²²⁷ See *supra* Introduction, Part II.

²²⁸ Simon A. Cole & Rachel Dioso-Villa, *Investigating the 'CSI Effect' Effect: Media and Litigation Crisis in Criminal Law*, 61 STAN. L. REV. 1335 (2009).

²²⁹ Alldredge, *supra* note 224, at 118 (describing studies that show actors in the criminal justice system are changing their tactics, as if the CSI Effect has a significant influence on the outcome of the case).

²³⁰ Jenny Wise, *Providing the CSI Treatment: Criminal Justice Practitioners and the CSI Effect*, 21 CURRENT ISSUES CRIM. JUST. 383 (2010) (noting that the CSI Effect causes unnecessary work and tests to be completed to overcome any suspected bias).

²³¹ *Id.*

²³² Sources cited *supra* note 209.

²³³ See *supra* Part II.

²³⁴ See Margaret A. Berger, *Expert Testimony in Criminal Proceedings: Questions Daubert Does Not Answer*, 33 SETON HALL L. REV. 1125, 1132 (2003) (explaining that a “jury will overestimate the evidence’s shaky probative value, especially if it is the only evidence that ties the defendant to the scene”).

reviewing certain types of forensic evidence, as identified below.²³⁵

A. *Rule 706 Is Not Enough to Prevent Flawed Forensic Testimony*

The value of a court-appointed expert is already recognized under Rule 706.²³⁶ Thus, Rule 706²³⁷ is oftentimes provided as a solution for judges to assess the reliability of forensic expert testimony.²³⁸

Yet, Rule 706 is an option rarely utilized²³⁹ despite the fact that, when judges do use independent experts, they find them helpful in assessing reliability.²⁴⁰ Moreover, when experts are appointed, judges apply Rule 706 much less often in jury trials than in non-jury trials.²⁴¹ Meaning that judges, when given the option, are less likely to ask for a presumably more neutral opinion in serious criminal cases with the most at stake—life and liberty.²⁴² Given the option, judges do not use experts.

Another drawback to Rule 706, is that court-appointed experts are used to supplement partisan experts, not to replace them.²⁴³ Under Rule 706 parties are still entitled to hire their own expert witness.²⁴⁴ Thus,

²³⁵ See *infra* Section IV.B.

²³⁶ FED. R. EVID. 706; see *supra* Section I.A; see also Anthony Champagne et al., *Are Court-Appointed Experts the Solution to the Problems of Expert Testimony?*, 84 JUDICATURE 178, 179 n.6 (2001) (citing to numerous judges and legal scholars arguing in favor of court-appointed experts).

²³⁷ There is also some support for the idea that independent experts can be appointed through a judge's inherent ability to assess evidence under Rule 104. See FED. R. EVID. 104(b); *Hall v. Baxter Healthcare Corp.*, 947 F. Supp. 1387, 1392 n.8 (D. Or. 1996) (using Rule 104, not Rule 706, to appoint independent experts).

²³⁸ See, e.g., *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 148 (1997) (Breyer, J., concurring) (suggesting Rule 706 may be necessary to assist judges evaluating complex scientific evidence in the most difficult cases).

²³⁹ *Krafka et al.*, *supra* note 82, at 326 tbl.5 (finding that only twenty-six percent of judges surveyed appointed independent experts); see also 7 ETHICAL PRACTICE IN PSYCHIATRY AND THE LAW 87 (Richard Rosner & Robert Weinstock eds., 1990) (“[R]ule 706 is the least-used provision of the Federal Rules of Evidence.”).

²⁴⁰ See sources cited *supra* notes 82–86 and accompanying text.

²⁴¹ *CECIL & WILLGING*, *supra* note 83, at 48 (only twenty percent of trials in which court-appointed experts testify are jury trials); *Timmerbeil*, *supra* note 77, at 167 (explaining that “[b]ecause [the] aura [of respectability] can influence the jury, judges apply FRE 706 far less frequently in jury trials than in non-jury trials”).

²⁴² Judges like to adhere to traditional adversarial procedures in criminal trials. See *Cecil & Willging*, *supra* note 84.

²⁴³ *Karen Butler Reisinger, Court-Appointed Expert Panels: A Comparison of Two Models*, 32 IND. L. REV. 225, 240 (1998) (“Since use of a court-appointed expert under Rule 706 is not intended to replace party experts, but merely to enhance the information available to the trier of fact, the neutral expert may fill in gaps of knowledge necessary for resolution of the parties’ dispute.” (footnote omitted)); see also FED. R. EVID. 706(e).

²⁴⁴ FED. R. EVID. 706(e) (“This rule does not limit a party in calling its own experts.”). This is not desirable in the context of criminal trials, because the prosecution is usually the only party that presents expert testimony to the jury. Not only is the prosecution automatically at an advantage, but there are some serious policy concerns about advantaging wealthier defendants

application of the Rule exacerbates the battle-of-the-experts problem.²⁴⁵ Potentially, up to three experts could provide the jury with three conflicting findings, furthering the confusion of the jury and defeating the purpose of Rule 702.²⁴⁶ This result is ill-fitting because science should be objective and ought to produce consistent results.²⁴⁷ Moreover, the jury is not qualified to decipher which science is most accurate and pertinent to the case.²⁴⁸

Therefore, Rule 706 fails to prevent flawed scientific testimony, because: (1) judges are not fulfilling their *Daubert* gatekeeping duties; (2) party-obtained experts often present flawed testimony²⁴⁹; (3) the jury heavily relies on expert testimony; and (4) the Rule exacerbates the battle-of-the-experts problem.²⁵⁰ In its current design, Rule 706 falls short of its potential to assist judges with *Daubert* reliability assessments and, more specifically, to prevent problems of flawed testimony.²⁵¹

There are two fundamental differences between this Note's proposal and Rule 706: (1) in certain forensic identification procedures listed below, court-appointed experts would be required to testify, and thus, judges would not be given an option; and (2) the court-appointed expert would be the only expert allowed to testify in these instances; therefore, parties would lose the right to hire a partisan expert.

B. Key Features of the Proposed Rule

1. Scope

This Note's proposal limits the requirement to appoint a court-appointed expert to a narrow and specific context of forensic testimony: when scientific testimony is being used to identify (or exculpate) a defendant as the source of probative evidence left at a crime scene by using a sample taken from the body of a defendant. Currently, forensic

over poorer ones.

²⁴⁵ See *supra* text accompanying notes 90–93.

²⁴⁶ See *supra* text accompanying notes 90–93; cf. Joseph Sanders, *Expert Witness Ethics*, 76 *FORDHAM L. REV.* 1539, 1578 (2007) (in this scenario, the factfinder may conclude that all experts are biased and discount them all).

²⁴⁷ Michael Welner et al., *Peer-Reviewed Forensic Consultation: Safeguarding Expert Testimony and Protecting the Uninformed Court*, 12 *J. FORENSIC PSYCHOL. PRAC.* 1, 2 (2012) (“[A] different expert interpretation is the exception, not the rule. This is because disciplines exist as sciences due to consensus over the meaning of evidence. Science as defined through the individual perspective of a single specialist is no longer science.”).

²⁴⁸ See *supra* text accompanying notes 205–21.

²⁴⁹ See *supra* Section I.B.

²⁵⁰ See *supra* notes 90–93.

²⁵¹ *Jurs, supra* note 58, at 1355.

evidence that would be partial to this rule include DNA, biological,²⁵² fingerprint, bite mark, and hair identifications.²⁵³ However, since science evolves, this proposal is meant to adapt with the changes of the field. Only in these specific identification procedures should courts be required to appoint a neutral expert.²⁵⁴

The reasoning for limiting the scope of this proposal is twofold. First, this type of expert testimony needs extra protections and regulation because it is highly inculpatory, probative, and prejudicial.²⁵⁵ Evidence derived from the body of a perpetrator that is “consistent” or “matches” a defendant establishes guilt in the mind of a juror.²⁵⁶ Since DNA, biological, fingerprint, bite mark, and hair identification procedures are almost exclusively used in the most serious crimes (murders and rapes), it is important that courts are acquitting and convicting rightfully.²⁵⁷ Second, because this proposal faces obstacles in affordability and implementation, as discussed below, narrowing its scope makes it more conceivable.²⁵⁸ This proposal, therefore, does not apply to all forensic expert testimony.

2. Appointment Process

The court hearing the case will select the expert at random from a prepared list of cleared and qualified experts designated to a specific field of forensic science.²⁵⁹ A prepared list would ensure objectivity, so

²⁵² Types of biological evidence include blood, semen, saliva, vaginal secretions, and hair. *Biological Evidence*, UCF NCFS, <https://ncfs.ucf.edu/research/biological-evidence> (last visited Apr. 17, 2018).

²⁵³ See Berger, *supra* note 234, at 1125 (defining forensic identification as “the field that encompasses a group of markedly different techniques that have in common the objective of matching a sample associated with the defendant . . . to a sample found at the crime scene”).

²⁵⁴ Domitrovich, *supra* note 89, at 47 (noting that “[f]orensic science appears to be an area that would benefit from greater use of court-appointed experts due to the specialized nature of the procedures used as well as the controversy that now surrounds even the most venerable of the forensic areas”).

²⁵⁵ See *supra* Part II, Section III.B.3.

²⁵⁶ See *supra* Part II, Section III.B.3. In the mind of a juror, when something that derives from the defendant’s body is also located at the crime scene or on the victim, it almost immediately establishes guilt. It is the cultural belief that every person is different, and thus, hair, dentition, secretions, and DNA can all be traced back to the person they came from. Yet, other forensic sciences do not merit the same reaction from a jury. Forensic disciplines that would not be within the scope of this proposal include, but are not limited to: handwriting, footprints, ballistics, arson, psychiatry and behavioral science, digital science, etc.

²⁵⁷ *Forensic Science*, ABOUT BIOSCIENCE, <http://www.aboutbioscience.org/topics/forensic-science> (last visited Apr. 17, 2018) (noting that these disciplines are most commonly used to investigate cases involving a victim, such as rape or murder).

²⁵⁸ See *infra* Section IV.C.

²⁵⁹ This is to ensure that the court-appointed expert must be understood in a non-adversarial manner. Neutrality is necessary to uphold accuracy in forensic testimony. “Cleared and qualified” refers to the credentials the expert must meet, and that the expert must be clear

that the court-appointed expert does not become an arm of the State. Either party may seek to recuse the expert if there is a conflict of interest. The standard for recusing an expert should be the same as the standard for recusing a judge.²⁶⁰

Alternatively, the court maintains the authority to ask the parties to designate a mutually agreed upon expert. If the parties agree on an expert, the court should appoint that expert.

3. No Partisan Experts

Parties will not be entitled to hire their own experts. The only expert to testify at trial will be the court-appointed expert.²⁶¹ This will eliminate “expert shopping” for a viewpoint that fits with the party’s theory of the case and eliminate the “battle-of-the-experts” problem.²⁶²

4. Cross-Examination

The parties should be given the opportunity to examine the expert in the presence of the jury.²⁶³ Discovery of the expert’s proposed views should be permitted, so that counsel are prepared to challenge or promote the trial testimony.²⁶⁴ At trial, the parties may cross-examine the expert, but the expert should be given the opportunity to fully explain their answers; experts should not be overly confined to the exact question asked if doing so would limit the factfinder’s complete understanding of the science. The parties may ask leading questions, however, whenever necessary, clarification questions are appropriate to assist the factfinder’s understanding of the scientific evidence. This would encourage testimony that is scientifically objective and complete. At the same time, by retaining the parties’ ability to cross-examine the expert, party interests will be safeguarded. Thus, the parties will continue to have the opportunity to expose any expert biases to the factfinder on cross-examination.

of past corrupt or misleading testimony.

²⁶⁰ See 28 U.S.C. § 455 (2012) (governing disqualification of a judge).

²⁶¹ This is a key difference between this Note’s proposal and Rule 706. See FED. R. EVID. 706.

²⁶² See *supra* Section I.B.

²⁶³ See generally Champagne et al., *supra* note 236 (noting that critics fear that court-appointed experts will receive too much respect from the judge and jury, while also arguing that when court-appointed experts are utilized, they are rigorously attacked in cross-examination).

²⁶⁴ Rule 706 currently authorizes parties to take the deposition of a court-appointed expert. FED. R. EVID. 706(a)–(b).

5. Court Directions

The court should issue instructions to the expert concerning the scope and nature of the expert's activities, including which details of the crime will be disclosed to the expert about the case. Only details that are necessary for the expert to perform an independent and neutral investigation should be disclosed. The court should also determine the extent of contact permitted between the expert and the parties, and whether and when the parties will be permitted to participate in the expert's investigations. The parties will not be given an opportunity to prepare the expert for trial. Any court order given to the expert should be disclosed to the parties.

The court's goal is to avoid co-option of the expert. By regulating the extent of the expert's activities, the expert will remain neutral and detached.

C. Concerns About the Proposed Rule

1. Implementation

This proposal faces concerns regarding how it should be implemented. There are several potential routes. Ideally, the Federal Rules of Evidence would adopt this court-appointed expert rule for forensic identifications as an addition and modification to Rule 706(a).²⁶⁵ In addition to an amendment to the Federal Rules of Evidence, states can adopt this proposal on their own. States have more specific or supplemental rules to expert testimony in addition to, or in place of, the Federal Rules of Evidence. Thus, states can enforce a statute requiring courts to appoint neutral experts for forensic

²⁶⁵ A proposed change could be (amendment italicized):

(a) Appointment Process. On a party's motion or on its own, the court may order the parties to show cause why expert witnesses should not be appointed and may ask the parties to submit nominations. The court may appoint any expert that the parties agree on and any of its own choosing. But the court may only appoint someone who consents to act. *When an expert is testifying as to whether the defendant is a source or a potential source of DNA, biological, hair, bite mark, and fingerprint evidence that is obtained from a crime scene, the court will appoint an expert. In these specific instances, the court-appointed expert will be the only expert allowed to testify about the relevant identification procedure.*

This amendment to the Federal Rules of Evidence would apply to federal courts and the thirty-eight states that have adopted the Federal Rules of Evidence (they would, however, still need to codify the rule in their state codes). For a list of state evidence codes that correspond to the Uniform Rules of Evidence, see *Uniform Rules of Evidence*, LEGAL INFO. INST., <https://www.law.cornell.edu/uniform/evidence> (last visited Apr. 17, 2018).

identifications.²⁶⁶ This would require a state to recognize the need to protect criminal defendants from flawed scientific testimony. A state acknowledging a problem on its own and codifying a rule to address it, thus acting as a model for the rest of the nation, is not unheard of.

In 2013, a Texas law, known as the “Junk Science Writ,” transformed the legal landscape.²⁶⁷ The Junk Science Writ gives courts the authority to grant habeas corpus²⁶⁸ relief to convicted individuals

²⁶⁶ A proposed model rule would read as follows:

Insofar as an expert is testifying as to whether the defendant is a source or a potential source of DNA, biological, hair, bite mark, and fingerprint evidence that is obtained from a crime scene, the court will appoint an expert.

(a) Appointment Process.

a. The court hearing the case shall select the expert at random from a prepared list of clear and qualified experts who are officially designated to a specific field of forensic science.

b. The court may ask the parties to the dispute to designate an agreed upon expert. Should the parties to the dispute agree on a person to be appointed as expert, the court is to comply with what they have agreed and appoint that expert.

c. Parties shall not be able to hire their own experts to testify.

d. During pre-trial proceedings, the judge will examine the expert. If the court is not convinced that the expert's views are consistent with the Federal Rules of Evidence, the court can appoint a new expert. The court must explain why, in its opinion, the expert has the necessary scientific knowledge and why the court follows or does not follow their opinion. The standard of review of the judge's decision is abuse of discretion.

(b) Directions by the court regarding the expert's activities.

a. The court is to direct the expert in terms of their activities and issue instructions concerning their nature and scope.

b. The court will determine the extent of the contact between the expert and the parties and at what point the parties are permitted to participate in the expert's investigations.

c. The court will disclose to the parties every order it gives to the expert.

(c) The Expert's Role. The court-appointed expert does not represent the interests of one party, but provides independent and impartial information and explication to the court.

(d) Cross-Examination. At trial, counsel for both parties will have the opportunity to examine the expert.

(e) Recusal. If the court appoints an expert without the parties' consent, each party may seek to recuse the expert, but only for certain narrow reasons. The standard for recusing an expert will be the same as the standard for recusing a judge. If one party seeks to recuse the expert, the court has discretion in granting the party's request. If the court denies the request, the party can appeal. There will be no possibility to review the court's appointment of an expert without appealing to the final judgment.

²⁶⁷ See Rick Jervis, *Texas Leads Trend in Challenging Forensic Evidence*, USA TODAY (Dec. 16, 2013, 2:17 PM), <http://www.usatoday.com/story/news/nation/2013/12/16/texas-forensics-challenge-cases-overturned/3992313>; see also Naina Soni, *New Science, Old Convictions—Texas Senate Bill 344: Identifying Further Necessary Reform in Forensic Science*, 2 J.L. & BIOSCIENCES 149 (2015).

²⁶⁸ *Habeas Corpus*, LEGAL INFO. INST., https://www.law.cornell.edu/wex/habeas_corpus (last

based on flawed or discredited scientific evidence.²⁶⁹ The law represented an unprecedented breakthrough in the U.S. criminal justice system.²⁷⁰ Texas's law quickly prompted California to pass its own Junk Science Writ.²⁷¹ Pressure continues to mount in other states to pass similar statutes.²⁷² Although the Junk Science Writ was the first of its kind in the United States, a comparison to the history of DNA testing laws hints at a promising future for nationwide reforms.²⁷³

The idea is that if one state implements a rule requiring court-appointed experts for forensic identifications, it may propel others to do so too.

2. Due Process

A potential counterargument to this proposal is whether due process requires that defendants have an opportunity to present their own partisan expert testimony²⁷⁴ in the instances barred by this proposal. However, this counterargument assumes that criminal defendants have the resources to hire their own expert witnesses to

visited Apr. 17, 2018) (“A writ of habeas corpus is used to bring a prisoner or other detainee . . . before the court to determine if the person’s imprisonment or detention is lawful.”).

²⁶⁹ S.B. 344, 83rd Leg., Reg. Sess. (Tex. 2013); *see also* Linda Rodriguez McRobbie, *In Texas, a New Law Lets Defendants Fight Bad Science*, ATLANTIC (Feb. 28, 2014), <https://www.theatlantic.com/national/archive/2014/02/in-texas-a-new-law-lets-defendants-fight-bad-science/283895>.

²⁷⁰ *See generally* Maurice Chamamah, *Bill Aims to Address Changing Science in Criminal Appeals*, TEX. TRIB. (Feb. 4, 2013, 4:00 PM), <http://www.texastribune.org/2013/02/04/criminal-justice-advocates-renew-call-flawed-scien>.

²⁷¹ Sudhin Thanawala, *California Man’s Case Prompts New Law on Expert Testimony*, NEWS & OBSERVER (Feb. 15, 2015, 10:55 AM), <http://www.newsobserver.com/news/nation-world/national/article10869302.html>.

²⁷² *See* Sabra Thomas, *Addressing Wrongful Convictions: An Examination of Texas’s New Junk Science Writ and Other Measures for Protecting the Innocent*, 52 HOUS. L. REV. 1037, 1059–61 (2015); *see, e.g.*, Harold Levy, *Junk Science Writs: Why Ohio Should Follow the Example of Texas and Legislate a Junk Science Writ*, CHARLES SMITH BLOG (Dec. 23, 2015), <http://smithforensic.blogspot.be/2015/12/junk-science-writs-why-ohio-should.html> (“Hopefully, more states will adopt laws like Texas and California, affording defendants the opportunity to challenge bad science. Hopefully Ohio will be one of them.”).

²⁷³ *See* Thomas, *supra* note 272, at 1061 (“Texas enacted its own law streamlining the process for new testing of DNA in 2001. By 2002, twenty-six states had enacted statutes to allow convicted prisoners access to DNA testing. By 2009, forty-three states had enacted such statutes. Today, all fifty states have some form of law allowing prisoners access to DNA testing. While this achievement did not happen overnight, it instills hope in those who support the Junk Science Writ and who urge other states to adopt similar bills.” (footnotes omitted)).

²⁷⁴ *See generally* Williamson v. Reynolds, 904 F. Supp. 1529, 1561–62 (E.D. Okla. 1995) (“As science has increasingly entered the courtroom . . . the importance of the expert witness has also grown. . . . [W]hen forensic evidence and expert testimony are critical parts of the criminal prosecution of an indigent defendant, due process requires the State to provide an expert who is not beholden to the prosecution.”).

begin with.²⁷⁵ When considered in the context of this proposal, this concern is less palpable since the majority of felony defendants are indigent, and thus, are unable to present their own expert testimony at trial.²⁷⁶

State courts that have considered requests from indigent defendants to the state for funding expert assistance have reached different results regarding the due process significance of these requests. Courts have mostly avoided considering the due process issue altogether by holding that the defendant did not demonstrate reasonable need for the expert.²⁷⁷ If the defendant's request is reasonable, courts will apply a balancing test to evaluate the different interests involved.²⁷⁸ Ultimately, courts and legislatures have not provided that due process requires that indigent defendants have a right to expert witnesses.²⁷⁹

Since most criminal defendants that are implicated by this proposal are indigent and would likely have their requests for state funding of expert assistance denied by the court,²⁸⁰ this proposal instead tries to alleviate the resource discrepancies between the prosecution and the defendant. In the vast majority of cases, unable to fund their own expert or having been denied state-funding for one, a defendant cannot present expert testimony, and so, the jury will only hear from the prosecution's

²⁷⁵ See *supra* text accompanying notes 101–02.

²⁷⁶ See *supra* text accompanying notes 101–02.

²⁷⁷ Jay. A. Zollinger, *Defense Access to State-Funded DNA Experts: Considerations of Due Process*, 85 CALIF. L. REV. 1803, 1804–05, 1809–10 (1997). In *Caldwell v. Mississippi*, the Supreme Court held that a court must first determine whether the defendant has demonstrated that their request for expert assistance is reasonable. *Caldwell v. Mississippi*, 472 U.S. 320 (1985), *vacated on other grounds*, 479 U.S. 1075 (1987). In other words, whether there is a “reasonable probability . . . that an expert would be of assistance to the defense and that denial of expert assistance would result in a fundamentally unfair trial.” *Moore v. Kemp*, 809 F.2d 702, 712 (11th Cir. 1987) (footnote omitted).

²⁷⁸ The analysis of whether a defendant has a right to forensic expert assistance is guided by *Mathews v. Eldridge*. *Mathews v. Eldridge*, 424 U.S. 319 (1976) (articulating a test for courts to use when determining the meaning of the Due Process Clause in a case). *Mathews* specifies that the Due Process Clause requires consideration of three distinct factors: (1) the importance of the interest at stake; (2) the risk of an erroneous deprivation of the interest because of the procedures used and the probable value of additional procedural safeguards; and (3) the state's interest. *Id.* at 335. Though the *Mathews* decision itself provides little guidance, *Ake v. Oklahoma* provides some instruction for understanding and weighing the different interests involved in an indigent defendant's request for expert assistance. See *Ake v. Oklahoma*, 470 U.S. 68 (1985) (applying the *Mathews* test to the issue of whether a state must provide a defendant with the services of an independent psychiatric expert); Zollinger, *supra* note 277, at 1806–07.

²⁷⁹ In *United States ex rel. Smith v. Baldi*, the Supreme Court held that the Due Process Clause does not require the appointment of an expert to assist an indigent defendant with their defense. *United States ex rel. Smith v. Baldi*, 344 U.S. 561, 568 (1953) (“We cannot say that the State has that duty by constitutional mandate.”). Though Congress has responded by enacting 18 U.S.C. § 3006A(e) and states have enacted statutes providing expert services to indigent defendants, in varying degrees, at the state's expense, these provisions are often limited. See sources cited *supra* notes 107–10 and accompanying text.

²⁸⁰ See *supra* text accompanying notes 107–11.

expert.²⁸¹ A neutral court-appointed expert would give criminal defendants access to the expert testimony they are so often denied, eliminating the typical scenario in which a jury hears only prosecution-proffered testimony—and ultimately may provide the defendant with more due process. This proposal encourages expert testimony to remain objective and scientific, and to be used for the ultimate purpose of helping the factfinder understand the facts, rather than to persuade the factfinder according to partisan logic.²⁸²

When evaluating concerns about due process, it is helpful to consider methods used to appoint experts in other legal systems. Finding an adequate balance between scientific expertise and legal process is not a problem unique to the United States.²⁸³ To address the same issues that plague the American expert witness system, many major nations have utilized court-appointed experts.²⁸⁴ In most countries, judges will appoint expert witnesses to serve as neutral and independent assistants to the court.²⁸⁵ Interestingly, in the last decade some major common law countries have followed stride by moving away from the use of partisan experts.²⁸⁶ Both England²⁸⁷ and Australia,²⁸⁸ in recent years, which like the United States have adversarial legal systems, have adopted measures to curtail biases in expert testimony. Looking to the methods other countries use to present independent expert testimony while also maintaining their own form of due process rights,²⁸⁹ may be helpful in developing a solution for the American criminal justice system.²⁹⁰

²⁸¹ See *supra* text accompanying notes 103–13.

²⁸² See generally *supra* Section III.B.

²⁸³ See Jurs, *supra* note 58, at 1333.

²⁸⁴ Adam Liptak, *In U.S., Expert Witnesses Are Partisan*, N.Y. TIMES (Aug. 11, 2008), <https://www.nytimes.com/2008/08/12/us/12experts.html>.

²⁸⁵ *Id.* (“The European judge who visits the United States experiences ‘something bordering on disbelief when he discovers that we extend the sphere of partisan control to the selection and preparation of experts’ . . .” (quoting Langbein, *supra* note 215, at 836)).

²⁸⁶ *Id.*

²⁸⁷ See generally *The Admissibility of Expert Evidence in Criminal Proceedings in England and Wales* (Law Comm’n, Consultation Paper No. 190, 2009), http://www.lawcom.gov.uk/app/uploads/2015/03/cp190_Expert_Evidence_Consultation.pdf; see also Nichola Fosier, *Expert Evidence Hot-Tubbing Is Here to Stay*, MONDAQ (Nov. 22, 2017), <http://www.mondaq.com/uk/x/648594/court+procedure/Expert+Evidence+HotTubbing+Is+Here+To+Stay>.

²⁸⁸ See generally Elizabeth Reifert, Comment, *Getting into the Hot Tub: How the United States Could Benefit from Australia’s Concept of “Hot Tubbing” Expert Witnesses*, 89 U. DET. MERCY L. REV. 103 (2011).

²⁸⁹ Victor V. Ramraj, *Four Models of Due Process*, 2 INT’L J. CONST. L. 492, 492 (2004) (“The constitutions of most modern states include some form of due process guarantee.”).

²⁹⁰ See Susan Haack, *Irreconcilable Differences? The Troubled Marriage of Science and Law*, 72 LAW & CONTEMP. PROBS. 1, 23 (2009) (“Maybe we could learn something from the experiences of other countries that are equally technologically advanced, but have different regulatory and legal arrangements; certainly, we would do well to approach these problems in a more empirical, experimental—a more scientific—spirit.”).

3. Affordability

Another counterargument this proposal will face is administrative costs.²⁹¹ The courts would likely have to fund requested court-appointed experts because most criminal defendants are indigent.²⁹² This proposal limits requiring court-appointed experts to the specific confines of scientific testimony identifying a defendant as the source of probative DNA, biological, bite mark, hair, or fingerprint evidence. This type of evidence is not present in all cases where forensic evidence is admitted.²⁹³ Once broken down, the frequency at which a court will be required to appoint an expert becomes much more manageable.

If this proposal is adopted, parties would only benefit from requesting a court-appointed expert when the forensic science can prove guilt or innocence to a high degree of certainty. Therefore, decreasing the financial burden on the courts. Since the court-appointed expert will be a neutral advisor to the factfinders, lawyers would most likely not benefit from using experts as often as they do now.²⁹⁴ Most of the field of forensic sciences has not been supported by sound science.²⁹⁵ Therefore, since a court-appointed expert would have to present results objectively, most forensic results will be inconclusive.²⁹⁶ Consider the case studies evaluated in this Note.²⁹⁷ Each expert that provided scientifically flawed testimony was retained by the prosecution.²⁹⁸ All of the flawed testimony was slanted towards the prosecution; inculcating the defendant more than it scientifically could.²⁹⁹ Had a neutral expert testified instead, the expert would probably have told the jury that the results were inconclusive or at best “consistent” with the defendant.

²⁹¹ *Expert Witness Fee Study*, SEAK, <http://www.seak.com/expert-witness-fee-study> (last visited Apr. 17, 2018) (“The average hourly fee for in court testimony for all non-medical experts [including forensic scientists] is \$248.”). This does not include surcharges; for example, potential fees for file review and depositions, travel time, lodging, etc. must all be calculated into the court’s pricing structure.

²⁹² See *supra* Section I.C.

²⁹³ Other types of forensic evidence include but are not limited to handwriting, footprint, and ballistic comparison.

²⁹⁴ See *supra* Section I.B.

²⁹⁵ See generally Cino, *supra* note 211.

²⁹⁶ Koehler & Saks, *supra* note 116, at 1188 (noting that “because no field of forensic identification has adequate grounds for making individualization claims, expert witnesses from those fields should not make such claims in their reports and testimony” and suggesting that experts “revise their testimonial language to . . . report only those inferences that can be supported by what is actually known by their fields”).

²⁹⁷ See *supra* Part II.

²⁹⁸ See *supra* Part II.

²⁹⁹ See *supra* Part II.

There would be no incentive to present one-sided testimony. Moreover, the experts would have to explain the limits of their results to the jury; that the results neither inculpated nor exculpated the defendant to a high degree of certainty. Parties in criminal cases use forensics frequently because they can mold the expert to say things that are consistent with their theory of the case using scientific jargon.³⁰⁰ However, if this proposal is adopted, parties would only be incentivized to request a court-appointed expert when the forensic science is likely to objectively prove guilt or innocence. Therefore, decreasing the financial burden on the courts.

Moreover, if parties can no longer benefit from forensic disciplines that have not been standardized and validated—because a neutral expert would have to explain that these disciplines are unsupported by empirical research, and thus, the testimony loses its value to a jury—the field of forensic sciences will have a financial incentive to reform its methodologies.³⁰¹ Therefore, this proposal may have a ripple effect of strengthening the field of forensic sciences as a whole.³⁰²

CONCLUSION

Even with the development of DNA testing, the other forensic disciplines will continue to play a role in criminal investigations since only twenty percent of violent crime investigations will include evidence suitable for DNA testing.³⁰³ Therefore, the forensic evidence problems

³⁰⁰ Daniel W. Shuman et al., *An Empirical Examination of the Use of Expert Witnesses in the Courts—Part II: A Three City Study*, 34 JURIMETRICS J. 193, 201 tbl.3 (1994) (finding that seventy-seven percent of experts agreed with the statement “[l]awyers manipulate their experts to weaken unfavorable testimony and strengthen favorable testimony”).

³⁰¹ Reform of the expert system is often suggested but rarely implemented, while the judicial system maintains a tolerance for the potential for inaccurate results. See NAS REPORT, *supra* note 113, at 111 (emphasizing the need for standards that are clear and repeatable for analysis, interpretation and reporting of results and “standards that guard against error and bias”); Roberts, *supra* note 66 (“The need for forensic science to raise its methodological game has subsequently been reinforced by a succession of official inquiries, authoritative reports and high profile miscarriages of justice . . . all of which have contributed to a diffuse sense of unease surrounding forensic science.”).

³⁰² See generally *Misapplication of Forensic Science*, INNOCENCE PROJECT, <https://www.innocenceproject.org/causes/misapplication-forensic-science> (last visited Apr. 17, 2018) (discussing the current state of the application of forensic sciences in the criminal justice system). See *Identity Crisis*, ECONOMIST (July 16, 2015), <http://www.economist.com/news/britain/21657837-forensic-sciences-flaws-are-catching-up-it-identity-crisis> (noting that “forensics contribute to nearly half of all wrongful convictions”); see also Daniel Cressey, *Forensic Specialist Discusses a Discipline in Crisis*, NATURE (Feb. 12, 2015), <http://www.nature.com/news/forensics-specialist-discusses-a-discipline-in-crisis-1.16870>; Linda Geddes, *The Troubling Flaws in Forensic Science*, BBC (May 13, 2015), <http://www.bbc.com/future/story/20150512-can-we-trust-forensic-science>.

³⁰³ PYREK, *supra* note 133, at 451.

discussed throughout this Note are not subsiding. Thus far, the judicial process has failed to provide obligatory controls to ensure fairness in admitting forensic evidence in criminal trials.³⁰⁴

The use of a court-appointed expert in limited instances of forensic identifications—which continue to contribute to wrongful convictions—further the pursuit of justice and fundamental fairness by ensuring that such highly valued testimony is presented objectively. Doing so would not jeopardize the adversarial nature of the United States judicial system, but would endorse the criminal justice goals of trial accuracy and consistency. Enforcing mechanisms that help remove biases and inaccuracies from forensic testimony used to establish guilt or innocence is neither pro-defense nor pro-prosecution, instead it promotes both science and justice.

³⁰⁴ See *supra* Section III.A.