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Tribute to Professor Paul Giannelli

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Edward J. Imwinkelried[†]

PROFESSOR PAUL GIANNELLI, (ALMOST) A HALF-CENTURY
LATER: THE “DEAN” OF THIS ERA’S SCIENTIFIC
EVIDENCE SCHOLARS

Law and science are different domains, but they intersect in the courtroom. Over the years in a growing number of cases, litigants have offered scientific or other expert testimony in court. A Rand Corporation study found that parties tendered expert testimony in 86 percent of the trials and that, on average, there were 3.3 experts per trial.¹ A later research project found that the average had increased to 4.3 experts per trial.²

In the early decades of the twentieth century, legal scholars paid little attention to the gradually increasing reliance on expert testimony. One notable exception was Dean Henry Wigmore. In several of his texts, he addressed the admissibility of expert opinion testimony.³ In particular, he was intrigued by such topics as lie detection,⁴ blood tests,⁵ and psychological analysis.⁶ With the notable exception of Dean Wigmore, though, most members of the legal academy of that era, including Evidence professors, ignored the topic of expert testimony. To be sure, there were a few useful texts on scientific testimony.⁷

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1. Samuel R. Gross, *Expert Evidence*, 1991 WIS. L. REV. 1113, 1119 (1991).
2. RONALD J. ALLEN ET AL., *EVIDENCE: TEXT, PROBLEMS, AND CASES* 649 (6th ed. 2011).
3. *E.g.*, 2 J. WIGMORE, *EVIDENCE IN TRIALS AT COMMON LAW* § 417a (3d ed. 1940); 3 J. WIGMORE, *EVIDENCE* § 795 (Chadbourn rev. 1970); J. WIGMORE, *SCIENCE OF JUDICIAL PROOF* § 220 (3d ed. 1937).
4. 3A J. WIGMORE, *supra* note 3, § 999.
5. 2 J. WIGMORE, *supra* note 3, § 662(c) (Chadbourn rev. 1979).
6. 3A J. WIGMORE, *supra* note 4, § 990.
7. *E.g.*, A. MOENSSENS & F. INBAU, *SCIENTIFIC EVIDENCE IN CRIMINAL CASES* (1973); JAMES R. RICHARDSON, *MODERN SCIENTIFIC EVIDENCE: CIVIL AND CRIMINAL* (1961).

However, many of those texts were largely descriptive. They reviewed the science and surveyed the case law but, in most cases, stopped short of critically evaluating either the empirical data or the case law.

Developments in the 1960s forced that attitude to change. During that period, the Warren Court rendered a number of landmark constitutional criminal procedure decisions that curtailed the ability of the prosecution to introduce testimony about the products of pretrial searches, interrogations, and lineups conducted by the police.⁸ In effect, these decisions created “gaps” in prosecution cases.⁹ To fill those gaps, prosecutors turned to forensic science.¹⁰ Even if the Fifth or Sixth Amendment precluded the prosecution from using the accused’s confession to prove his presence at the crime scene, the prosecution could use a scientific analysis of physical evidence found at the crime scene to do so. That development was the primary reason why in 1968 Congress created the Law Enforcement Assistance Administration (“LEAA”) and appropriated millions of dollars to fund research into developing cutting edge forensic techniques.¹¹

These developments in the 1960s cried out for more intense scrutiny of the use of science in court. Professor Giannelli would soon undertake the task. Professor Giannelli graduated from the University of Virginia School of Law in 1970. From 1972 to 1973, he served as a Fellow in the Forensic Medicine Program at the Armed Forces Institute of Pathology. In 1973, he earned his Master of Science in Forensic Science from George Washington University. Later that year he joined the Criminal Law Division of the Army’s Judge Advocate General’s School at the University of Virginia. He immediately began teaching and writing about expert testimony. That subject emerged as the focal point of his scholarship when he became a member of the Case Western Reserve University School of Law faculty in 1975. Over the next five decades he would distinguish himself as one of the premier scientific evidence

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8. JAMES W. OSTERBURG, *Forensic Science and the United States Supreme Court: The Impact and Significance of Past Decisions*, in LEGAL MEDICINE ANNUAL 1 (C. Wecht ed. 1972) (discussing the Supreme Court’s *Miranda*, *Gideon*, and *Escobedo* decisions).
 9. Wilkaan Fong, *Criminalistics and the Prosecutor*, in THE PROSECUTOR’S DESKBOOK 547 (P. Healy & J. Manak eds. 1971).
 10. *Worley v. State*, 263 So. 2d 613, 616 (Fla. Dist. Ct. App. 1972) (Mager, J., concurring) (“In this day and age . . . where recent decisions of the United States Supreme Court establish stringent guidelines in the investigative, custodial and prosecutorial areas a premium is placed upon the development and use of scientific methods of crime detection.”).
 11. Omnibus Crime Control and Safe Streets Act of 1968, Pub. L. No. 90-351, 82 Stat. 197. The provision creating the LEAA was part of the Omnibus Crime Control and Safe Streets Act of 1968.

scholars in the United States—the “dean” of the academics writing in this area.

THE 1970S

In 1923, the Court of Appeals for the District of Columbia handed down its decision in *Frye v. United States*.¹² In *Frye*, the defense offered testimony about a systolic blood pressure test—a predecessor to the modern polygraph.¹³ The theory underlying the test was that if a subject engaged in a conscious attempt to deceive, the attempt would affect his or her blood pressure. According to the theory, by carefully monitoring the subject’s blood pressure during an interrogation, the analyst could determine whether the subject was being untruthful. In *Frye*, the defense called an expert prepared to testify that in a systolic blood pressure test, Frye had truthfully denied committing the charged crime. The trial judge excluded the evidence, and the appellate court affirmed.¹⁴ In the most famous passage in the American law of expert testimony, the court declared:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while the courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.¹⁵

Applying that test, the court affirmed the trial judge’s ruling. The court found that the defense had not established that the blood pressure test enjoyed widespread acceptance in the pertinent fields—namely, psychology and physiology.¹⁶

As the years passed and expert testimony was offered more frequently in court, more and more courts adopted the *Frye* test. By the early 1970s, it had become the governing law in both federal

12. 293 F. 1013 (D.C. Cir. 1923).

13. *Id.* at 1013.

14. *Id.* at 1014.

15. *Id.*

16. *Id.*

practice and forty-five states.¹⁷ Since expert testimony was relatively rare until the developments in the 1960s and early 1970s, it was understandable that the early cases embraced *Frye* rather facilely. However, once the judicial system became increasingly reliant on scientific evidence, it was imperative to evaluate *Frye* more closely.

Professor Giannelli met that need with his masterful *Columbia Law Review* article, “*The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later.*”¹⁸ Written in the late 1970s, the article was released in 1980. The article represented the first, in depth analysis of *Frye*. Early in the article, Professor Giannelli made the point that although *Frye* had become the overwhelming majority view in the United States, the opinion itself neither cited authority nor advanced a policy argument for the general acceptance test.¹⁹ The “rationale” for the test developed as post hoc rationalization by later courts that adopted the test.²⁰ Professor Giannelli next noted that even in those later decisions, the court’s analysis tended to be generalized and conclusory. Professor Giannelli then articulated the nuanced, detailed analysis that, to date, neither the courts nor other commentators had provided.

In his analysis, he initially dissected the test to identify the sub-issues: Who must accept the technique? How should the judge identify the scientific fields to which the technique “belonged”?²¹ What did “general acceptance” mean? How widespread did the acceptance have to be?²² Precisely what had to be accepted—only the abstract, underlying theory or also the more concrete technique implementing the theory?²³ What methods could the proponent use to prove general acceptance in the pertinent fields—expert testimony, a literature review, or other judicial opinions?²⁴ And, fundamentally, what types of testimony constituted “scientific” evidence subject to the test?²⁵ Professor Giannelli not only sorted out these discrete sub-issues, he also compre-

17. Betty R. Steingass, Note, *Changing the Standard for the Admissibility of Novel Scientific Evidence: State v. Williams*, 40 OHIO ST. L.J. 757, 769 (1979).

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

19. *Id.* at 1205.

20. *Id.* at 1206.

21. *Id.* at 1208–10.

22. *Id.* at 1210–11.

23. *Id.* at 1211–15.

24. *Id.* at 1215–19.

25. *Id.* at 1219–23.

hensively reviewed the case law on each sub-issue and demonstrated the confusion among the lower courts. After the comprehensive review, Professor Giannelli addressed the policy impact of the state of the law. He convincingly demonstrated that while *Frye* sometimes permitted the admission of unreliable evidence, in other instances it resulted in the exclusion of highly reliable testimony that would have materially advanced a judicial inquiry.²⁶

At the end of the article, Professor Giannelli called on the courts to abandon the *Frye* test.²⁷ He noted that the Federal Rules of Evidence had taken effect a few years earlier in 1975. He outlined a statutory construction argument that the enactment of the Rules had impliedly superseded *Frye*.²⁸ He highlighted Federal Rule of Evidence 402, which then read “[a]ll relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or other rules prescribed by the Supreme Court pursuant to statutory authority”²⁹ such as the Federal Rules of Civil and Criminal Procedure. *Frye* was a creature of case, and there did not seem to be any statutory language that could reasonably bear the interpretation that it codified a general acceptance test.

The article became an instant classic. To this date, it remains the finest analysis of *Frye* ever published.³⁰ It is the most cited article on the subject of the *Frye* test. On one occasion or another, every contemporary scientific evidence scholar has cited the article. It is a “must” read for anyone interested in seriously studying the *Frye* general acceptance test.

The article not only filled a void in the doctrinal analysis of expert testimony. Perhaps even more importantly, it created a template for later expert testimony scholarship. The article was a model for scholarship on this subject. First, the article included a thorough, painstaking review of the case law on general acceptance test. The footnotes contain voluminous citations. Second, the article contained a policy-oriented

26. *Id.* at 1223–28.

27. *Id.* at 1250.

28. *Id.* at 1230.

29. *Id.* Restyled Rule 402 reads: [R]elevant evidence is admissible unless any of the following provides otherwise: the United States Constitution; a federal statute; these rules; or other rules prescribed by the Supreme Court. FED. R. EVID. 402. Restyled Rule 101(b)(5) clarified the last phrase in Rule 402: “In these rules . . . a ‘rule prescribed by the Supreme Court’ means a rule adopted by the Supreme Court under statutory authority.” FED. R. EVID. 101(b)(5).

30. Professor Giannelli’s *Columbia Law Review* piece is the very first article excerpted in the scientific evidence section of EDWARD J. IMWINKELRIED & GLEN WEISSENER, AN EVIDENCE ANTHOLOGY 87 (1996).

critical evaluation of the test. From the outset, the article developed the theme that if expert testimony is to enhance the integrity of judicial fact-finding, the testimony admitted must be reliable.³¹ In analyzing the sub-issues, Professor Giannelli explained how the courts' various, often conflicting positions on the sub-issues either increased or decreased the probability that the evidence admitted was empirically reliable. Thirdly, Professor Giannelli was not content to rely on "common sense" speculation about the impact of expert testimony, instead using a methodology now commonplace in first-rank scholarship on this subject; he marshaled empirical studies such as investigations of jurors' ability to comprehend certain species of expert testimony.³² To this day Professor Giannelli's article serves as a model for outstanding analyses of scientific evidence issues. The best contemporary treatments of the subject display the same three characteristics as Professor Giannelli's landmark article. And we shall soon see that, to a striking degree, the analysis in the article presaged the Supreme Court's reasoning in its celebrated 1993 *Daubert v. Merrell Dow Pharmaceuticals*³³ decision.

THE 1980S

After writing his seminal *Columbia Law Review* article in the late 1970s, Professor Giannelli undertook an even more ambitious task in the 1980s. Early in the decade he decided to author a text on scientific evidence. He completed that project and released the first edition in 1986.³⁴

The early chapters in the text expanded on the legal analysis he had presented in the *Columbia Law Review* article. For example, Chapter 1 was devoted to the *Frye* test and the competing approaches to determine the admissibility of scientific testimony.

However, Professor Giannelli realized that if judges and attorneys were to make more discerning judgments about the reliability of expert testimony, they needed to learn more about the science. The first edition therefore included chapters devoted to such varied subjects as neutron activation analysis, polygraphy, hypnosis, and psychological testimony about battered woman syndrome.³⁵ Reviewing the research related to that wide array of topics was a mammoth challenge. In each chapter, Professor Giannelli not only described the current state of the

31. Giannelli, *supra* note 18, at 1200, 1207, 1245.

32. *Id.* at 1240.

33. 509 U.S. 579 (1993); *see infra* notes 37–57 and accompanying text.

34. PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, SCIENTIFIC EVIDENCE (1986).

35. *See generally id.*

art within the discipline. In addition, he summarized the most trenchant criticisms of the discipline.

The first edition of the treatise reviewed the current state of the most popular forensic techniques, and in some sections, the treatise also forecast important developments in forensic science. When the first edition was released, no American court had yet passed on the admissibility of DNA typing. American laboratories were just beginning to explore the possibility of importing the forensic techniques developed in the United Kingdom. The first edition was prophetic about the importance of the advent of DNA typing: “The genetic laboratories now researching DNA may ultimately advance genetic marker analysis far beyond the status.”³⁶

Just as it played a role in introducing some new scientific developments to the legal community, Professor Giannelli’s treatise would play a role in the Supreme Court’s later rendition of the *Daubert* decision in the 1990s. The Court would cite the treatise in its opinion,³⁷ and Professor Giannelli would be instrumental in drafting the plaintiff’s briefs that persuaded the Court to abandon *Frye* and announce a new reliability-validation test for the admissibility of scientific testimony.

THE 1990s

As previously stated, the Federal Rules of Evidence took effect in 1975. As Professor Giannelli had explained, there was a strong statutory construction argument that the enactment of the Rules impliedly overturned the general acceptance test. The lower federal courts were badly divided over that statutory construction issue.³⁸ That division of sentiment set the stage for a Supreme Court decision to resolve the split of authority. In 1992 the Court granted certiorari in *Daubert*, which squarely posed the question of whether *Frye* was still good law in federal practice.³⁹

As soon as it was clear that the Court had taken the *Daubert* case, the plaintiffs’ attorneys contacted Professor Giannelli and asked him to consult on their briefs. It is true that Professor Giannelli’s name does not appear on the briefs. There were two tactical reasons for that. First, the plaintiffs’ counsel had already decided to rely on Professor

36. *Id.* § 17-8(E); EDWARD J. IMWINKELRIED, DNA AND THE CRIMINAL JUSTICE SYSTEM: THE RELATIVE PRIORITY THAT SHOULD BE ASSIGNED TO TRIAL STAGE DNA ISSUES 91 (David Lazer, ed. 2004).

37. *Daubert*, 509 U.S. at 585 n.3, 587 n.5.

38. See PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, SCIENTIFIC EVIDENCE §§ 1-5-6 (4th ed. 2007).

39. Edward J. Imwinkelried, *The Daubert Decision: Frye Is Dead, Long Live the Federal Rules of Evidence*, TRIAL, Sept. 1993, at 60, 61.

Giannelli's treatise as authority. The counsel decided that the references to the treatise would carry more weight if Professor Giannelli did not assume a clearly adversary role in the litigation. Second, by this time Professor Giannelli's writings on the subject were voluminous. The plaintiffs' counsel feared that if Professor Giannelli were a named counsel, the defense would scour his writings to find any passage at all inconsistent with the contents of the plaintiffs' briefs.⁴⁰ In any event, although Professor Giannelli was not designated as counsel, he was instrumental in drafting the briefs.

In 1993, the Court released its opinion.⁴¹ The opinion bears the imprint of Professor Giannelli's scholarship.⁴² At one point, Justice Blackmun cites Professor Giannelli's *Columbia* article.⁴³ There are also two citations to Professor Giannelli's treatise, the first appearing in footnote 3. The first two footnotes merely recite the background of the plaintiffs' and defense expert witnesses. Footnote 3 is the first to invoke any legal authority, and the very first authority cited is Professor Giannelli's treatise.

Professor Giannelli's imprint on the opinion is more than citation deep. To a striking degree, the analysis in his *Columbia* article anticipated Justice Blackmun's reasoning in *Daubert*.

The Justice's first ruling in *Daubert* was that after the enactment of the Federal Rules, *Frye* was no longer good law.⁴⁴ He based that ruling on statutory construction. As previously stated, in his article Professor Giannelli sketched a statutory interpretation argument for abandoning *Frye*.⁴⁵ More specifically, he had contended that Federal Rule 402 could be construed as abolishing uncodified, case law restrictions such as *Frye*.⁴⁶ Justice Blackmun premised his ruling on an identical interpretation of Rule 402.⁴⁷

The Justice's second ruling was that the reference to "scientific . . . knowledge" in Rule 702 ought to be construed as supplanting *Frye* with a new reliability-validation test. According to

40. An amicus supporting Merrell Dow selected as its counsel an Evidence professor who had written an article that lent support to the petitioners' position. Needless to say, the petitioners made that point in their rebuttal brief in the case.

41. *Daubert*, 509 U.S. at 579.

42. Fittingly, Professor Giannelli was chosen to write the article about *Daubert* in EVIDENCE STORIES 181–206 (R. Lempert ed. 2006).

43. *Daubert*, 509 U.S. at 586 n.4.

44. *Id.* at 585–89.

45. Giannelli, *supra* note 18, at 1230.

46. *Id.*

47. *Daubert*, 509 U.S. at 587–88.

Justice Blackmun, under Rule 702 the trial judge has a “gatekeeping” responsibility to ensure that “any and all scientific testimony or evidence admitted is . . . reliable.”⁴⁸ Thirteen years earlier, Professor Giannelli had written that “[f]or [scientific] evidence to contribute to the truth-determining function of a trial, it must be reliable.”⁴⁹ The Justice added that the reliability of a theory depends on its scientific validity.⁵⁰ Earlier, Professor Giannelli had written that a scientific technique cannot be considered reliable unless it is valid.⁵¹ In the Justice’s view, to be valid, a scientific theory must be empirically testable “and . . . [in fact] tested.”⁵² A theory is reliable only if it is “supported by [adequate empirical] validation . . .”⁵³ Professor Giannelli’s article had asserted that “[e]mpirical validation should be recognized as” a “method of establishing the reliability of a [scientific] technique;”⁵⁴ the technique should be “validated empirically.”⁵⁵ Later in its 1997 decision in *General Electric Co. v. Joiner*,⁵⁶ the Supreme Court expanded on *Daubert*; *Joiner* declared that in assessing whether a particular empirical study sufficiently validates a theory or technique, the trial judge must evaluate the propriety of the extrapolation from the data in the study to the facts of the pending case.⁵⁷ Professor Giannelli anticipated even that later modification to the *Daubert* test in his article.⁵⁸

Professor Giannelli was not only prescient about the substance of the *Daubert*’s reliability-validation test; he also anticipated Justice Blackmun’s procedural prescriptions for administering the new test. In *Daubert*, the Justice announced that the proponent of the evidence would have the burden of proof on the issue of reliability.⁵⁹ In his article, Professor Giannelli had reached the same conclusion as to the proper allocation of the burden.⁶⁰ Justice Blackmun specified that in deciding

48. *Id.* at 589.

49. Giannelli, *supra* note 18, at 1200; *see also id.* at 1207, 1245.

50. *Daubert*, 509 U.S. at 590.

51. Giannelli, *supra* note 18, at 1202.

52. *Daubert*, 509 U.S. at 593.

53. *Id.* at 590.

54. Giannelli, *supra* note 18, at 1213.

55. *Id.* at 1227.

56. 522 U.S. 136 (1997).

57. *See id.* at 146.

58. *See* Giannelli, *supra* note 18, at 1213.

59. *See* *Daubert*, 509 U.S. at 592.

60. *See* Giannelli, *supra* note 18, at 1247.

whether the proponent's foundational testimony satisfied the burden, the trial judge should follow the preliminary fact-finding procedures codified in Federal Rule 104(a).⁶¹ Thirteen years earlier, Professor Giannelli had likewise stated that it would be sensible to require a trial judge passing on the admissibility of scientific testimony to follow Rule 104(a).⁶²

When the dust settled at the end of the *Daubert* litigation, in many respects the Supreme Court had moved the law of expert testimony in the direction that Professor Giannelli had urged over a decade earlier.

THE 2000S

As forensic science entered a new decade in the 2000s, the scholarly debates over the reliability of several forensic disciplines intensified.⁶³ In a growing number of cases, defense counsel were mounting attacks on types of forensic testimony, such as document examination⁶⁴ and firearms identification,⁶⁵ that had been admitted routinely under the *Frye* standard. To better equip federal judges to evaluate these challenges, the Federal Judicial Center, in conjunction with the National

-
61. *Daubert*, 509 U.S. at 592. Restyled Federal Rule of Evidence 104(a) now reads: "In General. The court must decide any preliminary question about whether a witness is qualified, a privilege exists, or evidence is admissible. In so deciding, the court is not bound by evidence rules, except those on privilege." FED. R. EVID. 104(a). When Rule 104(a) governs, the judge serves as a factfinder. Rule 104(b) prescribes the procedure for deciding such preliminary facts as whether a lay witness has personal knowledge under Federal Rule 602 or whether an exhibit is authentic under Rule 901. When 104(b) controls, the judge has a much more limited, screening rule. Restyled Federal Rule of Evidence 104(b) provides: "Relevance That Depends on a Fact. When the relevance of evidence depends on whether a fact exists, proof must be introduced sufficient to support a finding that the fact does exist." FED. R. EVID. 104(b). Thus, the judge does not decide whether the fact exists, as the judge does under 104(a). Instead, the judge inquires only whether the proponent's foundational testimony has sufficient probative value to permit the trier of fact to rationally conclude that the fact exists.
62. Giannelli, *supra* note 18, at 1247.
63. See Mark Hansen, *John Hancock*, 83 A.B.A. J. 76 (1997) (describing the questioning of handwriting analysis). Compare D. Michael Risinger & Michael Saks, *Science and Nonscience in the Courts: Daubert Meets Handwriting Identification Expertise*, 82 IOWA L. REV. 21, 65–66 (1996) with Andre Moenssens, *Handwriting Identification Evidence in the Post-Daubert World*, 66 UMKC L. REV. 251, 328–331 (1997).
64. See 2 PAUL C. GIANNELLI, EDWARD J. IMWINKELRIED, ANDREA ROTH & JANE CAMPBELL MORIARTY, *SCIENTIFIC EVIDENCE* § 21.07[a] (5th ed. 2012).
65. See 1 GIANNELLI, IMWINKELRIED, ROTH & MORIARTY, *supra* note 64, § 14.06.

Research Council, prepared a *Reference Manual on Scientific Evidence*.⁶⁶ The manual included chapters, authored by leading experts, on such subjects as DNA typing, statistics, epidemiology, engineering, and mental health evidence. Every federal judge received a copy of the manual. Assume that a federal judge was assigned a case dealing with a type of expert testimony that he or she had never previously dealt with but which was covered in a chapter in the manual. The judge could reach for the manual and find an expert primer about the discipline. The manual quickly became a “go to” text for federal trial judges.

Since scientific research was ongoing, the Judicial Center found it necessary to release a second edition of the manual and then a third. There was a conspicuous omission from the first two editions: a treatment of forensic science. As previously stated, the debates over the reliability of forensic evidence had become heated. The topic became even more pressing when, in 2009, the National Research Council (“NRC”) released its report entitled “*Strengthening Forensic Science in the United States: A Path Forward*”.⁶⁷ The report included a number of pointed criticisms of forensic disciplines. Although many fingerprint examiners use the ACE-V—analysis, comparison, evaluation, verification—methodology, the NRC characterized ACE-V as “a broadly stated framework” that “is not specific enough to qualify as a validated method for this type of analysis.”⁶⁸ The report also stated that “not enough is known about the variabilities among individual . . . guns” to have any “given level of confidence in the result” of a purported firearms identification.⁶⁹ The report “found no scientific support for the use of [microscopic] hair comparisons for individualization”⁷⁰ The report damned questioned-document analysis with faint praise when it added that there “may be some value in handwriting analysis.”⁷¹

As previously stated, the Judicial Center had released two editions of its manual without a chapter devoted to forensic science; but after the NRC released its 2009 report, it was no longer possible for the center to ignore the topic. Since the topic had become so controversial, however, the center needed to find an author with an impeccable scholarly

66. FED. JUDICIAL CTR., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (1st ed. 1994).

67. COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCI. CMTY., NAT’L RESEARCH COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD (2009) [hereinafter A PATH FORWARD].

68. *Id.* at 142.

69. *Id.* at 154.

70. *Id.* at 161.

71. *Id.* at 167.

reputation who would command respect from all sides. Predictably, the center selected Professor Giannelli to be the lead author.⁷² For the first time, the manual now includes sections devoted to fingerprint examination, handwriting evidence, firearms identification, bite mark analysis, and hair microscopy. To maximize its utility, each section surveys the relevant empirical research as well as the pertinent case law. The chapter displays the balance and objectivity that have always characterized Professor Giannelli's scholarship. In some instances, the chapter approves of the courts' decision to find the empirical validation sufficient. By way of example, the chapter states that a confident fingerprint identification is possible when the examiner compares two clear sets of ten fingerprints.⁷³ In other instances, the chapter faults the courts for accepting expert claims too readily. In particular, the chapter identifies a number of troubling gaps in the empirical investigations of bite mark identification.⁷⁴

THE 2010s

It is an understatement to say that in this decade, Professor Giannelli has continued his scholarly work. He has released an impressive number of new law review articles⁷⁵ as well as new editions of several of his treatises, including a fifth edition of "*Scientific Evidence*."⁷⁶

Although the pace of Professor Giannelli's scholarly productivity has consistently been extraordinary, over the years there has been a shift in its focus. His early works, including the *Columbia* article, primarily addressed the doctrinal legal issue of the admissibility of scientific testimony. However, he has increasingly turned his attention to broader

72. Paul C. Giannelli, Edward J. Imwinkelried & Joseph L. Peterson, *Reference Guide on Forensic Identification Evidence*, in FED. JUDICIAL CTR., REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 55 (3d ed. 2011).

73. *Id.* at 73.

74. *Id.* at 108–10.

75. See, e.g., Paul C. Giannelli, *Forensic Science: Daubert's Failure*, 68 CASE W. RES. L. REV. 869 (2018); Paul C. Giannelli, *Regulating DNA Laboratories: The New Gold Standard*, 69 N.Y.U. ANN. SURV. AM. L. 617 (2013); Paul C. Giannelli, *Junk Science and the Execution of an Innocent Man*, 7 N.Y.U. J. L. & LIB. 221 (2013); Paul C. Giannelli, *Confrontation, Experts, and Rule 703*, 20 J.L. & POL'Y 443 (2012); Paul C. Giannelli, *Forensic Science Reform*, 90 TEX. L. REV. 29 (2011); Paul C. Giannelli, *Forensic Science: Why No Research?*, 38 FORDH. URBAN L.J. 503 (2011).

76. PAUL C. GIANNELLI, EDWARD J. IMWINKELRIED, ANDREA ROTH & JANE CAMPBELL MORIARTY, *SCIENTIFIC EVIDENCE* (5th ed. 2012); see also EDWARD J. IMWINKELRIED, PAUL C. GIANNELLI, FRANCIS A. GILLIGAN, FREDERIC I. LEDERER & LIESA RICHTER, *COURTROOM CRIMINAL EVIDENCE* (6th ed. 2016).

issues of the systemic reform of forensic science. At the macro level, he has written extensively about the need to make crime laboratories independent of police departments and district attorney offices.⁷⁷ His own research and studies such as the 2009 NRC report have underscored the extent to which forensic scientists rely on subjective judgment rather than objective, quantified standards. The reliance on subjective judgment creates room for the play of bias. Especially when the laboratory depends on the police department for funding, there is the risk that a pro-prosecution bias will affect the exercise of the subjective judgment. At the micro level, he has repeatedly cautioned about the cognitive biases,⁷⁸ including confirmation bias,⁷⁹ that can distort the judgment of the individual analyst.

Professor Giannelli has long appreciated that reform efforts will succeed only if the bench and bar have a much more sophisticated understanding of the science in forensic “science.” To make science more accessible to those audiences, he has poured out specialized articles tailored for those groups. He has written tens of articles in the *Public Defender Reporter*. Between 1991 and 2012, he also authored tens of articles on forensic science for *Criminal Law Bulletin*, one of the leading periodicals for criminal practitioners, judges, prosecutors, and defense counsel. Since 2001 he has served as the scientific evidence columnist for *Criminal Justice*, the principal periodical of the Criminal Justice Section of the American Bar Association.

Scientific and criminal justice organizations took notice that Professor Giannelli was so willing to donate his time to the cause of reforming forensic science. He was invited to serve as the co-chair of the A.B.A. Ad Hoc Innocence Committee to Ensure the Integrity of the Criminal Process. He was named reporter for both the A.B.A. group that promulgated Criminal Justice Standards on Biological Evidence and the Study Committee on DNA Evidence of the National Conference of Commissioners on Uniform State Laws. He was either a member of or reviewer for several National Research Council studies: the Planning Group on the DNA Project, the Evaluation of Forensic DNA Evidence, The Polygraph and Lie Detection, and the 2009 NRC Report itself.

Given his longstanding commitment to the reform of forensic science, it is only fitting that in 2014 he was appointed a Commissioner on the new National Commission on Forensic Science, established by

77. Paul C. Giannelli, *Forensic Science Reform*, 90 TEX. L. REV. 29 (2011); Paul C. Giannelli, *Wrongful Convictions: The Need to Regulate Crime Labs*, 86 N.C. L. REV. 163 (2007); Paul C. Giannelli, *Crime Labs Need Improvement*, ISSUES IN SCI. & TECH., Fall 2003, at 55; Paul C. Giannelli, *The Abuse of Scientific Evidence in Criminal Cases: The Need for Independent Crime Laboratories*, 4 VA. J. SOCIAL POL'Y & L. 439 (1997).

78. Paul C. Giannelli, *Cognitive Bias in Forensic Science*, CRIM. JUST., Summer 2010, at 61.

79. Paul C. Giannelli, *Confirmation Bias*, CRIM. JUST., Fall 2007, at 60.

the Department of Justice. His long record of public service and deep understanding of both the legal and scientific aspects of expert testimony made him uniquely well qualified for this prestigious position. After years of advocating for change, he was in a position to effect change.

CONCLUSION

The 2016 report of the President's Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*,⁸⁰ and the National Research Council's 2009 report, *Strengthening Forensic Science In The United States: A Path Forward*,⁸¹ are arguably the two most important modern reports on the state of American forensic science. Even a quick perusal of those reports demonstrates the lasting impact that Professor Giannelli has had on the evolution of law and policy in this area. The PCAST report contains three citations to Professor Giannelli's writing,⁸² including the *Columbia* article.⁸³ The NRC report contains ten citations,⁸⁴ also including, of course, the *Columbia* article.⁸⁵

Today there is a large, dynamic group of legal scholars studying the problems raised in the NRC report. A partial list would include, in alphabetical order, the names of such exceptional academics as the late Erica Beecher-Monas,⁸⁶ David Bernstein, Edward Cheng, Jane Campbell Moriarty, Jules Epstein, David Faigman, Brandon Garrett, Samuel Gross, Carol Henderson, David Kaye, Jonathan Koehler, Jennifer Mnookin, Erin Murphy, Peter Neufeld, Michael Risinger, Andrea Roth, Michael Saks, and Joseph Sanders. When Professor Giannelli began working in this field in the mid-1970s, only a handful of scholars recognized the problems posed by the increasing reliance on scientific evidence. In the *Columbia* article that he wrote almost four decades ago, Professor Giannelli identified many of the issues that contemporary scholars continue to explore. In part, the academic interest

80. PRES. COUNCIL ADVISORS ON SCI. & TECH., REPORT TO THE PRESIDENT: FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE-COMPARISON METHODS (2016) [hereinafter PCAST].

81. A PATH FORWARD, *supra* note 67.

82. PCAST, *supra* note 80, at 34, 41–42.

83. *Id.* at 41.

84. A PATH FORWARD, *supra* note 67, at 6, 12, 44, 85, 88–89, 96, 161, 187, 194.

85. *Id.* at 89 n. 18.

86. Tragically, last summer Professor Beecher-Monas passed away. She was such a serious student of scientific evidence that in her last week, she worked on the expert testimony chapter of her Evidence coursebook from her hospital bed.

in these issues has grown so dramatically because of Professor Giannelli's inspiring example as a scholar, teacher, and law reformer. The scientific and legal communities owe Professor Giannelli an enormous debt; he has played a pioneering role in helping to realize the potential contribution that science can make to enhancing the integrity of judicial fact-finding. Simply stated, Professor Giannelli is a great credit to Case Western Reserve University Law School and the legal academy.