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Cover Page Footnote
J.D. Candidate, 2003, Fordham University School of Law. I would like to thank Professor Deborah W. Denno for directing me to this topic and for her guidance. Special thanks to my parents for their love and support, and to Timothy Carey for his understanding and encouragement.

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LATENT JUSTICE: DAUBERT'S IMPACT ON THE EVALUATION OF FINGERPRINT IDENTIFICATION TESTIMONY

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INTRODUCTION

The world contains many "unique" occurrences. For example, it is commonly believed that no two snowflakes,1 zebra stripes,2 diamonds,3 or fingerprints, are identical. However, scientists may never be able to determine empirically whether or not such assumptions about uniqueness are true.4

Because it is impossible to compare every snowflake, zebra stripe, diamond, or fingerprint ever created, scientists must instead rely on mathematical presumptions. Thus, they can speculate that approximately $3 \times 10^{30}$ (or $3,000,000,000,000,000,000,000,000,000,000,000$) snowflakes have fallen in the last 130 million years.5 Scientists can also determine that the number of possible molecular compositions of a snowflake far exceeds the number of snowflakes ever created.6 Based on these statistics, as well as empirical data that show no two snowflakes in a given group have ever matched, scientists extrapolate the probabilities of two identical snowflakes ever existing.7

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5. Inman & Rudin, supra note 1, at 4 (estimating the number of snowflakes that have fallen since the Jurassic period).
6. Id. (describing the number of molecular water molecules in a typical snowflake as having $(1,000,000,000,000,000)^{10^{30}}$ possible arrangements, a number seemingly impossible to comprehend).
7. Some scientists refer to this method as the "multiplication rule of probability."
magnitude of these probabilities has led scientists to conclude that the likelihood of finding two identical snowflakes is infinitesimal.\(^8\)

However, despite the near certainty that data about the uniqueness of snowflakes may engender, "there are no certainties in science."\(^9\)

Like the comparison of snowflakes, the comparison of fingerprints, a science called "dactylography," yields scientific probabilities without absolute conclusions. The infinite number of different spatial configurations and variable appearances of fingerprints mean the chance of finding two identical fingerprints is similar to that of finding two identical snowflakes.\(^10\) This uniqueness is a fundamental tenet of fingerprint identification.

Yet, unlike snowflakes, fingerprints can be used to convict criminals; "liberty and sometimes life" are at stake.\(^11\) Because fingerprint comparison techniques may be used for this end, they merit special attention. While two fingerprints being compared to one another may look similar, they may in fact be different. Numerous individuals have been convicted because fingerprint examiners made incorrect identifications using fingerprints.\(^12\)

Although scientists cannot know if every fingerprint that ever existed is unique, fingerprint examiners move closer to scientific certainties when they rely on well thought-out hypotheses and precise methodologies. The careful work of the individuals who employ these methodologies is critical to the accuracy of the conclusion reached, for human error can result in the improper conviction of criminal defendants. Thus, the study and comparison of fingerprints pose significant challenges and risks that this Note will examine in detail.\(^13\)

Michael J. Saks, Merlin and Solomon: Lessons From the Law's Formative Encounters With Forensic Identification Science, 49 Hastings L.J. 1069, 1086 (1998). This rule posits that if an object varies in the number of independent factors that contribute to its makeup, as snowflakes vary in their molecular composition, the probability of finding any one combination of these factors is found by multiplying together the probability of finding each independent factor. \textit{Id.}

8. Inman & Rudin, \textit{supra} note 1, at 4 ("\textit{I}t is unreasonable to believe that any one \textit{snowflake} has occurred more than once." (emphasis added)).

9. \textit{See supra} note 4, and accompanying text.

10. \textit{See Inman} & \textit{Rudin, supra} note 1, at 5.


13. When fingerprint examiners operate with the assumption that fingerprints are unique, they can blind themselves to the alternative possibility that two identical prints may exist. Saks, \textit{supra} note 7, at 1086 n.76. The overall scientific reliability of dactylography may be weakened as a result, because the science will never be thoroughly tested. \textit{Id.}; \textit{cf.} United States v. Llera Plaza, 179 F. Supp. 2d 492, 505 (E.D. Pa. Jan. 7, 2002), \textit{vacated}, Cr. No. 98-362-10, 2002 WL 389163 (E.D. Pa. Mar. 13, 2002) ("\textit{E}ven when there are an impressive number of consistent outcomes and no inconsistent outcomes, the hypothesis is not definitively confirmed because it is
The standards for admission of expert testimony regarding fingerprint identification in the courtroom have changed over the last one hundred years. Fingerprints have long been considered "scientific" evidence. This perception of fingerprints has been questioned in light of recent Supreme Court decisions regarding the admissibility of expert scientific testimony. One recent federal judicial decision, United States v. Llera Plaza, 14 limited the extent to which testimony by fingerprint examiners could be used to identify a defendant. This and other recent federal judicial decisions have challenged forensic science in general, and fingerprint examiners in particular, to justify the reliability of their methodologies as never before. 15

For over seventy years, federal courts required scientific techniques to be generally accepted among the relevant scientific community before they could be admitted at trial. This "general acceptance" standard, enunciated in Frye v. United States, 16 a 1923 federal criminal case, dominated the debate over how expert scientific witnesses could testify in the courtroom, 17 even after the introduction of Federal Rule of Evidence 702 in 1975. 18 Rule 702, entitled "Testimony by Experts," stated that a qualified expert could testify to any specialized knowledge, including scientific knowledge, that would help the jury better understand the evidence or "determine a fact in issue." 19

The Supreme Court's 1993 decision in Daubert v. Merrell Dow Pharmaceuticals, Inc. 20 a civil case, held that Rule 702 superseded the Frye standard. 21 After Daubert, general acceptance of a technique in

always possible that an empirical test will some day demonstrate the theory to be incorrect." (quoting Edward J. Imwinkelried, Evidence Law Visits Jurassic Park: The Far-Reaching Implication of the Daubert Court's Recognition of the Uncertainty of the Scientific Enterprise, 81 Iowa L. Rev. 55, 62 (1995))).


15. For example, several federal courts have recently limited the admission of handwriting analysis testimony in the courtroom. See infra note 327 and accompanying text. The court in Llera Plaza used one court's reasoning in a handwriting evidence case to make its January 7, 2002, determination to admit fingerprint evidence. 179 F. Supp. 2d at 516-17 (citing United States v. Hines, 55 F. Supp. 2d 62 (D. Mass. 1999)).

16. 293 F. 1013 (D.C. Cir. 1923).


18. See infra text accompanying notes 162-64.


21. See infra notes 167-68 and accompanying text. Although Daubert is a Supreme Court case that held Rule 702 superseded the Frye standard, neither
the scientific community became only one of several factors for a federal judge to evaluate when deciding whether to exclude expert testimony on scientific issues.\textsuperscript{22} \textit{Daubert} placed increased emphasis on the overall reliability of proffered scientific evidence. In \textit{Kumho Tire Co. v. Carmichael}, another civil case, the Supreme Court emphasized that the factors it had listed in \textit{Daubert} applied to technical, as well as scientific, knowledge.\textsuperscript{23}

The overall impact of \textit{Daubert} on judicial decision-making in criminal cases has been less than dramatic, as expert scientific testimony regarding forensic evidence has continued to be routinely admitted. As one judge wrote after allowing the admission of fingerprint evidence at trial, "[t]he court's decision may strike some as comparable to a breathless announcement that the sky is blue and the sun rose in the east yesterday. Nevertheless, \textit{Daubert} and \textit{Kumho Tire} invite fresh and critical looks at old habits and beliefs."\textsuperscript{24}

However, the few changes that have occurred under the new standards for admission have been significant. On occasion, the reconsideration of scientific evidence under \textit{Daubert} has resulted in the exclusion of long-accepted scientific techniques in criminal cases.\textsuperscript{25} Most notably, on January 7, 2002, after a pre-trial \textit{Daubert} hearing to consider the admissibility of fingerprint evidence, Judge Louis Pollak excluded expert testimony regarding fingerprints as unreliable.\textsuperscript{26} The court's January 7, 2002, decision in \textit{United States v. Llera Plaza} represented the first exclusion of fingerprint evidence on reliability grounds in the history of fingerprints.\textsuperscript{27} While the court ultimately

\textit{Daubert} nor Rule 702 governs state courts. The Court in \textit{Daubert} was construing a federal evidentiary rule—Rule 702—and not ruling on a constitutional issue. Rhoda B. Billings, \textit{Expert Testimony to Accommodate the Frye, Daubert, and Kumho Tire Standards of Admissibility}, 54 Okla. L. Rev. 613, 618 (2001). Thus, states are still free to adopt their own evidentiary standards. Although a further discussion of state expert testimony practices is beyond the scope of this Note, it suffices to say that many state courts continue to apply \textit{Frye} today. See David E. Bernstein, \textit{Frye, Frye, Frye: The Past, Present, & Future of the General Acceptance Test}, 41 Jurimetrics J. 385, 386-87 (2001) (listing Alabama, Arizona, California, Colorado, the District of Columbia, Florida, Illinois, Kansas, Maryland, Michigan, Minnesota, Mississippi, Nebraska, New Jersey, New York, Pennsylvania, and Washington as states that still applied \textit{Frye} in the year 2001). A number of other state courts have adopted evidentiary standards based on Rule 702 and \textit{Daubert}. See infra note 164 and accompanying text.

\textsuperscript{22} \textit{Daubert}, 509 U.S. at 593-94.
\textsuperscript{24} \textit{United States v. Havvard}, 117 F. Supp. 2d 848, 849 (S.D. Ind. 2000), aff'd, 260 F.3d 597 (7th Cir. 2001).
\textsuperscript{26} \textit{Llera Plaza}, 179 F. Supp. 2d at 516.
\textsuperscript{27} See Simon A. Cole, \textit{Suspect Identities: A History of Fingerprinting and
reversed itself on March 13, 2002, the debate about the admission of fingerprint evidence at trial is far from over.

This Note attempts to connect the scientific techniques used in fingerprinting, as well as the scientific premises that underlie these techniques, with the judicial evaluation of fingerprint evidence in the courtroom. As a closer analysis of Judge Pollak's decisions in Llera Plaza will show, Daubert[^28] fails to provide sufficient assistance to judges ruling on expert scientific testimony. Daubert is the reality with which courts must work; within that reality, however, courts are struggling. The decisions rendered in Llera Plaza on January 7, 2002, and March 13, 2002, highlight the confusion over the Daubert standard as well as the areas where courts should more thoroughly analyze the reliability of scientific techniques and the admission of testimony about these techniques in the courtroom.

While fingerprints have long been recognized as a unique human characteristic that could be used for identification purposes[^29], modern forensic techniques are rooted in more recent history[^30]. Part I discusses how fingerprints are formed and the special characteristics of fingerprints that make them a valuable law enforcement tool. This part also details the history of fingerprinting in two ways. First, it examines the development of fingerprinting techniques for identification purposes[^31] and the application of these techniques in a criminal law context[^32]. Second, Part I discusses the historical introduction of fingerprint evidence in the courtroom[^33].

[^29]: See Andrew C. Bernasconi, Comment, Beyond Fingerprinting: Indicting DNA Threatens Criminal Defendants' Constitutional and Statutory Rights, 50 Am. U. L. Rev. 979, 1004 (2001) ("The use of traditional, or dermatoglyphic, fingerprints to identify people dates back over two thousand years to ancient times, when the Chinese used thumbprints in lieu of signatures for legal documents and criminal confessions." (footnote omitted)).
[^31]: See discussion infra Part I.B.1.
[^32]: See discussion infra Part I.B.2.
[^33]: See discussion infra Part I.C.
Part II traces the path of dactylography, the science of fingerprint identification, in court. First, Part II discusses the Supreme Court’s decisions in *Daubert* and *Kumho Tire*. In the aftermath of these decisions, courts must show that their determinations are not based on a reflexive presumption of admissibility.

Part II then analyzes Judge Pollak’s recent decisions in *Llera Plaza* in light of these prevailing evidentiary standards. While *Daubert* and *Kumho Tire* encourage a fresh look at long-accepted scientific evidence, and despite the debatable reliability of fingerprint matches made by experts in court, judges have continued to routinely admit fingerprint identification testimony in the 1990s.

This part uses the *Llera Plaza* decision to highlight the discord between the federal standard for admissibility of expert testimony enunciated in *Daubert* and *Kumho Tire*, and the practical application of this standard by courts.

Part III argues for more uniformity in courts’ evaluations of expert scientific testimony, particularly fingerprint identification testimony, in light of the issues discussed in Parts I and II. It demonstrates, using Judge Pollak’s opinions in *Llera Plaza* as a starting point, how courts often fail to apply *Daubert* in a manner helpful to future courts. By fleshing out Judge Pollak’s opinions in greater detail, Part III shows the need for courts to thoroughly analyze testimony about long-accepted scientific evidence and to clearly explain their reasoning. Only with better guidance from the courts can individuals regain the certainty and stability they deserve from the justice system.

Part III also suggests a partial solution to the perceived unreliability of fingerprint identification testimony. As shown by Judge Pollak’s detailed but incomplete application of *Daubert* and *Kumho Tire* to fingerprint identification testimony on January 7, 2002, and his subsequent reversal of himself on March 13, 2002, the status of fingerprint evidence remains uncertain. Although the concepts underlying the evidentiary value of fingerprints are complex, the actual application of identification techniques is an uncomplicated function that juries are capable of performing. Allowing the jury to assume this function may help reduce the challenges to reliability that

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35. *See discussion infra* Part II.A.
38. *See discussion infra* Part II.B.
39. *Supra* note 24 and accompanying text.
40. *See infra* note 197 and accompanying text.
courts have to consider when admitting fingerprint identification testimony stating that two fingerprints "match."

Thus, this part argues that while Judge Pollak's reasoning in his January 7, 2002, decision in *Llera Plaza* needed to be more thorough, the result Judge Pollak reached when he excluded expert testimony concerning fingerprints was fair. Judge Pollak's subsequent decision to admit all fingerprint identification testimony on March 13, 2002, should not overshadow the court's valuable analysis in its January 7, 2002, ruling.

I. THE HISTORY OF FINGERPRINTING AND ITS USE AS SCIENTIFIC EVIDENCE IN CRIMINAL CASES

A. What Are Fingerprints?

The configurations of lines at the end of human fingers and thumbs on the palmar side of the hands are commonly called "fingerprints." The term also encompasses the lines on the palms of the hands and on the soles of the feet. Scholars often refer to fingerprints as "friction ridges" or "papillary ridges," each of which describes the unique formation of fingerprints in humans and in other animal life. "Fingerprint" is also a word that describes the impression left behind when a person touches something with the tips of the fingers.

Fingerprints typically begin to form in utero through a random process during the first four to six weeks of gestation. Because they

42. Coppock, *supra* note 34, at 3.
43. *Id.* at 3, 12; see also Medical Dictionary, *supra* note 41, at 1022 (defining papillary ridges, or "papillae corii" as "superficial projections of the . . . dermis that . . . contain vascular loops and specialized nerve endings, and are arranged in ridgelike lines best developed in the hand and foot").
44. Coppock, *supra* note 34, at 4 ("Most all *Homo sapiens* exhibit friction ridge detail on the gripping surfaces of the hands and feet. Other primates can also have these friction ridges on their gripping surfaces. Some primates are even known to have friction ridges on the underside of the tail . . . .").
45. *Infra* text accompanying note 56.
46. Mary Brandon et al., "Cloned" Primates and the Possibility of Identical Fingerprints, The Print, September/October 1997, at 1-5, http://www.scafo.org/library/130501.html (last visited Mar. 12, 2002). The formation is described as follows:

Together, fetal environment, in conjunction with genetically programmed development, play an essential role in the formation of what becomes friction skin. Beginning around the third month of fetal life, observable ridge detail begins to form and is apparent by the fifth month of gestation in humans. The general pattern of a finger is influenced by heredity, while the papillary minutiae are a result of stress and variable pressure on the tactile surfaces as the points fuse into lines during in utero development. Ridge alignment, ridge shape, minutiae location and the location of pore openings on the ridge unit, all evolve randomly.
are formed as a result of a random process, fingerprints differ from finger to finger on every individual.\textsuperscript{47} They also differ between individuals, including identical twins.\textsuperscript{48} This characteristic of fingerprints is known as the "uniqueness" factor. Rare genetic defects, however, can impair or delay the normal development of fingerprints.\textsuperscript{49} As a result, most, but not all, people are born with a complete set of fingerprints.\textsuperscript{50}

Fingerprints are contained in the epidermis (the outermost layer of human skin) but they are imprinted in, and generated from, the dermis (the thick layer of tissue underlying the epidermis).\textsuperscript{51} Thus, a fingerprint will not be destroyed unless damage to the skin reaches the dermis.\textsuperscript{52} Moreover, fingerprints remain unchanged from infancy until death; while they may expand or contract based on the weight of the individual, the pattern remains static.\textsuperscript{53} This characteristic is known as the "permanency" factor.

Sweat pores are also found on the surface of the skin.\textsuperscript{54} These pores typically form, like the development of friction ridges, in utero.\textsuperscript{55} These pores allow lubrication of the palmar surface of the hand. As a result, fingerprints can be retrieved from various surfaces, such as glass or metal, because sweat or other fluids, such as grease, flow along the finger's "friction" ridges, thereby leaving an impression.\textsuperscript{56}


47. Robert D. Olsen, Sr., Scott's Fingerprint Mechanics 11 (1978) ("Each of the ten fingers on every person's hands bears its own individual and distinctive trademark in its ridge pattern and characteristics."); see infra text accompanying note 63.

48. Coppock, \textit{supra} note 34, at 21 ("[Identical] twins will often share similar fingerprint patterns and shapes, yet the spatial relationships of the friction skin's finely detailed characteristics still vary.").

49. \textit{Id.} at 3. For example, dysplasia, a condition that causes abnormal skin development, may result in fingerprints that contain noticeably fragmented ridges. \textit{Id.; see also} Medical Dictionary, \textit{supra} note 41, at 434 (defining dysplasia).

50. See Coppock, \textit{supra} note 34, at 4.


52. \textit{Id.} at 14-15 ("Most minor burns, blisters, and warts only affect the top-most epidermis layer of the skin. The normal healing process gradually replaces the epidermis layer with new skin. This new skin will again reflect the ridge structure of the dermis layer.").

53. The first person to publish information about the unchanging nature of fingerprints was German scientist Herman Welcker in 1897. Joe Nickell & John F. Fischer, Crime Science: Methods of Forensic Detection 114 (1999). For a further discussion of permanency, see infra text accompanying note 64 (discussing research of Sir Francis Galton).


B. Fingerprints as a Means of Identifying Individuals

1. The Development of Fingerprinting as a Science

Although the Chinese used thumbprints to "sign" criminal confessions over two thousand years ago, fingerprints were not used for identification purposes in criminal investigations until much later. In 1880, Dr. Henry Faulds, a Scottish missionary, published the first known paper to suggest that criminals could be identified by their fingerprints. He also observed the regeneration of fingerprints after "shaving off the ridges which contained the patterns near the fingertips till no pattern should be traced."

Meanwhile, Sir Francis Galton had begun to experiment with a system of classifying fingerprints. Galton, an anthropologist, divided fingerprints into three main patterns that are still used in most modern classification systems: loop, arch, and whorl. In addition, he developed the concepts of uniqueness and permanency, which underlie the use of fingerprinting technology in criminal trials.

Sir Edward Henry further developed Galton's system of fingerprint categorization. In the "Henry" system, loops, arches, and whorls, the three basic fingerprint patterns, were further divided into

New York City ("NYC") Police Officers written by Former Commanding Officer of the NYC Latent Print Unit).

57. Bernasconi, supra note 29, at 1004.
59. Criminal Justice Monograph, supra note 58, at 3 (quoting an article by Henry Faulds in the publication The Hidden Hand).
60. Id. at 4.
61. Simon A. Cole suggests that Galton's decision to divide fingerprints into three groups was a result of the difficulty he experienced when he attempted to divide his own empirical data into the nine groups suggested by a predecessor. Cole, supra note 27, at 77-79. Galton may have devised as many as sixty categories of fingerprints before retracting to his conclusion that all prints generally had either an arch, whorl, or loop pattern. Id.
62. See infra notes 209-16 and accompanying text (discussing the permanency and uniqueness of fingerprints).
63. Criminal Justice Monograph, supra note 58, at 4.
64. Id. at 5 (quoting Francis Galton, Finger Prints (1892)).
65. Id.
approximately eight subcategories. For example, within the arch pattern, a pattern accounting for approximately five percent of all fingerprints, Henry described two different patterns: plain arch and tented arch. The term “plain arch” describes horizontal fingerprint ridges with a subtle arch in the middle of the finger, while the fingerprint ridges of a “tented arch” form a steeper, bell-curve pattern. Loop prints comprise sixty-five percent of all fingerprint patterns. They have a circular pattern that loops back within itself in a spiral, and include two subdivisions: radial and ulnar. Whorls, which are generally circular, account for the remaining thirty percent of fingerprint patterns. The whorl category is divided into four subcategories: plain, central pocket, double loop, and accidental.

Henry's method of classification was adopted by the United Kingdom at the turn of the twentieth century. The system was adopted, in part, because it presented a simple, cost effective, and speedy alternative to other methods of identifying criminal suspects. However, while fingerprinting techniques adopted by the United Kingdom, and later the United States, typically combined Faulds's idea that fingerprints would be a useful tool for identifying criminals and Henry's categorization of fingerprint types, the work of Galton truly substantiated fingerprinting as a science.

66. Nickell & Fischer, supra note 53, at 117. Although discussions of fingerprint categorization often focus on the eight subdivisions of Henry's classification system, Johannes Evangelist Purkinje had developed an extensive fingerprint categorization system while studying in Poland in 1823, containing nine different types of prints. Criminal Justice Monograph, supra note 58, at 2.
68. Coppock, supra note 34, at 16.
69. Id. at 17.
70. Nickell & Fischer, supra note 53, at 117, 120.
72. Nickell & Fischer, supra note 53, at 117. An “accidental” whorl refers to a fingerprint that contains an amalgamation of print characteristics and thus fits into none of the three main categories neatly. See id. at 120.
73. See Beavan, supra note 54, at xv; Bernasconi, supra note 29, at 1004. Sir Edward Henry was ultimately promoted to Commissioner of Scotland Yard in 1905. Beavan supra note 54, at 13.
74. See Criminal Justice Monograph, supra note 58, at 1-2, 5. For example, photographic identification of suspects was considered flawed, in part, because human appearance is so easily altered. Id. at 1. Fingerprints, however, are impossible to alter and difficult to obliterate entirely. See supra note 52 and accompanying text. However, perhaps one of the primary reasons fingerprints have endured without extensive scrutiny by law enforcement officials and courts for so many years is that they are a relatively cheap and quick method of identification.
75. Criminal Justice Monograph, supra note 58, at 4 (“It was probably due to the efforts of Galton more than any other person that fingerprints were accepted as a scientific method of identification.”); see also Jennifer L. Mnookin, Fingerprint Evidence in an Age of DNA Profiling, 67 Brook. L. Rev. 13, 31-32, 36 (2002) (adding
Galton devised a method for identifying fingerprints by comparing fixed points that occur with regularity in fingerprints. Today, these points are known as "Galton points" or "Galton details." They are also referred to as "ridge characteristics," "ridge details," or "points of similarity." Galton identified several minutiae that appeared from time to time on the fingertips. For example, Galton's "ridge dot" point consisted of a friction ridge that was wider than it was long.

After locating points of identification on an unidentified fingerprint, fingerprint examiners would look for the same points in the fingerprint of a known individual. The number of points of detail being compared could vary, depending on the size of the fingerprints being compared. If the prints matched each other at the points examined, the fingerprints were considered identical. Because fingerprints were considered unique, if identical prints were found, examiners would conclude that both prints belonged to the same person.

What emerged from the combined work of the pioneering individuals described above was a method for humans to determine whether or not the fingerprint of a known individual matched a fingerprint found at a crime scene or on a piece of incriminating evidence. Fingerprint identification techniques have not changed dramatically since their inception in the early 1900s. Fingerprint identification techniques have not changed dramatically since their inception in the early 1900s. Fingerprint identification techniques have not changed dramatically since their inception in the early 1900s. Fingerprints were seen as a reliable identification tool because of their uniqueness and permanency.

that the American recognition of fingerprint identification techniques in the courtroom stemmed from the "cultural plausibility" of the uniqueness of fingerprints and the certainty with which expert witnesses spoke of fingerprint identification techniques.

76. See Cole, supra note 27, at 79-80.
77. See id. at 79. Galton ultimately calculated that the probability of two identical fingerprints was one in sixty-four billion. Id. at 80.
78. Id. at 79.
80. While the idea of using ridge characteristics to compare fingerprints has been attributed to Galton, the points of comparison he identified are but a sampling of those used by fingerprint examiners today. Nickell & Fischer, supra note 53, at 125-26 (naming ridge endings and bifurcations, the branching of one ridge in two directions, as points of identification in addition to those specifically named by Galton).
81. Fingerprints were seen as a reliable identification tool because of their uniqueness and permanency.
82. More than seventy years after investigators began to use fingerprints in criminal trials, the popularity for this identification tool had not waned. As one law enforcement official wrote in 1978, "[f]ingerprints are the most positive means of identifying individuals. Of all the methods of identification, fingerprinting alone has proved to be both infallible and practical." Olsen, supra note 47, at 5. However, fingerprints were not used exclusively in criminal investigations. They were also a convenient tool for governments interested in tracking "suspect" populations, see Cole, supra note 27, at 3 (opining that the drive for fingerprint identification techniques was caused "[n]ot [only by] criminal suspects, but also a wide range of people considered 'suspect' and alien for other reasons: the natives of Europe's
2. Advances in Fingerprint Technology

Fingerprints are taken from criminal suspects using a two-part method. First, law enforcement officers apply ink to the suspect's finger and roll the inked finger on a piece of paper with boxes labeled for each finger of both the left and right hands. Next, "plain impressions" are taken by pressing, not rolling, inked fingertips directly against the paper below the labeled boxes. This step insures against manual error and serves as a backup impression should the rolled print become smudged. After prints are recorded on paper, they are classified according to the Henry system or some variation of the Henry system. The rules of classification in the Henry system mandate that a fingerprint examiner first determine whether the pattern is an arch, whorl, or loop. The technician then proceeds to subcategorize the prints according to a complex classification system. When the inked prints come from a known individual, the prints are called exemplar prints.

Fingerprint examiners compare exemplar prints with fingerprints left at a crime scene or those found on a piece of evidence. These prints fall into one of three categories. "Plastic" fingerprints are those impressed in soft material, such as wax, putty, or dust. "Visible" prints are those plainly identifiable because they appear in colored substances such as blood, grease, or ink. Fingerprints obtained by the ink and roll method fit in this category. "Latent" prints, which are not visible to the human eye, constitute the third type of prints.

colonies; recent immigrants; people of color; poor, mobile 'vagrants'; 'degenerates'; and prostitutes"), and for insurance companies interested in preventing false claims. Holt, supra note 81, at 23-24. Banks, which had long sought a way to identify illiterate customers who could not sign their names, also found fingerprint identification methods useful. Id. at 15-16. In addition, fingerprints were used by the military to identify personnel in situations of death and desertion. Id. at 16-17.

83. Holt, supra note 81, at 31. This process remains the same today. Cole, supra note 27, at 75.
84. Holt, supra note 81, at 31; see Cole, supra note 27, at 75. If a careless fingerprint technician accidentally rolls the same print twice, a comparison of the rolled prints to the plain impressions can correct the error. See id.
85. See Coppock, supra note 34, at 25-28 (distinguishing between the classic Henry system of classification, which required the manual filing of fingerprint cards, with the National Crime Information Center ("NCIC") classification system, which modernized the Henry system by computerizing fingerprint cards, and the Automated Fingerprint Identification System ("AFIS"), another computerized system).
86. See Holt, supra note 81, at 67.
87. See Coppock, supra note 34, at 25-28; see also supra note 85.
88. Coppock, supra note 34, at 6.
90. Id. at 130.
91. Id.
92. Id. at 130-31. Latent prints are comprised primarily of sweat emitted from the pores of the fingers. Thus, they are more easily recovered on nonporous surfaces. See id.
Fingerprint examiners obtain latent prints in a variety of ways. Since the 1900s, fingerprint examiners have recovered these prints by powdering a surface, and then dusting the powder off with a small brush so as to differentiate the fingerprint image from its background. Light-colored powder was used for dark surfaces, while dark-colored powder was used for light surfaces. Investigators then photographed the resulting image, and "lifted" the powdered image and transferred it to paper using clear tape. After classifying the fingerprint according to the prevailing classification system, examiners compared a number of fixed points, or "Galton details," of the exemplar image with those of the latent print.

Today, fingerprint examiners continue to use many of the techniques developed by fingerprinting pioneers. However, individuals can now be fingerprinted using either ink or an electronic hand scan. Using a computer imaging system called Live-Scan, fingerprint technicians, most often law enforcement officers, scan an individual's hand and print out the resulting image. This process is both quick and efficient. In addition, it lessens the likelihood that latent prints will be smudged or destroyed during the "lifting" process. However, one drawback to Live-Scan is that the computer is often unable to reproduce an image as detailed or nuanced as the inked fingerprint image.


94. Kuhne, supra note 81, at 98.
95. Id.
97. Id. at 192-95; see also supra note 85.
98. See supra notes 76-80 and accompanying text.
99. See supra note 81 and accompanying text.
100. See Interview with Rose Gribben, New York City Police Officer in charge of Latent Fingerprints for the Twentieth Precinct, in New York, N.Y. (Mar. 1, 2002); see also discussion infra Part II.B.1.
101. See Coppock, supra note 34, at 33-35 (describing the computer technology of Live-Scan).
102. See id. at 34.
103. See Nickell & Fischer, supra note 53, at 130 (describing the "delicate nature" of latent prints).
104. Coppock, supra note 34, at 35. However, Coppock seems to indicate that the benefits to this technology far outweigh the drawbacks, because latent prints recovered from crime scenes are often clearer than the inked prints generated in practice. See id. As Seth DuCharme, a former Deputy U.S. Marshall confirmed, criminal suspects are often talented at smudging their fingerprints during ink and roll fingerprinting, thus making the job of the fingerprint technician difficult. Interview
Both DNA and fingerprint evidence are cataloged in national law enforcement databases; however, unlike DNA evidence, fingerprint evidence is not contained solely in a national database.105 Instead, many jurisdictions maintain separate fingerprint databases using Automated Fingerprint Identification System ("AFIS") computers.106 These fingerprint identification computer systems are often linked to larger networks, thus expanding the number of fingerprints to compare.107 AFIS computers enable officials to compare individual fingerprints quickly—officers input search criteria and the computer generates a list of likely matches.108 Once the computer generates such a list the fingerprint examiner must compare the prints to one another manually.109 In 1999, the Federal Bureau of Investigation ("FBI") implemented the Integrated Automatic Fingerprint Identification System ("IAFIS"), which contains over thirty-six million known prints.110 The FBI's Criminal Justice Information Services Division also possesses the world's largest collection of fingerprints, which can be searched manually.111

C. Acceptance of Fingerprint Identification Techniques as Scientific Evidence in Criminal Cases

By the early 1900s, fingerprints were recognized as a unique and permanent form of physical evidence.112 In addition, law enforcement officers had begun to develop techniques for gathering and categorizing fingerprints.113 However, to use fingerprint technology to convict criminals, expert witnesses need to testify at trial about the identity of the individual whose prints are found at a crime scene or on a piece of evidence. These witnesses can explain the physical properties of fingerprints as well as the techniques used to identify the

with Seth DuCharme, in New York, N.Y. (Feb. 18, 2002). However, some fingerprint examiners still prefer the familiarity of the ink and roll method to the Live-Scan method. Interview with Rose Gribben, supra note 100.

105. While state and local law enforcement agencies may access the national FBI fingerprint database, these agencies often maintain separate databases. Telephone Interview with Dr. Lawrence Kobilinsky, Associate Provost and Professor of Forensic Science at John Jay College of Criminal Justice (Mar. 22, 2002). As a result, state and local law enforcement agencies may not be able to access each other's fingerprint databases, making the search for criminals "on the lam" more difficult.

106. Coppock, supra note 34, at 111-12.

107. Id. at 115.

108. Id. at 111-19. As Coppock notes, "[f]ingerprint pattern types that are used as database search parameters can vary among the different manufacturers of AFIS computers.... [B]ut the software itself is designed to compare the spatial relationships of fingerprint characteristics." Id. at 112, 115.

109. Id. at 115 ("AFIS computers do not make identifications.").


111. See id.

112. See supra text accompanying notes 63-64.

113. See discussion supra Part I.B.
owner of a fingerprint. In addition, the expert can give his or her opinion as to the identity of the person to whom the fingerprint belongs if a known and an unidentified fingerprint match. Because of the respect that juries pay to expert witnesses, this fingerprint identification testimony is exceptionally powerful.114

In 1902, fingerprint evidence was first used to obtain a criminal conviction in England.115 The United States followed England’s lead, and, in 1908, began to develop a nationwide fingerprinting system.116 However, acceptance of fingerprinting as a science was slow—the line between scientific technique and “quackery” had not yet clearly developed.117 In addition, law enforcement officials were slow to abandon anthropometry, also called the Bertillon method, a science that identified criminals by their body measurements, as their preferred identification technique.118

In 1911, the first American was convicted for murder using the testimony of fingerprint identification experts in People v. Jennings.119 The Jennings case was tried in Illinois state court. Thus, the court’s determination did not bind federal courts or other state courts. However, Jennings paved the way for the introduction of expert testimony regarding fingerprint evidence in several states, including New York, New Jersey, and Nevada.120 Courts that were once hesitant to trust fingerprint evidence endorsed this evidence without a great deal of analysis after the Jennings decision.121 By 1932, expert testimony regarding fingerprints was regularly accepted in American courts.122 At that time, only five states had not yet accepted fingerprint identification techniques as valid scientific evidence.123

The court opinions from the early twentieth century reveal an alarming lack of judicial examination into the soundness of

114. Cf. infra notes 129-33 and accompanying text (illustrating how easily even judges were impressed by fingerprint identification testimony).
115. Beavan, supra note 54, at xv.
116. Bernasconi, supra note 29, at 1005. By 1999, approximately ninety years after the United States first developed a system of fingerprint identification, the FBI created a computer system able to store over sixty-five million fingerprints. Beavan, supra note 54, at xvi. The system has not yet reached capacity. See supra text accompanying note 110.
117. See Beavan, supra note 54, at 8.
118. See Criminal Justice Monograph, supra note 58, at 2.
119. 96 N.E. 1077 (Ill. 1911); Beavan, supra note 54, at xv. Jennings was convicted of murder and executed on February 16, 1912. Mnookin, supra note 75, at 17 n.14.
121. See Mnookin, supra note 75, at 21; Saks, supra note 7, at 1100-01.
122. Bernasconi, supra note 29, at 1006.
123. Saks, supra note 7, at 1101.
fingerprinting techniques. Judges casually cited criminal treatises or other cases that had admitted fingerprint evidence. For example, Michael Saks points out that

Nowhere in the [Jennings] opinion... does the court articulate the basis of the expertise it is evaluating, or discuss any scientific evidence bearing on empirical claims, or illuminate the technique's theoretical premises, or explain why anyone should believe that fingerprint examiners can do what they claim the ability to do.

Scholars argue about how and why the Jennings case propelled fingerprints into a category of judicially-accepted scientific evidence. In Jennings, the court recognized that fingerprint evidence was a matter of first impression in American courts. However, the court found exemplary support for print evidence in the United Kingdom, "where it ha[126]d been used since 1891 in thousands of cases without error." In addition, the court determined that the prosecution's four expert witnesses, who testified that they had compared the fingerprints of the defendant with those found at the crime scene, and had concluded that the fingerprints matched, were qualified as experts because they had compared fingerprints in numerous instances in the past.

The court compared fingerprint evidence to other types of evidence of which courts had at first been suspicious, but which were later "admitted without question." These types of evidence included photographs, X-rays, and microscope evidence. The court ultimately held that fingerprints, as a "method of identification," were

\[\text{124. See Mnookin, supra note 75, at 43 ("[N]ineteenth century judges did not scrutinize fingerprinting (or other forensic sciences) carefully...")}.\]
\[\text{125. Saks, supra note 7, at 1101.}\]
\[\text{126. Id. at 1101-02.}\]
\[\text{127. See, e.g., Mnookin, supra note 75, at 17-22; Saks, supra note 7, at 1100-06. While both Jennifer Mnookin and Michael Saks agree that the Jennings court did not scrutinize fingerprinting techniques before admitting fingerprint identification testimony, each scholar offers a slightly different interpretation of how and why this occurred.}\]
\[\text{128. People v. Jennings, 96 N.E. 1077, 1081 (Ill. 1911).}\]
\[\text{129. Id. at 1081. Much appears amiss in the court's analysis. First, historical accounts of fingerprint evidence show that the use of this evidence did not begin in the United Kingdom until the turn of the twentieth century. Supra text accompanying note 115. Second, even if fingerprint evidence had been used in cases "thousands of times," the court prematurely stated that the use of this evidence was "without error." After all, the techniques had only been in use for approximately ten years at the time of this opinion. Id.; see also, Mnookin, supra note 75, at 20 ("[T]he judge in Jennings was simply overstating the extent of acceptance of fingerprinting outside the courtroom at the time.").}\]
\[\text{130. See Jennings, 96 N.E. at 1082.}\]
\[\text{131. Id.}\]
\[\text{132. Id.}\]
One scholar has described the judicial attitude towards fingerprints after *Jennings* as “[w]e’re letting so much else in, we might as well let this in, too.” After a number of legal decisions characterized by the same dearth of reasoning as *Jennings*, state courts seemed to have determined that a sufficient foundation for fingerprint evidence had been laid so as to permit them to refer to the previous fingerprint identification decisions as precedent. Or, as one scholar suggests, were these courts just being lazy?

In 1923, in *Frye v. United States*, the District of Columbia Circuit Court enunciated a standard for expert scientific testimony known today as the “general acceptance” test. Although the court in this murder trial was addressing polygraph, rather than fingerprint, evidence, the standard it used closely resembled the standard used by the *Jennings* court. Even though *Frye* was not controlling on any state or federal jurisdiction except the District of Columbia Circuit, most federal and state courts adopted some version of the *Frye* standard.

The court in *Frye* posited that scientists, who work in the particular field of science at issue, are the individuals best able to determine what is “real” science and what is “junk” science. Thus, the court reasoned, scientists should be the primary determiners of which sorts

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133. *Id.*

134. Saks, *supra* note 7, at 1104. Professor Saks refers to the evidentiary standard for expert scientific testimony before 1923 as the “implicit marketplace test,” because judges often evaluated evidence by “whether consumers... found it useful in important everyday affairs of life outside the courtroom.” *Id.* at 1129.


137. *Id.* at 1105 (“The courts of other states that contented themselves with citing *Jennings* and its progeny were being lazy.”).


139. *Specifically, the evidence before the court in Frye was called the “systolic blood pressure deception test.” Id.* at 1013. This test was a predecessor of today’s polygraph test. *See Encyclopedia of Crime & Justice* 1377 (Joshua Dressler, ed., 2d ed. 2002) [hereinafter Crime & Justice].

140. People v. Ferguson, 526 N.E.2d 525, 532 (Ill. 1988) (“[W]hile *Jennings* predated the *Frye* decision, the test it set up for the admissibility of evidence is not unlike the ‘general acceptance’ test articulated in *Frye*.”).


142. One scholar defines “junk” science as “opinions based on unproved and unprovable [sic] hypotheses in claimed areas of expertise that were outside the range of scientific disciplines considered to be legitimate.” Billings, *supra* note 21, at 615.

143. *See Frye*, 293 F. at 1014.
of scientific evidence are admissible.\textsuperscript{144} When a technique was said to be "generally accepted" in the scientific community, testimony concerning it was considered admissible under Frye.\textsuperscript{145} The court noted, "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."\textsuperscript{146} Although Frye no longer represents the federal evidentiary standard for scientific evidence,\textsuperscript{147} many state courts still follow Frye.\textsuperscript{148}

As with any judicial standard that withstands the test of time, the "general acceptance" rule had both its detractors and its supporters.\textsuperscript{149} Some believed the Frye test was too restrictive, because it usually took a long time for scientific communities to recognize novel techniques.\textsuperscript{150} Others claimed that Frye rested on the faulty premise that jurors are unduly influenced by scientific evidence.\textsuperscript{151}

One might also argue that the Frye test's practical effect was somewhat arbitrary, because techniques that were developed and accepted by federal courts before Frye were not subject to the same limitations to which novel scientific techniques were subject after Frye.\textsuperscript{152} For example, fingerprint identification testimony was routinely admitted by courts before the Frye decision, and therefore never subject to the rigors of the Frye test, which required expert scientific testimony to be "generally accepted" by the scientific community.\textsuperscript{153} The only "community" by which fingerprint testimony was ever generally accepted was the judicial community.

144. Crime & Justice, supra note 139, at 1378 ("[T]he 'requirement of general acceptance in the scientific community assures that those most qualified to assess the general validity of a scientific method will have the determinative voice.'" (quoting United States v. Addison, 498 F.2d 741, 743-44 (D.C. Cir. 1974))).
146. Id. at 1014.
147. See infra text accompanying note 167.
149. Compare Coppage, supra note 148, at 611 ("The Frye test is extremely lax . . . ."); with Crime & Justice, supra note 139, at 1378-79 ("[C]ourts favoring the general acceptance test recognize its conservative nature but believe this aspect does not exact an 'unwarranted cost.'" (quoting Addison, 498 F.2d at 743)).
151. See Crime & Justice, supra note 139, at 1379. However, some scholars argue that the idea of jurors as "overwhelmed" by scientific evidence has empirical support. See id.
152. See Coppage, supra note 148, at 612.
153. Cf. Andre A. Moenssens, Handwriting Identification Evidence in the Post-Daubert World, 66 UMKC L. Rev. 251, 272 (1997) ("[Handwriting examiners'] testimony as expert witnesses was well grounded in precedent long before the general acceptance test was announced, and therefore the Frye test was not needed to determine the admissibility of handwriting identification testimony.").
The judicial evaluation of the reliability of scientific evidence was exactly what the court in Frye had attempted to prevent. This task, according to the court, would be better left to scientists themselves. However, the court could not make the application of its ruling retroactive. Thus, as shown by the Jennings and Frye decisions, fingerprints were never subjected to the same level of judicial exactitude as other evidentiary techniques. Had fingerprints been subjected to the Frye standard over seventy years ago, they might never have been deemed admissible evidence.

II. THE RECENT CONFUSION ABOUT THE PROPER APPLICATION OF EVIDENTIALY STANDARDS GOVERNING THE ADMISSIBILITY OF FINGERPRINT IDENTIFICATION TESTIMONY IN CRIMINAL CASES

Part I described the development of fingerprint identification methods in the late nineteenth and early twentieth centuries. Because of their uniqueness and permanency, fingerprints soon gained acceptance among courts as a legitimate form of evidence. However, the increased use of scientific evidence, such as fingerprints, prompted courts to create clearer standards for admissibility. This part analyzes the different guidelines set forth by courts to ensure that only reliable evidence gained admission at trial. It was only fair that unreliable scientific testimony, which could improperly influence a jury, be excluded. In addition, this part analyzes how the judicial standards for expert scientific testimony have been interpreted, using the decisions in United States v. Llera Plaza, a recent district court case involving fingerprint evidence, to highlight the confusion that persists in this field.

A. From “General Acceptance” to Daubert: The Murky State of the Law on Scientific Evidence

Approximately fifty years after the establishment of the Frye test in 1923, little had changed. Federal courts continued to use the general acceptance test to admit novel scientific techniques in criminal cases. However, a fissure became apparent in this seemingly solid

154. See supra notes 143-44 and accompanying text.
155. Although Frye was a brief decision, the “general acceptance” standard the court described was not necessarily easy to apply. Many struggled with how to “identify[] the field in which the underlying principle [fell],” and then how to “determin[e] whether that principle ha[d] been generally accepted by members of the identified field.” Crime & Justice, supra note 139, at 1378. Moreover, judges in different jurisdictions applying Frye often reached different conclusions about the same scientific technique, thus leading to increased uncertainty among litigants. See Bernstein, supra note 21, at 390.
157. Interestingly, the general acceptance test was applied almost exclusively to criminal cases. Bernstein supra note 21, at 389 (“[F]ew courts considered the types of
standard when, in 1975, the Federal Rules of Evidence became law.\textsuperscript{158} Rule 702 of the Federal Rules provided: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise."\textsuperscript{159}

Under Rule 702, some scholars believed the proponent of the evidence needed only to show that evidence was "generally relevant" to gain admission at trial.\textsuperscript{160} This standard seemed to clash with the \textit{Frye} test's requirement of general acceptance in the scientific community. Rule 702 shifted the evaluation of expert scientific testimony away from the scientific community, on which the \textit{Frye} test had focused, and back to judges.\textsuperscript{161} As a result, some federal courts, finding Rule 702 more permissive than \textit{Frye}, adopted this rule as the controlling standard for the admissibility of expert scientific testimony.\textsuperscript{162} Other federal courts interpreted the two standards in such a way that they would not conflict with one another.\textsuperscript{163} These courts were then free to apply each standard as they saw fit.\textsuperscript{164}

Thus, by the 1990s, the federal standard for admission of expert scientific testimony varied greatly from jurisdiction to jurisdiction.\textsuperscript{165} In 1993, the Supreme Court stepped in to resolve the controversy over which rule, \textit{Frye} or Rule 702, applied to expert testimony in federal court.\textsuperscript{166} In \textit{Daubert v. Merrell Dow Pharmaceuticals, Inc.}, the Court rejected \textit{Frye} as the controlling federal standard for the admission of expert scientific evidence presented in a typical civil case... to be based on a novel scientific technique within the meaning of the \textit{Frye} rule."\textsuperscript{167}). Yet, fingerprint identification testimony was routinely admitted by federal courts without reference to the \textit{Frye} test, because it had been accepted by courts prior to \textit{Frye}. See supra text accompanying notes 152-53.

158. Montz, supra note 17, at 93.
159. Fed. R. Evid. 702.
161. Before \textit{Frye}, judges were the sole evaluators of the admissibility of expert scientific testimony; however, the end result before \textit{Frye} was similar, because judges tended to look to the scientific community when ruling on the admissibility of expert testimony. See supra notes 129-33 and accompanying text (discussing the judicial evaluation of expert fingerprint testimony in the Jennings case).
162. Moenssens, supra note 153, at 273. One example of a federal court that abandoned \textit{Frye} in the wake of Rule 702 was the Second Circuit. \textit{Id.} at 273 n.82 (citing United States v. Williams, 583 F.2d 1194 (2d Cir. 1978)).
163. \textit{Id.} at 273 \& n.83. Some scholars believed that the uncertainty about how to interpret the \textit{Frye} test gave courts flexibility in their evaluation of whether \textit{Frye} conflicted with Rule 702. \textit{Id.} at 273.
164. In addition, some state courts, persuaded by the actions of federal courts, chose to adopt the new standard under Rule 702 and abandon \textit{Frye}. See Coppage, supra note 148, at 612.
166. See \textit{id.} at 585 ("We granted certiorari... in light of sharp divisions among the courts regarding the proper standard for the admission of expert testimony.").
expert scientific testimony. The Court found Frye inconsistent with, and thus superseded by, Federal Rule of Evidence 702, which favored the liberal admission of evidence.

Daubert was a products liability case involving the drug Bendectin, which was prescribed to pregnant women for morning sickness, and which allegedly caused birth defects. The trial court prohibited the plaintiff's experts from testifying about epidemiological studies they had conducted that linked Bendectin to birth defects, because the evidence did not pass the Frye test.

The Supreme Court reversed, ultimately holding that general acceptance alone was an inadequate measure of the reliability of scientific evidence. The Court found that the Frye standard was only one of several criteria a court could consider. In addition to general acceptance within the scientific community, the Court discussed the following nonexclusive list of factors a court may consider:

1. whether the technique or theory can be or has been tested—that is, whether the expert's theory can be challenged in some objective sense, or whether it is simply a subjective, conclusory approach that cannot reasonably be assessed for reliability; 2. whether the theory or technique has been subject to peer review and publication; 3. the known or potential rate of error; [and] 4. the existence and maintenance of standards and controls.

Thus, the Supreme Court envisioned the use of a "flexible" standard for the admission of scientific evidence.

The Court further explained that under the Federal Rules of Evidence, judges play an important role as "gatekeepers" for the admission of scientific evidence. The Court stated, "under the Rules the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable." The Court surmised that while "there are no certainties in science," scientific methods should be based on "good grounds."

Thus, in Daubert, the Supreme Court shifted the evidentiary focus from an evaluation of the conclusions reached by experts to an evaluation of the methods and techniques used to reach those conclusions.
The Court considered the jury capable of drawing conclusions about the validity of expert scientific testimony for themselves, especially with the aid of judges who keep a watchful eye out for unreliable evidence.

Although some saw *Daubert* as an answer to the confusing muddle of federal decisions rendered under the dual scheme of *Frye* and Federal Rule of Evidence 702, many others felt *Daubert* further obfuscated the evidentiary standard for the admission of scientific evidence. Federal courts struggled to determine whether *Daubert* was more or less restrictive of scientific evidence than *Frye*.

In 1999, the Supreme Court decided *Kumho Tire Co. v. Carmichael* to clarify how the standard set forth in *Daubert* applied to “nonexperts.” In *Kumho Tire*, the Court ruled that the *Daubert* standard applied to “‘technical’ and ‘other specialized’ knowledge” in addition to scientific knowledge. In addition, the Court emphasized that the factors listed in *Daubert* were nonexclusive; they represented a general suggestion for courts to treat the admission of expert scientific testimony flexibly.

In 2000, shortly after the Supreme Court’s decision in *Kumho Tire*, the Federal Rules of Evidence were amended to track the path of the Supreme Court’s expert testimony jurisprudence. The amendment

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178. See id. at 595.

179. See Bonnie J. Davis, *Admissibility of Expert Testimony After Daubert and Foret: A Wider Gate, A More Vigilant Gatekeeper*, 54 La. L. Rev. 1307, 1320-21, 1323 (1994) (“The overwhelming response to [Daubert] has been positive... [T]he lower courts successfully use the framework and the flexibility in the Daubert analysis... [In sum, t]he Daubert decision... has proven to be flexible and helpful.”).

180. See, e.g., James R. McCall, *Misconceptions and Reevaluation—Polygraph Admissibility After Rock and Daubert*, 1996 U. Ill. L. Rev. 363, 365, 394-95 (1996) (“[C]ommentators have generally agreed that the Daubert opinion is confusing...”); Joelle Anne Moreno, *Beyond the Polemic Against Junk Science: Navigating the Oceans that Divide Science and Law with Justice Breyer at the Helm*, 81 B.U. L. Rev. 1033, 1035-36 (2001) (“Daubert has imposed a foreign and unwieldy burden on judges who must resolve questions of scientific admissibility, lawyers who must master the scientific theories of expert witnesses, and legal and scientific scholars searching for meaning and direction.” (citation omitted)).

181. Capra, supra note 173, at 704. Adding to the confusion, many state courts, although not bound by the Supreme Court’s decision, because it was limited to the interpretation of a federal evidentiary standard, adopted *Daubert*. See supra note 164 and accompanying text. This was perhaps a result of *Daubert’s* reputation as a more permissible evidentiary standard. See Montz, supra note 17, at 96 ("[I]n a period of only four years since the decision twenty-eight states either adopted the *Daubert* standard, explicitly assimilated it as similar to a test already in place, or maintained a Daubert-like test without mentioning *Daubert*.” (internal quotations omitted)). However, several populous states continue to use the *Frye* standard. See supra note 21.


183. Id.

184. Id. at 149-50.

185. Fed. R. Evid. 702 amendment committee note. Rule 702 was amended on December 1, 2000.
to Rule 702 stated that an expert could testify, provided that the proffered testimony assisted the trier of fact, the expert was qualified, and "(1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case."\(^{186}\)

The Amendment Committee Note following the amendment to Rule 702 observed that courts have used factors not specifically mentioned in Daubert to evaluate the reliability of proffered expert scientific testimony.\(^{187}\) The amendment to Rule 702 was not meant to change Daubert's flexibility; instead, it reflected the need to set minimum guarantees of evidentiary sufficiency, methodology, and applicability.\(^{188}\)

B. In the Aftermath of Daubert: The Uncertain Status of Fingerprint Evidence as Shown in United States v. Llera Plaza

The Supreme Court's rulings in Daubert and Kumho Tire caused concern among advocates of forensic science. Specifically, some wondered if these decisions signaled the "beginning of the beginning of the end of fingerprint identification,"\(^{189}\) because commentators saw Daubert as inviting new challenges to the legitimacy of fingerprint identification techniques.\(^{190}\) However, despite changes in the judicial evaluation of expert scientific testimony, fingerprint evidence remained relatively unaffected at first. Perhaps this resulted from the longstanding acceptance of fingerprint evidence in the courtroom. But, as federal courts around the country have applied Daubert and its progeny over the last several years, the judicial treatment of forensic evidence has changed.

\(^{186}\) Fed. R. Evid. 702 (emphasis added). The full text of Rule 702 of the Federal Rules of Evidence now reads

\[\text{[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.}\]

**Id.**

\(^{187}\) Fed. R. Evid. 702 amendment committee note (citing factors such as whether the expert: (1) came to his or her conclusion solely for the purpose of testifying at trial; (2) gave an opinion reached using a "field of expertise" generally known to give reliable results; (3) drew an unfounded conclusion from a standard scientific principle; (4) ruled out alternative explanations for his or her results; and (5) "is being as careful as he would be in his regular professional work outside his paid litigation consulting" (quoting Sheehan v. Daily Racing Form, Inc., 104 F.3d 940, 942 (7th Cir. 1997))).

\(^{188}\) See Fed. R. Evid. 702 amendment committee note.


\(^{190}\) See infra note 328 (discussing the increase in challenges to fingerprint identification testimony since 1993).
No clearer was this change than in District Court Judge Louis Pollak's courtroom in the Eastern District of Pennsylvania on January 7, 2002. On this date, in United States v. Llera Plaza ("Llera Plaza I"), a federal court ruled for the first time that fingerprint evidence did not meet the federal evidentiary standard. Exercising his gatekeeping discretion in a pre-trial evidentiary hearing conducted to determine the admissibility of expert testimony regarding fingerprints, also known as a Daubert hearing, Judge Pollak granted the defendant's motion to preclude the fingerprint evidence in part and denied the motion in part. 

In Llera Plaza I, the court held that the government's experts could testify to the permanency and uniqueness of fingerprints; the experts could also point out places of comparison between two sets of fingerprints. However, witnesses could not testify that the latent fingerprints matched those of the defendants. This was significant because no federal judge had used his or her gatekeeping powers, as described by the Supreme Court in Daubert and Kumho Tire, to preclude fingerprint testimony. It appears that no federal judge had ever barred fingerprint identification testimony prior to Judge Pollak's decision in Llera Plaza I.

Judge Pollak later "changed [his] mind," in a March 13, 2002, hearing on the government's motion for reconsideration of the court's exclusion of proffered fingerprint identification testimony. This later decision ("Llera Plaza II") vacated Llera Plaza I and denied the defendant's motion to preclude fingerprint evidence in its entirety.

191. Judge Pollak was educated at Harvard University and Yale University. He clerked for Supreme Court Justice Wiley B. Rutledge in 1948, and was a faculty member and former dean of both the University of Pennsylvania Law School and Yale Law School. He has been a well-respected member of the federal bench for over twenty years. Judge H. Pollak, Policies and Procedures, http://www.paed.uscourts.gov/procedures/pollak_policy.pdf (last visited Mar. 19, 2002).
193. Id.
194. Id. at 517-18.
195. Id. at 518.
196. Id. at 500 ("Several courts have addressed the issue of whether fingerprint identifications are admissible as expert testimony under Federal Rule of Evidence 702, and, since the Supreme Court's Daubert ruling, all have come to the conclusion that fingerprint testimony should be admitted.").
197. See Andy Newman, Judge Rules Fingerprints Cannot Be Called a Match, N.Y. Times, Jan. 11, 2002, at A14 ("A judge has ruled for the first time that fingerprint evidence ... does not meet the standards set for scientific testimony."); Joseph A. Slobodzian, Fingerprint Experts Are Pointed Toward the Courthouse Door, Phila. Inquirer, Jan. 27, 2002, at C03, 2002 WL 4558554 ("Pollak is the first federal judge to bar fingerprint-identification testimony ... .").
199. Id. The defendants cannot appeal the court's decision in Llera Plaza II until their trial had ended. Andy Newman, Judge Who Ruled Out Matching Fingerprints
The court's decision in *Llera Plaza I* to limit fingerprint identification testimony had prompted widespread commentary from both proponents and adversaries of fingerprint identification testimony. Although this decision is no longer law in the Eastern District of Pennsylvania, the reliability of fingerprint identification evidence is far from settled.

The *Llera Plaza* case involves three defendants charged with committing four separate "murders for hire" in Puerto Rico and Pennsylvania. The murders were allegedly committed in furtherance of a gang-related drug conspiracy. The FBI recovered several latent fingerprints on evidence connected to the murders. This evidence included fingerprints found in two separate vehicles allegedly used in the course of the crimes. In addition, latent prints were obtained from weapons and ammunition found in one of the vehicles. The *Llera Plaza* trial is the first federal capital murder trial in Philadelphia's history.

1. Judge Pollak's January 7, 2002, Decision To Limit Fingerprint Identification Testimony in *Llera Plaza I*

The parties in *Llera Plaza I* stipulated, for the pre-trial evidentiary hearing, to rely on the record of expert scientific testimony compiled in *United States v. Mitchell*, a case decided in the Eastern District of Pennsylvania in 1999. In *Mitchell*, the court held a Daubert hearing to evaluate the admissibility of fingerprint identification testimony. After briefly describing the record in *Mitchell* as it pertained to
The court first addressed the government's request that it recognize the uniqueness and permanency of fingerprint evidence under Rule 201 of the Federal Rules of Evidence. Uniqueness and permanency "provide the basis for associating a particular fingerprint with a particular individual, and for matching latent fingerprints with rolled fingerprints." Based on the testimony of a doctor who was both a professor of gross anatomy and an embryologist, the court concluded that fingerprint patterns remain fixed throughout individuals' lives—hence, permanent.

In addition, the court acknowledged the uniqueness of fingerprints after reviewing the testimony of an algorithmist who had helped develop the FBI's Automatic Fingerprint Identification System, a computer database used for fingerprint comparison and identification. The expert testified that he had conducted two algorithmic studies that compared 50,000 fingerprints. He concluded that the probability of finding two identical fingerprints in his first experiment, which was a comparison of full fingerprints (approximately one square inch), was one in 10^9. His second study compared prints cropped to the size of the average latent print with full-sized fingerprints. He concluded that the probability of finding two identical prints in this manner was one in 10^7. The probability decreased in the latter study because fewer points of comparison were available.

That Judge Pollak did not wrestle with the issue of whether to accept the uniqueness and permanency of fingerprints is not surprising. Fingerprint concepts and fingerprinting technology have
fingerprint specialist with the FBI, and Sergeant David Ashbaugh, a fingerprint specialist with the Royal Canadian Mounted Police, to determine whether the empirical findings of fingerprint examiners were subject to "testing" under Daubert.227 Ashbaugh testified that fingerprint examiners use a technique known by the acronym ACE-V—"analysis," "comparison," "evaluation," and "verification"—to identify fingerprints.228

According to Ashbaugh, under ACE-V, examiners begin by analyzing the overall clarity of the latent print and look for any "red flags," which include overlapping ridge details, evidence of differing amounts of pressure, and shadows.229 The red flags may indicate that two prints have been deposited in the same place or that some other contamination of the prints has occurred.230 Next, examiners compare the latent print to a set of identified fingerprints.231 They look at the overall pattern of the fingerprint (loop, whorl, arch), and then examine points of comparison between the prints (Galton points).232

The number of points an examiner compares differs from country to country and from state to state. In the United States and Canada,233 fingerprint examiners can make a quantitative/qualitative determination of how many Galton points to compare—the clearer the print, the fewer the details that need to be matched.234 For example, according to Meagher, if one of the two prints compared is small but clear, an accurate comparison of the two prints is still possible, even though few Galton points are used.235 Ashbaugh further testified that the United Kingdom mandated technicians to compare a minimum of sixteen points of comparison.236 Ashbaugh claimed that this part of the technique is objective; however, the

229. Llera Plaza, 179 F. Supp. 2d at 498.
230. Id.
231. Id. at 498-99.
232. Id. at 498.
233. Neith the United States nor Canada requires the analysis of a minimum number of common Galton points before a fingerprint match can be declared. Id. at 513.
234. Id. at 499-500.
235. Id. at 500.
236. Id. at 513. In addition, Australia requires twelve points in common for a match, France requires sixteen points, and Sweden requires seven points. Peter Neufeld & Barry Scheck, Will Fingerprinting Stand Up in Court?, N.Y. Times, Mar. 9, 2002, at A15.
changed very little in the last one hundred years. The concepts of permanency and uniqueness have been consistently accepted by scientists, judges, and juries alike. While Judge Pollak did not question the validity of fingerprints as a unique and permanent form of evidence, he did reevaluate the admissibility of fingerprint comparison evidence under *Daubert*.

Using the five factors outlined in *Daubert*, the court in *Llera Plaza I* proceeded to analyze the admissibility of the proffered expert fingerprint comparison testimony based on the evidence set forth by several expert witnesses in the *Mitchell* case. While the Supreme Court had emphasized the flexibility of the *Daubert* standard, Judge Pollak, like many judges before him, analyzed the fingerprint evidence only according to those criteria specifically mentioned in *Daubert*. Although it could have found ways to test the reliability of the proffered testimony other than, or in addition to, these factors, the court decided that they were "a proper touchstone of admissibility."

a. *Testing*

The first factor considered by the court was "whether a theory or technique... can be (and has been) tested." Although the government argued that fingerprint identification testimony had been tested in courtrooms around the country for almost a century, the court rejected this argument stating, "'[a]dversarial' testing in court is not... what the Supreme Court meant when it discussed testing as an admissibility factor." It reasoned that adversarial testing of scientific evidence ran contrary to the judge's role as gatekeeper under Rule 702 and *Daubert*. Instead, Judge Pollak stated that when it used the word "testing," the Supreme Court meant testing hypotheses to see if they are falsifiable.

Judge Pollak examined the testimony of defense witness Dr. David Stoney, a forensic scientist, prosecution witness Stephen Meagher, a
methodological error was difficult to calculate and accepted, arguendo, testimony that the rate of methodological error was "zero." 252

In Llera Plaza I, the fingerprint experts admitted that, although the methodological rate of error was zero, practitioner error was a valid concern with regard to the overall rate of error in fingerprint identifications. 253 In an attempt to prove a rate of practitioner error, Meagher had sent the fingerprints of the defendant in the Mitchell case to fifty-three law enforcement agencies across the United States, along with the defendant's alleged latent fingerprints, and asked the agencies to apply their fingerprint identification techniques to this evidence. 254 The court stated that the results of this survey showed that nine out of thirty-four responding agencies (approximately twenty-six percent) failed to make an identification, citing reasons such as insufficient time, inexperience, and "just screw[ing] up." 255 The court in Llera Plaza I concluded that these results "fall far short of establishing a 'scientific' rate of error" in the Daubert sense. 256

No court had yet defined what an appropriate rate of error for fingerprint practitioners would be under Daubert. However, in past fingerprint cases, courts had concluded that rates of error were sufficiently minute, if they existed at all. 257 As one court noted, the error rate for latent prints is

certainly far lower than the error rate for other types of opinions that courts routinely allow, such as opinions about the diagnosis of a disease, the cause of an accident or disease, whether a fire was accidental or deliberate in origin, or whether a particular industrial facility was the likely source of a contaminant in groundwater. 258

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252. Llera Plaza, 179 F. Supp. 2d at 511.
253. See id. at 512. When questioned by government counsel regarding the practitioner rate of error, Meagher agreed that practitioner error existed, replying, "[s]ure, we're human." Id.
255. Llera Plaza, 179 F. Supp. 2d at 512.
256. Id. at 513. In addition to Meagher's study, the court noted the rate of error for fingerprint examiner proficiency tests. In 1995 forty-four percent of examiners tested could identify all of the fingerprints in the given test. Neufeld & Scheck, supra note 236. In 1998 this number grew to fifty-eight percent. Id.
257. United States v. Havvard, 117 F. Supp. 2d 848, 854-55 (S.D. Ind. 2000), aff'd, 260 F.3d 597 (7th Cir. 2001); see United States v. Reaux, 2001 WL 883221, at *2 (E.D. La. July 31, 2001) (citing the reasoning in Havvard). In Havvard, the court stated there was not a "high known or potential error rate" for fingerprints, and added:

[it]he defense has presented no evidence of error rates, or even of any errors. The government claims the error rate for the method is zero. The claim is breathtaking, but it is qualified by the reasonable concession that an individual examiner can of course make an error in a particular case.

117 F. Supp. 2d at 854.
In addition, several courts have simply not evaluated proffered fingerprint identification testimony by its rates of error because of the perceived reliability of all fingerprint testimony.\textsuperscript{259} Courts have also suggested that although a rate of practitioner error exists, it is mitigated by independent evaluation of the evidence by two different experts during the verification stage of ACE-V.\textsuperscript{260}

While the court in \textit{Llera Plaza I} accepted, arguendo, a low rate of methodological error for fingerprint identification, it found the practitioner rate of error too significant to ensure reliability under \textit{Daubert}.\textsuperscript{261}

d. Controlling Standards

The fourth \textit{Daubert} factor analyzed by the court in \textit{Llera Plaza I} was the controlling standards used by fingerprint technicians. The court divided its analysis in accordance with three subcategories: "Galton point minima," "identifying fingerprints," and "examiner qualifications."\textsuperscript{262} The court concluded that, because no uniform standards exist for any of these criteria, fingerprinting technology lacks controlling standards under \textit{Daubert}.\textsuperscript{263} Examiners may compare any number of Galton points\textsuperscript{264} in reaching their decision about fingerprint identification because no minimum standards exist.\textsuperscript{265} In addition, the decision that two fingerprints are identical is itself a subjective determination.\textsuperscript{266} Furthermore, fingerprint examiners have no certification requirements and no standard certification process.\textsuperscript{267} In fact, many have no formal training other than the training they receive on the job.\textsuperscript{268}


\textsuperscript{261} \textit{Llera Plaza}, 179 F. Supp. 2d at 516.

\textsuperscript{262} Id. at 513-14.

\textsuperscript{263} Id. at 516.

\textsuperscript{264} \textit{See supra} notes 77-80 and accompanying text.

\textsuperscript{265} \textit{Llera Plaza}, 179 F. Supp. 2d at 513.

\textsuperscript{266} Id. at 513-14.

\textsuperscript{267} Id. at 514.

\textsuperscript{268} \textit{See} Coppock, \textit{supra} note 34, at 92. As Coppock notes [m]inimum educational and experience qualifications for the hiring of a fingerprint specialist vary greatly .... The requirement may simply be a high school diploma or GED, driver's license and 21 years of age.... [or a] bachelor's degree, or a minimum amount of experience in a related field of study. Most fingerprint training relies on state and FBI-sponsored programs, as well as on-the-job experience.

\textit{Id.} However, in \textit{Kumho Tire}, the Court reasoned that even a perfume tester, for example, could be deemed qualified by virtue of his experience testing perfumes.
Judge Pollak began with a brief summary of his January 7, 2002 opinion in *Llera Plaza I.* He then discussed his decision to grant the government’s motion for reconsideration of his exclusion of fingerprint testimony. The court acknowledged that the typical reasons for granting a motion for reconsideration—a change in law or in material facts—were not factors in its decision. Instead, the court agreed to reconsider its decision in *Llera Plaza I* because that decision was based on the cold record in the *Mitchell* case. Judge Pollak felt that reconsideration was “prudent” because he had never seen or heard witnesses testify when he ruled on January 7, 2002.


**a. Rate of Error**

Stephen Meagher, an FBI agent who had testified in the *Mitchell* case, testified for the government at the February 2002 hearing. He explained that FBI fingerprint examiners must have a bachelor’s degree and must complete a two-year training program and a three-day certifying examination. Meagher pointed out that, in addition to meeting the FBI’s hiring standards, FBI fingerprint examiners who testify in court must be certified.

In order to gain certification, examiners must pass an annual proficiency test administered by FBI personnel. The test requires examiners to match a series of latent fingerprints with a series of exemplar prints. Meagher testified that from 1995 to 2001 only three identification errors were recorded. None of these errors were “false positives” (the matching of two prints that are not identical); instead, the recorded errors were the result of an examiner’s failure to match two prints that were in fact identical.

Allan Bayle, a defense witness and former fingerprint examiner for New Scotland Yard, asserted that the FBI’s proficiency tests were too easy because the prints used were much clearer than those found at a typical crime scene. He also claimed that the FBI tests contained...
more matching prints than were typical in a criminal investigation. Judge Pollak agreed that "the proficiency tests are less demanding than they should be"; however, he found the tests a sufficient indicator of a low rate of practitioner error for purposes of Daubert because FBI examiners had scored "spectacularly well." Judge Pollak also based his conclusion on the defense's inability to assert evidence to contradict the low rate of practitioner error among FBI fingerprint examiners. While several practitioner errors have been recorded among state and local fingerprint examiners, the FBI's rate of error was effectively zero. While Judge Pollak's January 7, 2002, analysis of practitioner error in Llera Plaza I determined the general error rate among fingerprint examiners to be high, by limiting his analysis to FBI examiners, Judge Pollak found a lower rate of error in his second evaluation of fingerprint evidence in Llera Plaza II.

b. Controlling Standards

In Llera Plaza I, Judge Pollak determined that inadequate controlling standards existed for fingerprint identification techniques based on his analysis of three categories: (1) examiner qualifications; (2) Galton points; and (3) fingerprint identifications. After hearing Stephen Meagher's testimony about the minimum qualifications for FBI fingerprint examiners in Llera Plaza II, Judge Pollak concluded that the examiner qualification standards were sufficiently rigorous. He then discussed the absence of a minimum standard for the number of Galton points required in fingerprint identifications in the United States.

In Llera Plaza II, Judge Pollak placed great emphasis on the recent change in the United Kingdom's fingerprint identification procedures. While the United Kingdom formerly required the

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298. Id.
299. Id. at *13-14.
300. Id. at *14.
301. See id. at *7; supra note 12 and accompanying text (describing criminal convictions based on erroneous fingerprint identification testimony).
302. See supra text accompanying notes 262-63.
303. See supra text accompanying notes 291-92.
304. In an effort to determine the current standards for fingerprint identification testimony in the United Kingdom, Judge Pollak contacted Lord Lester of Herne Hill, "a leading barrister and also a leading public law scholar [and] . . . good friend . . . for some thirty years." Llera Plaza, 2002 WL 389163, at *17 n.9. Judge Pollak reasoned that Lord Lester "seemed the logical person to ask about the current state of English fingerprint jurisprudence." Id. As Judge Pollak further explained, "[w]hat I certainly did not anticipate was that Lord Lester would undertake to enlarge his (and, by extension, my, and, by further extension, counsel's) knowledge base by formally addressing questions to Her Majesty's Government." Id. Judge Pollak concluded, however, that "[t]his is a method of legal research to which I could cheerfully become
evaluation stage that follows this part involves subjective opinion-making.\footnote{Llera Plaza, 179 F. Supp. 2d at 498-99.} After fingerprint examiners analyze and compare prints, they make an evaluation that can take three different forms: (1) "absolutely him"; (2) "absolutely not him"; and (3) "absolutely I don’t know."\footnote{Id. at 500.} Ashbaugh indicated that the evaluation stage is "based on your knowledge and experience and your ability."\footnote{Id. at 499.} The final stage of ACE-V, verification, requires the submission of fingerprints to independent peer-testing, where a different examiner repeats the identification process from analysis to evaluation.\footnote{Id.}

Judge Pollak decided that fingerprints were not able to be "tested" within the meaning of \textit{Daubert}, because no objective criteria existed by which to prove or disprove the conclusion of a given fingerprint examiner.\footnote{Id.} Instead, the decision that two fingerprints matched was, as the experts admitted, a subjective conclusion.\footnote{Id. at 500.} This sort of conclusion did not square with the court’s notion of "scientific evidence." As it pointed out, by quoting Dr. Stoney’s testimony, "there is not an objective standard that has been tested."\footnote{Id. at 507-08.}

\textbf{b. Peer Review}

The second \textit{Daubert} factor considered by the court in \textit{Llera Plaza I} was whether fingerprint identification evidence had been subject to peer review.\footnote{Id. at 516.} Much has been written about fingerprinting techniques and classification over the last century. However, the court concluded that because fingerprint examiners comprised a technical community, rather than a scientific community, fingerprint identification evidence had not been peer reviewed within the meaning of \textit{Daubert}.\footnote{Id. at 508.} The court held that peer review necessitated

\footnote{Id. Some scholars feel the verification stage of ACE-V would operate more effectively if the technician repeating the steps of analysis, comparison, and evaluation is kept away from any information about the case that is not absolutely essential to the fingerprint identification process. \textit{See} D. Michael Risinger, Michael J. Saks, William C. Thompson, & Robert Rosenthal, \textit{The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion}, 90 Cal. L. Rev. 1, 45 (2002). This would prevent any suggestive prejudice from interfering with the verification stage. \textit{See id.} \footnote{See Llera Plaza, 179 F. Supp. 2d at 516.} \footnote{Id. at 507-08.} \footnote{Id. at 508.} \footnote{Id.} \footnote{Id.} \footnote{Id.} \footnote{The court did not explain what it considered to be peer review in the "\textit{Daubert} sense" other than to quote from \textit{Daubert} that "submission to the scrutiny of the scientific community is a component of ‘good science.’" \textit{Id.} (quoting Daubert v. Merrell Dow Pharm., 509 U.S. 579, 593 (1993)).}}
"the scrutiny of the scientific community" rather than that of the technical community of fingerprint examiners.246

However, in Kumho Tire, the Supreme Court had extended the Daubert analysis to an evaluation of technical, or nonscientific, expert testimony. While fingerprint examiners may not qualify as a relevant "scientific" community, they comprise a "technical" community for purposes of peer review and publication.247 Instead of interpreting the "peer review and publication" factor as also applying to a relevant "technical" community, the court maintained that this Daubert factor applied exclusively to an evaluation of a "scientific" community.248

c. Rate of Error

One of the most complicated portions of the court's decision in Llera Plaza I was its discussion of potential rates of error for fingerprint identifications. Judge Pollak began with an examination of the probable rate of methodological error in fingerprint identification.249 While the government argued that the error rate was "not a relevant inquiry,"250 and that methods of fingerprint identification "[do not] have error at all,"251 Judge Pollak seemed dubious. However, the court conceded that the rate of

246. Id. (emphasis added).
248. As the court noted:
Given that Kumho Tire establishes that the Daubert analysis is applicable to "technical" as well as "scientific" knowledge, it may be thought that this court's characterization of the knowledge base of fingerprint examiners as "technical" rather than "scientific" is a semantic distinction which is of no practical consequence. However... the court finds that ACE-V does not [satisfy Daubert's standards].
Llera Plaza, 179 F. Supp. 2d at 516.
249. "Methodological error" refers to any errors resulting from the fingerprint identification techniques alone, without calculating the effect that human error could have on the techniques.
250. Llera Plaza, 179 F. Supp. 2d at 509.
251. Id. at 510. One scholar suggests the weight accorded to the rate of methodological error in fingerprint identification and other technologies by courts stems from the increased reliance on DNA evidence in the courtroom. See Mnookin, supra note 75, at 54-56. Because DNA experts are able to calculate methodological rates of error, courts have come to expect other experts to be able to do the same. Id. However, judges will have difficulty piercing the seemingly impenetrable culture among fingerprint examiners, who as one body rarely admit to making mistakes, to discern the methodological rate of error. Id. As one website maintained by a latent fingerprint examiner claims, "[t]he science of friction ridge identification leaves no room for error when professional guidelines are followed in its application." Ed German, Frequently Asked Questions About Fingerprints, Latent Print Examination, at http://onin.com/fp/lpfaq.html#q1po (last visited Feb. 18, 2002).
France, among other countries, requires examiners to compare a minimum number of detail points, or Galton points, before making an identification.\textsuperscript{269} While the FBI once had a minimum standard, it abandoned it in the 1940s.\textsuperscript{270} Some fingerprint examiners argue that minimum standards would impede the reliability of their conclusions.\textsuperscript{271} It is more likely that minimum standards would limit the number of identifications to which examiners could testify, because the size of some latent prints is so small that examiners could not locate the minimum number of identification points required.\textsuperscript{272} Regardless, this lack of uniformity poses a serious challenge to the forensic community.

e. General Acceptance

The fifth and last factor discussed by the court in \textit{Llera Plaza I} was the \textit{Frye} “general acceptance” standard.\textsuperscript{273} Based on the extensive history of fingerprint evidence admitted under the general acceptance standard in the courtroom, this standard would seem to be the easiest for the government to substantiate. However, while the court in \textit{Llera Plaza I} admitted that ACE-V satisfies this criterion “in significant fashion,” it nonetheless ruled that “[g]eneral acceptance by the fingerprint examiner community does not . . . meet the standard set by Rule 702.”\textsuperscript{274}

As previously discussed, Judge Pollak premised his evaluation of “general acceptance,” as well as peer review and publication, on the determination that fingerprint examiners are not scientists and that fingerprint evaluation techniques are not scientific.\textsuperscript{275} Thus, Judge Pollak reasoned that fingerprint examiners’ techniques will never be “uniformly accepted” under \textit{Daubert}.\textsuperscript{276} Instead, they will remain
accepted only among the “technical” fingerprint examiner community.\textsuperscript{277}

Some might argue that, under \textit{Kumho Tire}, a technique could satisfy \textit{Daubert} by its “general acceptance” among the technical community that uses it. After all, the policy behind the general acceptance standard was that those who develop and use a particular technique are best able to determine its reliability.\textsuperscript{278} However, Judge Pollak ruled that even if fingerprint identification testimony satisfied the general acceptance test, this factor alone was not enough to ensure the reliability of the testimony for purposes of admission at trial.\textsuperscript{279}

Thus, in \textit{Llera Plaza I}, Judge Pollak redefined fingerprint identification evidence as “technical” rather than “scientific” evidence. Although he acknowledged that technical evidence is admissible according to \textit{Daubert} and \textit{Kumho Tire}, he found that ACE-V, the scientific technique used by fingerprint examiners to identify prints, failed at least four of the five \textit{Daubert} standards analyzed.\textsuperscript{280} The court stopped short of excluding all fingerprint evidence.\textsuperscript{281} Instead, it excluded only that portion of the ACE-V analysis that it thought required subjective evaluation on the part of the examiner.\textsuperscript{282}

2. Judge Pollak’s March 13, 2002, Decision To Reverse Himself and To Admit All Proffered Fingerprint Identification Testimony in \textit{Llera Plaza II}

On March 13, 2002, in \textit{Llera Plaza II}, Judge Pollak reversed his previous decision to limit the testimony of the government’s expert fingerprint identification witnesses.\textsuperscript{283} Although the court reiterated that fingerprint identification techniques fail to comprise a science, it acknowledged that these techniques are rooted in science because of the uniqueness and permanency of fingerprints.\textsuperscript{284} In \textit{Llera Plaza II} the court ultimately held that, when viewed “through the [p]rism of \textit{Kumho Tire},”\textsuperscript{285} fingerprint identification techniques are reliable enough to be admitted at trial.

\begin{footnotes}
\item 277. \textit{Id.} at 515-16.
\item 278. \textit{Supra} notes 143-44 and accompanying text.
\item 279. \textit{Llera Plaza}, 179 F. Supp. 2d at 515-16 (“The failure of fingerprint identifications fully to satisfy the [other] … \textit{Daubert} factors militates against heavy reliance on the general acceptance factor.”).
\item 280. \textit{Id.} at 516.
\item 281. \textit{Id.}
\item 282. \textit{Id.} at 516-17.
\item 284. \textit{Id.} at *11.
\item 285. \textit{Id.}
\end{footnotes}
comparison of sixteen Galton points in order to make an identification, this standard was recently abandoned. The United Kingdom now employs the same quantitative/qualitative analysis of fingerprints used in the United States and Canada. The court concluded that "the minimum-Galton-point issue discussed in the January 7 opinion is now moot," because England's abandonment of a minimum standard led the court to believe "there is sufficient uniformity within the principal common law jurisdictions to satisfy Daubert." 

The perceived subjectivity of fingerprint identification techniques had been critical to the court's decision to exclude testimony about the evaluation stage of ACE-V in *Llera Plaza I*. In *Llera Plaza II*, however, Judge Pollak stated "[o]n further reflection, I disagree with myself." Judge Pollak recognized that experts are often permitted to testify to their subjective opinions at trial. To support this assertion, Judge Pollak cited cases involving engineering and market research experts, where "the expert is operating within a vocational framework that may have numerous objective components, but the expert's ultimate opining is likely to depend in some measure on experiential factors."

c. Testing

While Judge Pollak discussed the Daubert criterion of "testing" at length in *Llera Plaza I*, he spent only a few sentences on this topic in *Llera Plaza II*. Despite the presentation of additional testimony regarding the ability of fingerprints to be tested, Judge Pollak remained unconvinced. He found that this criterion was still not met, because neither "adversarial" testing nor the "verification" stage of ACE-V constituted "testing" for purposes of Daubert.

d. Peer Review and General Acceptance

The court also gave short shrift to the topics of peer review and general acceptance in *Llera Plaza II*. Judge Pollak concluded that, while the peer review journals of fingerprint examiners are not scientific journals, they satisfy Daubert because of "the utility of the accustomed." *Id.*

305. Judge Pollak used the results of Lord Lester's questioning of Her Majesty's Government in order to arrive at this knowledge. *Id.* at *17.
306. *Id.* at *17-18.
307. *Id.* at *18.
308. See supra text accompanying note 282.
310. See *id.*
311. *Id.*
312. See supra Part II.B.1.a.
identification procedures employed by fingerprint specialists, whether on the witness stand or at a disaster site."^^\footnote{315}

In addition, while Judge Pollak acknowledged in *Llera Plaza I* that general acceptance was the *Daubert* factor that fingerprint identification techniques satisfied "in significant fashion,"^^\footnote{315} in *Llera Plaza II*, Judge Pollak further stated that

the fingerprint community's "general acceptance" of ACE-V should not be discounted because fingerprint specialists—like accountants, vocational experts, accident-reconstruction experts, appraisers of land or of art, experts in tire failure analysis, or others—have "technical, or other specialized knowledge" (Rule 702), rather than "scientific... knowledge" (id.), and hence are not members of what *Daubert* termed a "scientific community."^^\footnote{316}

In *Llera Plaza II* the court also relied heavily on the treatment of fingerprint identification techniques in the United Kingdom.^^\footnote{317} Judge Pollak wrote extensively about the English origin of fingerprint identification techniques.^^\footnote{318} He concluded that "[t]he ACE-V regime that is sufficiently reliable for an English court is... a regime whose reliability should... be regarded by the federal courts of the United States as satisfying the requirements of Rule 702 as the Supreme Court has explicated that rule in *Daubert* and *Kumho Tire*."^^\footnote{319}

In sum, after reanalyzing the five *Daubert* factors used in *Llera Plaza I*, the court in *Llera Plaza II* concluded that fingerprint identification testimony was sufficiently reliable to be admitted at trial. While the inability of ACE-V to be tested was a concern, it was insufficient to warrant the exclusion of fingerprint identification testimony.^^\footnote{320}

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314. *Id.*

315. *See supra* text accompanying note 274.

316. *Llera Plaza*, 2002 WL 389163, at *12. Despite the court's proper application of *Kumho Tire*, it should be noted that the gravity of the role of "accountants, vocational experts, accident-reconstruction experts, appraisers of land or art, [and] experts in tire failure analysis" in civil cases differs significantly from the role of fingerprint examiners in a death penalty case.

317. In total, the court read approximately two pages of testimony from Lord Lester's questioning of Her Majesty's Government into the record.


319. *Id.* at *21.

320. While Judge Pollak, quoting from a March 9, 2002 OpEd article in the New York Times written by Peter Neufeld and Barry Scheck, recognized that further scientific testing of fingerprint identification techniques is needed, he was "not persuaded that courts should defer admission of testimony with respect to fingerprinting... until academic investigators... have made substantial headway. *Id.* at *20. He concluded that to do so "would be to make the best the enemy of the
III. THE NEED FOR CLARITY IN THE LAW GOVERNING FINGERPRINT IDENTIFICATION EVIDENCE

Confusing and inconsistent standards cloud the history of expert scientific testimony.\(^2\) In Daubert and Kumho Tire, the Supreme Court made an effort to clarify these standards and provide increased certainty to parties.\(^3\) The technology involved in fingerprint identification is simple and straightforward.\(^3\) An application of Daubert standards to this technique should produce consistent results regarding the admissibility of fingerprint evidence. Increased attacks on fingerprint identification testimony, however, coupled with the controversy surrounding the decisions in Llera Plaza I and II, indicate that certainty may be a long way off.

In the two months between Judge Pollak's January 7 decision in Llera Plaza I and his March 13 decision in Llera Plaza II, at least one criminal defendant attempted to use Judge Pollak's reasoning to exclude fingerprint identification testimony in federal court.\(^4\) The attention paid to Llera Plaza I resulted, at least in part, from Judge Pollak's stature as a jurist and a scholar,\(^3\) as well as from his distinction as the first judge to exclude fingerprint identification testimony.\(^3\)

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\(^{2}\) See Saks, supra note 7, at 1128 ("[Forensic evidence admissibility] is riddled with contradiction, confusion and chaos.").

\(^{3}\) See discussion supra Part II.A. However, while a uniform federal standard for admission of expert testimony exists, states continue to follow a number of different rules, including the Frye test. See supra note 21.

\(^{4}\) Unlike other types of forensic evidence, fingerprint comparison techniques require no fancy accoutrements. While the analysis may be aided by computers, it is not dependent on technology, as DNA evidence is.


\(^{25}\) See supra note 191.

\(^{26}\) See supra notes 196-97 and accompanying text; See also Newman, supra note 197 (quoting David L. Grieve, editor of the Journal of Forensic Identification, as forecasting in 1999 that "if the court determines that fingerprint analysis is not a science, other types of forensic examination will surely follow").

More surprising than his ultimate conclusion in Llera Plaza I, was Judge Pollak's unequivocal categorization of fingerprint examiners as "technical" rather than "scientific." United States v. Llera Plaza, 179 F. Supp. 2d 492, 515-16 (E.D. Pa. Jan. 7, 2002), vacated, Cr. No. 98-362-10, 2002 WL 389163 (E.D. Pa. Mar. 13, 2002). James E. Starrs, a professor of law and forensic science at George Washington University, and witness for the defense in United States v. Mitchell, commented, "what's so important is the judge has distinguished what is science from what is not." Gibson, supra note 254. This view of fingerprint examiners is not without its adherents. As one scholar wrote, "[a] vote for science is a vote to exclude fingerprint expert opinions." Saks, supra note 7, at 1106. In his March 13 opinion, Judge Pollak did not retreat from his categorization of fingerprint identification techniques as
Other types of forensic evidence have recently received increased scrutiny. At least one district court judge has excluded proffered handwriting analysis evidence in its entirety, citing the failure of this evidence to pass Daubert's minimum standards. Legal scholars believe increased challenges to ballistics and other types of forensic evidence will likely follow from these decisions. Thus, the need for clarity in the treatment of scientific and technical evidence is a pressing concern.

This part argues for increased clarity in the application of Daubert to fingerprint evidence in criminal cases in light of the court's decisions in Llera Plaza I and II. Few courts have ever seriously questioned the reliability of fingerprint identification testimony. In Llera Plaza I, Judge Pollak applied the five Daubert reliability factors in a much more thorough manner than most, if not all, judges before him. Perhaps the court was more cautious than previous courts because Llera Plaza is a capital murder case. Regardless, Judge Pollak's exacting treatment of fingerprint evidence represents a step in the right direction that should not be overshadowed by his subsequent reversal of himself.

As Llera Plaza I and II show, the application of Daubert to fingerprint identification testimony is difficult, even for a scholar of


328. Newman, supra note 197. Ballistics is defined as "the study of a weapon's firing characteristics, esp. as used in criminal cases to determine... whether a particular gun fired a given bullet." Black's Law Dictionary 138 (7th ed. 1999). Experts fear ballistics will face increased evidentiary challenges because gun barrels change over time, as shots are fired, and thus lack the permanency of fingerprints. See Printing Errors, The Economist, Jan. 19, 2002, at 66.

Other commentators expected Judge Pollak's decision to have little impact on the overall treatment of scientific evidence in the courtroom, even before learning of Judge Pollak's reversal of himself on March 13, 2002. See Newman, supra note 197 (citing Lawrence Brown, executive director of the California District Attorneys' Association as opining that "a single ruling from a federal judge did not mean the demise of fingerprinting"). Since Daubert was decided in 1993, as many as seventeen challenges to fingerprint evidence have been successfully diverted in federal criminal cases. See Latent Print Examination, Legal Challenges to Fingerprints, at http://onin.com/fp/daubert_links.html (last visited Mar. 12, 2002). In addition to federal district court proceedings, the Fourth and Seventh Circuits have also refused to exclude fingerprint evidence as unreliable. Id. (citing United States v. Rogers, No. 01-4455, 2001 U.S. App. LEXIS 27052 (4th Cir. Dec. 20, 2001); United States v. Havvard, 260 F.3d 597 (7th Cir. 2001)).

329. See supra note 153 and accompanying text.

330. See United States v. Cline, No. 00-40024, 2002 WL 436737, at *3 (D. Kan. Feb. 21, 2002) (characterizing the Llera Plaza I decision as "exhaustive and informed"); see also infra note 344 and accompanying text.
Judge Pollak’s magnitude. Courts cannot continue to shirk their duty to apply Daubert, however, simply because fingerprint identification testimony has been accepted in the United States and the United Kingdom for over one hundred years. The court’s decision in Llera Plaza I to limit expert fingerprint identification testimony represents a helpful foundational analysis on which future courts may build when analyzing the admissibility of such evidence. The court’s decision, however, had several gaps in its reasoning.

Because Llera Plaza I was contrary to all previous decisions on fingerprints, Judge Pollak needed to ensure that no such gaps existed. This part argues that the court in Llera Plaza I needed to explain more thoroughly its rationale for excluding testimony that two prints “match” so that other courts less familiar with scientific evidence, or more apprehensive about excluding long-accepted forensic techniques, might gain the confidence to apply Daubert in a similar manner. By applying Daubert correctly, courts will provide individuals with the certainty they deserve from the justice system.

In addition, this part argues that the January 7 Llera Plaza I decision suggests an alternative way for courts to address reliability concerns with expert fingerprint testimony. Judge Pollak’s exclusion of the final evaluation stage of fingerprint expert testimony in Llera Plaza I highlighted an often under-emphasized part of Rule 702.331 The Rule states that “[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness . . . may testify thereto.”332

In Llera Plaza I, Judge Pollak allowed experts to testify to the uniqueness and permanency of prints. He also allowed testimony about the most complicated aspects of fingerprint identification technology—the analysis and comparison stages of ACE-V.333 Undoubtedly, this testimony will help the jury. The one part of expert fingerprint testimony that Judge Pollak excluded, however, was the one thing jurors are able to do on their own—evaluate whether two fingerprints match.334 Thus, while some might find the court’s

331. Few courts spend much time with this section of Rule 702, probably because the entire standard has been interpreted by courts as only requiring general relevance for admissibility. While that may be true, and while the standard for relevance is rather low, this part of Rule 702 may highlight a new avenue for courts to proceed down in their struggle with the reliability of fingerprint identification testimony.
334. See supra text accompanying note 282. If a judge allowed an expert to point out the Galton points on two fingerprints, including the distance between the points, and explained the background of fingerprint analysis, the last step is simply to “match” the prints. If any one point does not match on both prints, the result is “absolutely not him.” See supra text accompanying note 238. Allowing juries to make these matches would increase the caution among parties proffering fingerprint identification testimony. Thus, the evidence brought before the court could enjoy an
reasoning incongruous with the result it reached, its conclusion presents an original way to consider expert fingerprint testimony.

A. The Need for Clarity and Predictability in the Evaluation of Expert Fingerprint Identification Testimony

A fundamental idea in American jurisprudence is that rules of law promote stability. Individuals may rely on a particular law and gain a measure of certainty in their lives as a result. While Daubert applies in both civil and criminal contexts, the threat to individual certainty is most substantial in the criminal context, where life and liberty are at stake. Thus, courts in criminal cases must apply Daubert uniformly to promote certainty.

Certainty, post-Daubert, is somewhat obviated by the judge’s role as gatekeeper. After all, judges now employ broad powers of discretion in how they evaluate the reliability of expert scientific testimony. The Supreme Court has emphasized that Daubert represents a flexible standard and not a rigid mandate. While the gatekeeping function of the court entails an increased license for judicial activism, the Supreme Court’s ultimate goal was the admission of only reliable expert testimony at trial so that juries would not be unduly influenced by “junk” science, and justice would not be perverted by “quackery.” Judge Pollak arguably fulfilled his role as a gatekeeper against unreliable expert testimony in Llera Plaza I. Moreover, his decision in Llera Plaza II did not change the impact on the perception of fingerprint identification testimony which was made by Llera Plaza I.

At least one court has recognized the importance of a complete analysis of fingerprint testimony under Daubert so as to serve as a useful guide to other courts. In United States v. Havward, the defendant, a convicted felon, was charged with firearms possession.

increase in reliability.

335. This concept of jurisprudence is reflected in the works of political theorists, such as H. L. A. Hart, who wrote, “all [legal] systems, in different ways, compromise between two social needs: the need for certain rules... and the need to leave open, for later settlement... issues which can only be properly appreciated and settled when they arise in a concrete case.” H. L. A. Hart, The Concept of Law 130 (2d ed. 1994).

336. See supra text accompanying note 11. Life is at stake in Llera Plaza, the first death penalty trial in the Eastern District of Pennsylvania since the death penalty was restored in the 1980s. Gibson, supra note 254. Perhaps Judge Pollak's careful adherence to the standards set forth in Daubert in his first decision reflects his appreciation for this reality.

337. Supra text accompanying notes 174, 184.


339. Supra text accompanying note 117.

The defendant sought to exclude a latent fingerprint recovered on one of the guns used in the crime. Like Judge Pollak in *Llera Plaza I* and *II*, the court discussed the five factors mentioned in *Daubert*, but concluded that fingerprint identification testimony was sufficiently reliable.

The court issued an opinion "so that other courts might avoid unnecessarily replicating the process of establishing these points as they try to ensure they comply with the Supreme Court's directive to ensure that all types of expert testimony are subject to screening for reliability." Had the court in *Havvard* conducted a detailed analysis of fingerprint identification testimony, its decision might have served as a better model for other courts to follow. The court's application of *Daubert* to the proffered expert fingerprint identification testimony, however, was exceedingly brief—less than two pages in length.

All other federal courts, besides the court in *Llera Plaza I*, that have entertained challenges to fingerprint identification testimony in criminal cases have reached the same conclusion as the court in *Havvard*. The *Havvard* decision has been attacked, however, for not properly applying *Daubert*. As one scholar remarked, *Havvard* represents "[a]n excellent, albeit deeply troubling, example of a court straining scientific credulity for the sake of a venerable forensic science." Despite the fact that Judge Pollak vacated his January 7, 2002 decision in *Llera Plaza I*, perhaps this first decision will serve as the touchstone of a movement away from the over-simplification of the *Daubert* test apparent in *Havvard*. *Havvard* emphasizes the need for other judges ruling against the tide of popular opinion to provide, as the court in *Llera Plaza I* attempted, detailed explanations of their exclusions of long-accepted expert testimony.

While Judge Pollak's reasoning in *Llera Plaza I* was detailed, in order to exclude unreliable evidence while promoting the stability of legal standards, Judge Pollak needed to go one step further so as to

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341. Id. at 851-55.
342. *Id.* at 855.
343. *Id.* at 855.
344. *Id.* at 853-55. The Seventh Circuit, reviewing the district court's decision *de novo*, affirmed its admission of fingerprint identification testimony. United States v. Havvard, 260 F.3d 597 (7th Cir. 2001).
345. David L. Faigman et al., *Legal Standards for the Admissibility of Scientific Evidence (Draft Chapter of Forthcoming Second Edition of Modern Forensic Evidence: The Law and Science of Expert Testimony)* (A.L.I.-A.B.A. Course of Study, April 2001), WL SF78 ALI-ABA 33. In contrast to this criticism of the *Havvard* decision, at least one court has recognized that the *Llera Plaza I* decision "should be applauded to the extent that it encourages empirical testing of the process within more traditional 'scientific' parameters, leads to additional submissions to the relevant body of peer review literature, and possibly fosters the development of uniform standards followed and accepted by all qualified fingerprint examiners." United States v. Cline, No. 00-40024, 2002 WL 436737, at *3 (D. Kan. Feb. 21, 2002).
properly instruct future courts. As the Supreme Court previously provided, the factors listed in *Daubert* are a nonexclusive list.\textsuperscript{346} Instead of applying only the five factors listed in *Daubert* to fingerprint identification testimony,\textsuperscript{347} Judge Pollak would have enhanced his analysis if he had applied some of the other factors of reliability recognized by courts.

As the Amendment Committee for Federal Rule of Evidence 702 noted, "[c]ourts both before and after *Daubert* have found other factors relevant in determining whether expert testimony is sufficiently reliable to be considered by the trier of fact."\textsuperscript{348} Factors considered by other courts include whether the expert: (1) drew an unfounded conclusion from a standard scientific principle; (2) ruled out alternative explanations for his or her results; or (3) gave an opinion using a "field of expertise" generally known to give reliable results.\textsuperscript{349} Although neither the government nor the defendant may have specifically raised these factors in *Llera Plaza I*, an evaluation of fingerprint identification testimony according to these standards would provide a more complete picture of the reliability of this evidence.

In both *Llera Plaza I* and *II* the court determined that fingerprint evaluation testimony was unreliable when analyzed according to factors of "scientific" reliability.\textsuperscript{350} Indeed, Judge Pollak categorized fingerprint examiners and their techniques as "nonscientific."\textsuperscript{351} This determination seems fitting in light of the history of fingerprint identification testimony in American courtrooms.\textsuperscript{352} Yet, because of its categorization as "technical," fingerprint identification testimony deserved to be evaluated using factors that did not focus solely on "scientific" guarantees of reliability.

In *Llera Plaza II*, Judge Pollak recognized the flexibility of *Daubert* when viewed through the "[p]rism of *Kumho Tire.*"\textsuperscript{353} While this recognition remedied the defect in his *Llera Plaza I* analysis of peer review and general acceptance, his second opinion represented an unnecessary step backward in terms of the proper application of *Daubert* to fingerprint identification techniques. Although Judge Pollak abandoned his semantic distinction between scientific and technical expert testimony, in its place he needlessly held that the status of fingerprint identification testimony in the United Kingdom is

\textsuperscript{346} Supra text accompanying notes 173-74.
\textsuperscript{347} Supra text accompanying note 173.
\textsuperscript{348} Fed. R. Evid. 702 amendment committee note.
\textsuperscript{349} Supra note 187.
\textsuperscript{350} See supra text accompanying note 280.
\textsuperscript{351} Supra text accompanying note 275.
\textsuperscript{352} See supra Part I.C.
determinative of the way fingerprints should be treated in the United States.

In *Llera Plaza II*, Judge Pollak discussed the history of fingerprint identification testimony in the United Kingdom and the United States. While such a discussion would have supplemented Judge Pollak's reasoning in *Llera Plaza I*, in his second decision it represented an effort to highlight the importance of the English treatment of fingerprint identification testimony. In addition, Judge Pollak solicited information about England's "fingerprint jurisprudence" from his friend Lord Lester of Herne Hill. The uniformity of fingerprinting techniques among common law jurisdictions, however, should not be a determinative factor of reliability under *Daubert*. In addition, Judge Pollak failed to recognize that, while England may also use the ACE-V technique for fingerprint identification, English courts are not bound by Rule 702, *Daubert* or *Kumho Tire*.

As one scholar, quoted by Judge Pollak in *Llera Plaza I*, commented, "[i]t takes a lot for a judge to reverse himself." Judge Pollak himself acknowledged that "[m]otions for reconsideration are not favorites of the law," because they undermine the finality of legal decisions. Perhaps Judge Pollak's ruling in *Llera Plaza II* was a result of the barrage of media attention that followed his first decision. Indeed, Judge Pollak's mention in *Llera Plaza II* of a recent New York Times article discussing the *Llera Plaza I* decision shows his awareness of the media scrutiny. Judge Pollak may have also been influenced by the possibility of a pre-trial appeal of *Llera Plaza I*. Such an appeal, according to one commentator, would have resulted in the dismissal of the jury pool that had been selected for the *Llera Plaza* case over a six month period.

Regardless of any outside pressure he may have felt, Judge Pollak's decision in *Llera Plaza II* harkens back to the *Jennings* era, when courts admitted fingerprint identification testimony because it had been "in such general and common use that the courts [could] not refuse to take judicial cognizance of it." The court in *Jennings* had also cited English practices when reaching its conclusion. While Judge Pollak briefly discussed the *Daubert* factors of reliability, he

354. See supra note 318 and accompanying text.
355. See supra note 304 and accompanying text.
358. *Id.* at *19.
360. See supra text accompanying note 133.
361. See supra notes 128-29 and accompanying text.
seemed to base his holding, like *Jennings*, on the conformity of American fingerprint identification techniques with those of England. Although Judge Pollak stated that a complete exclusion of fingerprints would be "unwarrantably heavy-handed," the logical result of his *Llera Plaza I* reasoning regarding the subjectivity of fingerprint techniques would be the complete exclusion of all fingerprint identification testimony. This is because the subjective identification of fingerprints by experts occurs at every stage of fingerprint analysis. When looking for "red flags," the expert is making a subjective determination. When comparing the overall pattern of fingerprints in the comparison stage, the expert is making a subjective determination. When evaluating whether two fingerprints match, the examiner is making a no less subjective determination.

The logical result of the court's analysis in *Llera Plaza II* is also the total exclusion of fingerprint identification testimony. As some scholars have noted, "[a] judge who takes *Daubert*'s commands seriously would be hard pressed to write a coherent opinion justifying a decision to admit [fingerprint identification testimony]." Judge Pollak held that fingerprints cannot be tested within the meaning of *Daubert*. In addition, the court determined that, while no controlling standards existed in the comparison stage of ACE-V, such standards did not matter in light of the United Kingdom's adoption of the quantitative/qualitative method of fingerprint comparison. Such a conclusion is not supported by the Supreme Court's rulings in *Daubert* or *Kumho Tire*. Thus, fingerprint identification testimony did not fully satisfy either controlling standards or testing, both *Daubert* factors, even when viewing this evidence through the "prism" of *Kumho Tire*. Had the court in *Llera Plaza II* properly considered the reliability of fingerprint identification techniques, it would have reached the same conclusion to exclude this evidence as it had in *Llera Plaza I*.\[369\]

\[363.\] *Supra* text accompanying notes 229-30.
\[364.\] *Supra* notes 231-37 and accompanying text.
\[365.\] *Supra* text accompanying note 238.
\[367.\] See *supra* text accompanying note 313.
\[368.\] See *supra* text accompanying note 306.
\[369.\] In *Llera Plaza II*, the court's evaluation of *Daubert*'s "rate of error" factor was also questionable. While Judge Pollak stated that the proficiency tests administered by the FBI were "less demanding than they should be," he concluded that the error rate factor had been satisfied, because "the defense witnesses offered not a syllable to suggest that certified FBI fingerprint examiners as a group, or any individual examiners among them, have not achieved at least an *acceptable* level of competence." United States v. Llera Plaza, Cr. No. 98-362-10, 2002 WL 389163, at *14
Yet, while judges encounter difficulties when analyzing fingerprint identification testimony according to federal standards for admissibility, fingerprints themselves are recognized as valuable scientific evidence. Fingerprints are regarded as "[t]he bedrock forensic identifier of the 20th century."\(^{370}\) In both \textit{Llera Plaza I} and \textit{II}, the court's first stage of analysis for fingerprint identification purposes was the recognition of the uniqueness and permanency of prints.\(^{371}\) Although science provides us with no absolutes,\(^{372}\) judges and scientists alike seem to accept without qualification these two basic tenets of fingerprints that make them useful for identification purposes.\(^{373}\) Judge Pollak also recognized the value of fingerprints as evidence. Thus, while he seriously questioned the reliability of fingerprint identification testimony, Judge Pollak refused to totally exclude this evidence in either \textit{Llera Plaza} decision.

The tension between the need to limit unreliable comparisons of fingerprints with the desire to admit testimony regarding the special capacities of fingerprints as evidence is clearly illustrated in \textit{Llera Plaza I} and \textit{II}. Future courts evaluating fingerprint identification testimony must learn to balance competing considerations of exclusion and admission in order to avoid unjust results.

\section*{B. Taking the “E” out of “ACE-V”: Leaving the Evaluation of Fingerprint Identification to the Jury}

While the reasoning in Judge Pollak's \textit{Llera Plaza I} decision may fail to provide judges or adversaries with total clarity about the \textit{Daubert} standard for fingerprint identification testimony, his ultimate conclusion is invaluable. Rule 702 "recognizes that an expert on the stand may give a dissertation or exposition of scientific or other principles relevant to the case, leaving the trier of fact to apply them to the facts."\(^{374}\) Although based on different grounds, Judge Pollak's conclusion that fingerprint examiners could testify to the first two steps of fingerprint identification under the ACE-V process, analysis and comparison, provides a better prescription for reliability than

(E.D. Pa. Mar. 13, 2002). However, as Rob Epstein, a defense attorney in the \textit{Mitchell} case stated, "[t]he burden of the defense to show that the error rate is unacceptably low. It's the government's [burden] to show that the rate is acceptably low." Newman, \textit{supra} note 199; see Fed. R. Evid. 702 amendment committee note (indicating that the proponent of the evidence bears the burden of satisfying Rule 702's admissibility criteria).

\(^{370}\) Neufeld & Scheck, \textit{supra} note 236.

\(^{371}\) This is usually the first stage of a court's analysis when evaluating expert fingerprint identification testimony post-\textit{Daubert}. For example, see the decisions in \textit{Llera Plaza}, \textit{Mitchell}, and \textit{Havvard}.

\(^{372}\) \textit{See supra} note 4 and accompanying text.

\(^{373}\) \textit{See supra} note 82 and accompanying text.

\(^{374}\) Fed. R. Evid. 702 amendment committee note.
excluding or admitting all fingerprint testimony in a wholesale manner.

As the testimony of several expert witnesses revealed, and as the history of fingerprint identification has shown, the ultimate determination of whether two fingerprints are identical is not one that involves advanced or special technology.\(^\text{375}\) No computer can make this identification; moreover, no tool is used other than the human mind.\(^\text{376}\) As one scholar noted

\[\text{[t]here is no more certain test for determining when experts may be used than the common sense inquiry whether the untrained layman would be qualified to determine intelligently and to the best possible degree the particular issue without enlightenment from those having a specialized understanding of the subject involved in the dispute.}\(^\text{377}\)

The evaluation stage of fingerprint identification clearly shows that, once the proper identification points are located on each print, the final determination is one that any lay individual is capable of making.\(^\text{378}\) While special training or experience could perhaps help the human mind make this ultimate determination more quickly, it is unlikely to help the mind see a match more clearly than any other person could.\(^\text{379}\)

 Granted, the ultimate evaluation of whether two fingerprints match is certainly more persuasive if delivered by an expert fingerprint examiner; however, this testimony ultimately "is adding nothing that could not be supplied by attorneys in the way of argument."\(^\text{380}\) Thus, Judge Pollak could have properly excluded the evaluation section of a fingerprint examiner’s expert testimony regardless of its perceived reliability.

If expert fingerprint identification testimony is strictly limited to that testimony which would truly assist the trier of fact, both advocates and judges would be better off. Time-consuming Daubert hearings could be limited in scope, as could the costly "battle of the experts,"\(^\text{381}\) if fingerprint identification testimony was limited to the

\(\text{375. See supra Part I.B.1.}\)
\(\text{376. See Ashbaugh, supra note 228, at 104-08 (discussing the mental process involved in fingerprint comparisons).}\)
\(\text{378. See supra text accompanying note 238.}\)
\(\text{379. Various training programs for fingerprint examiners exist, including several offered by the FBI. See, e.g., Latent Fingerprint Examination, Upcoming Training Courses, at http://www.onin.com/fp/wwwbd/messages/3/3.html (last visited Mar. 3, 2002). While these programs teach techniques such as location of Galton points and how to detect “red flags,” they provide no specific training to increase powers of observation.}\)
analysis and comparison stages and the evaluation stage is left to the jury. In federal criminal trials, these benefits would follow from the resulting need of prosecutors to use more caution in seeking to introduce expert fingerprint identification.

Increased challenges to scientific evidence such as fingerprint evidence demonstrate that major changes are ahead.\textsuperscript{382} If the reasoning from Judge Pollak's opinions in \textit{Llera Plaza} is used by other courts, the possibility of total exclusion of expert fingerprint testimony remains. In addition, \textit{Llera Plaza II} narrowly addressed the reliability of FBI fingerprint examiners.\textsuperscript{383} Thus, in cases involving state and local expert witnesses, advocates may use the reasoning of either \textit{Llera Plaza I} or \textit{II} in arguing against the admission of fingerprint identification testimony.

Prosecutors who attempt to identify perpetrators by the testimony of fingerprint examiners using poor quality latent prints risk having all fingerprint evidence excluded in the future. In both \textit{Llera Plaza} decisions, Judge Pollak retained, during the course of the trial, the gatekeeping power to exclude testimony about individual fingerprints whose quality was deemed, in his opinion, too poor for the proper application of ACE-V. For the forensic community to stem the tide of challenges and regain a measure of certainty in its use of scientific evidence in the courtroom, courts should at least allow jury evaluations of evidence such as fingerprint evidence. Overall, this option presents a better outcome than the looming alternative—total exclusion.

**CONCLUSION**

While fingerprints may be objectively unique and permanent, subjectivity is introduced when experts testify about the identification of fingerprints. Under \textit{Daubert v. Merrell Dow Pharmaceuticals, Inc.}, fingerprint identification testimony has been routinely accepted as reliable; however, change is afoot. On January 7, 2002, the court in \textit{United States v. Llera Plaza} considered this evidence unreliable because of the nonscientific nature of fingerprint identification techniques, and the subjective qualities of fingerprint identification itself.

Judges who apply \textit{Daubert} to exclude long-accepted scientific techniques like fingerprint identification need to carefully explain their reasoning. Not only will this ensure the proper application of \textit{Daubert}, but it will also aid in the establishment of reliable decisions to guide other courts in the future. In this respect, the vagueness in

\textsuperscript{382} See supra note 328 and accompanying text.

certain areas of the reasoning in both *Llera Plaza I* and *II* is cause for concern as to how subsequent courts will interpret these decisions in their own analyses of fingerprint evidence. Nevertheless, Judge Pollak’s decision to limit fingerprint testimony in *Llera Plaza I* leaves open the appealing possibility that triers of fact can be trusted to evaluate fingerprints and decide if they are identical.