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2009

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# THE NRC REPORT AND ITS IMPLICATIONS FOR CRIMINAL LITIGATION

Paul C. Giannelli\*

**ABSTRACT:** The National Research Council (NRC), an arm of the National Academy of Sciences (NAS), issued a landmark report on forensic science in February 2009. In the long run, the report's recommendations, if adopted, would benefit law enforcement and prosecutors. The recommendations would allow forensic science to develop a strong scientific basis and limit evidentiary challenges regarding the reliability of forensic evidence. In keeping with its congressional charge, however, the NRC committee did not directly address admissibility issues. Nevertheless, given its content, the report will inevitably be cited in criminal cases. Indeed, within months, the United States Supreme Court cited the report, noting that "[s]erious deficiencies have been found in the forensic evidence used in criminal trials."<sup>1</sup> Defense attorneys would be derelict if they did not use it, and prosecutors will have no choice but to respond to defense arguments. This essay examines how courts may respond to the NRC report in the near future.

**CITATION:** Paul C. Giannelli, *The NRC Report and Its Implications for Criminal Litigation*, 50 *Jurimetrics J.* 53–66 (2009).

The National Research Council's report<sup>2</sup> on forensic science undoubtedly will have a profound impact on crime laboratories and the judicial system. The report's findings are significant: "Among existing forensic methods, only nuclear DNA analysis has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between an evidentiary sample and a specific individual or source."<sup>3</sup> Although commentators<sup>4</sup> and some courts had made this point before, such a finding, coming from one of the nation's most prestigious scientific organizations, carries far more authority. Moreover, the report noted that in some cases faulty forensic analyses may have contributed to the wrongful conviction of innocent defendants.<sup>5</sup>

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1. *Melendez-Diaz v. Massachusetts*, 129 S. Ct. 2527, 2537 (2009).

2. COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCI. CMTY. ET AL., NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., *STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD* (2009) [hereinafter NRC REPORT].

3. *Id.* at 100.

4. See generally Michael J. Saks & David L. Faigman, *Failed Forensics: How Forensic Science Lost Its Way And How It Might Yet Find It*, 4 ANN. REV. L. & SOC. SCI. 149 (2008); Michael J. Saks & Jonathan J. Koehler, *The Individualization Fallacy in Forensic Science Evidence*, 61 VAND. L. REV. 199 (2008).

5. NRC REPORT, *supra* note 2, at 42, 100. See generally Brandon L. Garrett & Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1 (2009);

Of course, the extent of the report's impact depends on which of its recommendations are implemented. Adoption of all recommendations would be the most important development in forensic science since the establishment of the crime laboratory in the mid-1920s.<sup>6</sup> Some recommendations are structural—that is, the creation of an independent federal entity, the National Institute of Forensic Sciences (NIFS), to oversee the field<sup>7</sup> and the removal of crime laboratories from the administrative control of law enforcement agencies.<sup>8</sup> Other recommendations could be adopted independently of these structural reforms, as the report acknowledges.<sup>9</sup> For example, legislatures could mandate the accreditation of crime laboratories, as a few states have done.<sup>10</sup> Similarly, recommendations concerning research to determine the reliability of forensic evidence<sup>11</sup> and the consequences of human observer bias<sup>12</sup> could be funded even in the absence of an independent agency.<sup>13</sup> These objectives, however, are all long-term goals. This essay focuses on short-term consequences: How courts may respond to the NRC report in the near future.

## I. ADMISSIBILITY ISSUES

In keeping with its congressional charge, the NRC committee did not directly address admissibility issues. The report states: “No judgment is made about past convictions and no view is expressed as to whether courts should reassess cases that already have been tried.”<sup>14</sup> When the report was released, the co-chair of the NRC committee stated:

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

6. “The oldest forensic laboratory in the United States is that of the Los Angeles Police Department, created in 1923 by August Vollmer, a police chief from Berkeley, California.” RICHARD SAFERSTEIN, *CRIMINALISTICS: AN INTRODUCTION TO FORENSIC SCIENCE* 6 (5th ed. 1995). “In 1923, Vollmer served as Chief of Police of the City of Los Angeles for a period of one year. During that time, a crime laboratory was established at his direction.” John I. Thornton, *Criminalistics—Past, Present, and Future*, 11 LEX ET SCIENTIA 1, 23 (1975).

7. NRC REPORT, *supra* note 2, recommendation 1, at 81–82.

8. *Id.*, recommendation 4, at 190–91.

9. “The remaining recommendations in this report are crucially tied to the creation of NIFS. However, each recommendation is a separate, essential piece of the plan to improve the forensic science community in the United States. Therefore, even if the creation of NIFS is forestalled, the committee vigorously supports the adoption of the core ideas and principles embedded in each of the following recommendations.” *Id.* at 20–21.

10. *E.g.*, N.Y. EXEC. § 995–b (McKinney 2009) (requiring accreditation by the state Forensic Science Commission); OKLA. STAT. ANN. tit. 74, § 150.37 (2004) (requiring accreditation by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) or the American Board of Forensic Toxicology); TEX. CODE CRIM. PROC. ANN. art. 38.35 (Vernon 2004) (requiring accreditation by the Department of Public Safety). Texas also created a Forensic Science Commission. *Id.* art. 38.01.

11. NRC REPORT, *supra* note 2, recommendation 3, at 190.

12. *Id.*, recommendation 5, at 191.

13. The NRC committee, however, found that “the research funding strategies of DOJ have not adequately served the broad needs of the forensic science community.” *Id.* at 18. Thus, whether the report will trigger a different approach remains problematic.

14. *Id.* at 85. The report goes on to state: “The report finds that the existing legal regime—including the rules governing the admissibility of forensic evidence, the applicable standards

I want to make it clear that the committee's report does not mean to offer any judgments on any cases in the judicial system. The report does not assess past criminal convictions, nor does it speculate about pending or future cases. And the report offers no proposals for law reform. That was beyond our charge. Each case in the criminal justice system must be decided on the record before the court pursuant to the applicable law, controlling precedent, and governing rules of evidence. The question whether forensic evidence in a particular case is admissible under applicable law is not coterminous with the question whether there are studies confirming the scientific validity and reliability of a forensic science discipline.<sup>15</sup>

Nevertheless, given its content, the report will inevitably be cited in cases. Defense attorneys would be derelict if they did not use it, and prosecutors will have no choice but to respond to defense arguments. Indeed, within months, the United States Supreme Court was citing the report, noting that "[s]erious deficiencies have been found in the forensic evidence used in criminal trials."<sup>16</sup>

It remains to be seen, however, how much impact the report will have and how soon that influence will be felt. Prior to the report, the courts had been extremely reluctant to scrutinize closely many forensic techniques, such as fingerprint examinations,<sup>17</sup> firearms (ballistics) identifications,<sup>18</sup> and handwriting comparisons.<sup>19</sup> The report acknowledged that "some courts appear to be loath to insist on [empirical] research as a condition of admitting forensic science evidence in criminal cases, perhaps because to do so would likely 'demand more by way of validation than the disciplines can presently offer.'"<sup>20</sup> Indeed, commentators had noted<sup>21</sup> and studies had confirmed the exist-

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governing appellate review of trial court decisions, the limitations of the adversary process, and judges and lawyers who often lack the scientific expertise necessary to comprehend and evaluate forensic evidence—is inadequate to the task of curing the documented ills of the forensic science disciplines." *Id.*

15. The Honorable Harry T. Edwards, Co-Chair, Forensic Sci. Comm., Opening Statement at the Release of the NRC Report (Feb. 18, 2009), [http://www.nationalacademies.org/includes/OS\\_Edwards.pdf](http://www.nationalacademies.org/includes/OS_Edwards.pdf).

16. *Melendez-Diaz v. Mass.*, 129 S. Ct. 2527, 2537 (2009).

17. "Overall, what is most striking about the judicial response to the challenges to fingerprinting is a general reluctance to admit that assessing fingerprinting under *Daubert* raises tricky issues." Jennifer L. Mnookin, *Fingerprint Evidence in an Age of DNA Profiling*, 67 BROOK. L. REV. 13, 66 (2001). See also Michael J. Saks, *The Legal and Scientific Evaluation of Forensic Science (Especially Fingerprint Expert Testimony)*, 33 SETON HALL L. REV. 1167, 1173–76 (2003) (discussing the reversal of the burden of persuasion as one of several judicial responses employed to avoid confronting the lack of empirical testing).

18. See Adina Schwartz, *A Systemic Challenge to the Reliability and Admissibility of Firearms and Toolmark Identification*, 6 COLUM. SCI. & TECH. L. REV. 1, 5 (2005).

19. See Jennifer L. Mnookin, *Scripting Expertise: The History of Handwriting Identification Evidence and the Judicial Construction of Reliability*, 87 VA. L. REV. 1723, 1844 (2001); D. Michael Risinger & Michael J. Saks, *Science and Nonscience in the Courts: Daubert Meets Handwriting Identification Expertise*, 82 IOWA L. REV. 21, 65 (1996).

20. NRC REPORT, *supra* note 2, at 12 (quoting Joan Griffin & David J. LaMagna, *Daubert Challenges to Forensic Evidence: Ballistics Next on the Firing Line*, 26 CHAMPION 20, 21 (Sept.–Oct. 2002)).

tence of a double standard, under which federal courts apply a more stringent admissibility standard in civil cases than in criminal cases.<sup>22</sup> The report recognized this development as well, noting that “the appellate courts appear to be more willing to second-guess trial court judgments on the admissibility of purported scientific evidence in civil cases than in criminal cases.”<sup>23</sup>

Yet, a few judges have been willing to tackle the issue. For example, dissenting in a fingerprint and handwriting comparison case, Judge Michael argued that “[t]he government has had ten years to comply with *Daubert*. It should not be given a pass in this case.”<sup>24</sup> Similarly, in a cartridge identification case, Judge Gertner admonished her peers: “The more courts admit this type of toolmark evidence without requiring documentation, proficiency testing, or evidence of reliability, the more sloppy practices will endure; we should require more.”<sup>25</sup> Significantly, some courts viewed the Supreme Court’s *Daubert* trilogy<sup>26</sup> as “inviting a reexamination even of ‘generally ac-

21. “[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.” D. Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?*, 64 ALB. L. REV. 99, 149 (2000).

22. Compare Jennifer L. Groscup et al., *The Effects of Daubert on the Admissibility of Expert Testimony in State and Federal Criminal Cases*, 8 PSYCHOL. PUB. POL’Y & L. 339, 364 (2002) (stating that “the *Daubert* decision did not impact on the admission rates of expert testimony at either the trial or the appellate court levels”), with LLOYD DIXON & BRIAN GILL, CHANGES IN THE STANDARDS FOR ADMITTING EXPERT EVIDENCE IN FEDERAL CIVIL CASES SINCE THE *DAUBERT* DECISION 25 (2001) (stating that “since *Daubert*, judges have examined the reliability of expert evidence more closely and have found more evidence unreliable as a result”). See also Margaret A. Berger, *Upsetting the Balance Between Adverse Interests: The Impact of the Supreme Court’s Trilogy on Expert Testimony in Toxic Tort Litigation*, 64 LAW & CONTEMP. PROBS. 289, 290 (2001) (“The Federal Judicial Center conducted surveys in 1991 and 1998 asking federal judges and attorneys about expert testimony. In the 1991 survey, seventy-five percent of the judges reported admitting all proffered expert testimony. By 1998, only fifty-nine percent indicated that they admitted all proffered expert testimony without limitation. Furthermore, sixty-five percent of plaintiff and defendant counsel stated that judges are less likely to admit some types of expert testimony since *Daubert*.”).

23. NRC REPORT, *supra* note 2, at 11.

24. *United States v. Crisp*, 324 F.3d 261, 272 (4th Cir. 2003) (Michael, J., dissenting).

25. *United States v. Green*, 405 F. Supp. 2d 104, 109 (D. Mass. 2005). In *United States v. Llera Plaza*, 188 F. Supp. 2d 549 (E.D. Pa. 2002), Judge Pollak ruled that fingerprint experts would not be permitted to testify that two sets of prints “matched”—that is, a positive identification to the exclusion of all other persons. *Id.* at 552. This was the first time in nearly 100 years that such a decision had been rendered. On rehearing, however, Judge Pollak reversed himself, and later cases would continue to uphold the admissibility of fingerprint evidence. *Id.* at 576. See also D.H. Kaye, *The Nonscience of Fingerprinting: United States v. Llera-Plaza*, 21 QUINNIPAC L. REV. 1073, 1073 (2003) (“The ruling sent shock waves through the community of fingerprint analysts, the FBI, and the Department of Justice.”).

26. The Supreme Court revolutionized the standards for admitting expert testimony in *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993), which was followed by *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997), and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999). *Daubert* has been transformed over time. In *Weisgram v. Marley Co.*, 528 U.S. 440 (2000), the Supreme Court referred to *Daubert* as imposing “exacting standards of reliability.” *Id.* at 455.

cepted' venerable, technical fields."<sup>27</sup> Moreover, the Second Circuit has written that the Supreme Court did not "'grandfather' or protect from *Daubert* scrutiny evidence that had previously been admitted under *Frye*,"<sup>28</sup> the previous test for admitting scientific evidence in federal court.<sup>29</sup> The report will provide support for those judges willing to grapple with the issue and ammunition for defense attorneys who take their responsibilities seriously. Possible developments are discussed below.

## II. EXAGGERATIONS

Several common types of testimonial assertions should now be unacceptable at trial. The NRC report criticized "exaggerated"<sup>30</sup> testimony, such as claims of perfect accuracy, infallibility, or a zero error rate.

### A. Claims of Zero Error Rate

In *United States v. Havvard*,<sup>31</sup> which involved a *Daubert* challenge to fingerprint evidence, the expert claimed "the error rate for the method is zero."<sup>32</sup> Note the word *method* in the above quotation. Examiners argued that, while individual examiners may make mistakes, the method itself is perfect. However, the dichotomy between "methodological" and "human" error rates in this context is "practically meaningless"<sup>33</sup> because the examiner is the method.<sup>34</sup>

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27. *United States v. Hines*, 55 F. Supp. 2d 62, 67 (D. Mass. 1999) (handwriting comparison). See also *United States v. Hidalgo*, 229 F. Supp. 2d 961, 966 (D. Ariz. 2002) ("Courts are now confronting challenges to testimony . . . whose admissibility had long been settled.").

28. *United States v. Williams*, 506 F.3d 151, 162 (2d Cir. 2007).

29. At the time *Daubert* was decided, *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), was the leading case on the admissibility of scientific evidence. Under *Frye*, the admissibility of expert testimony depended on its "general acceptance in the particular field in which it belongs." *Id.* at 1014. See generally Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence*: *Frye v. United States, a Half-Century Later*, 80 COLUM. L. REV. 1197 (1980) (criticizing *Frye*).

30. "[I]mprecise or exaggerated expert testimony has sometimes contributed to the admission of erroneous or misleading evidence." NRC REPORT, *supra* note 2, at 4.

31. 117 F. Supp. 2d 848 (S.D. Ind. 2000), *aff'd*, 260 F.3d 597 (7th Cir. 2001).

32. *Havvard*, 117 F. Supp. 2d at 854.

33. Mnookin, *supra* note 17, at 60. Professor Mnookin goes on to provide this analogy: "The same argument could be made of eyewitness testimony, a notoriously unreliable form of evidence. People are all distinct from one another in observable ways; therefore the theoretical error rate of eyewitness identification is zero, though in practice observers may frequently make errors." *Id.* See also Simon A. Cole, *More Than Zero: Accounting for Error in Latent Fingerprint Identification*, 95 J. CRIM. L. & CRIMINOLOGY 985, 1040 (2005) ("in fingerprint practice the concept is vacuous"). Professor Cole identified twenty-two misidentifications, which he argues "are most likely only the tip of the proverbial iceberg of actual cases of fingerprint misattribution." *Id.* at 991. The misidentification cases include some that involved (1) verification by one or more other examiners, (2) examiners certified by the International Association of Identification, (3) procedures using a sixteen-point standard, and (4) defense experts who corroborated misidentifications made by prosecution experts. See *id.* at 1001-17.

34. See Sandy L. Zabell, *Fingerprint Evidence*, 13 J.L. & POL'Y 143, 172 (2005) ("But, given its unavoidable subjective component, in latent print examination people *are* the process.").

The NRC report addressed this point: “Although there is limited information about the accuracy and reliability of friction ridge analyses, claims that these analyses have zero error rates are not scientifically plausible.”<sup>35</sup> Furthermore, there already is judicial support for this position. For example, in *United States v. Mitchell*,<sup>36</sup> the Third Circuit commented: “Testimony at the *Daubert* hearing indicated that some latent fingerprint examiners insist that there is no error rate associated with their activities . . . . This would be out-of-place under Rule 702 [which governs expert testimony].”<sup>37</sup>

## B. Claims of One Hundred Percent Accuracy

In a firearms identification case, *United States v. Monteiro*,<sup>38</sup> the court noted that “the examiners testified to the effect that they could be 100 percent sure of a match. Because an examiner’s bottom line opinion as to an identification is largely a subjective one, there is no reliable statistical or scientific methodology which will currently permit the expert to testify that it is a ‘match’ to an absolute certainty, or to an arbitrary degree of statistical certainty.”<sup>39</sup> The report concurred: “The insistence by some forensic practitioners that their disciplines employ methodologies that have perfect accuracy and produce no errors has hampered efforts to evaluate the usefulness of the forensic science disciplines.”<sup>40</sup>

## C. Scientific?

The use of terms such as *science* or *scientific* in presenting expert testimony may also be problematic. In 1995, a federal district court in *United States v. Starzecpyzel*<sup>41</sup> concluded that “forensic document examination, despite the existence of a certification program, professional journals and other trappings of science, cannot, after *Daubert*, be regarded as ‘scientific . . . knowledge.’”<sup>42</sup> The court further stated “that while scientific principles may relate to aspects of handwriting analysis, they have little or nothing to do with the day-to-day tasks performed by [Forensic Document Examiners (FDEs)] . . . . [T]his attenuated relationship does not transform the FDE into a scientist.”<sup>43</sup>

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35. NRC REPORT, *supra* note 2, at 142. “Some in the latent print community argue that the method itself, if followed correctly . . . has a zero error rate. Clearly, this assertion is unrealistic . . . . The method, and the performance of those who use it, are inextricably linked, and both involve multiple sources of error (e.g., errors in executing the process steps, as well as errors in human judgment).” *Id.* at 143.

36. 365 F.3d 215 (3d Cir. 2004).

37. *Id.* at 246.

38. 407 F. Supp. 2d 351 (D. Mass. 2006).

39. *Id.* at 372.

40. NRC REPORT, *supra* note 2, at 47.

41. 880 F. Supp. 1027 (S.D.N.Y. 1995).

42. *Id.* at 1038 (quoting FED. R. EVID. 702).

43. *Id.* at 1041.

Although the court went on to admit the testimony as technical evidence, it placed conditions on its admissibility.<sup>44</sup> Because FDEs use terms such as “laboratory” and refer to authorities with titles containing the words “science” or “scientific,” there is a risk, according to the court, that jurors may bestow upon FDEs the aura of the infallibility of science.<sup>45</sup> Consequently, these terms should not be used in the expert’s testimony. Moreover, the court approved a jury instruction, which stated “that FDEs offer practical, rather than scientific expertise.”<sup>46</sup> Similarly, in *United States v. Glynn*,<sup>47</sup> a firearms identification case, the court ruled: “Based on the *Daubert* hearings this Court conducted . . . the Court very quickly concluded that whatever else ballistics identification analysis could be called, it could not fairly be called ‘science.’”<sup>48</sup>

The NRC report also supports this position: “The law’s greatest dilemma in its heavy reliance on forensic evidence . . . concerns the question of whether—and to what extent—there is *science* in any given forensic science discipline.”<sup>49</sup> A subsequent passage concludes: “Much forensic evidence—including, for example, bite marks and firearm and toolmark identifications—is introduced in criminal trials without any meaningful scientific validation, determination of error rates, or reliability testing to explain the limits of the discipline.”<sup>50</sup>

#### D. Claims of to the Exclusion of All Others

Experts frequently testify that they have made a match “to the exclusion of all other firearms.”<sup>51</sup> In *United States v. Green*,<sup>52</sup> the court questioned such testimony: “O’Shea [the expert] declared that this match could be made ‘to the exclusion of every other firearm in the world.’ . . . That conclusion, needless to say, is extraordinary, particularly given O’Shea’s data and methods.”<sup>53</sup> Further, in 2008, a year before the NRC report on forensic science was issued, a different NRC report, one on computerized ballistic imaging, addressed this issue. The 2008 NRC ballistic imaging report cautioned: “*Conclusions drawn in firearms identification should not be made to imply the presence of a firm*

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44. In the court’s view, *Daubert* did not apply to nonscientific experts. *Id.* at 1041–42. The court relied on the following statement in *Daubert*: “Our discussion is limited to the scientific context because that is the nature of the expertise offered here.” *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 578, 590 n.8 (1993). This position was undercut by *Kumho Tire*, which held that all expert testimony must pass the *Daubert* reliability test. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 149 (1999).

45. *Starzecpyzel*, 880 F. Supp. at 1029.

46. *Id.* at 1049.

47. 578 F. Supp. 2d 567 (S.D.N.Y. 2008).

48. *Id.* at 570.

49. NRC REPORT, *supra* note 2, at 9.

50. *Id.* at 107–08.

51. See 1 PAUL C. GIANNELLI & EDWARD L. IMWINKELRIED, JR., SCIENTIFIC EVIDENCE § 14.01, at 706 n.1 (4th ed. 2007) (citing FBI HANDBOOK OF FORENSIC SCIENCE 57 (rev. ed. 1994)).

52. 405 F. Supp. 2d 104 (D. Mass. 2005).

53. *Id.* at 107 (citations omitted).



statistical basis when none has been demonstrated.”<sup>54</sup> In particular, the NRC ballistic imaging report was concerned about testimony cast “in bold absolutes,” such as that a match can be made to the exclusion of all other firearms in the world: “Such comments cloak an inherently subjective assessment of a match with an extreme probability statement that has no firm grounding and unrealistically implies an error rate of zero.”<sup>55</sup>

### E. Claims of Reasonable Scientific Certainty

The expression *reasonable scientific certainty*, which is often included (and sometimes demanded) in expert testimony, is another phrase that should come under attack. The phrase, which combines two suspect words—*scientific* and *certainty*—has no scientific meaning. Although it is used frequently in cases, its legal meaning is ambiguous at best. Sometimes it is used in lieu of a confidence statement—that is, “I am confident of my opinion.”—in which case the expert could avoid the term altogether and directly testify how confident she is in her opinion.<sup>56</sup>

In other cases, courts have interpreted the phrase to mean that the expert must testify that a sample probably came from the defendant and not that it possibly came from him. In *State v. Holt*,<sup>57</sup> for instance, the expert testified, based on neutron activation analysis, that two hair samples were “similar and . . . likely to be from the same source.”<sup>58</sup> The Ohio Supreme Court ruled that expert testimony is admissible only if the opinion is based upon reasonable scientific certainty.<sup>59</sup> For that court, reasonable scientific certainty meant that the expert had to testify that the hair sample *probably* came from the defendant and not that it *possibly* came from him.<sup>60</sup>

54. COMM. TO ASSESS THE FEASIBILITY, ACCURACY, AND TECHNICAL CAPABILITY OF A NAT'L BALLISTIC DATABASE ET AL., NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., BALLISTIC IMAGING 82 (2008) [hereinafter NRC BALLISTIC IMAGING].

55. *Id.*

56. “[T]here is nevertheless an undercurrent that the expert in federal court express some basis for both the confidence with which his conclusion is formed, and the probability that his conclusion is accurate.” James E. Hullverson, Jr., *Reasonable Degree of Medical Certainty: A Tort et a Travers*, 31 ST. LOUIS U. L.J. 577, 582 (1987). “Many courts continue to exclude opinions which fall short of expressing a probability or certainty. . . . These opinions have even been excluded in jurisdictions which have adopted the Federal Rules of Evidence.” Edward J. Imwinkelried & Robert G. Scofield, *The Recognition of an Accused's Constitutional Right to Introduce Expert Testimony Attacking the Weight of Prosecution Science Evidence: The Antidote for the Supreme Court's Mistaken Assumption in California v. Trombetta*, 33 ARIZ. L. REV. 59, 69 (1991).

57. 246 N.E.2d 365 (Ohio 1969).

58. *Id.* at 368 (emphasis added).

59. *Id.*

60. The requirement that experts testify in terms of probability may have originated as a “sufficiency” rule in civil cases in which causation was an issue. Generally, expert testimony concerning causation (more probable than not) is required to avoid a directed verdict. This sufficiency rule may then have been improperly converted into an “admissibility” rule in civil cases and then improperly transplanted into criminal cases. See 1 PAUL C. GIANNELLI & BARBARA ROOK SNYDER, BALDWIN'S OHIO PRACTICE: EVIDENCE § 702.6 (2d ed. 2001) (describing the Ohio experience with the term).

*Holt* is wrong. Experts frequently testify that two samples “could have come from the same source” or “were likely to be from the same source.”<sup>61</sup> Such testimony meets the relevancy standard of Federal Rule 401, and there is no requirement in the Federal Rules of Evidence that an expert’s opinion be expressed in terms of “probabilities.” Thus, in *United States v. Cyphers*,<sup>62</sup> the expert testified that hair samples found on items used in a robbery “could have come” from the defendants.<sup>63</sup> The defendants argued that the testimony was inadmissible because the expert did not express his opinion in terms of “reasonable scientific certainty.” The court responded: “There is no such requirement.”<sup>64</sup>

In *United States v. Glynn*,<sup>65</sup> the court ruled that the term *reasonable scientific certainty* could not be used in a firearms identification case.<sup>66</sup> In light of the expert’s admission concerning the subjective nature of the examination, “the Government did not seriously contest the Court’s conclusions that ballistics lacked the rigor of science and that, whatever else it might be, its methodology was too subjective to permit opinions to be stated to ‘a reasonable degree of ballistic certainty.’”<sup>67</sup>

### III. LIMITATIONS ON SCOPE OF TESTIMONY

The NRC report should buttress defense efforts to limit the scope of handwriting testimony, permitting expert testimony about the similarities and dissimilarities between exemplars, but not the specific conclusion that the defendant was the author, sometimes referred to as a “common authorship” opinion.<sup>68</sup> Although the courts have used this approach most frequently in

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61. See, e.g., *People v. Horning*, 102 P.3d 228, 236 (Cal. 2004) (expert “opined that both bullets and the casing could have been fired from the same gun . . . because of their condition he could not say for sure”); *Luttrell v. Commonwealth*, 952 S.W.2d 216, 218 (Ky. 1997) (expert “testified only that the bullets which killed the victim could have been fired from Luttrell’s gun”); *State v. Reynolds*, 297 S.E.2d 532, 539–40 (N.C. 1982); *Commonwealth v. Moore*, 340 A.2d 447, 451 (Pa. 1975).

62. 553 F.2d 1064 (7th Cir. 1977).

63. *Id.* at 1072. See also *United States v. Davis*, 44 M.J. 13, 16 (C.A.A.F. 1996) (“Evidence was also admitted that appellant owned sneakers which ‘could have’ made these prints.”).

64. *Cyphers*, 553 F.2d at 1072. See also *State v. Boyer*, 406 So. 2d 143, 148 (La. 1981) (reasonable scientific certainty not required where expert testifies concerning the presence of gunshot residue based on neutron activation analysis).

65. 578 F. Supp. 2d 567 (S.D.N.Y. 2008).

66. *Id.* at 574–75.

67. *Id.* at 571.

68. “Many other district courts have similarly permitted a handwriting expert to analyze a writing sample for the jury without permitting the expert to offer an opinion on the ultimate question of authorship.” *United States v. Oskowitz*, 294 F. Supp. 2d 379, 384 (E.D.N.Y. 2003). “[T]he Court concludes that FDE Rauscher’s testimony meets the requirements of Rule 702 to the extent that he limits his testimony to identifying and explaining the similarities and dissimilarities between the known exemplars and the questioned documents. FDE Rauscher is precluded from rendering any ultimate conclusions on authorship of the questioned documents and is similarly precluded from testifying to the degree of confidence or certainty on which his opinions are based.” *United States v. Rutherford*, 104 F. Supp. 2d 1190, 1194 (D. Neb. 2000). See also *United States v. Hines*, 55 F. Supp. 2d 62, 70–71 (D. Mass. 1999) (expert testimony concerning the

questioned document cases, they have sometimes applied it to other types of forensic expertise such as firearms examinations.<sup>69</sup> Another court took a less restrictive approach, ruling that the expert would be permitted to testify only that it was “more likely than not” that recovered bullets and cartridge cases came from a particular weapon.<sup>70</sup> Either of these approaches could be extended to other techniques, such as fingerprint comparisons.

#### IV. UNUSUAL AND NEW TECHNIQUES

Any new technique or extension of an older procedure is a good candidate for challenge. For example, in *Commonwealth v. Patterson*,<sup>71</sup> the Supreme Judicial Court of Massachusetts found that, although the traditional fingerprint method was generally accepted by the relevant scientific community, the same was not demonstrated in the record when that methodology was applied to simultaneous impressions.<sup>72</sup> Simultaneous impressions “are two or more friction ridge impressions from the fingers and/or palm of one hand that are determined to have been deposited at the same time.”<sup>73</sup> The key, of course, is determining whether the impressions were left at the same time and thus came from the same person, rather than having been left by two different people at different times.<sup>74</sup> The court remanded the case to the trial court.

Several toolmark cases are also illustrative. Although most courts have admitted toolmark evidence, the Florida Supreme Court, in *Ramirez v. State*,<sup>75</sup> rejected the testimony of five experts who claimed general acceptance for a process of matching a knife with a cartilage wound in a murder victim—a type

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general similarities and differences between a defendant’s handwriting exemplar and a stick up note was admissible, but not the specific conclusion that the defendant was the author).

69. See *United States v. Green*, 405 F. Supp. 2d 104, 107 (D. Mass. 2005). In response, prosecutors could use demonstrative exhibits, such as in the Lindbergh kidnapping trial. For illustrations of the handwriting charts in the Lindbergh case, see ANDRE A. MOENSSENS ET AL., *SCIENTIFIC EVIDENCE IN CIVIL AND CRIMINAL CASES* 370–72 (5th ed. 2007).

70. *Glynn*, 578 F. Supp. 2d at 575.

71. 840 N.E.2d 12 (Mass. 2005).

72. *Id.* at 24, 29–30.

73. Bruce Budowle et al., *Review of the Scientific Basis for Friction Ridge Comparisons as a Means of Identification: Committee Findings and Recommendations*, FORENSIC SCI. COMM., Jan. 2006, [http://www.fbi.gov/hq/lab/fsc/backissu/jan2006/research/2006\\_01\\_research02.htm](http://www.fbi.gov/hq/lab/fsc/backissu/jan2006/research/2006_01_research02.htm). An FBI review addressed this subject: “[I]f an item could only be held in a certain manner, then the only way of explaining the evidence is that the multiple prints are from the single person. In some cases, identifying simultaneous prints may infer, for example, the manner in which a knife was held.” *Id.* However, this review found that there was not even agreement on what constitutes a “simultaneous impression,” and therefore more explicit guidelines were needed. *Id.*

74. “[T]he examiner apparently may take into account the distance separating the latent impressions, the orientation of the impressions, the pressure used to make the impression, and any other facts the examiner deems relevant. The record does not, however, indicate that there is any approved standardized method for making the determination that two or more print impressions have been made simultaneously.” *Patterson*, 840 N.E.2d at 18.

75. 810 So.2d 836 (Fla. 2001). Although the court applied *Frye*, it emphasized the lack of testing, the paucity of “meaningful peer review,” the absence of a quantified error rate, and the lack of developed objective standards—that is, the *Daubert* factors. *Id.* at 849–52.

of “tool mark” comparison.<sup>76</sup> In *Sexton v. State*,<sup>77</sup> an expert testified that cartridge cases from unfired bullets found in the appellant’s apartment had distinct marks that matched fired cartridge cases found at the scene of the offense.<sup>78</sup> The Texas Criminal Court of Appeals ruled the testimony inadmissible: “This record qualifies Crumley as a firearms identification expert, but does not support his capacity to identify cartridge cases on the basis of magazine marks only.”<sup>79</sup>

## V. LACK OF STANDARDS

The NRC report found the lack of standards in examining evidence to be troublesome: “Often there are no standard protocols governing forensic practice in a given discipline. And, even when protocols are in place (e.g., [Scientific Working Group] standards), they often are vague and not enforced in any meaningful way.”<sup>80</sup> In another section, the report noted that some disciplines “need to develop rigorous protocols to guide these subjective interpretations and pursue equally rigorous research and evaluation programs.”<sup>81</sup>

Experts in some cartridge identification cases failed to follow any protocol. In *Monteiro*, the expert did not make any sketches or take any photographs.<sup>82</sup> Thus, adequate documentation was lacking. As a result, the court wrote: “Until the basis for the identification is described in such a way that the procedure performed by [the examiner] is reproducible and verifiable, it is inadmissible under Rule 702.”<sup>83</sup> In *Green*, the court noted that, although the expert had seven years of experience in the field, he was not certified, and his laboratory was not accredited.<sup>84</sup> Moreover, he had never formally been tested by a neutral proficiency examination.<sup>85</sup> “And although he relied on his past experience with these weapons, he had no notes or pictures memorializing his past observations.”<sup>86</sup>

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76. *Id.* at 852.

77. 93 S.W.3d 96 (Tex. Crim. App. 2002).

78. *Id.* at 98.

79. “[T]he magazine or magazines that made the marks upon which Crumley based his identification were not found by the police. Therefore Crumley was not able to make test marks for comparison. Also, Crumley did not say whether he was familiar with the manufacturing process of the magazine or magazines that he said left identifiable marks on the live rounds and cartridge cases.” *Id.* at 101.

80. NRC REPORT, *supra* note 2, at 6.

81. *Id.* at 8.

82. *United States v. Monteiro*, 407 F. Supp. 2d 351, 374 (D. Mass. 2006).

83. *Id.*

84. *United States v. Green*, 405 F. Supp. 2d 104, 107 (D. Mass. 2005).

85. *Id.*

86. *Id.*

## VI. EVIDENTIARY RULES

Two evidentiary rules may play a role in admitting some of the NRC report's findings into criminal trials: the learned treatise hearsay exception and the judicial notice doctrine.

### A. Learned Treatise Exception

Learned treatises were admissible at common law but only for the impeachment of experts.<sup>87</sup> Federal Evidence Rule 803(18) changed this result, making the treatise admissible as substantive evidence by recognizing a hearsay exception for such texts.<sup>88</sup> According to the federal drafters, "the hearsay objection must be regarded as unimpressive when directed against treatises since a high standard of accuracy is engendered by various factors: the treatise is written primarily and impartially for professionals, subject to scrutiny and exposure for inaccuracy, with the reputation of the writer at stake."<sup>89</sup>

The rule refers to "published treatises, periodicals, or pamphlets," including those on "science" if "established as a reliable authority by the testimony or admission of the witness or by other expert testimony or by judicial notice."<sup>90</sup> One would assume that a report prepared by one of the foremost scientific institutions in the nation, at the direction of Congress, after more than a two year study, would qualify as reliable.<sup>91</sup> If so, the prosecution expert could be required to read selected passages from the report during cross-examination.<sup>92</sup>

### B. Judicial Notice

Federal Evidence Rule 201(b) provides that a court may judicially notice an adjudicative fact that is "not subject to reasonable dispute in that it is . . . capable of accurate and ready determination by resort to sources whose accu-

87. Some jurisdictions still follow the traditional rule. *E.g.*, MICH. R. EVID. 707 (treatises "admissible for impeachment purposes only"). See generally PAUL C. GIANNELLI, UNDERSTANDING EVIDENCE § 33.16 (3d ed. 2009).

88. Two limitations appear in the rule. First, a treatise may be used substantively only when an expert is on the stand. FED. R. EVID. 803(18). This requirement provides an important safeguard because it ensures that a knowledgeable person is available "to explain and assist in the application of the treatise . . ." *Id.* (Advisory Committee's Note, exception (18)). Second, the treatise may be read to the jury but not received as an exhibit, thus precluding its misuse in the jury room. *Graham v. Wyeth Labs.*, 906 F.2d 1399, 1414 (10th Cir. 1990) (noting that permitting a treatise in the jury room raises the danger that jurors will be unduly impressed by the treatise).

89. FED. R. EVID. 803(18) (Advisory Committee's Note, exception (18)).

90. *Id.*

91. The NRC committee, which was established in the fall of 2006, met eight times. "During these meetings, the committee heard expert testimony and deliberated over the information it heard and received. Between meetings, committee members reviewed numerous published materials, studies, and reports related to the forensic science disciplines, engaged in independent research on the subject, and worked on drafts of the final report." NRC REPORT, *supra* note 2, at 2.

92. FED. R. EVID. 803(18). The rule of completeness may permit the prosecutor to have other passages of the report read to the jury at the same time. FED. R. EVID. 106.

racy cannot reasonably be questioned.”<sup>93</sup> As the Supreme Court has noted: “[T]heories that are so firmly established as to have attained the status of scientific law, such as the laws of thermodynamics, properly are subject to judicial notice under Federal Rule of Evidence 201.”<sup>94</sup>

Once a scientific principle is sufficiently established, a court may take judicial notice of the validity of that principle. The principles underlying many forensic techniques, including radar, intoxication tests, fingerprints, palm prints, firearms identification, handwriting comparisons, DNA profiling, blood-spatter evidence, as well as other procedures have all been judicially recognized in this fashion.<sup>95</sup> But judicial notice is not so limited. The 1992 National Academy of Sciences report listed a number of facts concerning DNA that could be judicially noticed.<sup>96</sup> There are numerous passages in the recent NRC report that are comparable. Statements about the subjectivity of many forensic techniques<sup>97</sup> and the lack of empirical testing come to mind.



In the long run, the NRC recommendations, if adopted, would benefit law enforcement and prosecutors. The recommendations would allow forensic science to develop a strong scientific basis and limit evidentiary challenges regarding the reliability of forensic evidence. At the moment, however, courts will confront serious challenges. Even if forensic testimony is limited, standards are followed, and findings in particular cases are documented, the underlying problem remains—that is, lack of research.<sup>98</sup> The report concluded

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93. FED. R. EVID. 201(b). See generally PAUL C. GIANNELLI, UNDERSTANDING EVIDENCE ch. 44 (3d ed. 2009).

94. *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 593 n.11 (1993).

95. See 1 PAUL C. GIANNELLI & EDWARD L. IMWINKELRIED, JR., SCIENTIFIC EVIDENCE § 1.02, at 3–5 nn.10–23 (4th ed. 2007) (listing cases).

96. The report stated:

- The study of DNA polymorphisms can, in principle, provide a reliable method for comparing samples.
- Each person's DNA is unique (except that of identical twins), although the actual discriminatory power of any particular DNA test will depend on the sites of DNA variation examined.
- The current laboratory procedure [RFLP] for detecting DNA variation (specifically, single-locus probes analyzed on Southern blots without evidence of band shifting) is fundamentally sound, although the validity of any particular implementation of the basic procedure will depend on proper characterization of the reproducibility of the system (e.g., measurement variation) and the inclusion of all necessary scientific controls.

COMM. ON DNA TECH. IN FORENSIC SCI., NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., DNA TECHNOLOGY IN FORENSIC SCIENCE 149 (1992).

97. "But even with more training and experience using newer techniques, the decision of the toolmark examiner remains a subjective decision based on unarticulated standards and no statistical foundation for estimation of error rates." NRC REPORT, *supra* note 2, at 153–54.

98. This underlying problem is noted in the Summary section of the NRC report:

Some of the forensic science disciplines are laboratory based (e.g., nuclear and mitochondrial DNA analysis, toxicology and drug analysis); others are based on expert interpretation of observed patterns (e.g., fingerprints, writing samples, toolmarks, bite marks, and specimens such as hair). . . . There are also sharp distinctions between forensic practitioners who have been trained in chemistry,

that "some forensic science disciplines are supported by little rigorous systematic research to validate the discipline's basic premises and techniques. There is no evident reason why such research cannot be conducted."<sup>99</sup> In a later passage, the report returned to this point: "[N]o forensic method other than nuclear DNA analysis has been rigorously shown to have the capacity to consistently and with a high degree of certainty support conclusions about 'individualization' (more commonly known as 'matching' of an unknown item of evidence to a specific known source)."<sup>100</sup> In particular, the report recognized deficiencies in many common forensic techniques. For example, the report made the following observation about firearms identification: "Because not enough is known about the variabilities among individual tools and guns, we are not able to specify how many points of similarity are necessary for a given level of confidence in the result."<sup>101</sup> Further, "[t]he scientific basis for handwriting comparisons needs to be strengthened."<sup>102</sup> Similarly, "[t]here is no science on the reproducibility of the different methods of [bite-mark] analysis that lead to conclusions about the probability of a match."<sup>103</sup>

This state of affairs presents courts with an immediate challenge. As the report comments: "[T]here are serious issues regarding the capacity and quality of the current forensic science system; yet, the courts continue to rely on forensic evidence without fully understanding and addressing the limitations of different forensic science disciplines."<sup>104</sup>

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biochemistry, biology, and medicine (and who bring these disciplines to bear in their work) and technicians who lend support to forensic science enterprises.

NRC REPORT, *supra* note 2, at 7.

99. *Id.* at 22. In addressing the lack of funding, the report commented: "Of the various facets of underresourcing, the committee is most concerned about the knowledge base. Adding more dollars and people to the enterprise might reduce case backlogs, but it will not address fundamental limitations in the capabilities of forensic science disciplines to discern valid information from crime scene evidence." *Id.* at 15. Similar statements are found elsewhere in the report. "A body of research is required to establish the limits and measures of performance and to address the impact of sources of variability and potential bias. Such research is sorely needed, but it seems to be lacking in most of the forensic disciplines that rely on subjective assessments of matching characteristics. These disciplines need to develop rigorous protocols to guide these subjective interpretations and pursue equally rigorous research and evaluation programs." *Id.* at 8.

100. *Id.* at 87.

101. *Id.* at 154. "The validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated." NRC BALLISTIC IMAGING, *supra* note 54, at 81.

102. NRC REPORT, *supra* note 2, at 166.

103. "No thorough study has been conducted of large populations to establish the uniqueness of bite marks; theoretical studies promoting the uniqueness theory include more teeth than are seen in most bite marks submitted for comparison. There is no central repository of bite marks and patterns." *Id.* at 174.

104. *Id.* at 85.