

TRENDS AND ISSUES IN SCIENTIFIC EVIDENCE

INTRODUCTION

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Scientific “truths” provide the underpinnings of forensic science. Generally, scientific fact is proven based upon accepted scientific method in the particular field. Legal “truths” sometimes depend upon scientific truth to prove or disprove a fact in issue but legal truths are not established merely by the exercise of scientific method. Legal truths derive from the processes of the adversary system. The legal selection criteria utilized in picking and choosing what is and is not legitimate forensic proof in the eyes of the law rests on the rules of evidence and established case precedent. As technology advances and the interdisciplinary fields of study expand to redefine the boundaries of scientific truth, the law must continually re-evaluate those techniques accepted as reliable and others cast aside under the rubric of “junk science.” In this process, scientific truth is subordinated to legal truth.¹

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¹ David L. Faigman, David H. Kaye, Michael J. Saks, Joseph Sanders, and Edward K. Cheng, *Modern Scientific Evidence: Forensics 4-5* (2006).

Legal educators increasingly use the classroom to import expertise from scientists and social scientists to better prepare law students to engage in specialized and collaborative fields of practice.² Indeed, this project grew out of a paper course on Scientific Evidence in Civil and Criminal Cases offered during the spring 2006 semester at the law school. Students heard from accident reconstruction experts, DNA scientists, forensic pathologists and medical malpractice experts. In February 2006, Dr. Aaron Lazare, Dean and Chancellor at the University of Massachusetts, addressed the law school on a cutting-edge legal theory from his recently published book, “On Apology.”³ Stimulated by this flow of information from scientists and social scientists, the journal staff invited articles from various scientific and non-scientific disciplines in an effort to identify new forensic theories and consider their relevance and possible application to the law.⁴

The boundaries of the law in terms of the admissibility of expert opinion testimony are fixed, however, those boundaries remain as uncertain in application as the underlying principles of science and technology that inform a court’s decisions. The hallmark of admissibility of expert witness testimony, under Rule 702 of the Federal Rules of Evidence,⁵ requires that the opinion be the “product of reliable principles and methods.” Rule 702 was subsequently amended in response to the Supreme Court’s decision in

² See Karen Tokarz, *Poverty, Justice, and Community Lawyering: Interdisciplinary and Clinical Perspectives*, 20 WASH. U. J.L. & POL’Y 1 (2006).

³ Dr. Aaron Lazare, *On Apology* (2005).

⁴ The call for articles is also directed to law students. It is part of the mission of the journal to promote a scholarly dialogue that includes a venue for gifted future lawyers and educators to weigh in on the issues.

⁵ FED.R.EVID.702:Testimony by Experts

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, 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.

Daubert v. Merrell Dow Pharmaceuticals, Inc.,⁶ and to the many cases applying *Daubert*, including *Kumho Tire Co. v. Carmichael*.⁷ In *Daubert*, the Supreme Court charged trial judges with the responsibility of acting as gatekeepers to exclude unreliable scientific testimony, and later, in *Kumho Tire*, the Supreme Court expanded the application of the gatekeeper function to non-scientific expert testimony.

Daubert provides a non-exclusive checklist for trial courts to use in assessing the reliability of scientific expert testimony: (1) whether the expert's 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 instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability; (2) whether the technique or theory has been subject to peer review and publication; (3) the known or potential rate of error of the technique or theory when applied; (4) the existence and maintenance of standards and controls; and (5) whether the technique or theory has been generally accepted in the scientific community. Consistent with this opinion, the Court applied the same factors in *Kumho Tire* to assess the reliability of non-scientific expert testimony, depending upon the particular circumstances of the particular case at issue.⁸

While the relevant factors for determining reliability will vary according to each particular field of expertise, the rules of evidence reject the premise that an expert's testimony should be treated more permissively simply because it is outside the realm of science.⁹ An opinion from an expert who is not a scientist should receive the same degree of scrutiny for reliability as an opinion from an expert who purports to be a scientist. Some types of expert testimony will be more objectively verifiable, and subject to the expectations of falsifiability, peer review, and publication,

⁶ *Daubert v. Merrell Dow Pharmaceuticals, Inc.* 509 U.S. 579 (1993).

⁷ *Kumho Tire Co. v. Carmichael*, 119 S.Ct. 1167 (1999).

⁸ *Id.* at 1176.

⁹ FED.R.EVID.702 advisory committee's note (5).

than others. Some types of expert testimony will not rely on anything like a scientific method, and so will have to be evaluated by reference to other standard principles attendant to the particular area of expertise.

With these legal standards and limitations in mind, the reader should consider whether the theories presented by the authors in this journal satisfy the current evidentiary standards governing admissibility. The challenge of applying law to science and the inevitable tension between interdisciplinary methods gives rise to an important and vigorous dialogue...one that we hope is found to be of interest within the pages of this journal.¹⁰

GLENN R. SCHMITT- “AN INTRODUCTION TO THE REPORT OF THE NATIONAL INSTITUTE OF JUSTICE: LESSONS LEARNED FROM 9/11: DNA IDENTIFICATION IN MASS FATALITY INCIDENTS”

Glenn R. Schmitt is the Deputy Director and Acting Director of the National Institute of Justice (NIJ). He was appointed Deputy Director in 2001. Prior to joining NIJ, Mr. Schmitt served as the Chief Counsel to the Subcommittee on Crime of the House Committee on the Judiciary. Director Schmitt authored a special introduction to the Report of the National Institute of Justice for this symposium journal. In his introduction, Schmitt emphasizes that although “*Lessons Learned From 9/11: DNA Identification in Mass Fatality Incidents*,” (Report), is designed primarily to help the Nation’s crime laboratory directors respond to future mass fatality disasters—be they natural disasters, large transportation accidents, or terrorist events—a variety of issues in the Report concern the intersection of criminal justice and forensics, particularly as it relates to using DNA analysis to identify victims when other identification methods are not enough. The Report is both a compelling story of the

¹⁰ The project continues. The journal staff invites articles for the 2007 journal on the topic of Trends and Issues in Constitutional Law; followed by the 2008 journal on the topic of Trends and Issues in International Intellectual Property; and, followed by the 2009 journal on the topic of Trends and Issues in Bankruptcy and the Family.

recovery of human remains using DNA technology and a guide to evidentiary issues involving the admissibility of DNA evidence, such as chain of custody and evidence preservation, of interest to every practitioner. However, the Report goes beyond the more obvious evidentiary issues connected to the use and admissibility of DNA evidence and includes other major litigation issues attendant to the use of DNA scientific evidence including: dealing with the press, privacy act considerations, and the use of an advisory panel of experts and/or bioethicists. At the same time, the Report underscores the need for the laboratory directors to be ever-mindful of the potential for civil action. Such litigation could arise out of misidentification, release of information, control of remains, and intellectual property assertions regarding the development of new DNA identification techniques. The Report offers guidance regarding the need for a laboratory director to work closely with contracting officers and attorneys on issues such as contracts, intellectual property rights, and privacy issues, including the creation of a next-of-kin release policy. Director Schmitt provides an excellent summary of the legal issues attendant to the courtroom use of DNA evidence and the less obvious but equally significant risks of litigation attendant to the collection, dissemination and use of this scientific evidence.

NATIONAL INSTITUTE OF JUSTICE-“LESSONS LEARNED FROM 911: DNA IDENTIFICATION IN MASS FATALITY INCIDENTS”¹¹

On the 5th anniversary of the terrorist attacks on the World Trade Center, the National Institute of Justice—the research, development, and evaluation agency of the U.S. Department of Justice—published a major report on the

¹¹ This article has been adapted and reprinted from the September 2006 NIJ Report entitled: “LESSONS LEARNED FROM 911: DNA IDENTIFICATION IN MASS FATALITY INCIDENTS” with permission from the United States Department of Justice and the National Institute of Justice.

identification of mass disaster victims using DNA analysis. The Report is prepared by the Kinship and Data Analysis Panel, a multidisciplinary group of scientists assembled by the National Institute of Justice to offer guidance to the New York City Office of the Chief Medical Examiner in the identification of those who perished in the World Trade Center. The Southern New England School of Law is privileged to offer this excellent work to its readers and the legal and scientific community.

SUSAN LECLAIR AND JAMES GRIFFITH-“DNA IN THE COURTROOM”

Dr. Susan Leclair is a professor of Medical Laboratory Science at the University of Massachusetts at Dartmouth. Dr. James Griffith is the Chancellor Professor and Chairman of the Medical Laboratory Science Department at the University of Massachusetts at Dartmouth. Dr. Griffith is also executive director of the University of Massachusetts Center for Molecular Diagnostics. He is also an adjunct professor at the Southern New England School of Law and participated as a guest lecturer in the course offered on Scientific Evidence in Civil and Criminal Cases at the law school.

The Leclair and Griffith article serves as the perfect accompaniment to the NIJ Report. Here, two renowned scientists in the field explain the science behind the scientific evidence of DNA. The article is a must for any practitioner. In order to introduce scientific evidence, a lawyer must understand the language and method of the science. In that way, the practitioner can act as an intermediary between the expert witness and the jury in the presentation of the scientific evidence to aid in the resolution of a matter in issue at trial. In the same way, an attorney can only test the reliability of the scientific method by first understanding the scientific principles that form the basis of the proposed expert opinion.

Leclair and Griffith deftly navigate the non-scientist through the scientific waters of DNA technology, defining its uses, limitations and reliability in the courtroom setting.

Specifically, the article explores the history and development of DNA. Leclair and Griffith then explain the basic structure of DNA, methods of inheritance, and the bridges to technology or forms of testing. The testing methods discussed include: DNA probe technology, PCR technology, and Immunoassay. Testing principles are examined in detail, including quantification and analysis. The article then connects the testing process to forensic application. After a cogent explanation of the forensic uses, Leclair and Griffith explore the uses of the forensic evidence in a courtroom and consider the differences between reliable DNA evidence and the stuff that defines “junk science.”

Finally, “professionalism” and the use experts are considered in the context of evidence presentation at trial. These scientists conclude that the future use of DNA to serve the interests of justice turns on its subservience to the legal system that dictates the contours of the admissibility of this unique scientific evidence.

NASEAM RACHEL BEHOUZFARD-“STRENGTHS, LIMITATIONS, AND CONTROVERSIES OF DNA EVIDENCE”

Naseam Behouzfard is a student at the Southern New England School of Law and a member of the law review staff. In her article, Behouzfard examines the historical and legal development of the use of DNA evidence in the courtroom. There is particular emphasis on the legal tests developed by the courts in ruling on its admissibility at trial and the evidentiary pitfalls that can preclude admissibility, including chain of custody issues and other possible contamination problems. Like the preceding NIJ report, the article concludes that use of DNA technology as scientific evidence is critical to the investigative and judicial fact finding processes, particularly in criminal cases where proof of innocence can, in some cases, be conclusively established through testing.

MATTHEW KOES-“SHELLFISH CONTAMINATION:
REDUCING THE NECESSITY FOR SCIENTIFIC
EVIDENCE IN NATURAL RESOURCE DAMAGES
UNDER THE COMPREHENSIVE ENVIRONMENTAL
RESPONSE, COMPENSATION AND LIABILITY ACT”

Matthew Koes is an attorney and recent graduate of the Southern New England School of Law. In his article, Koes examines the problems of using scientific evidence in quantifying future damages to shellfish resources caused by pollution contamination to the fragile coastal eco-systems. Koes examines the benefits of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) over traditional common law remedies as the vehicle for compensating the public for damages to natural resources caused by industrial contamination.

However, a problem arises under CERCLA because the ultimate manifestations of hazardous waste pollution are unpredictable and long term and the extent of these damages cannot be accurately quantified until long after the legal dispute is resolved in the courts. Because of the speculative nature of the scientific evidence as a predictor of future harm, the reliability of its use is frequently called into question. The legal conundrum is how to use scientific evidence to prove the unpredictable future harms occasioned by industrial pollution. The problem is significant because unknown but anticipated future harm, surfacing long after the lawsuit is over, may result in an unfair economic burden to the public whereas the economic burden should be borne by the polluter.

The author argues that the evidentiary requirements under CERCLA for establishing causation between actual known damage and future unknown but anticipated harm should be relaxed to ease proof standards consistent with the quasi-strict liability standards imposed by Congress on certain industries responsible for industrial contamination and remediation. To this end, Koes examines the nature of scientific evidence and the use of expert testimony in CERCLA litigation. He carefully considers the limitations of the federal rules of evidence in light of the decisions in

Daubert and *Kumho Tire*, concluding that some courts have recognized that environmental litigation requires a special application of the rules of evidence to compensate for the unpredictable nature of the certain harm caused by industrial polluters. Koes then applies that consideration to the CERCLA legislative framework.

Koes offers a template for utilizing scientific evidence to establish a prima facie case under CERCLA. He explains the use of “fingerprinting” sources of pollution and contamination over time in a particular coastal region and then using the fingerprint as a predictor for future damages. Koes demonstrates the reticence of some courts to accept the proof while others show a greater willingness to accept the reliability of this scientific evidence.

Koes underscores the case law finding that calculating damages may be an abstract exercise to some degree but the value of the nation’s natural resources are also not “fully captured by the market system.” Koes thus concludes by acknowledging the “awkward partnership” between law and science in the area of CERCLA litigation and the need to replace the current causation standard with a more workable proof standard tied to strict liability.

MATTHEW PILLSBURY-“SAY SORRY AND SAVE: A PRACTICAL ARGUMENT FOR A GREATER ROLE FOR APOLOGIES IN MEDICAL MALPRACTICE LAW”
-WITH A FOREWARD BY ROBERT WARD

Matthew Pillsbury is an attorney and recent graduate and valedictorian (2006) of the Southern New England School of Law. Prior to seeking his law degree, he worked as a journalist and writer. In his article, Pillsbury considers more than just the restorative effects of an apology by the wrongdoer to the victim in a medical malpractice action. He considers the empirical proof which supports the claim that an apology reduces the incidence of litigation and/or the size and amount of damages awards. The particular evidentiary problem examined in the article arises out of the inability to

use apology as a means to mitigate damages where the statement can later be used as a damaging admission against interest in subsequent litigation.

Pillsbury examines the novel theory of using apology as a means to reduce litigation and damages awards set forth in Dr. Aaron Lazare's recent book, "On Apology." The skeptic might be surprised to learn from Pillsbury's article that several state legislatures have agreed with the theory and, to implement its use, enacted legislation to exclude from evidence at trial the use of an apology as a damaging admission of liability. Roughly twenty nine states have "apology laws" that protect expressions of sympathy or sorrow from being used as evidence against the apologizer. In fact, Massachusetts was the first state in the nation to enact an apology protection law. Likewise, several court opinions also recognize the importance of apology in the field of medical malpractice and exclude its use at trial as an admission against interest by a party opponent.

Pillsbury concludes that the introduction of apology as a legal tool has the power to revolutionize medical malpractice law. Robert Ward, Dean at the Southern New England School of Law, agrees and in his "Foreword" to the article advocates the use of apology as a means to achieving damages reform in the hotly debated political arena of litigation caps on damages. The practitioner is presented with scientific empirical proof supporting this trend in the law.

DENNIS RODERICK AND SUSAN KRUMHOLZ-"MUCH ADO ABOUT NOTHING? A CRITICAL EXAMINATION OF THERAPEUTIC JURISPRUDENCE"

Dr. Dennis Roderick is a Lecturer in Psychology and Crime and Justice Studies at the University of Massachusetts at Dartmouth. He is also a Lecturer in Psychology at Curry College. Dr. Susan Krumholz is an Associate Professor in the Department of Sociology and Anthropology and the Director of Criminal Justice Studies at the University of Massachusetts at Dartmouth. She also served as legal counsel for the Office of Human Rights in the Massachusetts Department of Mental Health. In their article, Roderick and

Krumholz argue that therapeutic jurisprudence, (TJ), originally conceived as a legal tool in the field of civil commitment and mental health law, offers an alternative means to aid in the mediation of litigation disputes in the criminal justice system. At least one goal of therapeutic remediation is a decrease in the rate of recidivism.

Therapeutic jurisprudence recognizes that legal rules, procedures and actors are social forces that intentionally or unintentionally produce therapeutic or anti-therapeutic consequences in the judicial process. The authors contend that the theoretical principles of TJ have been utilized by legal scholars, judges, practitioners, social scientists and even lawmakers, in the field of criminal justice. It has been employed as a successful “problem-solving technique” or healing process designed to mitigate the psychological and social harms arising out of the operation of the criminal justice system to both the victim and the perpetrator. Specifically, the authors explore how TJ provides a study or explanation of how legal processes, laws and legal actors can have a therapeutic effect or non-therapeutic effect in the criminal justice system.

Roderick and Krumholz explore the debate between social scientists as to an accurate definition of TJ. Then, the authors embark upon the study of the validity (accuracy) and reliability (consistency) of its theoretical constructs in direct application to the criminal justice system. TJ is a social sciences theory. It is a perspective that examines whether the criminal justice system has failed the participants by merely serving as a vehicle to mete out punishment and vindicate the interests of society at large without truly accounting for the harm or damage suffered by the victims and the perpetrators or the roles of other relevant actors, including judges and lawyers, in that process.

At least one goal of TJ is to reduce recidivism through some form of systematic therapeutic method. Like any scientific method, whether aimed at evidentiary admissibility or achieving some verifiable result in the criminal justice system, it should be subject to empirical verification.

However, the authors conclude that major structural reform in the criminal justice system is required before any significant empirical results could be obtained.

The legal system seldom looks at itself critically and the viewpoints of social scientists contribute to that examination process. Roderick and Krumholz offer a theoretical but nonetheless important first step to considering new options to the current methodology of prosecution and sentencing. With increased rates of recidivism, the debate is certainly worth considering. Whether therapeutic jurisprudence offers a scientific method capable of empirical verification or reliability remains to be seen.

CONCLUSION

What is justice without truth? What would the law be without forensic science? The articles published in this volume provide some insight into these perplexing questions. That glimmer of wisdom is the goal of this project. The authors and editors welcome your comments and feedback. The Roundtable Symposium Law Journal is proud to dedicate this volume to the Southern New England School of Law in honor of its 25th year celebration.