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NOTES

BREAKING BAD SCIENCE: DUE PROCESS AS A VEHICLE FOR POSTCONVICTION RELIEF WHEN CONVICTIONS ARE BASED ON UNRELIABLE SCIENTIFIC EVIDENCE

VINCENT P. IANNECE[†]

Whatever disagreement there may be as to the scope of the phrase “due process of law,” there can be no doubt that it embraces the fundamental conception of a fair trial, with opportunity to be heard.¹

INTRODUCTION

Picture this: A family man living with his wife, his two young stepsons, and his six-month-old baby. While he was putting away groceries, his stepsons went to the shed to play. Minutes later, his neighbors alerted him that smoke was pouring out of the shed and quickly turning to flames which consumed the structure, killing both of his stepsons. Fire department incendiary scientists indicated that the physical clues and the results of scientific testing of the pour patterns undoubtedly pointed to arson. That was all it took to successfully prosecute this father and send him to prison for the rest of his life. His only son was forced to grow up with the harsh reality that his father is a murderer. Twenty-five years later, the field of fire investigation advanced considerably and the evidence that was instrumental in his conviction is now known to be fundamentally unreliable. Experts reviewing his case found the pour and burn patterns were simply evidence that the shed was subjected to intense fire, and the toxicology report of the boys proved that the

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¹ *Frank v. Mangum*, 237 U.S. 309, 347 (1915) (Holmes, J., dissenting).

fire was not started with gasoline as the medical examiner had testified. Based on the current split of authority in federal circuit courts, there is a possibility that this case may never be retried.²

Over the last fifty years, science has become crucial to the investigation and prosecution of crime.³ Increasingly, the solution of major crimes will turn on “the discovery at crime scenes and subsequent scientific laboratory analysis of latent fingerprints, weapons, footprints, hairs, fibers, blood, and similar traces.”⁴ Such evidence can be admitted to satisfy the State’s burden as to a particular element of a charge, to establish that the defendant—and not some other individual—committed an alleged crime or to prove that a crime has occurred. Proof of the growing reliance on scientific evidence is exhibited by how noteworthy its nonexistence has become.⁵

Regrettably, unreliable expert forensic science testimony has been introduced into evidence and innocent people have been wrongfully convicted due, at least in part, to its admission, despite the Supreme Court’s requirement that only reliable expert testimony be admitted.⁶ For many traditional types of forensic science, “experts’ claims about their field, the authority of their methodologies, and their own abilities have dramatically outstripped what has actually been established by persuasive

² This hypothetical is based on the conviction of Ed Graf. Dave Mann, *The Arson Files: After Serving 25 Years, Ed Graf May Finally Receive New Trial*, OBSERVER, Jan. 17, 2013, <http://www.texasobserver.org/the-arson-files-after-serving-25-years-ed-graf-may-finally-receive-new-trial/>.

³ Jennifer E. Laurin, *Remapping the Path Forward: Toward a Systemic View of Forensic Science Reform and Oversight*, 91 TEX. L. REV. 1051, 1052 (2013); see also Paul C. Giannelli, *The Twenty-First Annual Kenneth J. Hodson Lecture: Scientific Evidence in Criminal Prosecutions*, 137 MIL. L. REV. 167, 167 (1992) (“Scientific and expert evidence is playing an ever-increasing and far more important role in criminal prosecutions than in the past.”).

⁴ Joseph L. Peterson & Anna S. Leggett, *The Evolution of Forensic Science: Progress amid the Pitfalls*, 36 STETSON L. REV. 621, 624 (2007) (footnote omitted) (internal quotation marks omitted).

⁵ Giannelli, *supra* note 3, at 169; see Rorie Sherman, *Technology, Emotion Key in Jogger Case*, 12 NAT’L L.J. 12 (1990) (“Among the defense’s strongest points in attacking the prosecution’s case was the surprising absence of physical evidence . . .”).

⁶ Jane Campbell Moriarty, *Misconvictions, Science, and the Ministers of Justice*, 86 NEB. L. REV. 1, 5–6 (2007); see Mark Hansen, *Crimes in the Lab*, A.B.A. J., Sept. 2013, at 47 (noting that forensic lab scandals “have the potential to put innocent people behind bars—or worse—and spawn litigation that could end up costing taxpayers dearly”).

research and careful study.”⁷ Forensic scientists frequently testify in court to matters that are not as recognized or as certain as they assert.⁸ These experts have exaggerated their level of knowledge, underreported the probabilities of error, and intimated greater confidence than is deserved.⁹ Too many experts in the criminal justice system manifest a police-prosecution bias—a willingness to shade or distort opinions to support the State’s claim—and too many prosecutors seek out these experts.¹⁰ Furthermore, there has been far too little study of how frequently forensic scientists make mistakes and when or why these potential errors are more likely to occur.¹¹ If evidentiary inputs into our criminal justice system cannot be trusted, neither should the outputs.¹² Recent research suggests that misleading and erroneous forensic science has been a significant contributing factor in many wrongful convictions.¹³

In recent years, both the scientific community and state and federal courts have increasingly acknowledged that flawed forensic science is seriously affecting the integrity of our criminal justice system.¹⁴ One of the most serious problems with forensic science is that it is not unusual for forensic disciplines, once considered reliable and routinely introduced at criminal trials, to be partially or wholly discredited after more thorough scientific evaluation is conducted. For example, courts once credited and

⁷ Jennifer L. Mnookin, *The Courts, the NAS, and the Future of Forensic Science*, 75 BROOK. L. REV. 1209, 1209–10 (2010); see Hansen, *supra* note 6, at 46 (describing that a review of a Minnesota crime lab “identified major flaws in nearly every aspect of the lab’s operation, including dirty equipment, a lack of standard operating procedures, faulty testing techniques, illegible reports, and a woeful ignorance of basic scientific principles”).

⁸ Mnookin, *supra* note 7, at 1210.

⁹ *Id.*

¹⁰ Paul C. Giannelli, *The Abuse of Scientific Evidence in Criminal Cases: The Need for Independent Crime Laboratories*, 4 VA. J. SOC. POL’Y & L. 439, 441 (1997); see Hansen, *supra* note 6, at 49–50 (describing an investigation that revealed overwhelming evidence of pro-prosecution bias at a crime lab).

¹¹ Mnookin, *supra* note 7, at 1210.

¹² *Id.* at 1210–11.

¹³ See Hansen, *supra* note 6, at 47 (“[S]tudies show that unverified or improper forensic science (defined as fraud, misconduct or the use of scientifically untested evidence) played a role in about 55 percent of [DNA exonerations].”). See generally Brandon L. Garrett & Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1 (2009).

¹⁴ See, e.g., *Melendez-Diaz v. Mass.*, 557 U.S. 305, 319 (2009) (cautioning that “[s]erious deficiencies have been found in the forensic evidence used in criminal trials”).

accepted such forensic techniques as hair microscopy,¹⁵ handwriting analysis,¹⁶ bite-mark comparisons,¹⁷ and comparative bullet lead analysis.¹⁸ These techniques are now widely considered to be unreliable and no longer accepted by some courts.¹⁹ Judge Cochran described this problem as a “fundamental disconnect between the worlds of science and of law” and opined:

This disconnect between changing science and reliable verdicts that can stand the test of time has grown in recent years as the speed with which new science and revised scientific methodologies debunk what had formerly been thought of as reliable forensic science has increased. The potential problem of relying on today's science in a criminal trial (especially to determine an essential element such as criminal causation or the identity of the perpetrator) is that tomorrow's science sometimes changes and, based upon that changed science, the former verdict may look inaccurate, if not downright ludicrous. But the convicted person is still imprisoned. . . . [f]inality of judgment is essential in criminal cases, but so is accuracy of the result—an accurate result that will stand the test of time and changes in scientific knowledge.²⁰

Compounding this problem is the fact that scientific evidence has a uniquely persuasive impact on juries. In *Reed v. State*, the court proclaimed that “[l]ay jurors tend to give considerable

¹⁵ See, e.g., *Williamson v. Reynolds*, 904 F. Supp. 1529, 1557–58 (E.D. Okla. 1995) (reversing a defendant's death sentence and finding, in part, that admission of “expert hair testimony at [appellant's] trial was irrelevant, imprecise and speculative, and its probative value was outweighed by its prejudicial effect”).

¹⁶ See, e.g., *United States v. Lewis*, 220 F. Supp. 2d 548, 554 (S.D. W. Va. 2002) (excluding handwriting expert's testimony for lack of reliability, noting that “[i]f courts allow the admission of long-relied upon but ultimately unproven analysis, they may unwittingly perpetuate and legitimate junk science”).

¹⁷ See, e.g., *Ege v. Yukins*, 380 F. Supp. 2d 852, 880 (E.D. Mich. 2005) (holding that the decision to admit expert testimony that the defendant was the only possible perpetrator in the Detroit metropolitan area, because of a bite mark on the murder victim's cheek, deprived the defendant of a fair trial in violation of her due process rights, where such evidence was the only physical evidence linking the defendant to the crime, and the testimony was unreliable and grossly misleading).

¹⁸ See, e.g., *Ragland v. Commonwealth*, 191 S.W.3d 569, 580 (Ky. 2006) (ordering a new trial for the defendant because the prosecution used the dubious forensic technique of comparative bullet lead analysis).

¹⁹ See The Innocence Project, *DNA Exonerations Nationwide*, INNOCENCE PROJECT (Feb. 7, 2007), http://www.innocenceproject.org/Content/DNA_Exonerations_Nationwide.php#.

²⁰ *Ex Parte Robbins*, 360 S.W.3d 446, 469–70 (Tex. Crim. App. 2011) (Cochran, J., dissenting).

weight to ‘scientific’ evidence when presented by ‘experts’ with impressive credentials.”²¹ A 1987 survey of recently discharged jurors serving on criminal cases exposed that forensic experts are the most persuasive trial witnesses.²² Moreover, approximately one-quarter of these jurors indicated that they would have instead come to a not guilty verdict had no scientific evidence been presented.²³ The research resulted in a finding that “the [mere] presence of forensic science evidence, regardless of the certainty with which it connects the defendant with the crime, is predicted to result in higher rates of conviction.”²⁴

The effect of forensic science on jurors has been amplified by what legal scholars have referred to as the “CSI-Effect”²⁵—the idea that jurors confuse the romanticized portrayal of the capabilities of forensic science on television with the actual capabilities of forensic science in the current criminal justice system.²⁶ Prosecutors believe that jurors have become spoiled as a result of these forensic television shows and now unrealistically expect conclusive scientific proof of guilt before they convict.²⁷ However, once this expectation has been satisfied, these same jurors, as a result of these same forensic television shows, often place too much weight on the forensic evidence, resulting in convictions in cases where defendants probably should have been acquitted.²⁸ This has come to be known as the “Reverse CSI-Effect,”²⁹ and it may be more damaging to the criminal

²¹ *Clemons v. State*, 896 A.2d 1059, 1064 n.6 (Md. 2006) (quoting *Reed v. State*, 391 A.2d 364, 370 (Md. 1978)).

²² Tara Marie La Morte, *Sleeping Gatekeepers: United States v. Llera Plaza and the Unreliability of Forensic Fingerprinting Evidence Under Daubert*, 14 ALB. L.J. SCI. & TECH. 171, 208 (2003).

²³ *Id.* at 208–09.

²⁴ *Id.* at 209.

²⁵ The “CSI-Effect” refers to the theory that the popularity of shows like CSI has spoiled jurors, and that they now unrealistically expect conclusive scientific proof of guilt before they convict. Mark A. Godsey & Marie Alou, *She Blinded Me With Science: Wrongful Convictions and the “Reverse CSI-Effect,”* 17 TEX. WESLEYAN L. REV. 481, 481–82 (2011).

²⁶ Simon A. Cole & Rachel Dioso-Villa, *Investigating the ‘CSI Effect’ Effect: Media and Litigation Crisis in Criminal Law*, 61 STAN. L. REV. 1335, 1336 (2009).

²⁷ Godsey & Alou, *supra* note 25, at 481.

²⁸ *Id.* at 483.

²⁹ The “Reverse CSI-Effect” refers to the theory that jurors, as a result of CSI-type shows, often place too much weight on forensic evidence to the defendant’s unfair detriment in cases where forensic evidence is in fact produced by the prosecution. *Id.*

justice system and the interest of justice than the CSI-Effect.³⁰ One empirical study found forensic science errors in sixty-three percent of all cases resulting in wrongful convictions.³¹ By proffering scientific evidence, the State makes a special claim on a jury's trust because the scientific evidence offers a truth that lay jurors cannot themselves draw from a set of facts.

The serious threat created by the "Reverse CSI-Effect" is exemplified in several cases. In *State v. Krone*,³² a criminal defendant was convicted of murder almost exclusively on the basis of evidence offered by a forensic odontologist.³³ The expert conclusively testified that bite marks on the victim's body matched the defendant's bite pattern.³⁴ In fact, the expert's testimony was so convincing that the defendant was nicknamed "the snaggletooth killer" by the press, and the jury found the defendant guilty.³⁵ However, Krone was completely exonerated in 2002 after subsequent DNA testing revealed that the expert testimony was simply wrong.³⁶

The criminal justice system's increasing dependence on scientific evidence has produced a long and troubling line of cases. These cases struggle with the problem of how to rectify convictions premised upon expert testimony and scientific evidence subsequently proven to be legally and scientifically inaccurate or unreliable. The reliability of such evidence will continue to face challenges and impugn existing—even longstanding—convictions as new scientific discoveries and revised methodologies improve the accuracy of forensic testimony. Specifically, the cases that have addressed this issue fall into three categories: (1) when an expert witness withdraws earlier opinions offered at trial because of mistake or inaccuracy; (2) where newly available evidence undermines expert testimony from trial; and (3) when an expert willfully testifies falsely.

³⁰ *Id.*

³¹ Michael J. Saks, *Scientific Evidence and the Ethical Obligations of Attorneys*, 49 CLEV. ST. L. REV. 421, 424 (2001).

³² 897 P.2d 621 (Ariz. 1995).

³³ *Id.* at 622.

³⁴ *Id.*

³⁵ See Flynn McRoberts, *Bite-Mark Verdict Faces New Scrutiny; Release of Other Death Row Inmate Prompts Arizona to Order DNA Tests*, CHI. TRIB., Nov. 29, 2004, at 1; see *Krone*, 897 P.2d at 622.

³⁶ See McRoberts, *supra* note 35.

This Note analyzes how the mandates of due process influence the standard courts should apply in granting postconviction relief to petitioners who were convicted based upon scientific evidence that is later proven to be unreliable, yet whose unreliability does not warrant full exoneration.

This Note argues that due process requires a new trial when scientific evidence necessary to the conviction becomes so unreliable as to call the validity of the jury's verdict into question. Part I of this Note discusses how scientific evidence is admitted, the procedure for a convicted defendant's postconviction relief once that evidence is deemed unreliable, and the constitutional protections that a convicted defendant is afforded under the Due Process Clause of the Fourteenth Amendment. Part II of this Note examines the divide among appellate courts as to whether the Due Process Clause requires a new trial when a conviction is based on evidence that has later been shown to be unreliable. Part III of this Note argues that due process requires a new trial when scientific evidence in the original trial is shown to be sufficiently unreliable as to compromise confidence in the accuracy and integrity of the jury verdict. A conviction later found to be based upon unreliable scientific evidence deprives the defendant of a fundamentally fair trial and thereby violates the Due Process Clause of the Fourteenth Amendment, under both procedural and substantive due process theories, because it raises an intolerable risk of an inaccurate verdict and undermines the integrity of the criminal justice system. Because the Antiterrorism and Effective Death Penalty Act impedes the rights of a petitioner to assert his or her fundamental right to a fair trial, this Note argues that the statute, as currently written and applied, should be found unconstitutional under strict scrutiny review. A new trial will ensure that innocent defendants do not fall victim to the inherent shortcomings of the scientific evidence juries so readily embrace.

I. OVERVIEW

This Part begins by examining various legal procedures to define what federal courts find to be scientific knowledge and provides a brief historical account of the standard to evaluate the reliability and admissibility of the scientific theory and technique. Next, it provides an overview of postconviction relief procedures available to convicted defendants. Finally, it provides

a background of the constitutional protections afforded to convicted defendants under the Due Process Clause of the Fourteenth Amendment.

A. *The Admissibility of Scientific Evidence*

The United States Supreme Court has declared that the trial court has a gatekeeping obligation to determine whether the explanative theory underlying every expert witness's testimony, regardless of whether based on scientific, technical or other specialized knowledge, is "reliable."³⁷ To reflect this, Federal Rule of Evidence 702 was amended to require that the trial judge, before permitting an expert to testify, determine that "[1] the testimony is based on sufficient facts or data; [2] the testimony is the product of reliable principles and methods; and [3] the expert has reliably applied the principles and methods to the facts of the case."³⁸ This Section examines the historical development of the law governing the use of scientific evidence.

1. The *Frye* General Acceptance Test

Commencing in the nineteenth century and lasting until the start of the twentieth century, "the general standard for determining the admissibility of expert testimony rested on the assumption that experts had superior knowledge and training."³⁹ Courts accredited this capability to experts due to their qualifications and success in their respective fields.⁴⁰ Despite there being no glaring problems with this standard, the Court of Appeals for the District of Columbia, in *Frye v. United States*,⁴¹ pronounced a test for determining the admissibility of scientific evidence.⁴²

In *Frye*, the court stated that the trial judge must determine whether the scientific evidence at issue had "gained general acceptance in [its] particular field" to justify admitting the

³⁷ *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 151–52 (1999); *see also* *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 597 (1993).

³⁸ FED. R. EVID. 702.

³⁹ Leslie Morsek, *Get on Board for the Ride of Your Life! The Ups, the Downs, the Twists, and the Turns of the Applicability of the "Gatekeeper" Function to Scientific and Non-Scientific Expert Evidence: Kumho's Expansion of Daubert*, 34 AKRON L. REV. 689, 694 (2001).

⁴⁰ *Id.* at 694–95.

⁴¹ 293 F. 1013 (D.C. Cir. 1923).

⁴² Morsek, *supra* note 39, at 695.

evidence.⁴³ This standard required judges to discern which scientific principles had achieved sufficient recognition and which scientific principles had not.⁴⁴ To facilitate this endeavor, the court developed what is known as the “general acceptance” test,⁴⁵ which requires a two-part analysis: (1) identifying the field in which the underlying principle falls,⁴⁶ and (2) determining whether the proffered evidence is generally accepted in that field.⁴⁷ The court articulated the general acceptance test as follows:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.⁴⁸

This new analysis was “the first procedural barrier to the admission of scientific evidence and expert testimony.”⁴⁹ Because this test excluded evidence not generally accepted in its particular field, it impeded the introduction of novel evidence that had not had time to gain acceptance in its respective field.⁵⁰ This inability to utilize new theories demonstrates the difficulties in devising the proper test for determining the admissibility of expert testimony.⁵¹

⁴³ See *Frye*, 293 F. at 1014.

⁴⁴ Morsek, *supra* note 39, at 696.

⁴⁵ Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 COLUM. L. REV. 1197, 1200 (1980).

⁴⁶ See *People v. Collins*, 94 Misc. 2d 704, 708, 405 N.Y.S.2d 365, 368 (Sup. Ct. Kings Cnty. 1978) (“At the threshold of determining whether the technique meets the test of acceptance in the scientific community, is the question of defining that community.”); see also Giannelli, *supra* note 45, at 1208–10.

⁴⁷ See Giannelli, *supra* note 45, at 1210–11.

⁴⁸ *Frye*, 293 F. at 1014.

⁴⁹ Morsek, *supra* note 39, at 698.

⁵⁰ *Id.* at 699.

⁵¹ *Id.* at 699–700.

2. The Federal Rules of Evidence

In 1975, the codification of the Federal Rules of Evidence presented an opportunity to illuminate the contention surrounding the admissibility of scientific evidence.⁵² Under the Federal Rules, however, the basic relevancy standard in Rule 702 came into conflict with the general acceptance standard of *Frye*.⁵³ Although most federal courts followed the *Frye* standard prior to the adoption of the Federal Rules, the Rules were silent as to whether the general acceptance test had been superseded.⁵⁴

Those who believe that the *Frye* test should still apply after the Federal Rules were enacted found some support in the legislative history.⁵⁵ They claimed that, because *Frye* was the established rule and no statement repudiating *Frye* appeared in the legislative history, the general acceptance standard remained intact.⁵⁶

Proponents of repealing the *Frye* standard emphasized the text of the Federal Rules. They claimed that, “[b]ecause scientific evidence could be shown to be reliable and thus relevant under Rule 401 without regard to its general acceptance in the scientific community, and because none of the exclusions enumerated in Rule 402 [were] applicable, the Federal Rules have provided a standard of admissibility inconsistent with *Frye*.”⁵⁷

In the early 1990s, legal scholars began to question the standard of admissibility for scientific evidence because of these differences of opinion.⁵⁸ In response to the inconsistencies, the United States Supreme Court ultimately pronounced a formal standard for admitting expert evidence.⁵⁹

⁵² Kaushal B. Majmudar, *Daubert v. Merrell Dow: A Flexible Approach to the Admissibility of Novel Scientific Evidence*, 7 HARV. J.L. & TECH. 187, 198 (1993).

⁵³ Andre A. Moenssens, *Handwriting Identification Evidence in the Post-Daubert World*, 66 UMKC L. REV. 251, 273 (1997).

⁵⁴ Giannelli, *supra* note 45, at 1229.

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Id.* at 1230.

⁵⁸ Carrie C. Coppage, Note, *The Revolution of the Admissibility of Scientific Evidence with Print Identification Evidence as a Model*, 24 AM. J. TRIAL ADVOC. 609, 612 (2001).

⁵⁹ Morsek, *supra* note 39, at 703.

3. The *Daubert* Declaration

In 1993, the United States Supreme Court, in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,⁶⁰ declared that the *Frye* general acceptance test did not survive the adoption of the Federal Rules of Evidence.⁶¹ Specifically, the Supreme Court imposed a new obligation that, with respect to the admission of scientific evidence, requires the trial judge under Rules 702 and 104(a) to act as a gatekeeper in screening scientific evidence to ensure both relevancy and reliability.⁶²

The Court stated that although the Federal Rules of Evidence displaced *Frye*, the Rules themselves do not place limits on the admissibility of purportedly scientific evidence.⁶³ However, the fact that the judge must ensure that any and all scientific testimony or evidence admitted is both relevant and reliable contemplates some degree of regulation of the subjects and theories about which an expert may testify.⁶⁴ Accordingly, the court said:

Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.⁶⁵

While the Supreme Court did not articulate a “definitive checklist or test,” the justices did identify five non-exclusive factors to aid in determining the admissibility of scientific evidence: (1) whether the theory or scientific technique “can be (and has been) tested”; (2) whether it has been “subjected to peer review and publication”; (3) “the known or potential rate of error”; (4) “the existence and maintenance of standards controlling the technique’s operation”; and (5) whether the principle was generally accepted in the relevant scientific

⁶⁰ 509 U.S. 579 (1993).

⁶¹ See *id.* at 587 (“[T]he *Frye* [general acceptance] test was superseded by the adoption of the Federal Rules of Evidence.”).

⁶² See *id.* at 589–92.

⁶³ *Id.* at 589.

⁶⁴ *Id.*

⁶⁵ *Id.* at 592–93.

community.⁶⁶ The Court stated that the analysis intended by Rule 702 is a “flexible one,” and “[i]ts overarching subject is the scientific validity and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission.”⁶⁷ The focus of the Rule 702 analysis must be exclusively on principles and methodology, not on the conclusions they produce.⁶⁸

While *Daubert* did suggest that the trial judge take on a gatekeeping function to prevent “unreliable” evidence from being admitted, it was unclear whether such screening was to always be exercised, or if it applied only to “novel” scientific evidence.⁶⁹ Because of the ambiguity in *Daubert*, federal courts struggled with these questions each time they were presented with non-scientific expert evidence.⁷⁰

4. The *Kumho Tire* Answer

In 1999, the United States Supreme Court answered the questions left unresolved by *Daubert* in *Kumho Tire Co. v. Carmichael*.⁷¹ The Supreme Court held that the gatekeeping obligation articulated in *Daubert* should apply to both testimony based on “scientific” knowledge and testimony based on “technical” and “other specialized” knowledge.⁷² In exercising its “gatekeeping” function, the trial court may, on the condition that doing so will help determine if the testimony is reliable, consider one or more of the five specific factors listed in *Daubert*.⁷³ *Kumho* instructs that the test of reliability is “flexible” and that “*Daubert’s* list of specific factors neither necessarily nor exclusively applies to all experts or in every case.”⁷⁴ Rather, the court must look for a reliable basis in the knowledge and experience of the relevant discipline and “the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.”⁷⁵

⁶⁶ *Id.* at 593–94.

⁶⁷ *Id.* at 594–95.

⁶⁸ *Id.* at 595.

⁶⁹ Coppage, *supra* note 58, at 614.

⁷⁰ Morsek, *supra* note 39, at 711–12.

⁷¹ 526 U.S. 137 (1999).

⁷² *Id.* at 141 (internal quotation marks omitted).

⁷³ *Id.* at 149–52.

⁷⁴ *Id.* at 141.

⁷⁵ *Id.* at 152.

5. The 2000 Amendment to the Federal Rules of Evidence

In 2000, Rule 702 was amended in response to the *Daubert* and *Kumho Tire* decisions.⁷⁶ The rule now states that an expert may testify if “the testimony is based on sufficient facts or data”; “the testimony is the product of reliable principles and methods”; and “the expert has reliably applied the principles and methods to the facts of the case.”⁷⁷ Thus, the amendment affirms the trial court’s gatekeeping function and “provides some general [principles] that the trial court must use to assess the reliability and helpfulness of proffered expert testimony.”⁷⁸ Consistent with *Kumho Tire*, the amended Rule “provides that all types of expert testimony present questions of admissibility for the trial court.”⁷⁹ As a result, the admissibility of expert testimony is regulated by Rule 104(a), which places the burden of establishing the pertinent admissibility requirements by a preponderance of the evidence on the proponent.⁸⁰

Furthermore, by not codifying the specific factors articulated in *Daubert*, the amendment allowed trial courts to determine which factors were pertinent to reliability in each case.⁸¹ However, it is clear that the amendment was not intended to overrule *Daubert* because the *Daubert* factors are still pertinent to resolving the issues raised when the expert offers an opinion in an area of science.

When convictions are based upon scientific evidence later shown to be unreliable, the foundations for the conclusions scientists made to help convict an individual have been undermined. Had this new scientific knowledge been known to

⁷⁶ DAVID P. LEONARD ET. AL., *EVIDENCE: A STRUCTURED APPROACH* 539 (2d ed. 2008).

⁷⁷ FED. R. EVID. 702(b)–(d).

⁷⁸ FED. R. EVID. 702 advisory committee’s note.

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ LEONARD ET. AL., *supra* note 76. In fact, the Advisory Committee’s Note to Rule 702 lists other factors that courts have found “relevant in determining whether expert testimony is sufficiently reliable to be considered by the trier of fact,” including: (1) whether experts have developed their opinions naturally out of their own research independent of litigation, or have done so expressly for purposes of testifying, (2) whether there is too big of an analytical gap between the data and the opinion offered, (3) whether the expert has considered all relevant variables, (4) whether the expert brings the same rigor to the courtroom as he would in his regular work, and “(5) whether the field of expertise . . . is known to reach reliable results.” FED. R. EVID. 702 advisory committee’s note.

the trial court, it is unlikely that the expert testimony would have been admitted into evidence at trial. Because the jury should have never seen the evidence they based the conviction on, postconviction remedies must be available to the convicted defendant.

B. *Postconviction Remedy Procedure*

A judgment of conviction rendered at the end of a criminal trial does not necessarily dispose of the case. Not only do American jurisdictions permit recourse to direct review of convictions for most offenses, but they all also permit the defendant to attack his conviction through postconviction remedies.⁸² Generally, “[d]irect appeals [] can be made on the basis of ‘any nonharmless legal error,’ whereas postconviction appeals are typically allowed only on the basis of more egregious (such as constitutional or jurisdictional) error.”⁸³

Federal prisoners have had postconviction relief available to them since the Judiciary Act granted federal courts the authority to issue writs of habeas corpus.⁸⁴ However, habeas relief was limited to only federal prisoners under the Act,⁸⁵ and even though the Act did not announce the substantive scope of the writ, courts understood it to apply to jurisdictional challenges.⁸⁶ Under the Habeas Corpus Act of 1867,⁸⁷ Congress broadened the implementation of habeas corpus to include state prisoners,⁸⁸ but courts continued to look upon the writ as a mere jurisdictional tool.⁸⁹ But in the 1930s and 1940s, “courts began to expand the scope of habeas corpus to permit challenges to nonjurisdictional flaws such as violations of due process, the right to counsel, and other constitutional rights.”⁹⁰ Both direct appeals and postconviction appeals should be available to defendants convicted based upon scientific evidence that has later been found to be unreliable.

⁸² Note, *State Post-Conviction Remedies*, 61 COLUM. L. REV. 681, 681 (1961).

⁸³ Terrell J. Iandiorio, Note, *Federal Postconviction Relief and 28 USC § 2255(4): Are State Court Decisions “Facts”?*, 71 U. CHI. L. REV. 1141, 1141 (2004).

⁸⁴ *Id.* at 1143–44; see also Judiciary Act of 1789, ch. 20 § 14, 1 Stat. 73, 81–82.

⁸⁵ See § 14, 1 Stat. at 82.

⁸⁶ Iandiorio, *supra* note 83, at 1144.

⁸⁷ ch. 27, § 1, 14 Stat. 385.

⁸⁸ § 1, 14 Stat. at 386.

⁸⁹ Iandiorio, *supra* note 83, at 1144.

⁹⁰ *Id.*

1. The Antiterrorism and Effective Death Penalty Act

In 1996, the Antiterrorism and Effective Death Penalty Act (“AEDPA”) was adopted.⁹¹ Congress enacted the AEDPA to modify the pre-existing habeas process.⁹² Although the AEDPA was created for many different reasons, its paramount purpose was to decrease the death penalty process so that inmates could be put to death in a more timely manner.⁹³

One significant change under the AEDPA has affected the rule demanding that a state prisoner exhaust all state remedies before seeking federal review.⁹⁴ This rule has been modified in two respects: (1) “the federal courts are now authorized to deny a petition on the merits even though the issues have not been exhausted,” and (2) “the federal courts are not permitted to infer state waiver of the exhaustion requirement from lack of response, although the state may still affirmatively waive the requirement.”⁹⁵

Under the language of the AEDPA, relief may be granted only if state court adjudication of the issues “resulted in a decision that was contrary to, or involved an unreasonable application of, clearly established Federal law, as determined by the Supreme Court of the United States.”⁹⁶ Factual determinations made by state courts continue to be presumed correct and under the Act may now be rebutted only by “clear and convincing evidence.”⁹⁷

Federal habeas corpus is not an ordinary remedy, and by no means should it be used to re-litigate state criminal dispositions on a regular basis.⁹⁸ State courts’ findings of fact and legal conclusions have been given great deference under 28 U.S.C. § 2254(d).⁹⁹ However, the AEDPA was enacted to provide

⁹¹ Pub. L. No. 104-132, 110 Stat. 1214 (1996). *See generally* 28 U.S.C. § 2254 (2012).

⁹² Kenneth Williams, *Why It Is so Difficult to Prove Innocence in Capital Cases*, 42 TULSA L. REV. 241, 246 (2006).

⁹³ *Id.*

⁹⁴ F. Martin Tieber, *Federal Habeas Corpus Law and Practice—The Antiterrorism and Effective Death Penalty Act of 1996*, 77 MICH. B.J. 50, 51–52 (1998).

⁹⁵ 28 U.S.C. § 2254(b)(2)–(3) (2012); Tieber, *supra* note 94, at 52.

⁹⁶ 28 U.S.C. § 2254(d)(1).

⁹⁷ § 2254(e)(1).

⁹⁸ Tieber, *supra* note 94, at 52.

⁹⁹ *Lindh v. Murphy*, 521 U.S. 320, 333 n.7 (1997) (stating that 28 U.S.C. § 2254(d) dictates a “highly deferential standard for evaluating state-court rulings”).

limitations on state courts.¹⁰⁰ Therefore, by limiting the procedural and substantive scope of the writ of habeas corpus, the AEDPA has made it even more challenging for potentially innocent inmates to obtain justice.¹⁰¹

C. *Due Process Clause of the Fourteenth Amendment*

The Due Process Clause of the Fourteenth Amendment provides that minimally fair due process must be provided to those deprived by the government of life, liberty, or property, as long as the amount of process sought does not outweigh the associated costs, risk of error, and adverse impact on the government.¹⁰² The theory of due process is not intended to be a “technical conception with a fixed content.”¹⁰³ Instead, it is meant to be flexible¹⁰⁴ and “adaptable to the exigencies of a particular factual context.”¹⁰⁵

Convictions secured using false and unreliable evidence, even scientific evidence, do not automatically give rise to a challenge under the Due Process Clause. Instead, the Supreme Court has recognized that, in most situations, other core constitutional protections suffice to protect a defendant against a conviction secured through such evidence by providing a real and meaningful opportunity to expose the flaws in the evidence in question.¹⁰⁶ The Court has stated the following:

The Constitution, our decisions indicate, protects a defendant against a conviction based on evidence of questionable reliability, not by prohibiting introduction of the evidence, but by affording the defendant means to persuade the jury that the evidence should be discounted as unworthy of credit.

¹⁰⁰ Tieber, *supra* note 94, at 52.

¹⁰¹ Williams, *supra* note 92, at 248.

¹⁰² U.S. CONST. amend. XIV, § 1; *see* Matthews v. Eldridge, 424 U.S. 319, 335 (1976).

¹⁰³ *Matthews*, 424 U.S. at 334 (quoting Cafeteria & Rest. Workers Union Local 473 v. McElroy, 367 U.S. 886, 895 (1961)); *see* Melissa Duncan, *Finding a Constitutional Right to Access DNA Evidence: Postconviction*, 51 S. TEX. L. REV. 519, 538 (2009) (internal quotation marks omitted).

¹⁰⁴ *McKithen v. Brown*, 481 F.3d 89, 108 (2d Cir. 2007) (citing *Greenholtz v. Inmates of Neb. Penal & Corr. Complex*, 442 U.S. 1, 12 (1979) (“It is axiomatic that due process ‘is flexible and calls for such procedural protections as the particular situation demands.’ ”)); *see* Duncan, *supra* note 103.

¹⁰⁵ *Wade v. Brady*, 460 F. Supp. 2d 226, 243 (D. Mass. 2006); *see* Duncan, *supra* note 103.

¹⁰⁶ *See* *Perry v. New Hampshire*, 132 S. Ct. 716, 723 (2012).

Constitutional safeguards available to defendants to counter the State's evidence include the Sixth Amendment rights to counsel; compulsory process; and confrontation plus cross-examination of witnesses.¹⁰⁷

These protections generally suffice to adequately protect a defendant and, therefore, obviate the need for further court intervention. When marshaled effectively, they ensure that the jury is provided with, and can fully consider, the flaws and potential errors in the challenged evidence.¹⁰⁸

The Court in *Perry v. New Hampshire*¹⁰⁹ recognized, however, that circumstances exist in which these safeguards may prove inadequate, requiring intervention by the courts.¹¹⁰ The Seventh Circuit has stated:

Our Constitution protects against conviction[s] based on evidence of questionable reliability. Despite the importance of this right, the admission of evidence rarely implicates due process. Rather, courts typically rely on other means to ensure reliable evidence—state and federal rules, as well as different constitutional guarantees, such as the Sixth Amendment rights to counsel and confrontation. Yet, when evidence is so extremely unfair that its admission violates fundamental conceptions of justice, due process, like the sleeping giant, awakens. In those situations, other protections have proven insufficient, and courts must step in to prevent injustice.¹¹¹

While the interest in fundamental fairness is an essential step in a due process analysis, the Court has found that “[d]ue [p]rocess does not require that every conceivable step be taken, irrespective of cost, to eliminate the possibility of convicting an innocent person.”¹¹² However, due process does serve to protect against baseless deprivations of liberty at the hands of government officials by “barring certain government actions

¹⁰⁷ *Id.* (citations omitted).

¹⁰⁸ *Id.* at 729 (noting that defense counsel cautioned the jury during both opening and closing arguments regarding the potential errors in the challenged evidence and explored these potential errors and flaws during cross-examination).

¹⁰⁹ 132 S. Ct. 716.

¹¹⁰ *See id.* at 723 (“Only when evidence ‘is so extremely unfair that its admission violates fundamental conceptions of justice,’ have we imposed a constraint tied to the Due Process Clause.”) (citations omitted).

¹¹¹ *United States v. Sanders*, 708 F.3d 976, 983 (7th Cir. 2013) (citations omitted) (quoting *Perry*, 132 S. Ct. at 723) (internal quotation marks omitted).

¹¹² *Wade v. Brady*, 460 F. Supp. 2d 226, 246 (D. Mass. 2006) (quoting *Herrera v. Collins*, 506 U.S. 390, 399 (1993)) (internal quotation marks omitted).

regardless of the fairness of the procedures used to implement them.”¹¹³ The standards of fundamental fairness “legitimately draw[] upon the principles that underlay the [established] categories of procedural and substantive due process.”¹¹⁴

1. Procedural Due Process

Procedural due process requires that the government may not deprive a person of life, liberty, or property unless fundamentally fair and free from arbitrariness.¹¹⁵ This requirement of fundamental fairness “prohibits the State from depriving its citizens of liberty in a criminal trial unless it first observes certain procedural safeguards.”¹¹⁶ Failure to comply with clearly delineated procedures will result in a “deprivation of liberty without due process of law.”¹¹⁷

To declare a violation of procedural due process, a person seeking relief must first demonstrate that he retains a life, liberty, or property interest in the right the government seeks to eliminate.¹¹⁸ A court must then balance certain factors to determine if there has been a violation of procedural due process.¹¹⁹ In *Matthews v. Eldridge*,¹²⁰ the Court articulated a balancing test to determine whether the government’s actions deprived a person of a life, liberty, or property interest without due process of law.¹²¹ The test requires a balancing of the following factors in order to determine whether procedural due process requires constitutional safeguards:

First, the private interest that will be affected by the official action; second, the risk of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards; and

¹¹³ *Cnty. of Sacramento v. Lewis*, 523 U.S. 833, 840 (1998) (quoting *Daniels v. Williams*, 474 U.S. 327, 331 (1986)) (internal quotation marks omitted).

¹¹⁴ *See Harvey v. Horan*, 285 F.3d 298, 311 (4th Cir. 2002) (Luttig, J., concurring); *see also Duncan, supra* note 103.

¹¹⁵ *See Matthews v. Eldridge*, 424 U.S. 319, 348–49 (1976); *see Duncan, supra* note 103.

¹¹⁶ *Jean v. Collins*, 221 F.3d 656, 677 (4th Cir. 2000) (Murnaghan, J., dissenting).

¹¹⁷ *Id.*; *see Duncan, supra* note 103, at 538–39.

¹¹⁸ *See McKithen v. Brown*, 565 F. Supp. 2d 440, 451 (E.D.N.Y. 2008).

¹¹⁹ *See Duncan, supra* note 103, at 539.

¹²⁰ 424 U.S. 319.

¹²¹ *Id.* at 334–35.

finally, the Government's interest, including the function involved and the fiscal and administrative burdens that the additional or substitute procedural requirement would entail.¹²²

2. Substantive Due Process

The Court has stated that prisoners lawfully deprived of their freedom retain substantive liberty interests under the Fourteenth Amendment.¹²³ Furthermore, “[s]ubstantive due process protects against deprivations of liberty where the state has no sufficient interest to justify the deprivation, regardless of the process that might be employed.”¹²⁴ The primary function of substantive due process is to protect individuals from practices that are “contrary to contemporary standards of decency,” “shocking to the conscience,” or contrary to a “principle of justice so rooted in the traditions and conscience of our people as to be ranked as fundamental.”¹²⁵

There are two primary features of judicial review in the realm of substantive due process analysis: (1) identification of a fundamental right or liberty interest that is “deeply rooted in this Nation’s history and tradition,” and “implicit in the concept of ordered liberty,”¹²⁶ and (2) “a careful description of the asserted fundamental liberty interest,” using the first prong as a guidepost.¹²⁷ These requirements emphasize the level of care necessary in “defining the interests at stake in substantive due process analysis because, in determining a statute’s constitutionality, the appropriate level of scrutiny to be applied depends on the nature and quality of the activity that the statute seeks to address.”¹²⁸

¹²² *Id.* at 335.

¹²³ *Youngberg v. Romeo*, 457 U.S. 307, 315 (1982) (“The mere fact that [petitioner] has been committed under proper procedures does not deprive him of all substantive liberty interests under the Fourteenth Amendment.”).

¹²⁴ Michael Avery, *Paying for Silence: The Liability of Police Officers Under Section 1983 for Suppressing Exculpatory Evidence*, 13 TEMP. POL. & CIV. RTS. L. REV. 1, 24 (2003).

¹²⁵ *Herrera v. Collins*, 506 U.S. 390, 419 (1993) (O’Connor, J., concurring) (citation omitted) (internal quotation marks omitted); *Rochin v. California*, 342 U.S. 165, 172 (1952).

¹²⁶ *Washington v. Glucksberg*, 521 U.S. 702, 720–21 (1997) (citation omitted) (internal quotation marks omitted).

¹²⁷ *Id.* at 721 (internal quotation marks omitted).

¹²⁸ Craig M. Jacobs, *The Constitutionality of Collateral Post-Conviction Claims of Actual Innocence*, 42 ST. MARY’S L.J. 455, 477–78 (2011); see *Glucksberg*, 521 U.S. at 722.

If an act of Congress infringes upon a liberty interest deemed fundamental, the appropriate level of review is strict scrutiny; if the act infringes upon a lesser liberty interest, then rational basis scrutiny generally applies.¹²⁹ When a statute or government action infringes upon a right that does not rise to the fundamental level but is in some way constitutionally suspect, the court applies intermediate level scrutiny.¹³⁰ Thus, substantive due process analysis requires identifying the nature of the liberty interest asserted to determine the appropriate level of judicial review.

Both federal and state courts disagree as to whether the Due Process Clause requires a new trial when a conviction is based upon science later shown to be unreliable. In particular, appellate courts are divided as to whether, in order to obtain a new trial, it suffices that the tainted expert testimony likely affected the trial's outcome or whether a convicted defendant must affirmatively disprove the expert's opinion. In order to decide the appropriate standard, each must be analyzed under both substantive and procedural due process.

II. THE DIVERGENT STANDARDS AMONG APPELLATE COURTS IN AFFORDING A CONVICTED DEFENDANT A NEW TRIAL WHEN A CONVICTION IS BASED ON UNRELIABLE SCIENTIFIC EVIDENCE

Notwithstanding the growing use of scientific evidence in criminal cases and the influence that such evidence has on the outcome of a trial, appellate courts lack uniformity in approaching wrongful conviction claims based on the use of false or unreliable scientific evidence. This Part discusses the division among appellate courts as to whether, in order to obtain a new trial, it suffices that the tainted expert testimony likely affected the trial's outcome or whether a convicted defendant must affirmatively disprove the expert's conclusion. Section A discusses the reasonable probability standard—that courts are willing to grant relief when scientific evidence in the original trial is shown to be sufficiently unreliable as to undermine confidence in the accuracy and integrity of the jury verdict. Section B discusses the actual innocence standard—that courts

¹²⁹ See, e.g., *Lawrence v. Texas*, 539 U.S. 558, 593–94 (2003) (Scalia, J., dissenting) (discussing when the strict scrutiny test applies and when the rational basis test applies).

¹³⁰ See *Turner Broad. Sys., Inc. v. FCC*, 520 U.S. 180, 189–90 (1997).

require a defendant who challenges scientific evidence as unreliable to proffer additional, exculpatory evidence that affirmatively demonstrates that the expert testimony was actually false, or that the defendant was innocent of the crime.

A. *The Reasonable Probability Standard*

Some appellate courts that have heard wrongful conviction claims based on the use of scientific evidence that was later found to be fundamentally unreliable have taken a less restrictive approach than others. These courts are willing to grant relief when scientific evidence in the original trial is shown to be sufficiently unreliable as to undermine confidence in the accuracy and integrity of the jury verdict.¹³¹

For example, in *Han Tak Lee v. Glunt*,¹³² the defendant was convicted of first degree murder and arson, and sentenced to life without the possibility of parole after his twenty-year-old mentally ill daughter died in a cabin fire.¹³³ The defendant sought federal habeas relief claiming that advances in the field of arson science demonstrated that the expert testimony offered against him at his original trial was fundamentally unreliable.¹³⁴ The district court denied the petition after concluding “claims of actual innocence based on newly discovered evidence are never grounds for federal habeas relief absent an independent constitutional violation.”¹³⁵ On appeal, the Third Circuit reversed the holding that the defendant was entitled to discovery and an opportunity to present his newfound evidence at an evidentiary hearing in order to ascertain whether the original trial was rendered fundamentally unfair by use of the unreliable expert testimony.¹³⁶ The court concluded that “[i]f [the defendant’s] expert’s independent analysis of the fire scene

¹³¹ See, e.g., *Han Tak Lee v. Glunt*, 667 F.3d 397, 403–04 (3d Cir. 2012); *United States v. Freeman*, 650 F.3d 673, 678–80 (7th Cir. 2011); *Drake v. L.A. Portuondo*, 553 F.3d 230, 233 (2d Cir. 2009); *State v. Edmunds*, 746 N.W.2d 590, 598–99 (Wis. Ct. App. 2008); *State v. Krone*, 897 P.2d 621, 621 (Ariz. 1995); *State v. Gookins*, 637 A.2d 1255, 1259 (N.J. 1994); *In re Investigation of W. Va. State Police Crime Lab., Serology Div.*, 438 S.E.2d 501, 504 (W. Va. 1993); *State v. Caldwell*, 322 N.W.2d 574, 587 (Minn. 1982).

¹³² 667 F.3d 397.

¹³³ *Id.* at 400.

¹³⁴ *Id.* at 402.

¹³⁵ *Id.*

¹³⁶ *Id.* at 403–04.

evidence—applying principles from new developments in fire science—shows that the fire expert testimony at [the defendant's] trial was fundamentally unreliable, then [the defendant] will be entitled to federal habeas relief on his due process claim.”¹³⁷

In *United States v. Freeman*,¹³⁸ four defendants were convicted of various drug crimes.¹³⁹ However, the district court ultimately decided that “the government's star witness had testified falsely, that the government knew this testimony was false, and that the government relied upon it to secure the defendants' convictions.”¹⁴⁰ The Seventh Circuit held that, before granting a new trial on due process grounds, it need not “be conclusively established that the . . . witness was lying.”¹⁴¹ In fact, the court squarely rejected the suggestion that a defendant must prove that the challenged evidence was verifiably false in order to trigger due process relief.¹⁴² The Seventh Circuit explained that there “does not need to be conclusive proof that the testimony was false” for the testimony to constitute a due process violation.¹⁴³

In *Drake v. Portuondo*,¹⁴⁴ the prosecution offered the testimony of a prison psychologist to establish that the defendant had the requisite intent to commit murder.¹⁴⁵ The expert testified that the facts of the case led him to conclude that the defendant suffered from picquerism—“a purported syndrome . . . in which the perpetrator realizes sexual satisfaction from penetrating a victim by sniper activity or by stab or bite wounds,” and the jury convicted the defendant on two counts of second degree murder.¹⁴⁶ In a habeas petition, the convicted defendant established that the expert had lied on the stand regarding his credentials, when he learned about the facts of the case, and how and when he concluded that the defendant suffered from picquerism.¹⁴⁷ The court determined that the

¹³⁷ *Id.* at 407–08.

¹³⁸ 650 F.3d 673 (7th Cir. 2011).

¹³⁹ *See id.* at 675.

¹⁴⁰ *Id.*

¹⁴¹ *Id.* at 679–80.

¹⁴² *See id.*

¹⁴³ *Id.* at 680.

¹⁴⁴ 553 F.3d 230 (2d Cir. 2009).

¹⁴⁵ *See id.* at 236.

¹⁴⁶ *Id.* at 235, 237.

¹⁴⁷ *Id.* at 237–39.

expert's conclusions were not based on reliable science, that the prosecutor knew that at least some of the expert's testimony was false, and that the defendant was entitled to a new trial.¹⁴⁸ The court did not, however, require the defendant to disprove the expert's conclusions regarding picquerism or to prove that the defendant lacked the requisite intent for the crime.

In *State v. Edmunds*,¹⁴⁹ the defendant was convicted of reckless homicide of an infant after expert medical testimony at trial suggested the infant's injuries could only be explained by shaken baby syndrome.¹⁵⁰ During postconviction proceedings, Edmunds presented expert testimony from multiple doctors revealing a newly developed debate in the medical community that undermined the testimony of the state's expert trial witness.¹⁵¹ Although it found that "the new evidence d[id] not completely dispel the old evidence," the court nonetheless found that a new trial was warranted because "the record establishes that there is a reasonable probability that a jury, looking at both the new medical testimony and the old medical testimony, would have a reasonable doubt as to Edmunds's guilt."¹⁵²

In *In re Investigation of the West Virginia State Police Crime Laboratory, Serology Division*,¹⁵³ the West Virginia court appointed a circuit judge to conduct an investigation into whether habeas relief should be granted to prisoners whose convictions were obtained through the testimony of a former serologist who was alleged to have engaged in systematic misconduct, including the falsification of evidence in criminal prosecutions.¹⁵⁴ The investigation concluded that the serologist's "pattern and practice of misconduct completely undermined the validity and reliability of any forensic work he performed or reported . . ." ¹⁵⁵ Although the report did not disprove the serologist's conclusion in every trial in which his testimony was offered, the court held that all of his testimony should be deemed false, and thus "in any habeas corpus hearing involving [the serologist's] evidence, the only issue is whether the evidence

¹⁴⁸ *Id.* at 243–44, 247–48.

¹⁴⁹ 746 N.W.2d 590 (Wis. Ct. App. 2008).

¹⁵⁰ *Id.* at 592–93.

¹⁵¹ *Id.* at 593.

¹⁵² *Id.* at 599.

¹⁵³ 438 S.E.2d 501 (W. Va. 1993).

¹⁵⁴ *Id.* at 502–03.

¹⁵⁵ *Id.* at 504.

presented at trial, independent of the forensic evidence presented by [the serologist], would have been sufficient to support the verdict."¹⁵⁶ Therefore, the court held that due process required a new trial for defendants who were convicted based on the serologist's evidence if such evidence "could . . . in any reasonable likelihood have affected the judgment of the jury . . ." ¹⁵⁷

Finally, in *State v. Gookins*,¹⁵⁸ three defendants arrested for drunk driving declared they were innocent but pleaded guilty when they were presented with breathalyzer blood-alcohol-concentration readings in excess of .10 percent.¹⁵⁹ After their pleas, an undercover operation resulted in the conviction of the arresting officer on charges of falsifying the results of a breathalyzer test on an undercover agent.¹⁶⁰ The three defendants moved for new trials based on the officer's conviction, but the Municipal Court denied the motions.¹⁶¹ The Law Division and the Appellate Division of New Jersey upheld the Municipal Court's decision because the charges against the arresting officer did not relate to the tests performed on the three defendants who pleaded guilty, and thus did not establish falsification of evidence in any of their cases.¹⁶² The three defendants were unable to prove that the officer falsified the results in their own cases and that they were actually innocent. The Supreme Court of New Jersey reversed that decision and remanded the cases to the municipal court where the State would be required "to prove defendants' guilt with evidence that is free of the taint of [the officer's] pattern of misconduct."¹⁶³

These courts hold that due process can be violated by the use of testimony or evidence whose validity has been seriously called into question, even where it has not necessarily been recanted or wholly discredited. In doing so, these courts equate "false" evidence with unreliable or discredited evidence. Thus, under the reasonable probability standard, a convicted defendant should be granted relief when he can show that scientific

¹⁵⁶ *Id.* at 506.

¹⁵⁷ *Id.* at 505 (quoting *Napue v. Illinois*, 360 U.S. 264, 271 (1959)).

¹⁵⁸ 637 A.2d 1255 (N.J. 1994).

¹⁵⁹ *Id.* at 1256.

¹⁶⁰ *Id.* at 1257.

¹⁶¹ *Id.*

¹⁶² *Id.*

¹⁶³ *Id.* at 1260.

evidence in the original has later been shown to be sufficiently unreliable as to undermine confidence in the accuracy and integrity of the jury verdict.

B. Actual Innocence Standard

The actual innocence standard that other appellate courts have adopted requires a defendant who challenges scientific evidence as unreliable to proffer additional, exculpatory evidence to affirmatively demonstrate that the expert testimony was actually false, or to demonstrate his or her actual innocence of the crime.¹⁶⁴ These courts hold that due process is not violated merely because an individual is convicted using evidence or testimony that was later found to be unreliable and thus misled the jury into reaching a guilty verdict.

For example, in *United States v. Berry*,¹⁶⁵ the petitioner claimed that his due process rights were violated because his conviction was based largely on expert testimony that had been subsequently found to be unreliable.¹⁶⁶ The petitioner had originally been convicted, in part, on the basis of “compositional analysis of bullet lead” evidence.¹⁶⁷ Following the petitioner’s conviction, the FBI discontinued the use of compositional analysis of bullet lead evidence because it was determined to be inaccurate.¹⁶⁸ Although the Ninth Circuit acknowledged that the expert testimony suffered from “significant criticisms,” the court denied relief because the petitioner failed to show that the evidence was “almost entirely unreliable.”¹⁶⁹

In *Fuller v. Johnson*,¹⁷⁰ a defendant was sentenced to death for robbery, murder, and sexual assault.¹⁷¹ The defendant initially confessed that he committed the crimes alone, but at trial, he recanted his confession and posited that an accomplice

¹⁶⁴ See *United States v. Berry*, 624 F.3d 1031, 1038 (9th Cir. 2010); *Byrd v. Collins*, 209 F.3d 486, 517–18 (6th Cir. 2000); *Fuller v. Johnson*, 114 F.3d 491, 496–97 (5th Cir. 1997); *Ex Parte Robbins*, 360 S.W.3d 446, 458–60 (Tex. Crim. App. 2011); *Trotter v. State*, 736 S.W.2d 536, 539 (Mo. Ct. App. 1987).

¹⁶⁵ 624 F.3d 1031.

¹⁶⁶ *Id.* at 1039–40.

¹⁶⁷ *Id.* at 1035–36 (internal quotation marks omitted).

¹⁶⁸ See *id.* at 1037.

¹⁶⁹ *Id.* at 1041 (internal quotation marks omitted).

¹⁷⁰ 114 F.3d 491 (5th Cir. 1997).

¹⁷¹ See *id.* at 494.

actually killed the victim with a pipe.¹⁷² To challenge the defendant's allegations, the prosecution presented autopsy evidence from a medical professional showing that the victim's injuries indicated she was killed with blows from a fist, not a pipe.¹⁷³ Following his conviction, the defendant filed a petition for writ of habeas corpus arguing that his due process rights were violated because his conviction was based on false testimony.¹⁷⁴ In support, the defendant submitted an affidavit from another medical professional who stated that the trial expert did not perform the scientific procedures necessary to make the conclusions presented to the jury.¹⁷⁵ The district court denied the petition and the Fifth Circuit affirmed because the defendant did not show that the expert's opinion was "actually false."¹⁷⁶

Similarly, in *Byrd v. Collins*,¹⁷⁷ the petitioner also claimed his due process rights were violated when he was convicted with allegedly false testimony.¹⁷⁸ The petitioner had originally been convicted and sentenced to death for aggravated murder.¹⁷⁹ In his federal application for a writ of habeas, the petitioner presented evidence to show that witnesses from his original trial were "involved in a scheme to testify falsely against [him] in order to further their own causes with the . . . [p]rosecutor's [o]ffice."¹⁸⁰ However, the Sixth Circuit denied relief because the petitioner failed to show that the statements were "indisputably false" rather than merely misleading.¹⁸¹

In *Ex Parte Robbins*,¹⁸² the petitioner was convicted of capital murder of his girlfriend's seventeen-month-old child and was sentenced to imprisonment for life.¹⁸³ The State's case largely depended on the expert opinion of a medical examiner who performed the autopsy and who testified that the child died from "asphyxia due to compression of the chest and abdomen and that

¹⁷² *See id.* at 495.

¹⁷³ *See id.*

¹⁷⁴ *See id.*

¹⁷⁵ *See id.* at 496.

¹⁷⁶ *Id.*

¹⁷⁷ 209 F.3d 486 (6th Cir. 2000).

¹⁷⁸ *Id.* at 500–01.

¹⁷⁹ *See id.* at 494.

¹⁸⁰ *Id.* at 500.

¹⁸¹ *Id.* at 517–18 (internal quotation marks omitted).

¹⁸² 360 S.W.3d 446 (Tex. Crim. App. 2011).

¹⁸³ *Id.* at 448.

the manner of death was homicide.”¹⁸⁴ More than eight years later, after the medical examiner had acquired “more experience in the field of forensic pathology,” she re-evaluated the evidence on which she had based her trial opinion and concluded that she had been wrong and that the cause and manner of death could not be determined.¹⁸⁵ Furthermore, four other forensic pathologists also opined that, based on the trial evidence, the child’s death could not be affirmatively attributed to homicide.¹⁸⁶ The petitioner filed an application for a writ of habeas corpus arguing, among other things, that he was denied a right to a fair trial because his conviction was based on false testimony.¹⁸⁷ As a result, the trial court recommended that the Texas Court of Criminal Appeals grant the petitioner a new trial because “his due process and due course of law rights were violated, as was his right to an impartial jury.”¹⁸⁸

However, the Texas Court of Criminal Appeals found that due process did not require a new trial because the expert’s prior testimony had not “been proven to be false.”¹⁸⁹ The court explained that the expert’s “trial testimony is not false just because her re-evaluation of the evidence has resulted in a different, ‘undetermined’ opinion, especially when neither she nor any other medical expert can exclude her original opinion as the possible cause and manner of death.”¹⁹⁰ In other words, there was no due process violation because petitioner could not definitively prove that no crime had occurred.

Finally, in *Trotter v. State*,¹⁹¹ a defendant was convicted of killing a police officer based on expert testimony that a .357 magnum revolver was used to kill the officer.¹⁹² After the defendant was convicted, the same expert examined the deceased

¹⁸⁴ *Id.* at 450.

¹⁸⁵ *Id.* at 454.

¹⁸⁶ *See id.* at 454–55.

¹⁸⁷ *Id.* at 454.

¹⁸⁸ *Robbins*, 360 S.W.3d at 457. *See generally* TEX. CONST. art. I, § 13 (1876). The term “remedy by due course of law,” as used in the constitutional provision guaranteeing to every person a remedy by due course of law for injury done to him in person or property, means the “reparation for injury ordered by a tribunal having jurisdiction in due course of procedure after a fair hearing.” *Noel v. Menninger Found.*, 267 P.2d 934, 943 (Kan. 1954).

¹⁸⁹ *Id.* at 461, 463.

¹⁹⁰ *Id.* at 461.

¹⁹¹ 736 S.W.2d 536 (Mo. Ct. App. 1987).

¹⁹² *See id.* at 538.

officer's own .38 caliber Smith & Wesson and determined that his expert trial testimony was wrong.¹⁹³ Instead, he found that it was the officer's own gun that was used to kill the officer, not the .357 magnum.¹⁹⁴ The circuit court and the Missouri Court of Appeals denied the defendant's request for a new trial because the expert's testimony at trial, though later recanted, was true to the best of the expert's knowledge at the time of the trial.¹⁹⁵

These courts hold that a new trial is not warranted unless the expert testimony can be shown to be actually false. In doing so they place the burden on the convicted defendant to affirmatively prove that testimony at a given trial is technically "false" rather than simply factually wrong or unreliable. Thus, under the actual innocence standard, a criminal defendant may receive a new trial only if he also proffers fully exonerating evidence.

III. DUE PROCESS REQUIRES A NEW TRIAL WHEN SCIENTIFIC EVIDENCE NECESSARY TO THE CONVICTION BECOMES SO UNRELIABLE AS TO CALL THE VALIDITY OF THE JURY'S VERDICT INTO QUESTION

This Part argues that due process requires courts to grant postconviction relief when scientific evidence in the original trial is shown to be sufficiently unreliable as to undermine confidence in the accuracy and integrity of the jury verdict. First, it protects the defendant's due process right to a fundamentally fair trial by eliminating the risk of an inaccurate verdict. Second, it keeps the burden of proof on the government. Third, policy reasons dictate that the reasonable probability standard calls for postconviction relief. Finally, convictions based upon unreliable evidence are analogous to other evidentiary errors that are entitled to due process postconviction relief.

¹⁹³ *See id.*

¹⁹⁴ *Id.*

¹⁹⁵ *Id.* at 539.

A. *The “Reasonable Probability Standard” Preserves the Integrity of the Criminal Justice System by Protecting the Defendant’s Right to a Fundamentally Fair Trial*

1. Procedural Due Process Rationale

Limits on powerful claims that the accuracy and integrity of a jury verdict have been compromised are not only unjustifiable but also violate the fundamental premises of the Supreme Court’s own procedural due process jurisprudence. Most clearly they violate the calculus in *Matthews v. Eldridge* for determining when due process requires a procedure to protect an interest in life, liberty, or property.¹⁹⁶

In *Matthews*, the court seeks to weigh any costs of an additional procedure against the expected value of said procedure.¹⁹⁷ The value of the procedure is formulated by “multipl[y]ing] the importance of the interest at stake by the degree to which a particular procedure would increase the accuracy of determining whether the interest should be deprived.”¹⁹⁸ This benefit should be weighed against the cost of providing the procedure.¹⁹⁹ While one can usually question the value to be assigned to most interests, “no one doubts the value in not being executed or in not having to serve a lengthy prison sentence.”²⁰⁰

When there is a reasonable probability that, had the jury not heard the unreliable scientific evidence, the result of the proceeding would have been different, it is plainly unjust to keep the prisoner incarcerated. Furthermore, because there is a reasonable probability of the petition’s success, a prisoner’s liberty has value in excess of the costs associated with litigation and review of the unreliable scientific evidence. Thus, under the concepts of fairness and efficiency, an additional procedure is both socially desirable and also likely required by the cost-benefit procedural due process test of *Matthews*.

¹⁹⁶ See *supra* Part I.C.1.

¹⁹⁷ George C. Thomas III et al., *Is It Ever Too Late for Innocence? Finality, Efficiency, and Claims of Innocence*, 64 U. PITT. L. REV. 263, 293 (2003).

¹⁹⁸ *Id.*

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

2. Substantive Due Process Rationale

Substantive due process analysis requires identifying the nature of the liberty interest asserted in a claim of unreliable scientific evidence. Petitioners claiming that their convictions were based upon scientific evidence later shown to be unreliable in their federal habeas petitions argue, at a basic level, that they were deprived of the fundamental right to a fair trial. The right to a fair trial is “the most fundamental of all freedoms” and it must be maintained at all costs.²⁰¹ The Supreme Court has described the right to a fair trial as deeply rooted in this Nation’s history and tradition by stating, “A fair trial in a fair tribunal is a basic requirement of due process.”²⁰² Therefore, if habeas petitioners can clearly establish that there is a reasonable probability that the result at trial would have been different had the jury known the scientific evidence was unreliable, they can demonstrate an infringement of their interest in being afforded a fair trial. Given the importance and fundamental nature of this right, strict judicial review should apply to the AEDPA—the federal habeas corpus statute—insofar as it impedes a criminal defendant’s right to a fair trial.

Due process is not a formula but rather a balancing of interests between the government’s interest in enforcing a statute and the individual’s interest in the exercise of fundamental liberties.²⁰³ “In order to sustain constitutionality, the more a statute restricts protected liberty interests, the more significant the governmental interest must be and the more narrowly tailored the statute must be.”²⁰⁴ The federal habeas statute should be held to a strict scrutiny standard to the degree it prohibits federal habeas courts from considering claims under the reasonable probability standard because what is being asserted is a fundamental liberty interest: the right to a fair trial.²⁰⁵ Under strict scrutiny review, a challenged statute must be “narrowly tailored” to achieve a “compelling [government]

²⁰¹ *Estes v. Texas*, 381 U.S. 532, 540 (1965).

²⁰² *Id.* at 543 (quoting *In re Murchison*, 349 U.S. 133, 136 (1955)) (internal quotation marks omitted).

²⁰³ *See, e.g.*, *Washington v. Glucksberg*, 521 U.S. 702, 765–68 (1997) (Souter, J., concurring) (illustrating that due process decisions strike a balance between individual liberties and society’s demands).

²⁰⁴ *Jacobs*, *supra* note 128, at 480.

²⁰⁵ *See id.* at 480–81.

interest,” and to the degree it fails to meet these requirements, the statute is an unconstitutional violation of substantive due process.²⁰⁶

The government has important interests at stake when it seeks to limit the availability of federal habeas review.²⁰⁷ The Court has stated, “[f]ederal intrusions into state criminal trials frustrate both the States’ sovereign power to punish offenders and their good-faith attempts to honor constitutional rights.”²⁰⁸ When conviction results from what is believed to be a fair trial, the State has presumably satisfied the constitutional burden required to convict the defendant for the charged crime.²⁰⁹ Nevertheless, “the matter is not settled for either the habeas petitioner who seeks to challenge his conviction[,] or the State which must respond to a convicted defendant’s claims for postconviction relief.”²¹⁰ Because the petitioner has seemingly been granted all procedural safeguards available both at trial and during her appeals, the government has supplied significant process, and a substantial interest in limiting habeas review.²¹¹ Yet, when it is later found that scientific evidence, from which the conviction was based, has been shown to be unreliable, the need to limit claims under the reasonable probability standard upon habeas review seems much less compelling.

Even if these “governmental interests are compelling enough, the denial of such claims is still not narrowly tailored to achieve those interests” because the same objectives could be achieved by other means.²¹² For example, the statute “could require a finding of a lower court that the underlying conviction has been called into doubt.”²¹³ This example would be “more narrowly tailored to the government’s interest in limiting the availability of habeas review while simultaneously acknowledging the constitutionality of a claim of” reasonable probability that the trial result would have been different had

²⁰⁶ See *Reno v. Flores*, 507 U.S. 292, 301–02 (1993).

²⁰⁷ *Jacobs*, *supra* note 128, at 481.

²⁰⁸ *Engle v. Isaac*, 456 U.S. 107, 128 (1982) (citing *Schneckloth v. Bustamonte*, 412 U.S. 218, 263–65 (1973) (Powell, J., concurring)).

²⁰⁹ *Jacobs*, *supra* note 128, at 482.

²¹⁰ *Id.* at 482–83.

²¹¹ *Id.* at 483.

²¹² *Id.* at 484.

²¹³ *Id.*

the jury known the scientific evidence was unreliable.²¹⁴ Therefore, to the extent that the AEDPA restricts petitioner's right to assert his entitlement to a fair trial under this specific reasonable probability standard, "the statute should fail to muster constitutionality under strict scrutiny review."²¹⁵

B. The Burden of Proof Throughout a Criminal Matter Should Remain with the Government

The burden of proof in a criminal prosecution as to all essential elements of the crime rest upon the prosecution and the proofs must be such as to convince the trier of the fact beyond a reasonable doubt.²¹⁶ If a petitioner were required to disprove an element of a crime, or prove his actual innocence, the burden of proof would be turned on its head. The consequences of the State's use of unreliable evidence should not fall on the shoulders of the petitioner. Rather, having used misleading scientific evidence to convict, the State must bear the burden of retrying the petitioner in a manner that permits confidence in the conviction. Furthermore, a petitioner would never be able to obtain a new trial where forensic science can neither support nor disprove the conclusion presented to the jury.

C. Policy Dictates Postconviction Relief

1. The Reasonable Probability Standard Takes into Account the Uniquely Persuasive Impact of Scientific Evidence in Criminal Trials

Criminal convictions increasingly turn on the availability and strength of scientific evidence offered by the prosecution to establish that a crime has been committed and that the charged defendant is the only possible perpetrator. Juries raised on television programs like CSI expect scientific evidence and, once that expectation is satisfied, give disproportionate—even dispositive—weight to that evidence. Thus, once an expert has indicated that a crime has occurred, the jury likely focuses on whether it was the defendant who committed the crime instead of on whether a crime was committed at all. However, if the

²¹⁴ *Id.*

²¹⁵ *Id.*

²¹⁶ *United States v. Carr*, 550 F.2d 1058, 1059 (6th Cir. 1977).

forensic evidence had been presented to the jury accurately, such evidence certainly would affect how the jury evaluated all of the evidence against a petitioner.

The reasonable probability standard accounts for the possibility that juries may have given considerable weight to scientific evidence that has since been shown to be unreliable. If convicted defendants can show that scientific evidence has been discredited so as to undermine confidence in the accuracy and integrity of the jury verdict, they should be granted relief. Because of the increasing availability and strength of scientific evidence offered in criminal prosecutions, this safeguard is necessary to protect the rights of criminal defendants.

2. The Reasonable Probability Standard Recognizes That the Accuracy of the Result Is More Important than Finality of the Judgment

Concerns over eroding a judgment's finality are intrinsic to writs of habeas corpus because every writ granted undermines a previously final judgment. In the rare instances where scientific experts revise their conclusion or where newly available evidence undermines expert testimony from trial, reopening a case that hinged on the expert's testimony will help courts keep pace with science.

Every opinion revised on habeas will present the court system with two more reviews of the scientific discipline at issue than otherwise would have occurred. Appellate courts would inquire into whether change had occurred in the discipline at issue, and if a significant change had occurred, whether the *Daubert* test, when applied in the new trial resulting from habeas, would be informed by the appellate level decision. In this light, the *Daubert* test would necessarily operate differently. Instead of a proforma application to scientific disciplines long established, it would be a fresh inquiry into the validity of the changes that occurred in the discipline. Courts would no longer lag behind scientific development; rather they would keep pace with it by regularly exposing it to the rigors of the adversarial system.

Providing a method that gives effect to the empirical process would encourage forensic practitioners to be driven by science's rapid advancement, rather than act as if they were mere technicians. Providing a methodology that recognizes

development in a scientific field would force practitioners to actively improve their skills and techniques rather than rely on outdated certifications and long years of practicing the same techniques. Therefore, “[i]f a convicted defendant can produce sufficient indication that the jury’s finding of guilt beyond a reasonable doubt was wrong, the institutional need for finality yields to the more compelling concerns of truth and fairness.”²¹⁷ This compromise should not threaten the criminal justice system’s responsibility to punish the guilty because “whatever the truth may be, whether the defendant be guilty or innocent, it can be established by another trial.”²¹⁸ In fact, it has been expressed that while “[f]inality of judgment is essential in criminal cases, [] so is accuracy of the result—an accurate result that will stand the test of time and changes in scientific knowledge.”²¹⁹

D. Convictions Based upon Scientific Evidence Later Shown To Be Unreliable Are Analogous to Other Evidentiary Errors That Are Entitled to Due Process Postconviction Relief

The Supreme Court has long been committed to the principle that due process forbids the government from obtaining a conviction through the use of false testimony.²²⁰ In fact, “[t]he development of due process protection against the use of false testimony has been intertwined with protection against non-disclosure of exculpatory evidence.”²²¹ Because scientific evidence later shown to be unreliable presents similar fairness problems to defendants, it should be afforded the same due process protection.

²¹⁷ *Burr v. Florida*, 474 U.S. 879, 881 (1985) (Marshall, J., dissenting).

²¹⁸ *Bussey v. State*, 64 S.W. 268, 269 (Ark. 1901).

²¹⁹ *Ex Parte Robbins*, 360 S.W.3d 446, 470 (Tex. Crim. App. 2011) (Cochran, J., dissenting).

²²⁰ *See, e.g., White v. Ragen*, 324 U.S. 760, 764 (1945) (acknowledging that obtaining a conviction through knowing use of perjury violates due process); *Hysler v. Florida*, 315 U.S. 411, 413 (1942) (finding that the prosecution’s complicity in obtaining a conviction through the use of perjured testimony violates due process); *cf. New York ex rel. Whitman v. Wilson*, 318 U.S. 688, 689 (1943) (remanding to state court to determine whether habeas corpus is available in light of changed law allowing the state court to set aside a conviction on a showing that a guilty plea was obtained by fraud where conviction had allegedly been procured through the use of perjured testimony knowingly used by the prosecution).

²²¹ Anne Bowen Poulin, *Convictions Based on Lies: Defining Due Process Protection*, 116 PENN ST. L. REV 331, 336 (2011).

In *Mooney v. Holohan*,²²² the prisoner alleged that his conviction violated due process because the “prosecuting authorities” knowingly used perjured testimony, which was the basis for his conviction.²²³ The Court condemned the state’s corruption of the proceeding without considering the precise requirements for such a due process claim.²²⁴ In *Brady v. Maryland*,²²⁵ the Court granted the defendant a new capital sentencing hearing because the prosecution had not disclosed evidence favorable to the defendant bearing on sentencing, thus establishing that proof of false testimony was not essential to a due process violation.²²⁶ While *Brady* did not involve false testimony, the Court labeled its holding as an extension of *Mooney*.²²⁷ The Court emphasized that *Mooney* rested on the “avoidance of an unfair trial to the accused” and not on “punishment of society for misdeeds of a prosecutor.”²²⁸

While requiring some governmental knowledge, the Court has made it clear that the crux of the wrong is the unfairness of the proceeding, not the wrongdoing of the prosecutor.²²⁹ Thus, the Court has concluded that “false testimony or non-disclosure of exculpatory evidence violated . . . due process . . . even when the prosecutor did not have actual knowledge of the falsity.”²³⁰

In *Mesarosh v. United States*,²³¹ “the Court . . . condemned reliance on false testimony even though the prosecution had presented it unknowingly.”²³² The Court held that “the dignity of the United States Government will not permit the conviction of

²²² 294 U.S. 103 (1935).

²²³ *Id.* at 110.

²²⁴ *Id.* at 112 (stating that due process cannot be satisfied “by mere notice and hearing if a state has contrived a conviction through the pretense of a trial which in truth is but used as a means of depriving a defendant of liberty through a deliberate deception of court and jury by the presentation of testimony known to be perjured”).

²²⁵ 373 U.S. 83 (1963).

²²⁶ *See id.* at 84–87 (holding that “the suppression by the prosecution of evidence favorable to an accused upon request violates due process where the evidence is material either to guilt or to punishment, irrespective of the good faith or bad faith of the prosecution”).

²²⁷ *Id.* at 86.

²²⁸ *Id.* at 87.

²²⁹ *See id.* at 87–88.

²³⁰ Poulin, *supra* note 221, at 338.

²³¹ 352 U.S. 1 (1956).

²³² Poulin, *supra* note 221, at 338; *Mesarosh*, 352 U.S. at 14.

any person on tainted testimony.”²³³ Furthermore, in *Giglio v. United States*,²³⁴ the Court recognized that the government's failure to correct false testimony could violate due process even though no one acting for the government actually knew the testimony was false.²³⁵ Like with false testimony, non-disclosure can violate due process even though the prosecutor was unaware of exculpatory evidence.²³⁶

The Court has also recognized that any false or misleading testimony may corrupt the truth-finding process and render the trial unfair.²³⁷ The Court has made it clear that a defendant need not establish perjury to prevail in a false testimony case.²³⁸ In *Alcorta v. Texas*,²³⁹ the Court granted relief because the witness conveyed a false impression even though the testimony was not clearly false.²⁴⁰ The misleading testimony strengthened the prosecution's case, and a more truthful testimony would have corroborated the defendant's claim and impeached the witness's credibility.²⁴¹ Similarly, in *Napue v. Illinois*,²⁴² the Court granted relief based on false testimony relevant only to impeach the witness.²⁴³

Analogously to false testimony and non-disclosure cases, cases tried on the basis of scientific evidence later shown to be unreliable convey false impressions to the jury and may corrupt the truth-finding process, rendering the trial fundamentally unfair. Therefore, scientific evidence later shown to be unreliable should also be seen as “tainted testimony,” and the defendant should be protected under the Due Process Clause even when both the prosecution and the expert presents it unknowingly.

²³³ Poulin, *supra* note 221, at 339 (internal quotation marks omitted); *Mesarosh*, 352 U.S. at 9.

²³⁴ 405 U.S. 150 (1972).

²³⁵ *Id.* at 155.

²³⁶ See, e.g., *Kyles v. Whitley*, 514 U.S. 419, 438 (1995) (granting the defendant relief on the basis of non-disclosure even though the prosecutor did not have all the exculpatory information until after trial).

²³⁷ See, e.g., *Napue v. Illinois*, 360 U.S. 264, 265 (1959) (granting relief based on the prosecution's failure to correct false testimony, which was relevant only to impeach the witness's credibility).

²³⁸ *Alcorta v. Texas*, 355 U.S. 28, 31–32 (1957).

²³⁹ 355 U.S. 28.

²⁴⁰ See *id.* at 30–31.

²⁴¹ *Id.* at 31–32.

²⁴² 360 U.S. 264.

²⁴³ *Id.* at 269–70.

In both the false testimony and the non-disclosure cases, one crucial question is whether the false testimony or the undisclosed exculpatory evidence is “material.”²⁴⁴ The Court has varied the definition of material depending on the nature of the defendant’s claim, holding that false testimony claims are subject to a lower materiality showing than non-disclosure claims.²⁴⁵ The Court introduced materiality into this line of cases in *Brady*, stating that suppression of exculpatory evidence by the prosecution “violates due process where the evidence is material either to guilt or to punishment.”²⁴⁶

To support a non-disclosure claim, a defendant must establish a reasonable probability that the result would have been different had the exculpatory evidence been disclosed.²⁴⁷ In contrast, a defendant who demonstrates that false testimony was improperly used at trial is required only to show a reasonable likelihood that the falsity had an impact on the outcome.²⁴⁸ The Court equated the reasonable likelihood standard with the harmless error test.²⁴⁹

The Court stated three reasons for employing a less demanding materiality standard in false testimony cases in *United States v. Agurs*.²⁵⁰ First, obtaining a conviction by the knowing use of perjury is fundamentally unfair.²⁵¹ Second, false testimony cases involve prosecutorial misconduct.²⁵² Third, the Court asserted that “more importantly . . . they involve a corruption of the truth-[finding] . . . process.”²⁵³

Applying the same standard, to establish a due process violation based on scientific evidence later shown to be unreliable, the defendant must show that unreliable scientific evidence was presented at trial, that the prosecution had the requisite culpability, and that the scientific evidence was material. Convicted defendants have been able to show that

²⁴⁴ Poulin, *supra* note 221, at 342.

²⁴⁵ See *United States v. Bagley*, 473 U.S. 667, 681–82 (1985).

²⁴⁶ *Brady v. Maryland*, 373 U.S. 83, 87 (1963).

²⁴⁷ *Bagley*, 473 U.S. at 682.

²⁴⁸ *Id.* at 679 n.9.

²⁴⁹ *Id.* at 679–80 (“[This rule] may . . . easily be stated as a materiality standard under which the fact that testimony is perjured is considered material unless failure to disclose it would be harmless beyond a reasonable doubt.”).

²⁵⁰ 427 U.S. 97, 103–04 (1976).

²⁵¹ *Id.* at 103.

²⁵² *Id.* at 103–04.

²⁵³ *Id.*

unreliable scientific evidence was presented at trial when an expert witness withdraws earlier opinions offered at trial because of mistake or inaccuracy, where newly available evidence undermines expert testimony from trial, and when an expert willfully testifies falsely.²⁵⁴ If the prosecution does not have the requisite culpability—either through actual, constructive, or imputed knowledge—the unreliable evidence must be held to the higher materiality showing. Therefore, if the defendant can establish a “reasonable probability” that the result would have been different had the jury known the scientific evidence was unreliable, she should be awarded postconviction relief.

CONCLUSION

Reliable scientific evidence can assist judges and juries in determining truth and advancing the proper, efficient, and fair administration of justice. Unreliable scientific evidence, however, creates a great potential that the government will imprison the wrongfully accused. The unreliability of evidence may be due to forensic fraud, examiner bias or error, invalid procedures, or well-established methodologies, the soundness of which is later disproven. Whatever the cause, the result is the same: A criminal defendant may be convicted based on unreliable evidence that should never have been admitted at trial, but whose unreliability was not known until after the defendant was convicted.

Due process of law requires a new trial when scientific evidence necessary to convict becomes so unreliable as to call the validity of the jury's verdict into question in order to ensure that innocent defendants do not fall victim to the inherent shortcomings of the scientific evidence juries so readily embrace. Courts should grant federal habeas petitioners relief under the Due Process Clause when they satisfy the “reasonable probability” standard for four reasons. First, it will ensure protection of the petitioners' procedural and substantive due process rights to a fundamentally fair trial. Second, it will keep the burden of proving all elements of a crime on the government. Third, policy reasons dictate that the reasonable probability standard calls for postconviction relief. Finally, convictions

²⁵⁴ See *supra* Introduction.

based upon unreliable evidence are analogous to other evidentiary errors that are entitled to due process postconviction relief.