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Chicken Little's Revenge: Strict Judicial Scrutiny of Scientific Evidence

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"CHICKEN LITTLE'S" REVENGE: STRICT JUDICIAL SCRUTINY OF SCIENTIFIC EVIDENCE

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I. INTRODUCTION

Everybody remembers "Chicken Little."¹ While journeying home, an acorn pounced on her head, prompting the unforgettable battle-cry: "The sky is falling!" Terrified by the fantasized threat to her community, the fuzzy little fowl attracted the attention of many colleagues. Chicken Little's convincing posture soon triggered an avalanche of chain-reaction panic. Alas, the cunning Foxy Loxy understood their ill-fated logic. Nevertheless, Chicken Little and her foolish flock warned the world of imminent doom, barely escaping Foxy Loxy's evil plans.

Although Chicken Little's knee-jerk assumption was eventually disproved by science, her spirit has been revitalized by tort reformists who busy themselves convincing the country that plaintiff victories in court are contributing to the demise of the modern corporation. In this view, million-dollar verdicts, like Chicken Little's bump on the head, are crippling industry and signal the need for restrictive regulation. Thus, the scientific expert has been singled out as the acorn causing the problem, and the modern

¹For the modernized, American version of this timeless children's tale, see STEVEN KELLOGG, *CHICKEN LITTLE* (1985).

Chicken Little has been courting government assistance in a quest to halt the expert's influence in the courtroom.²

Although debate on standards for the admissibility of expert testimony is not a new motif in legal academia,³ contemporary critics have been quick to blame so-called "junk science"⁴ and inadequate policing of the scientific expert

²The Bush administration responded by attempting to narrow the standards for admissibility of scientific evidence which became the cornerstone of its "war on the legal system." In 1991, former Vice-President Dan Quayle's Council on Competitiveness released a broad program for "reform" of the tort system. Six of the Council's fifty specific proposals were aimed at curtailing the use of scientific expert witnesses by plaintiffs. In his report, the former Vice-President aimed at the jugular of the legal profession by attacking its overuse of scientific experts:

Expert Witnesses and "Junk Science"

An area of the law particularly ripe for [judicial] reform is expert witness practice. The Federal Rules of Evidence, which govern most expert testimony, eliminated many of the common law restrictions on the use of expert witnesses. The resulting uncontrolled use of expert witnesses has led to longer trials, more expensive litigation, and a reduction in the quality of expert testimony in many cases.

It has also allowed "junk science" to tarnish the legal process. Peter Huber, a leading observer of American courtrooms, has written recently that "scientific frauds . . . are attempted almost daily in our courts, and many succeed." Huber wrote that "the most fantastic verdict recorded so far was worthy of a tabloid:"

"With the backing of 'expert' testimony from a doctor and police department officials, a soothsayer who decided she had lost her psychic powers following a CAT scan persuaded a Philadelphia jury to award her \$1 million."

Stories such as these are becoming almost commonplace. "Expert" witnesses regularly offer their "scientific" opinions on the connections between automobile accidents and breast cancer or environmental pollutants and "chemically induced AIDS."

Proposed Civil Justice Reform Legislation, *Agenda for Civil Justice in America*, 60 U. CIN. L. REV. 979, 984 (1992) (omissions in original). Although the Clinton administration has not taken a position on this issue to date, congressional action regarding reform of expert witness practice is still quite possible. See *infra* text accompanying notes 196-203.

³See, e.g., Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half Century Later*, 80 COLUM. L. REV. 1197 (1980); Edward J. Imwinkelried, *The Standard for Admitting Scientific Evidence: A Critique from the Perspective of Juror Psychology*, 28 VILL. L. REV. 554 (1983); *Historical and Practical Considerations Regarding Expert Testimony*, 15 HARV. L. REV. 40 (1901); Mason Ladd, *Expert Testimony*, 5 VAND. L. REV. 414 (1952); Judge Jack B. Weinstein, *Improving Expert Testimony*, 20 U. RICH. L. REV. 473 (1986); Note, *Fit to be Fried: Frye v. United States and the Admissibility of Novel Scientific Evidence*, 77 KY. L.J. 849 (1988-89).

⁴The term "junk science" was coined by Peter A. Huber, Senior Fellow of the Manhattan Institute and outspoken critic of scientific expert witness practice. See PETER HUBER, *GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM* (1991). Mr. Huber views experts who are on the outside of the scientific mainstream, as well as the trial lawyers who employ them, as clear and present dangers to "good science" and appropriate litigation outcomes in toxic tort litigation. See Robert F. Blomquist, *Science, Toxic Tort Law, and Expert Evidence: A Reaction to Peter Huber*, 44 ARK. L. REV. 629 (1991). See also Kenneth J. Cheseboro, *Galileo's Retort: Peter Huber's Junk Scholarship*, 42 AM. U. L. REV.

as a significant cause of the "litigation explosion." Fearing the ravages of "untrained jurors bamboozled by smooth-talking scientific charlatans,"⁵ critics contend that unfounded scientific testimony regarding causation has infiltrated America's courtrooms and, if unchecked, will continue imposing liability on entities in specious claims. Especially in toxic tort litigation,⁶ where the stakes are high and causation is often the decisive issue, critics have seized on new scientific techniques of proof as the most glaring example of overuse and abuse of science in the courtroom.

The dilemma as to how attorneys, scientists, judges, and jurors are to handle novel forms of expert testimony has become so divisive that either the Supreme Court or Congress will soon enter the polemic. Since the D.C. Circuit announcement of *Frye v. United States*⁷ in 1923, and the adoption of the Federal Rules of Evidence in 1975,⁸ the federal courts have been caught between two standards for determining the admissibility of expert testimony.

Under the current⁹ Federal Rules, the determination of admissibility of expert testimony requires affirmative answers to two relatively simple questions.¹⁰ First, is the proffered expert "qualified," and second, will the expert's "specialized knowledge . . . assist the trier of fact to understand the

1637, 1722 (1993) (critically analyzing Huber's GALILEO'S REVENGE, and concluding that the book "employs distortion of the facts of cases and of the content of legal doctrines, including an ignorance of controlling constitutional principles."). For other treatises written by Huber debunking tort law and the use of expert witnesses, see PETER HUBER, LIABILITY: THE LEGAL REVOLUTION AND ITS CONSEQUENCES (1988); Peter Huber, *On Law and Sciosophy*, 24 VAL. U. L. REV. 319 (1990).

⁵Peter A. Bell, *Strict Scrutiny of Scientific Evidence: A Bad Idea Whose Time Has Come*, 20 PROD. SAFETY & LIAB. REP. (BNA) 47, 47 (1992) (Part I of a two-part article).

⁶One of the first judicial opinions to use the phrase "toxic torts" was *In re Agent Orange Product Liability Litigation*, 506 F. Supp. 737, 743 (E.D.N.Y. 1979). For further discussion of the Agent Orange litigation, see PETER H. SCHUCK, AGENT ORANGE ON TRIAL: MASS TOXIC DISASTERS IN THE COURTS (1986).

The field of toxic tort law has exploded in the past fifteen years. See generally TOXIC TORTS AND PRODUCT LIABILITY: CHANGING TACTICS FOR CHANGING TIMES 11 (M. Brown ed. 1989) (toxic tort actions typically involve plaintiffs who "contend that they have sustained actual or potential physical injuries . . . which were caused by substances in the air, ground and water."); see also 1 A GUIDE TO TOXIC TORTS M. SEARCY § 1.01 (1989); Note, *Developments in the Law: Toxic Waste Litigation*, 99 HARV. L. REV. 1458 (1986).

⁷293 F. 1013 (D.C. Cir. 1923).

⁸FEDERAL RULES OF EVIDENCE, Pub. L. No. 93-595, 88 Stat. 1926 (1975) (current version at 28 U.S.C. app. (1988) (amended 1989)).

⁹See *infra* notes 196-203 and accompanying text.

¹⁰This is, of course, presuming that the initial relevancy requirements have been met. "Relevance" is defined as "evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more or less probable than it would be without the evidence." FED. R. EVID. 401. The Rules mandate that "all relevant evidence is admissible," subject to enumerated exceptions, and "evidence which is not relevant is not admissible." *Id.* at 402.

evidence or determine a fact in issue"?¹¹ Thus, the focus is on the helpfulness of the testimony, and the logical trend should be easy admissibility.¹² But under the common law *Frye* standard, expert scientific opinion evidence is inadmissible unless it has been "sufficiently established to have gained general acceptance" in the relevant scientific community.¹³ The Circuit Courts disagree as to the extent that the Federal Rules of Evidence have superseded the common law evidentiary doctrine.¹⁴ That disagreement is evidenced by the courts' struggle with the issue of whether the *Frye* doctrine has survived the enactment of the Federal Rules of Evidence.

On October 13, 1992, the United States Supreme Court issued a Writ of Certiorari to the Ninth Circuit Court of Appeals¹⁵ to resolve the split and answer vexing questions at the heart of the furor surrounding "junk science." Nevertheless, even the most conservative decision by the Supreme Court may not quell the disturbance. With the support of the Bush administration,¹⁶ proponents of reform of expert witness practice are urging Congress to amend the current Federal Rule of Evidence 702. The proposal¹⁷ is highly restrictive, and represents the belief that allowing the trial judge to actively screen

¹¹FED. R. EVID. 702. The Rule provides: "If scientific, technical or other specialized knowledge will assist the trier of fact to understand the evidence or 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." *Id.*

¹²See Edmund B. Spaeth, Jr., *Proposed Amendments to the Federal Rules On Admissibility of Scientific Evidence: A Judge's Perspective*, 115 F.R.D. 112 (1987); see also Jack B. Weinstein, *Rule 702 of the Federal Rules of Evidence is Sound; It Should Not Be Amended*, 138 F.R.D. 631 (1991).

¹³*Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

¹⁴Three circuits have ruled that the *Frye* standard has not survived the enactment of the Federal Rules of Evidence: *United States v. Jakobetz*, 955 F.2d 786, 794-97 (2d Cir.), *cert. denied*, 113 S. Ct. 104 (1992); *DeLuca v. Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d 941, 955 (3d Cir. 1990); *United States v. Baller*, 519 F.2d 463, 466 (4th Cir.), *cert. denied*, 423 U.S. 1019 (1975). Six Circuits have ruled that the *Frye* standard has survived the enactment of the Federal Rules of Evidence: *Christopherson v. Allied-Signal Corp.*, 939 F.2d 1106, 1115-16 (5th Cir.) (per curiam) (en banc), *cert. denied*, 112 S. Ct. 1280 (1991); *United States v. Two Bulls*, 918 F.2d 56, 60 n.7 (8th Cir. 1990), *reh'g granted, vacated*, 925 F.2d 1127 (8th Cir. 1991) (en banc); *United States v. Smith*, 869 F.2d 348, 351 (7th Cir. 1989); *United States v. Shorter*, 809 F.2d 54, 59-61 (D.C. Cir.), *cert. denied*, 484 U.S. 817 (1987); *United States v. Metzger*, 778 F.2d 1195, 1203 (6th Cir. 1985), *cert. denied*, 477 U.S. 906 (1986); *Daubert v. Merrell Dow Pharmaceuticals*, 951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993).

¹⁵This Note was completed prior to the United States Supreme Court's decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993). For a discussion and critique of the Court's holding in *Daubert*, see *infra* notes 206-39 and accompanying text.

¹⁶See *supra* note 2 and accompanying text.

¹⁷See *infra* notes 196-203 and accompanying text.

challenged expert testimony will reduce litigation costs and curtail "commonplace abuses" in the utilization of expert witnesses.¹⁸

This note focuses on the current controversy over admissibility standards for novel scientific testimony. It will trace the development of legal standards for expert witness admissibility from the common law through the adoption of the Federal Rules of Evidence and to the current trend of strict judicial scrutiny. In addition, this note will analyze the issues before the United States Supreme Court in *Daubert* and will argue, in spite of indications to the contrary,¹⁹ that the Court should not be too quick to continue tightening the judicial noose on scientific experts. Finally, this note will dispute the utility of amending Federal Rule of Evidence 702 and will argue that the potential harm of that proposition will have devastating effects on the jury trial which substantially outweigh its laudable aims.

Through this analysis it will become apparent that the current trend of strict judicial scrutiny of scientific evidence not only betrays the notion of civil justice, but has grown through knee-jerk assumptions ascribing scientific evidence as responsible for the "disappearance of valuable and perhaps even life-saving products and services."²⁰ Like Chicken Little's provocation of chain-reaction panic, strict scrutinists have been highly successful in persuading lawmakers to pay less attention to potentially dangerous and life-threatening products and services by dismissing questionable industries as the real cause of successful lawsuits. To be sure, if the trend continues, industry will certainly thrive at the expense of the consumer; and modern fans of Chicken Little will be placed in the ironic position of cheering for Foxy Loxy.

II. HISTORICAL DEVELOPMENT OF EXPERT EVIDENCE STANDARDS

A. Common Law Standards

At common law, courts admitted the opinions of experts under limited circumstances. The fear that juries might be overwhelmed and hence confused,

¹⁸Because this note was completed prior to the United States Supreme Court's decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993), it must be noted that formal discussions regarding the proposal to amend Federal Rule of Evidence 702 were halted pending the High Court's proclamation. Since the decision in *Daubert* the Evidence Rules Advisory Committee has not, as of the date of the publication of this note, begun the task of reconsidering the proposal. According to Professor Margaret Berger, Reporter to the Evidence Rules Advisory Committee, any proposal to amend Federal Rule of Evidence 702 must be reconsidered in light of *Daubert* and, if such proposal should be adopted, it could not become effective for a number of years. Telephone Interview with Professor Margaret Berger, Reporter to the Evidence Rules Advisory Committee (Apr. 13, 1994).

¹⁹See *supra* note 15.

²⁰HUBER, GALILEO'S REVENGE, *supra* note 4, at 5.

or unduly impressed and thus biased, had much to do with these restrictions.²¹ First, experts were allowed to testify only when the subject matter of that testimony was deemed to be outside of the common knowledge or experience of the ordinary person.²² Therefore, expert testimony was inadmissible unless the court believed that jurors could not decide a factual issue without technical assistance.²³ Second, courts often excluded expert witnesses if the opinion was one which embraced an ultimate issue to be decided by the jury.²⁴ Thus, ultimate issue opinions were inadmissible as an invasion and usurpation of the jury's province.²⁵ Third, in order to assist the trier of fact in its evaluation of the expert's opinion, the basis of that opinion must have been disclosed by the party calling the witness prior to offering the opinion.²⁶ Therefore if the jury rejected the premises as untrue, it must have rejected the testimonial conclusion as well.²⁷ Finally, the admittance of expert testimony at common law required the expert's opinion to be framed from a hypothetical question assuming certain evidentiary circumstances.²⁸ This requirement avoided the need for the expert to weigh the evidence in issue, a practice precluded by common law courts.²⁹

The restrictions placed on expert witnesses at common law were criticized as cumbersome, too restrictive, and contrary to the adversarial process.³⁰ For example, Wigmore criticized the view that experts should be allowed to testify only in instances where the proffered testimony was outside the common knowledge of lay persons:

²¹Michael H. Graham, *Expert Witness Testimony and the Federal Rules of Evidence: Insuring Adequate Assurance of Trustworthiness*, 1986 U. ILL. L. REV. 43, 51.

²²*Id.* at 48.

²³*Id.*

²⁴*Id.* at 49. (citing *Chicago & A.R.R. v. Springfield & N.W. R.R.*, 67 Ill. 142, 145-46 (1873) (stating "[W]here the witness is an expert . . . it is not competent to ask the opinion of witnesses in such a way as to have it cover the very question to be found by the jury"), and citing *Lincoln v. Saratoga & S. R.R.*, 23 Wend. 425, 432 (N.Y. 1840) (stating "[o]pinions, belief deductions from facts, and such like, are matters which . . . belong to the jury and by which they arrive at their verdict . . .") (emphasis in original)).

²⁵*Id.*

²⁶Graham, *supra* note 21, at 59.

²⁷*Id.*

²⁸*Id.*

²⁹*Id.*

³⁰See generally FED. R. EVID. 704 advisory committee's note (stating "[the] older cases often contained strictures against allowing witnesses to express opinions upon ultimate issues, as a particular aspect of the rule against opinions. The rule was unduly restrictive, difficult of application, and generally served only to deprive the trier of fact of useful information.").

The true test of the admissibility of [expert] testimony is not whether the subject matter is common or uncommon, or whether many persons or few have some knowledge of the matter but it is whether the witnesses offered as experts have any peculiar knowledge or expertise, not common to the world, which renders their opinions founded on such knowledge or experience any aid to the Court or the jury in determining the questions at issue.³¹

Similarly, a rethinking of the common law's ultimate issue rule led to the conclusion that the restriction was unnecessary since it did not invade the jury's province.³² The drafters of the Federal Rules of Evidence thus specifically rejected the common law ultimate issue rule in Federal Rule of Evidence 704(a).³³ Further, the hypothetical question and the requirement of prior disclosure of an expert's basis of opinion were criticized as confusing, subject to abuse, and at odds with a search for the truth.³⁴ The prior disclosure requirement came to be seen as unnecessary and time-consuming because cross-examination provides ample opportunity for the exploration of an expert's basis.³⁵ Wigmore commented on the hypothetical question as "misused by the clumsy and abused by the clever, [leading] to intolerable obstruction of truth."³⁶ Today, Federal Rule of Evidence 705 does not require prior disclosure of the expert's basis of opinion in court; nor does it require a party to use hypothetical questions to elicit an expert's opinion.³⁷

Thus, Rules 704 and 705 of the Federal Rules of Evidence do not present courts or commentators with much difficulty today. Each rule represents

³¹7 JOHN H. WIGMORE, WIGMORE ON EVIDENCE § 1923, at 31-32 (Chadbourn rev. 1978); see also Ladd, *supra* note 3, at 418 (stating that the test for finding the use of expert testimony permissible is whether a layperson could determine the particular issue intelligently).

³²Graham, *supra* note 21, at 49 (citing CHARLES T. MCCORMICK, MCCORMICK ON EVIDENCE § 12, at 31 (3d ed. 1984)). "This change in viewpoint concerning ultimate fact opinion resulted from the fact that the rule excluding opinion on ultimate facts is unduly restrictive . . . [and] can often unfairly obstruct the presentation of a party's case" *Id.*

³³FED. R. EVID. 704(a) states: "Except as provided in subsection (b), testimony in the form of an opinion or inference otherwise admissible is not objectionable because it embraces an ultimate issue to be decided by the trier of fact." *Id.*; see also FED. R. EVID. 704 advisory committee's note (stating that the basis usually assigned for the ultimate issue rule is to prevent the witness from "usurping the province of the jury," and is aptly characterized as "empty rhetoric.").

³⁴Graham, *supra* note 21, at 59-60.

³⁵See FED. R. EVID. 705 advisory committee's notes.

³⁶7 JOHN H. WIGMORE, WIGMORE ON EVIDENCE § 686, at 962 (Chadbourn rev. 1978).

³⁷"The expert may testify in terms of opinion or inference and give reasons therefor without prior disclosure of the underlying facts or data, unless the court requires otherwise. The expert may in any event be required to disclose the underlying facts or data on cross-examination." FED. R. EVID. 705.

widely accepted standards regarding the form and substance of an expert's opinion, and abolishes common law restrictions which have limited applicability to the complexities of contemporary litigation. However, much more complex issues arise regarding the threshold requirements for the admissibility of scientific expert evidence. Lying at the heart of the battle is the common law requirement, announced in 1923 by the D.C. Circuit in *Frye v. United States*³⁸, that an expert's opinion must be sufficiently established to have gained general acceptance in the relevant scientific community in order to enter the courtroom.

B. Frye v. United States and the General Acceptance Standard

Frye involved a criminal conviction for second degree murder in which the defendant attempted to prove his innocence through the introduction of the results of a "systolic blood pressure deception test."³⁹ Counsel for the defendant offered an expert witness to testify that, when examined, the defendant truthfully denied involvement in the crime for which he was charged.⁴⁰ The trial court sustained the government's objection to the evidence and refused the defendant's request to be tested in front of the jury.⁴¹ On appeal, the sole assignment of error was the exclusion of the evidence, and the defendant argued that the weight and credibility of the evidence was a question for the jury, not the trial judge.⁴²

In its opinion, the appellate court rejected the established common law approach to admissibility of expert testimony and fashioned a sweeping new

³⁸293 F. 1013 (D.C. Cir. 1923).

³⁹*Id.* The "systolic blood pressure deception test" is an ancestor of the polygraph, commonly referred to as the "lie detector" test. The test was designed to show a relationship between an examinee's conscious deception or falsehood and systolic blood pressure. *Id.*

⁴⁰*Id.*

⁴¹*Id.*

⁴²The case was one of first impression in the United States, and in their brief, counsel for the defendant argued the broad common law principle that expert evidence which is outside the common knowledge and experience of the ordinary layperson is admissible:

The rule is that the opinions of experts or skilled witnesses are admissible in evidence in those cases in which the matter of inquiry is such that inexperienced persons are unlikely to prove capable of forming a correct judgment upon it, for the reason that the subject-matter so far partakes of a science, art, or trade as to require a previous habit or experience or study in it, in order to acquire a knowledge of it. When the question involved does not lie within the range of common experience or common knowledge, but requires special experience or special knowledge, then the opinions of witnesses skilled in that particular science, art, or trade to which the question relates are admissible in evidence.

Id. at 1014.

rule to guide future courts in the determination of admissibility of novel scientific evidence:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.⁴³

Noting that the systolic blood pressure deception test had not gained general acceptance in the relevant scientific community,⁴⁴ the court held that the exclusion of the evidence was not error and affirmed the conviction.⁴⁵

The *Frye* test, recognized by courts across the country⁴⁶, dominated the judicial approach to controversial scientific evidence by the 1970s.⁴⁷ Its justification rests on a number of theories. First, proponents argue that the test assures that "a minimal reserve of experts exists who can critically examine the validity of a scientific determination in a particular case."⁴⁸ Second, because the standard requires acceptance by the "scientific community," those best qualified to determine what types of evidence are "acceptable" will resolve such

⁴³*Frye*, 293 F. at 1014.

⁴⁴"We think the systolic blood pressure deception test has not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made." *Id.*

⁴⁵*Id.*

⁴⁶*See, e.g.*, *Scales v. City Court*, 594 P.2d 97, 100 (Ariz. 1979); *People v. Kelly*, 549 P.2d 1240, 1244-45 (Cal. 1976); *Ibn-Tamas v. United States*, 407 A.2d 626, 633 (D.C. 1979); *Coppolino v. State*, 223 So. 2d 68, 70 (Fla. 1968); *Reed v. State*, 391 A.2d 364, 372 (Md. 1978); *People v. Barbara*, 255 N.W.2d 171, 172 (Mich. 1977); *State v. LaForest* 207 A.2d 429, 430-31 (N.H. 1965); *City of East Cleveland v. Ferrell* 154 N.E.2d 630, 632 (Ohio 1958); *Commonwealth v. Topa*, 369 A.2d 1277, 1281 (Pa. 1977); *State v. Helmer*, 278 N.W.2d 808, 812 (S.D. 1979); *State v. Canaday*, 585 P.2d 1185, 1188 (Wash. 1978); *State v. Frazier*, 252 S.E.2d 39, 43 (W. Va. 1979).

⁴⁷*Giannelli, supra* note 3, at 1205 (citing *Reed v. State*, 391 A.2d 364, 368 (Md. 1978) (stating "[t]his criterion of 'general acceptance' in the scientific community has come to be the standard in almost all of the courts in the country which have considered the question of the admissibility of scientific evidence.")).

⁴⁸*See Note, supra* note 3, at 859 (citing *United States v. Addison*, 498 F.2d 741, 744 (D.C. Cir. 1974) (holding inadmissible spectrographic voice identification which was not generally accepted)); *see also Graham, supra* note 21, at 53.

disputes.⁴⁹ Third, the standard promotes uniformity in judicial decisions by requiring courts to rely on national pronouncements of scientific agreement.⁵⁰ Fourth, the standard "protects the jury from the 'unwarranted impact caused by the misleading aura of certainty that frequently surrounds new discoveries.'"⁵¹ Fifth, an appellate decision accepting a scientific development would establish precedent binding in subsequent trials until the "relevant scientific community" accepts the evidence as reliable.⁵² Finally, at least one commentator has argued what "junk science" critics have used as their cornerstone argument: that the *Frye* test seeks "prevention of the introduction into evidence of specious and unfounded scientific principles or conclusions based upon such principles."⁵³

The rationale espoused in defense of *Frye* has been accepted as theoretically sound;⁵⁴ however, a closer look at its practical limitations led many courts and commentators to abandon the standard in the 1970s.⁵⁵ Dean McCormick catalyzed the attack on the *Frye* rule in the first edition of his leading hornbook,⁵⁶ characterizing the standard as "a proper condition upon the court's taking judicial notice of scientific facts, but not a criterion for the admissibility of scientific evidence."⁵⁷

Specific attacks on the *Frye* rule centered on at least five major criticisms.⁵⁸ First, a difficulty in distinguishing "scientific" from other types of evidence led to selective application of *Frye*, which in turn created widespread inconsis-

⁴⁹Note, *supra* note 3, at 859.

⁵⁰*Id.*

⁵¹*Id.* (citing Mark McCormick, *Scientific Evidence: Defining a New Approach to Admissibility*, 67 IOWA L. REV. 879, 883 (1982)).

⁵²McCormick, *supra* note 51, at 883.

⁵³Strong, *Questions Affecting the Admissibility of Scientific Evidence*, U. ILL. L. F. 1, 14 (1970); see also Cass, *Using the Frye Rule to Control Expert Testimony Abuses*, 31 FOR THE DEF. 23, 24 (No. 2 1989) (stating that "[w]hile a certain amount of error must be tolerated in a legal system composed of fallible human beings, erroneous legal judgments founded on erroneous scientific theories will ultimately erode the respect and obedience necessary for the legal system to function.").

⁵⁴Note, *supra* note 3, at 860.

⁵⁵Three cases illustrate the high water mark of the *Frye* standard: *United States v. Addison*, 498 F.2d 741 (D.C. Cir. 1974); *People v. Kelly*, 549 P.2d 1240 (Cal. 1976); *Reed v. State*, 391 A.2d 364 (Md. 1978). For an excellent discussion of the decline of judicial adherence to the *Frye* standard following these cases, see McCormick, *supra* note 51, at 883-905.

⁵⁶See CHARLES T. MCCORMICK, *HANDBOOK OF THE LAW OF EVIDENCE* § 171, 363 (1954).

⁵⁷*Id.*

⁵⁸See Note, *supra* note 3, at 860-62.

tencies in its use in American courts.⁵⁹ Second, defining the "relevant scientific field" led to similar inconsistent results.⁶⁰ Third, the phrase "general acceptance" has been criticized as vague and ambiguous.⁶¹ Fourth, because *Frye* forces the court to focus on the "general acceptance" of a particular scientific technique, critical problems in the use of the disputed evidence are overshadowed.⁶² For example, one writer has illustrated this criticism with cases addressing the admissibility of paraffin tests, used to determine whether an individual had fired a firearm.⁶³ By focusing on whether such tests were "generally accepted," courts often overlooked critical problems with the test such as "that the test was specific for [positive indications] of nitrates and nitrites, but not necessarily for gunshot residues."⁶⁴ Fifth, and most importantly, *Frye* has been condemned for frustrating the search for the truth by banning valuable and reliable scientific evidence from the courtroom.⁶⁵ It is this critical point that has led the battle for the rejection of *Frye*. The Fourth Circuit in *United States v. Baller*⁶⁶ addressed this criticism in a case holding that the introduction into evidence of voice spectrogram analysis⁶⁷ was not error:

Deciding whether [the *Frye* test has] been met is normally within the discretion of the trial judge. Absolute certainty of result or unanimity of scientific opinion is not required for admissibility. 'Every useful new development must have its first day in court. And court records are full of the conflicting opinions of doctors, engineers, and accountants, to name just a few of the legions of expert witnesses.' Unless an

⁵⁹*Id.* at 860 (citing Edward J. Imwinkelried, *A New Era in the Evolution of Scientific Evidence—A Primer on Evaluating the Weight of Scientific Evidence*, 23 WM. & MARY L. REV. 261, 264-65 (1981-82); *State v. Hall*, 297 N.W. 2d 80, 85 (Iowa 1980) (en banc), *cert. denied*, 450 U.S. 927 (1981).

⁶⁰Note, *supra* note 3, at 860 (citing Imwinkelried, *supra* note 59, at 265) (asking "[s]hould forensic science itself be treated as a scientific field?"); *see also Hall*, 297 N.W. 2d at 85 (stating "[d]espite its apparent simplicity, distinguishing 'scientific' evidence from other areas of expert testimony is a difficult determination in many instances.").

⁶¹Note, *supra* note 3, at 860.

⁶²*See Giannelli, supra* note 3, at 1226.

⁶³*Id.* at 1227.

⁶⁴*Id.*

⁶⁵Imwinkelried, *supra* note 3, at 265 (arguing "[t]he test ensures that the courts will constantly lag behind the advances of science while the courts wait for novel scientific techniques to win 'general acceptance.'").

⁶⁶519 F.2d 463 (4th Cir. 1975).

⁶⁷Voice spectrogram analysis, commonly referred to as "voiceprints" are used as a method to determine a speaker's identity. The spectrograph reduces the spoken word to a pattern of light and, when printed, show a pattern of dark lines representing frequency, duration, and amplitude. *See, e.g., United States v. Williams*, 583 F.2d 1194 (2d Cir. 1978), *cert. denied*, 439 U.S. 1117 (1979); *United States v. Baller*, 519 F.2d 463 (4th Cir. 1975); *United States v. Addison*, 498 F.2d 741 (D.C. Cir. 1974).

exaggerated popular opinion of the accuracy of a particular technique makes its use prejudicial or likely to mislead the jury, it is better to admit relevant scientific evidence in the same manner as other expert testimony and allow its weight to be attacked by cross-examination and refutation.⁶⁸

Many other courts took a similar view, but it was the enactment of the Federal Rules of Evidence in 1975 which hastened the abandonment of *Frye*.

C. Expert Testimony and the Federal Rules of Evidence

Many of the hurdles that the common law placed in front of expert witnesses were removed by the enactment of the Federal Rules of Evidence in 1975. As previously noted, the Rules abolished the hypothetical question requirement and now allow the expert to embrace the ultimate issue of a case.⁶⁹ Moreover, unlike the common law, the Rules do not mandate that expert evidence be based on knowledge or experience uncommon to lay persons.⁷⁰ These common law rules have been supplanted by Federal Rules of Evidence 704 and 705.⁷¹ Further liberalizing common law restrictions on experts are Rules 702 and 703, the vanguard Federal Rules governing the admissibility of expert testimony.⁷²

Under Rule 702, a trial judge's preliminary concern is whether the proffered expert is qualified to testify. At common law, a proposed expert would not be allowed to testify unless the trial judge was convinced of the expert's qualifications.⁷³ Rule 702 maintains this requirement. Under the Rule, an expert may be qualified within the Rule if she possesses knowledge, skill, experience, training, or education which relates directly to the complexity of the subject matter to which she will testify.⁷⁴ The degree of knowledge or experience required in order to qualify one as an expert is solely within the discretion of

⁶⁸519 F.2d at 466 (citations omitted).

⁶⁹See *supra* notes 24-27 and accompanying text.

⁷⁰See *supra* notes 22-23 and accompanying text.

⁷¹See *supra* notes 32-37 and accompanying text.

⁷²Initially, it must be noted that under Federal Rule of Evidence 104(a) the trial judge has the discretion to decide preliminary questions, such as the admissibility of expert testimony. Federal Rule of Evidence 104(a) provides, in relevant part: "Preliminary questions concerning the qualification of a person to be a witness . . . or the admissibility of evidence shall be determined by the court." FED. R. EVID. 104(a). Such determinations are, of course, conducted out of the hearing of the jury in most cases. See FED. R. EVID. 104(c).

⁷³See Note, *Expert Testimony Based on Novel Scientific Techniques: Admissibility Under the Federal Rules of Evidence*, 48 GEO. WASH. L. REV. 774, 782 (1980).

⁷⁴FED. R. EVID. 702.

the trial judge; and the trial court will not require the proposed expert to satisfy an "overly narrow test" of his or her own qualifications.⁷⁵

An often overlooked aspect of Rule 702 is that it does not limit expert testimony to that which is "scientific" or "technical." Rather, the Rule encompasses those persons who possess "specialized" knowledge. Thus, various individuals, referred to as "skilled" witnesses may fall within the scope of the Rule. Typical examples of "skilled" witnesses include bankers and landowners testifying to land values.⁷⁶

After the judge has answered the qualification issue in the affirmative, she must determine whether the expert's testimony will assist the trier to understand the evidence or determine a fact in issue.⁷⁷ Under the Rule, the trial court determines the admissibility of expert testimony solely on the basis of its helpfulness to the fact-finder. To be helpful, the subject of the testimony must be within the expert's field and the foundation for the opinion must intelligibly relate the testimony to the facts.⁷⁸ Because of the flexibility of the Rule and the liberal approach to the admissibility of evidence taken by the Federal Rules of Evidence, testimony which is borderline helpful is generally admitted.⁷⁹

Next, the trial judge must consider the basis of the proposed expert's testimony under Rule 703.⁸⁰ The Rule was adopted in order to facilitate judicial efficiency by not requiring an attorney to produce and examine several authenticating witnesses.⁸¹ Under Rule 703, an expert may base an opinion on facts known to her, ascertained through study or practice. For example, a

⁷⁵See *Duff v. Page*, 249 F.2d 137 (9th Cir. 1975); see also *Gardner v. General Motors Corp.*, 507 F.2d 525, 528 (10th Cir. 1974).

⁷⁶FED. R. EVID. 702 advisory committee's notes; see also *Robinson v. Watts Detective Agency*, 685 F.2d 729 (1st Cir. 1982) (finding the owner of a business competent to give his opinion as to the value of his property); *Kastenbaum v. Falstaff Brewing Co.*, 514 F.2d 690 (5th Cir. 1975) (permitting landowner's opinion on the value of his property). Experienced truckers and long-time employee's of an industry provide additional examples. See, e.g., *Farner v. Paccar, Inc.*, 562 F.2d 518 (8th Cir. 1977) (allowing a person in the trucking business with thirty years experience to testify on proper design of suspension systems for trucks); *Panger v. Duluth, Winnipeg & Pac. Ry.*, 490 F.2d 1112 (8th Cir. 1974) (permitting an employee injured in an industrial accident to testify based upon his experience with industry as to how the employer could have avoided the accident).

⁷⁷FED. R. EVID. 702.

⁷⁸*McCormick*, *supra* note 51, at 881.

⁷⁹See, e.g., *In re Agent Orange Prod. Liab. Litig.*, 611 F. Supp. 1223, 1242 (E.D.N.Y. 1985), *aff'd*, 818 F.2d 145 (2d Cir. 1987).

⁸⁰The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or known to [him] at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.

FED. R. EVID. 703.

⁸¹FED. R. EVID. 703 advisory committee's notes.

physician who testifies may base her opinion on statements from patients, reports and opinions from nurses and other physicians, hospital records, and X-rays.⁸² Moreover, if the facts upon which the expert will rely are not themselves admissible in evidence, the Rule gives the trial judge discretion in disallowing an expert's opinion if other experts in the relevant field do not rely upon them as well.⁸³ For example, if an opinion is based upon an unsupported theory or on facts that other experts would feel insufficient to warrant reliance, the judge may exclude it.⁸⁴ The test for determining the admissibility of an opinion based on facts reasonably relied on by other experts in the field is not satisfied simply by a showing that other experts would rely on the data for purposes of litigation; rather, the attorney proposing a contested expert must show that other experts would rely on the same facts in a non-litigation context.⁸⁵

Even if the trial judge determines that a proposed expert satisfies these requirements, the inquiry is not at an end. An expert may still be excluded from testifying if the probative value of the evidence is substantially outweighed by prejudice, time considerations, or confusion of the jury.⁸⁶ In making a ruling based on Rule 403, the trial judge engages in a balancing test which considers the probative value of the evidence against the harm likely to result from its admission.⁸⁷ The purpose of Rule 403 is to exclude relevant evidence which has an undue tendency to suggest a decision on an improper basis, such as emotionalism.⁸⁸

III. CHICKEN LITTLE "FRYES" SCIENTIFIC EXPERTS: THE DEVELOPMENT OF STRICT SCRUTINY

Although there has been much discussion to the effect that the general acceptance standard in *Frye v. United States* has been abandoned in many jurisdictions as a result of the enactment of the Federal Rules of Evidence in

⁸²*Id.*; see also *In re Japanese Elec. Prods. Antitrust Litig.*, 723 F.2d 238, 277 (3d Cir. 1983), *cert. granted on other grounds*, 471 U.S. 1002 (1985), *rev'd and remanded sub. nom. Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574 (1986). Rule 703 has been construed broadly by the federal courts. See, e.g., *United States v. Baca*, 687 F.2d 1356, 1361 (10th Cir. 1982) (an expert could give an opinion as to defendant's competence based on another doctor's evaluations).

⁸³FED. R. EVID. 703.

⁸⁴See Note, *supra* note 73, at 783.

⁸⁵*Id.*

⁸⁶Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.
FED. R. EVID. 403.

⁸⁷FED. R. EVID. 403 advisory committee's note.

⁸⁸*Id.*

1975,⁸⁹ a closer look at the modern trend toward skepticism of plaintiffs' experts reveals that this is simply not the case.⁹⁰ Many courts have now embarked on a trend which purports to apply *Frye*, a criminal case, in civil toxic tort litigation. It is this critical distinction which has received too little attention from courts and commentators. Although it has been suggested that the *Frye* standard should persevere in criminal cases as an extra protection for defendants battling the powers of the State,⁹¹ it is less clear whether the use of *Frye*, in any form, is a good idea in the civil context.

The typical situation in which the strict scrutiny idea flourishes is the so-called toxic tort in which the plaintiff alleges harm was done as a result of exposure to toxic chemicals. Because of the difficulties in linking exposure of toxic chemicals to human harm, causation, via the expert opinion, is often the decisive factor in such cases.⁹² The strict scrutiny approach, or active review, is an attempt to ensure that a plaintiff's scientific experts testify within the mainstream of scientific knowledge by empowering the trial judge to reject claims of causation which seemingly do not reflect widely adopted theories.⁹³

Perhaps the first recent court to take active judicial control of scientific testimony was the U.S. District Court for the Eastern District of New York in the well-known *In Re Agent Orange Product Liability Litigation*.⁹⁴ In this class-action suit, Vietnam veterans and their families sued a number of chemical companies which manufactured an herbicide designed for defoliation of the Vietnam jungles.⁹⁵ The plaintiffs sought compensation for various diseases allegedly caused as a result of their exposure to dioxin.⁹⁶

In support of their claims, plaintiffs sought to enter into evidence proof of causation by extrapolating through epidemiological studies⁹⁷ and animal tests

⁸⁹ See generally Giannelli, *supra* note 3; Graham, *supra* note 21; McCormick, *supra* note 51; Note, *supra* note 3.

⁹⁰ See Bell, *supra* note 5, at 50. "The modern version of the *Frye* rule finds its dangerously amorphous equivalent in the most prevalent version of the strict scrutiny idea: the concept of active review." *Id.*

⁹¹ See Giannelli, *supra* note 3, at 1245-50.

⁹² See SCHUCK, *supra* note 6, at 8-9. "In the traditional tort case, the nature of the injury is typically straightforward In the toxic tort dispute, the nature of the injury is very different and the processes of establishing, defining, and measuring the injury are far more complex Often the pathways of causation are difficult to detect" *Id.*

⁹³ See Gass, *supra* note 53; Bert Black, *Evolving Legal Standards for the Admissibility of Scientific Evidence*, 239 SCI. 1508 (1988).

⁹⁴ 611 F. Supp. 1223 (E.D.N.Y. 1985).

⁹⁵ *Id.* at 1228.

⁹⁶ *Id.* at 1229.

⁹⁷ Epidemiological studies rely on "statistical methods to detect abnormally high incidences of disease in a study population and to associate these incidences with unusual exposures to suspect environmental factors." Michael Dore, *A Commentary on*

a trend that showed "to a reasonable degree of medical probability" exposure to dioxin was the source of their ailments.⁹⁸ The defense argued that they were entitled to summary judgment as a matter of law because the plaintiffs failed to "present credible evidence of a causal link between exposure to Agent Orange and the various diseases from which they are suffering."⁹⁹ In granting the motion for summary judgment, Judge Weinstein sounded the trumpet for active review by stating that "[w]hen either the expert's qualifications or his testimony lie at the periphery of what the scientific community considers acceptable, special care should be exercised in evaluating the reliability and probative worth of the proffered testimony."¹⁰⁰

Perhaps the best illustration of the development of strict scrutiny following *Agent Orange* can be found through a study of Fifth Circuit precedent since 1986. The first call to active review was sounded in *In Re Air Crash Disaster at New Orleans*.¹⁰¹ In this case, the surviving children of parents who were killed in a Pan American airplane crash sued the airline for wrongful death.¹⁰² The jury awarded the children a total of \$4,700,000 and an award of \$100,000 each for loss of inheritance.¹⁰³ On appeal, the court reversed the award of loss of inheritance on the grounds that plaintiffs' economist's testimony was "so abusive of the known facts, and so removed from any area of demonstrated expertise, as to provide no reasonable basis for calculating how much of [the decedent's] income would . . . be inherited by his children."¹⁰⁴

The criticism, however, should not be focused on the court's reasoning for overturning the loss of inheritance verdict. Indeed, the court—an appellate court charged with the duty of reviewing such decisions—devoted two pages to criticizing the erroneous assumptions of the plaintiffs' economist.¹⁰⁵ Rather, the criticism is directed toward the "message [sent] to [their] able trial colleagues: it is time to take hold of expert testimony in federal trials."¹⁰⁶ To be sure, it is of the utmost importance to scrutinize "experts" who will testify as to critical issues in a case in order to assure trustworthiness. However, when taken to its logical extreme, this vigorous attitude toward experts whose qualifications are beyond dispute tends to "further entrench[] our legal

the Use of Epidemiological Evidence in Demonstrating Cause-in-Fact, 7 HARV. ENVTL. L. REV. 429, 431 (1983).

⁹⁸611 F. Supp. at 1237-38.

⁹⁹*Id.* at 1229.

¹⁰⁰*Id.* at 1242.

¹⁰¹795 F.2d 1230 (5th Cir. 1986).

¹⁰²*Id.* at 1231.

¹⁰³*Id.* at 1232.

¹⁰⁴*Id.* at 1235.

¹⁰⁵*Id.* at 1234-35.

¹⁰⁶795 F.2d at 1234.

system's bias towards not imposing liability upon defendants whose toxic substances in fact have caused injuries."¹⁰⁷

The Fifth Circuit continued its call for active review in more blatant terms when it held that defendants were entitled to a judgment notwithstanding the verdict in *Brock v. Merrell Dow Pharmaceuticals*.¹⁰⁸ This case was one of the many filed against Merrell Dow by parents of children with birth defects allegedly caused by the ingestion of Bendectin¹⁰⁹ during pregnancy.¹¹⁰ In this case, as with all Bendectin cases, plaintiffs sought to prove causation through epidemiological evidence.¹¹¹ The plaintiffs obtained a jury verdict in the amount of \$550,000 in compensatory and punitive damages.¹¹² In holding that the epidemiological evidence which the trial judge allowed the jury to hear was not conclusive,¹¹³ the court stated: "[h]opefully our decision will have the effect of encouraging district judges faced with medical and epidemiological proof in subsequent toxic tort cases to be especially vigilant in scrutinizing the basis, reasoning, and conclusiveness of studies presented by both sides."¹¹⁴

The Fifth Circuit then denied the plaintiffs' petition for rehearing *en banc* over the spirited dissent of six judges.¹¹⁵ Noting that "six highly qualified and experienced experts testified that Bendectin is . . . capable of causing human

¹⁰⁷Bell, *supra* note 5, at 79.

¹⁰⁸874 F.2d 307 (5th Cir. 1989), *modified*, 884 F.2d 166 (5th Cir.), *cert. denied*, 496 U.S. 1046 (1990).

¹⁰⁹Bendectin, a drug marketed and sold by Merrell-Dow, has been prescribed to thousands of women to combat "morning sickness" during pregnancy. It was first approved for sale in 1956 by the Food and Drug Administration and public concern about its relationship to birth defects mounted in the 1970's. See DeLuca v. Merrell Dow Pharmaceuticals, Inc., 911 F.2d 941 (3d Cir. 1990); Brock v. Merrell Dow Pharmaceuticals, Inc., 874 F.2d 307 (5th Cir. 1989); Richardson v. Richardson-Merrell, Inc., 857 F.2d 823 (D.C. Cir. 1988), *cert. denied*, 110 S. Ct. 218 (1989); Lynch v. Merrell Nat'l Labs, 830 F.2d 1190 (1st Cir. 1987).

¹¹⁰Brock, 874 F.2d at 309.

¹¹¹*Id.* at 308.

¹¹²*Id.*

¹¹³The plaintiffs relied on re-analysis results, conducted as the "Heinonen study" under the auspices of the U.S. National Institute of Neurological and Communicative Disorders which was based on over 50,000 pregnancy records collected in the United States. The study revealed that of 1,000 women who took Bendectin during the first trimester, 63 had infants born with malformations as opposed to 3,200 of 49,000 who had not taken Bendectin. This yielded a relative risk (a number used to describe the increased incidence of birth defects in those who took Bendectin as opposed to those who did not) of .97. A relative risk of 1.0 or greater means that there were more birth defects in the women who took Bendectin. On appeal, the court held that the .97 relative risk was not conclusive evidence in showing a causal link between ingestion of Bendectin and resulting birth defects. *Id.* at 312.

¹¹⁴*Id.* at 315.

¹¹⁵Brock v. Merrell Dow Pharmaceuticals, 884 F.2d 166 (5th Cir. 1989).

birth defects," the dissenters attacked the reversal of the jury verdict for circumventing the Federal Rules of Evidence.¹¹⁶ The dissent asks rhetorically: "[i]n the absence of expert consensus must we now always await population studies before a jury verdict may be based on medical opinion?"¹¹⁷

The battle on the Fifth Circuit came to a climax two years later in the classic toxic tort setting of *Christopherson v. Allied-Signal Corp.*¹¹⁸ In stark contrast to *Brock*, the Fifth Circuit granted a rehearing *en banc*¹¹⁹ after the appellate panel upbraided the trial judge for granting a defense motion for summary judgment.¹²⁰ Remarkably, on rehearing the Fifth Circuit reversed the appellate panel and affirmed the original granting of the defense motion for summary judgment.¹²¹

Albert Christopherson was exposed to defendant's nickel and cadmium fumes for fourteen years at his workplace, a battery manufacturing plant.¹²² He died in 1986 from a rare form of colon cancer that metastasized to his liver.¹²³ Believing that the exposure caused Albert's death, his surviving wife and children subsequently brought a wrongful death suit against those entities allegedly responsible.¹²⁴

The *en banc* decision, while claiming that its approach introduced "no new concepts to our jurisprudence,"¹²⁵ based its decision on a combination of Rule 703 and *Frye v. United States*.¹²⁶ The opinion proceeded through a reading of

¹¹⁶*Id.* at 168. Indeed, the panel decision did not cite a single Federal Rule of Evidence in support of its rationale.

¹¹⁷*Id.*

¹¹⁸939 F.2d 1106 (5th Cir. 1991).

¹¹⁹*Christopherson v. Allied-Signal Corp.*, 914 F.2d 66 (5th Cir. 1990).

¹²⁰*Christopherson v. Allied-Signal Corp.*, 902 F.2d 362, 366 (5th Cir. 1990). The panel concluded that the trial court had excluded plaintiff's expert solely because it found the expert's opinion to be unreliable as a whole. The panel said that any questions about the adequacy of an opinion based on the exposure information provided to plaintiff's expert should be raised at trial to assist the jury in determining the weight and credibility of his conclusion. Moreover, the panel noted that the dismissal was based on affidavits of four defense experts who, without being subject to any cross-examination, concluded that plaintiff's expert's conclusions had no support in medical science. The panel acknowledged that some of the defense affidavits posed a direct conflict with the plaintiff's expert, but pointed out that they simply raised the sort of conflicting opinion which the trial process was supposed to permit a jury to resolve, and the trial judge "simply chose sides in this battle of the experts and thereby usurped the role of the jury." *Id.*

¹²¹939 F.2d at 1108.

¹²²*Id.*

¹²³*Id.*

¹²⁴*Id.*

¹²⁵*Id.* at 1120 (Clark, C.J., concurring).

¹²⁶939 F.2d at 1109.

Frye into Rule 703, resulting in the requirement that an expert's opinion or methodology be reasonably reliable.¹²⁷ The court concluded that the plaintiff's expert opinion was not reasonably reliable because the expert based his opinion, in part, on information received by one of Mr. Christopherson's fellow employees regarding the amount of toxic exposure on the job.¹²⁸ In revitalizing and citing *Frye*,¹²⁹ the court held that the expert was properly excluded because two defense experts testified in affidavits that they rejected plaintiff's expert's reasoning and methodology.¹³⁰

In a riveting dissent, four judges attacked the majority for "'tak[ing] hold' of expert testimony by taking over."¹³¹ The dissent pointed out that Rule 703 is satisfied once there is a showing that an expert's testimony is based on the type of data a reasonable expert in the field would use in rendering an opinion on the subject at issue; the Rule "does not address the reliability or general acceptance of an expert's methodology."¹³² Moreover, the dissent criticized the majority's use of *Frye* which goes far beyond its pre-1975 confines. The court noted that the Fifth Circuit had previously "only once employed *Frye* outside the criminal context, never applied it to 'reasoning,' and indeed once expressly limited the *Frye* doctrine to 'pseudo-scientific data.'"¹³³

In a separate dissent, one judge questioned the motives behind the per curiam opinion, succinctly illustrating the debate over so-called "junk science":

Lest anyone misunderstand, at root this is not a case about the Federal Rules of Evidence, albeit that two of them have been mangled in the process. It is instead about the outcomes in toxic tort cases. What the majority is saying is that in its view, the outcomes in toxic tort cases

¹²⁷*Id.* at 1114. The court stated: "[D]istrict judges may reject opinions founded on critical facts that are plainly untrustworthy, principally because such an opinion cannot be helpful to the jury." *Id.*

¹²⁸*Id.* at 1113.

¹²⁹*Id.* at 1115.

¹³⁰*Id.* at 1115-16.

¹³¹ 939 F.2d at 1122. The dissent finishes the paragraph by stating:

The per curiam opinion effectively allows judges to decide the reliability, weight, and relative merit of expert opinions, at least in toxic tort cases. And with such control, we signal a willingness to increase the proof and persuasion burdens of the disfavored party Surely my colleagues . . . should know that their use of these concepts confuses the admissibility of evidence with the sufficiency of evidence, changes the Rules of Evidence without benefit of amendment, denies Mrs.

Christopherson her right to trial by jury, and eliminates substantive rights in tort cases where federal courts have only diversity jurisdiction.

Id. (Reavley, J., dissenting).

¹³²*Id.* at 1129 n.30 (quoting *DeLuca v. Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d 941, 953 (3d Cir. 1990)).

¹³³*Id.* at 1133.

that have been left to the jury have too often been unacceptable. The majority's solution is to re-write the Federal Rules of Evidence . . . which, implicitly, have too often been misapplied by "our able trial colleagues." . . . Plaintiffs attempting to establish liability in areas in which scientific methodology or reasoning is not yet well-established will face a nearly insurmountable burden. The result will be to deprive plaintiffs with possibly meritorious claims of a jury's assessment of their right to recovery.¹³⁴

The strict scrutiny approach exemplified by the Fifth Circuit is just one in an increasing number of jurisdictions. Modern toxic tort litigation presents novel, challenging problems for the federal judiciary. Nevertheless, the dangers of a court's wading into scientific issues with this "especially vigilant" attitude are coming to the fore. Active review clearly signals that courts are readily accepting the "junk science" position that plaintiffs are attempting to prove causation with "methods as bizarre as tarot cards and ouija boards."¹³⁵ The Federal Rules of Evidence quite clearly allow a court to exclude such patently unreliable testimony.¹³⁶ But testimony which is merely controversial, debatable, questionable, unsettled or suspicious should be given only as much weight and credibility as a jury will allow.¹³⁷ Judges are now invited to weigh the credibility of witnesses, determine the merits of testimonial evidence, and exclude plaintiff's proof of causation if defendants can produce more experts¹³⁸ to disagree—in an affidavit—as to the degree of "acceptance" of an unusual or uncertain methodology.¹³⁹ As courts strain to read the *Frye* doctrine into

¹³⁴*Id.* at 1136-37.

¹³⁵Michael Ciresi, *Protecting Your Evidence Against 'Junk Science' Attacks*, TRIAL, Nov. 1991, at 35.

¹³⁶*See Christopherson*, 939 F.2d at 1127 (Reavley, J. dissenting).

The language expressing such patent unreliability varies, but never signals testimony or assumptions that are merely controversial, debatable, questionable, unsettled, or suspicious. These terms connote weight and credibility. Instead, courts speak of testimony that is 'almost entirely unreliable,' reliance upon 'assumptions devoid of any basis in the real world,' opinions that are 'abusive of the known facts' or 'contrary to the proven facts,' or so manifestly wrong as to offend common sense.'

Id. (citations omitted).

¹³⁷*See, e.g., DeLuca v. Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d 941, 956 (3d Cir. 1990) (explaining that the Federal Rules of Evidence embody a strong and undeniable preference for admitting any evidence having some potential for assisting the trier of fact and for dealing with the risk of error through the adversarial process).

¹³⁸Even more shocking, the trial court's decision might rest on the affidavit of a single expert, versus numerous plaintiff's experts, as it did in *Daubert*. *See infra* notes 153-63 and accompanying text.

¹³⁹*Christopherson* was decided within one year of its filing by the unusual method of summary judgment. The dissent lamented that "The causation issue is not sufficiently investigated to warrant summary proceedings based on direct judicial precedent or judicial acknowledgement of decisive negative findings.

particular evidentiary rules, courthouse doors are being slammed on plaintiffs while the bench continues to erode the proposition that "relevant, unprivileged evidence should be admitted and its weight left to the fact-finder, who would have the benefit of cross-examination and contrary evidence by the opposing party."¹⁴⁰

The U.S. Supreme Court entered the debate¹⁴¹ to attempt to settle the issue by deciding a Bendectin case, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*¹⁴² As with other Bendectin cases specifically, and toxic tort cases in general, both sides in the *Daubert* dispute were armed with highly qualified, reputable scientific experts. Employing the strict scrutiny approach adopted in three other Bendectin cases,¹⁴³ the trial court granted summary judgment in favor of Merrell Dow.¹⁴⁴ The Ninth Circuit Court of Appeals upheld that decision, citing Peter Huber's latest assault on the tort system, *Galileo's Revenge: Junk Science in the Courtroom*,¹⁴⁵ as persuasive.¹⁴⁶ The Supreme Court is urged to adopt the following analysis of the issues presented before it. A contrary decision will confirm a failure "to set our faces firmly against these cries of wolf, [and] we will find the adversary system destroyed and replaced by an inquisitorial system of review by panels of experts drawn from the reigning establishments."¹⁴⁷

No clearly established facts in the record controvert the scientific facts [of plaintiff's expert's] reasoning With its deference to summary rendering of *Christopherson*, the majority endows judges with the work of juries." 939 F.2d at 1127-29.

¹⁴⁰Barefoot v. Estelle, 463 U.S. 880, 898 (1983).

¹⁴¹See *supra* note 15.

¹⁴²951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993).

¹⁴³See *Brock v. Merrell Dow Pharmaceuticals, Inc.*, 874 F.2d 307 (5th Cir. 1989); *Richardson v. Richardson-Merrell, Inc.*, 857 F.2d 823 (D.C. Cir. 1988); *Lynch v. Merrell Nat'l Labs*, 830 F.2d 1190 (1st Cir. 1987).

¹⁴⁴*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 727 F. Supp. 570 (S.D. Cal. 1989), *aff'd*, 951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993).

¹⁴⁵See HUBER, *GALILEO'S REVENGE*, *supra* note 4.

¹⁴⁶*Daubert*, 951 F.2d at 1131.

¹⁴⁷George W. Conk, *Free Marketeers Assail Free Market of Ideas*, 129 N.J. L.J. Index Page 779 (Nov. 14, 1991). Peer review of scientific opinions and methodologies is an approach advocated by strict scrutinists, adopted by the Ninth Circuit and an issue before the Supreme Court in *Daubert*. See HUBER, *GALILEO'S REVENGE*, *supra* note 4, at 228 (stating that the best test of certainty we have is good science—the science of publication, replication, and verification, the science of consensus and peer review).

IV. CHICKEN LITTLE GOES TO THE SUPREME COURT: *DAUBERT V. MERRELL DOW PHARMACEUTICALS, INC.*

A. Procedural Background

Plaintiffs Jason Daubert and Eric Schuller were born with severe and permanent limb-reduction birth defects.¹⁴⁸ They and their parents brought suits in California state court alleging that the birth defects were caused by their mothers' ingestion of Bendectin during the first trimester of their pregnancy.¹⁴⁹ The defendants invoked the diversity jurisdiction of the federal district court and had the cases removed.¹⁵⁰ Following discovery, the defendants moved for summary judgment on the basis that the plaintiffs could not offer admissible evidence to prove their allegations.¹⁵¹ That motion was granted by the district court, stating that the "necessary predicate to the admission of scientific evidence is that the principle upon which it is based 'must be sufficiently established to have gained general acceptance in the field to which it belongs.'"¹⁵²

The plaintiffs employed eight expert witnesses, all of whom have outstanding credentials, and hold important positions in their fields.¹⁵³ Each expert concluded that Bendectin is a human teratogen¹⁵⁴ and that when ingested during pregnancy, is capable of producing limb defects in human fetuses.¹⁵⁵ One expert further concluded, based on the teratogenic properties of Bendectin, the timing of its ingestion by plaintiffs' mothers, and the lack of any medical factors in their mothers' backgrounds that might explain the defects, that Bendectin in fact caused the malformities.¹⁵⁶ The experts based

¹⁴⁸*Daubert*, 951 F.2d 1128.

¹⁴⁹*Id.*

¹⁵⁰Brief for Petitioners at 2, *Daubert v. Merrell-Dow Pharmaceuticals, Inc.*, 951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993).

¹⁵¹*Id.* The defense motion did not contest whether the plaintiff's mothers had ingested Bendectin, nor did the motion suggest the possibility that the birth defects were caused by anything else, including genetic factors. *Id.*

¹⁵²*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 727 F. Supp. 570, 570 (S.D. Cal. 1989) (citing *United States v. Kilgus*, 571 F.2d 508, 510 (9th Cir. 1978), *aff'd*, 951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993). While the district court did not cite *Frye*, the *Kilgus* opinion from which it quoted the rule cites *Frye* as its source.

¹⁵³Brief for Petitioners at 3, *Daubert v. Merrell-Dow Pharmaceuticals, Inc.*, 951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993).

¹⁵⁴A teratogenic agent is any substance which causes fetal malformations "or monstrosities." WEBSTER'S II NEW RIVERSIDE DICTIONARY 1194 (1984).

¹⁵⁵Brief for Petitioners at 4, *Daubert v. Merrell-Dow Pharmaceuticals, Inc.*, 951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993).

¹⁵⁶*Id.*

their conclusions, with respect to causation, upon an analysis of four sources, "in vivo" animal studies,¹⁵⁷ "in vitro" studies of animal cells,¹⁵⁸ pharmacological studies,¹⁵⁹ and epidemiological studies.¹⁶⁰ The experts' affidavits submitted by the plaintiffs in opposition to the defense motion for summary judgment recited that these four sources of information are the standard sources generally consulted by scientists when attempting to form opinions about whether a substance causes birth defects.¹⁶¹ Moreover, the plaintiffs also submitted the testimony of several experts, called by Merrell Dow in other Bendectin litigation, agreeing that conclusions respecting causation are customarily predicated upon the results of all four of these sources.¹⁶²

The defendants, in support of their motion for summary judgment, submitted a two page affidavit of a single expert. That affidavit merely stated that the expert had reviewed all of the Bendectin and human birth defect literature and concluded that the maternal use of Bendectin during the first trimester of pregnancy is not a risk factor for human birth defects.¹⁶³ It was on the basis of this record that the trial court ruled plaintiffs' expert testimony inadmissible.

It is difficult, if not impossible, to imagine a scenario more ripe for *adversarial*, as opposed to *unilateral, judicial*, adjudication. As any first-year law student knows, the burden of persuasion in the civil tort context is typically based on "a preponderance of the evidence" standard or, more simply, that a defendant's negligence was "more likely than not" the cause of a plaintiff's injuries.¹⁶⁴ In

¹⁵⁷"In vivo" animal studies compare the offspring of animals subjected to dosages of Bendectin during pregnancy with the offspring of those not subjected to Bendectin.

¹⁵⁸"In vitro" studies examine animal cells exposed to Bendectin, to determine whether abnormal cell development associated with human limb birth defects results.

¹⁵⁹Pharmacological studies examine the chemical structure of Bendectin and compare that structure with the structures of other similar substances known to cause comparable birth defects in humans.

¹⁶⁰These particular epidemiological studies compile data gathered in studies comparing the incidence of birth defects of various types in the offspring of women who took Bendectin during pregnancy with those of women who did not.

¹⁶¹Brief for Petitioners at 4-5, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 951 F.2d 1128 (9th Cir. 1991), *cert. granted*, 113 S. Ct. 320 (1992), and *vacated*, 113 S. Ct. 2786 (1993).

¹⁶²*Id.*

¹⁶³*Id.* at 2.

¹⁶⁴See BLACK'S LAW DICTIONARY 1182 (6th Ed. 1990) (defining "preponderance of evidence" as "standard of proof in civil cases . . . which as a whole shows that the fact sought to be proved is more probable than not"); see also *Bourjaily v. United States*, 483 U.S. 171, 175 (1987) (stating that preliminary questions, such as admissibility of evidence, are required to "be established by a preponderance of proof."); BLACK'S LAW DICTIONARY at 161 (defining "beyond a reasonable doubt" as standard in evidence, used in criminal cases, meaning "fully satisfied, entirely convinced, satisfied to a moral certainty.").

addition, a court determines summary judgment by construing the evidence "in the light most favorable to the non-moving party."¹⁶⁵ The Dauberts, it seems, were not afforded the benefit of either of these propositions which are an intrinsic part of the legal package which ensures a fair trial, and moreover, a trial by jury. Active review, or strict judicial scrutiny of scientific evidence not only defies common sense, but conveniently ignores long-standing and basic tenets of American jurisprudence. To continue encouraging judges to place scientific testimony under a powerful microscope during the pretrial stages of litigation ensures that plaintiffs in the future will face an insurmountable burden when trying to prove their injuries.

B. Burning the Frye Standard

The United States Supreme Court, in *Bourjaily v. United States*¹⁶⁶ considered the status of the so-called "bootstrapping rule" under the co-conspirator exception to the hearsay rule.¹⁶⁷ In that case, the petitioner argued that the bootstrapping rule, as construed by several courts of appeals, survived the enactment of the Federal Rules of Evidence.¹⁶⁸ The Court rejected the argument, finding that "[i]t would be extraordinary to require legislative history to confirm the plain meaning of Rule 104."¹⁶⁹ Thus, because Congress did not include the common law bootstrapping rule in any of the codified hearsay exceptions,¹⁷⁰ the plain meaning of Rule 104¹⁷¹ mandated the conclusion that hearsay statements themselves were not barred to prove conspiracy and trigger the co-conspirator exception to the hearsay rule.¹⁷²

¹⁶⁵See *DeLuca v. Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d at 941, 945 (1990) ("Summary judgment is appropriate when, after considering the record evidence in the light most favorable to the non-moving party, no issue of material fact exists and the moving party is entitled to judgment as a matter of law.") (emphasis added).

¹⁶⁶483 U.S. 171 (1987).

¹⁶⁷The "bootstrapping rule"—firmly embraced by the United States Supreme Court itself prior to the Rules' enactment in 1975—had always barred hearsay statements themselves from being used to prove conspiracy and thus to trigger the co-conspirator exception to the prohibition on hearsay. *Bourjaily*, 483 U.S. at 177. In previous cases, the Court had reasoned that without that rule, "hearsay would lift itself up by its own bootstraps to the level of competent evidence." *Id.* (quoting *Glasser v. United States*, 315 U.S. 60, 74-75 (1942)).

¹⁶⁸*Id.* at 178.

¹⁶⁹*Id.* (emphasis in original).

¹⁷⁰See FED. R. EVID. 803-04 (hearsay exceptions).

¹⁷¹See *supra* note 72.

¹⁷²A statement is not hearsay if . . . "[t]he statement is offered against a party and is . . . a statement by a coconspirator of a party during the course and in the furtherance of the conspiracy." FED. R. EVID. 801(d)(2)(E).

Other decisions by the Supreme Court have rejected similar arguments for skewed readings of the Federal Rules of Evidence.¹⁷³

Beginning with the premise, as recognized by the United States Supreme Court, that an interpretation of the Federal Rules of Evidence must proceed with the "plain meaning" of the Rules themselves, it logically follows that the "general acceptance" standard of *Frye v. United States* cannot stand independently of the Rules if Congress did not intend to preserve it therein. A careful reading of the Federal Rules of Evidence, including its legislative history, unmistakably reveals no such intention. Rule 402, "the keystone of the whole scheme"¹⁷⁴ states that "[a]ll relevant evidence is admissible."¹⁷⁵ Rule 402, then, represents a desire "to wipe the slate clean"¹⁷⁶ of all common law exclusionary rules and mandate that "the rest of the Evidence Rules are exceptions to the basic rule of relevance."¹⁷⁷

No support can be found for an exclusionary doctrine regarding expert opinions that are not "generally accepted" in any of the five Federal Rules dealing with expert witnesses. A colorful argument has been made however, that Rule 702 requires exclusion of scientific evidence that is not "generally accepted" in the scientific community because it is not helpful to the trier of fact.¹⁷⁸ However, this is a fundamental misreading of the Rule. Nothing in the Rule allows a judge to substitute his judgment as to the credibility of a witness or the weight to be given the evidence over that of the jury. Moreover, an argument to the effect that only "generally accepted" opinions are helpful to the trier of fact is simply illogical. After all, "almost every generally accepted view was once deemed eccentric or heretical."¹⁷⁹

¹⁷³See, e.g., *United States v. Salerno*, 112 S. Ct. 2503 (1992); *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153 (1988); *Huddleston v. United States*, 485 U.S. 681 (1988); *United States v. Owens*, 484 U.S. 554 (1988); see also Judge Edward R. Becker & Aviva Orenstein, *The Federal Rules of Evidence After Sixteen Years—The Effect of "Plain Meaning" Jurisprudence, the Need for an Advisory Committee on the Rules of Evidence, and Suggestions for Selective Revision of the Rules*, 60 GEO. WASH. L. REV. 857 (1992).

¹⁷⁴CHARLES A. WRIGHT & KENNETH W. GRAHAM, *FEDERAL PRACTICE AND PROCEDURE: EVIDENCE* § 5192, at 177 (1978) (quoting NEW JERSEY SUPREME COURT COMMITTEE ON EVIDENCE, REPORT, at 10 (1953)).

¹⁷⁵All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible. FED. R. EVID. 402.

¹⁷⁶WRIGHT & GRAHAM, *supra* note 174, at 178.

¹⁷⁷*Id.* at 177.

¹⁷⁸See, e.g., *United States v. Two Bulls*, 918 F.2d 56 (8th Cir. 1990); *United States v. Christophe*, 833 F.2d 1296 (9th Cir. 1987); *United States v. Kozminski*, 821 F.2d 1186 (6th Cir. 1987), *aff'd in part on other grounds and remanded in part*, 487 U.S. 931 (1988).

¹⁷⁹Bell, *supra* note 5, at 80.

A second approach advocated for finding *Frye* in the Federal Rules of Evidence rests in the language of Rule 703.¹⁸⁰ The argument advanced is that the phrase "reasonably relied upon by experts in the particular field in forming opinions" in Rule 703 incorporates *Frye*.¹⁸¹ However, Rule 703 was not designed to restrict expert testimony; rather it was designed to broaden and liberalize the permissible bases for expert testimony.¹⁸² Rule 703 states that "[i]f [the facts or data upon which the expert relies are] of a type reasonably relied upon . . . [they] . . . need not be admissible into evidence."¹⁸³ Thus, the plain language of the Rule does away with the common law requirement of admitting into evidence the data upon which an expert relies in forming an opinion, which would otherwise constitute hearsay.¹⁸⁴ Thus, for example, the experts offered by the plaintiffs in *Daubert* consulted the precise facts and data that scientists generally rely upon in forming an opinion about whether birth defects were caused by toxic substances.¹⁸⁵ It is the conclusions reached from those "facts and data" which are the source of controversy. A defense objection to their choice of data base might trigger 703 analysis, yet the controversial nature of the experts' conclusions therefrom do not. The Court should be mindful that "the proper inquiry is not what the [trial] court deems reliable, but what experts in the relevant field deem it to be."¹⁸⁶

Furthermore, it is quite unlikely that requiring proposed experts' conclusions on such issues to be published in a peer-reviewed journal would add anything to the persuasiveness of the testimony.¹⁸⁷ Indeed, weighing the persuasiveness of testimony is a duty of the jury. Moreover, "the Federal Rules of Evidence contain no requirement that an expert's testimony be based upon reasoning subjected to peer review and published in the professional litera-

¹⁸⁰See *supra* note 80.

¹⁸¹See, e.g., *Brock v. Merrell Dow Pharmaceuticals, Inc.*, 884 F.2d 167, 168 (5th Cir. 1989) (Reavley, J., dissenting).

¹⁸²See *DeLuca v. Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d 941, 952-53 (3d Cir. 1990).

¹⁸³FED. R. EVID. 703 (emphasis added).

¹⁸⁴See *supra* notes 80-85 and accompanying text.

¹⁸⁵See *supra* notes 153-62 and accompanying text.

¹⁸⁶*In re Paoli R.R. Yard PCB Litig.*, 916 F.2d 829, 853 (3d Cir. 1990) (quoting *In re Japanese Elec. Prods. Antitrust Litig.*, 723 F.2d 238 (3d Cir. 1983), *rev'd sub nom. Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574 (1986)), *cert. denied*, 499 U.S. 961 (1991).

¹⁸⁷See Charles W. McCutchen, *Peer Review: Treacherous Servant, Disastrous Master*, TECH. REV., Oct. 1990, at 28-33.

ture."¹⁸⁸ An expert's "'peer review' comes when experts called by the other party . . . mount the witness stand."¹⁸⁹

Perhaps the most critical aspect of finding justification for the incorporation of *Frye* into the Federal Rules of Evidence is that in so holding, the Supreme Court would threaten an annihilation of diversity jurisprudence as announced in the seminal case of *Erie R.R. Co. v. Tompkins*¹⁹⁰ and its progeny. Because the Federal Rules of Evidence apply to diversity actions governed by state substantive law, application of the *Frye* doctrine to causation issues in toxic tort litigation would often be outcome-determinative. For example, in *Oxendine v. Merrell Dow Pharmaceuticals Inc.*,¹⁹¹ the D.C. Court of Appeals upheld a jury finding that Bendectin caused birth defects.¹⁹² If the Supreme Court finds that *Frye* survived the enactment of the Federal Rules of Evidence in 1975, the next case filed in the District of Columbia can (and undoubtedly will) be removed to federal court and the same evidence found to be admissible by the D.C. Court of Appeals would be inadmissible in the federal forum. Similarly, in *Daubert*, a case that was removed from state to federal court, the causation evidence most likely would have been admissible under California state law¹⁹³ and removal to the federal court produced precisely this result.¹⁹⁴

The only plausible method of incorporating *Frye* into the Federal Rules of Evidence, then, is for Congress to actually do so—by passing an amendment to one of the Rules governing the admissibility of scientific evidence. If the Supreme Court adopts a view similar to that as presented herein, and reverses the Ninth Circuit Court of Appeals in *Daubert*,¹⁹⁵ then it becomes academic as to whether the formerly proposed amendment to Rule 702 will reemerge in Congressional debates. For such is surely to be the case. An amendment to Rule 702 will do nothing more than ensure that fewer plaintiffs are compensated for their injuries. Despite the laudable concerns voiced by its proponents, adoption of a proposed amendment to Federal Rule of Evidence 702 will represent Chicken Little's ultimate form of revenge. For in the area of Rules formulation, Congress has the final word.

¹⁸⁸*DeLuca v. Merrell Dow Pharmaceuticals, Inc.*, 911 F.2d 941, 954 (3d Cir. 1990).

¹⁸⁹Brief for Petitioners at 48, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 951 F.2d 1128 (4th Cir.), cert. granted, 113 S. Ct. 320 (1992), and vacated, 113 S. Ct. 2786 (1993).

¹⁹⁰304 U.S. 64 (1938).

¹⁹¹506 A.2d 1100 (D.C. 1986), cert. denied, 493 U.S. 1074 (1990).

¹⁹²*Id.* at 1110.

¹⁹³California is one of the states that adopted the *Frye* rule. See *People v. Kelly*, 549 P.2d 1240, 1244 (Cal. 1976). However, its use has been limited solely to the original context of *Frye*—criminal cases.

¹⁹⁴*Cf. Christopherson*, 939 F.2d 1106, 1135-36 (5th Cir. 1991) (Reavley, J., dissenting) (intimating that under Texas state law, the plaintiff undoubtedly "would have received her jury trial and . . . would have recovered [her] judgment.")

¹⁹⁵See *supra* note 15.

V. CHICKEN LITTLE GOES TO CONGRESS: AMENDING FEDERAL RULE OF EVIDENCE 702

Perhaps because those straining to read *Frye* into the Federal Rules of Evidence can not justifiably do so, strict scrutinists have proposed a revision of Rule 702 designed to enlarge district court power in excluding novel forms of expert testimony. The former proposed amendment to Rule 702, which has been withdrawn and postponed until after the Supreme Court's decision in *Daubert*, provided for the following changes:

Rule 702. Testimony by Experts

*If the court finds (1) that reliable scientific, technical, or other specialized knowledge-information will substantially assist the trier of fact to understand the evidence or determine a fact in issue; and (2) that a witness is qualified as an expert by knowledge, skill, experience, training, or education to provide such assistance, it may permit the witness to testify thereto in the form of an opinion or otherwise. Except with leave of court for good cause shown, the witness shall not testify on direct examination in any civil action to any opinion or inference, or reason or basis therefor, that has not been seasonably disclosed as required by Rule 26(a) (2) and Rule 26(e) (1) of the Federal Rules of Civil Procedure.*¹⁹⁶

Despite the advisory committee's disclaimer that "the amendment does not mandate a return to the strictures of *Frye*,"¹⁹⁷ it is doubtful that such a radical change would avoid such an effect. First, the insertion of the words "reliable" and "substantially" represents an approach even more conservative than the *Frye* standard itself. Requiring an explicit finding by the court that "reliable" expert testimony will "substantially" assist the trier gives federal judges the power to make *their own* assessments of the type of information that will be helpful, rather than leaving that determination to what *the scientific community* considers "generally accepted." Moreover, this phraseology metamorphoses the judge into a quasi-jury by concentrating the determination of credibility and weight to be given a witness in the hands of a single black-robed individual. Such an approach will undoubtedly raise the threshold level of discretionary abuse, and consequently, on appeal, plaintiffs will be fighting the proverbial "losing battle." Furthermore, Judge Weinstein has voiced displeasure with the requirement of a formal judicial finding on the record, noting that the approach will "slow trials and provide an additional basis for appeals and motion practice."¹⁹⁸ Finally, and perhaps most importantly, the use of the word "may" together with "permit" represents a fool-proof mechanism that allows the judge to throw an expert witness's testimony out even if the other strict commands of the rule have been satisfied.

¹⁹⁶FED. R. EVID. 702 advisory committee's note on proposed amendments (June 1991).

¹⁹⁷*Id.*

¹⁹⁸Weinstein, *supra* note 12, at 636.

Amending Rule 702 seems not only dangerous but also unnecessary. It is dangerous because of the enormous substantive impact such a radical approach will have on future litigation outcomes. The present era seems to be witnessing a shift from so-called "plaintiff sympathy" to "Goliath sympathy"—a displeasure associated with seeing resource abundant industries transform seriously injured individuals into wealthy citizens. Thus, as Judge Weinstein has noted, amendments to the Federal Rules of Evidence represent "courthouse door-closing initiatives . . . based on exaggerated claims of abuse."¹⁹⁹ Also, amending the Rule will open the door to greater possibilities of discretionary abuse. In the same vein, defining and pin-pointing "discretionary abuse" at the appellate level will become more problematic, adding startling new twists to an already nebulous term. Moreover, an amendment to Rule 702 will have an enormous substantive effect on state law claims. As previously noted,²⁰⁰ diversity cases commenced in state courts where the law allows the introduction of controversial expert opinions will be removed to federal courts where the plaintiff will not be allowed to prove causation. Thus, only those few lucky plaintiffs who share residence with the allegedly responsible corporation will have legal recourse.

Amending Rule 702 is unnecessary for a variety of practical reasons. Overall, this approach seems to be imbedded in an unfounded fear that allowing non-mainstream scientific opinions to reach the jury will result in a finding of causation where it does not exist. Those who embrace this fear overlook both the "David and Goliath" parallel with "Plaintiff and Corporation" and the adversarial process. The legal and scientific resources at the disposal of most defendants are often impressive and overwhelming.²⁰¹ Thus, defendants who have produced a substance alleged to be toxic will usually have easy access to many scientists familiar with that substance; and defendants will not have much trouble making it clear to a jury when a plaintiff's expert is either lying or wrong.²⁰² Most importantly, there already exists sufficient mechanisms in the Federal Rules of Evidence with which a trial judge may exclude the occasional farcical scientist.²⁰³

¹⁹⁹*Id.* at 633.

²⁰⁰See *supra* notes 190-94 and accompanying text.

²⁰¹See Bell, *supra* note 5, at 80 (noting that in *Christopherson*, the plaintiff's lawyer was a solo practitioner who fought 16 lawyers of record for the defense, including four from Washington D.C., representing amici Chemical Manufacturers Association and the Product Liability Advisory Committee).

²⁰²See *id.* at 81 (noting, in addition, that across the full range of toxic tort cases there is virtually no chance that defendants in toxic tort cases have been forced to pay for more injuries than their substances have in fact caused. Because the law and science continue to aim their efforts toward finding no causation where it in fact exists, strict scrutiny of plaintiff's experts will only increase the overall inaccuracy of toxic tort verdicts.).

²⁰³Judge Weinstein notes that:

[T]he vast bulk of cases in our courtrooms involve experts who testify sensibly and truthfully. The exceptional as well as the routine cases can

VI. CONCLUSION

There are some abuses in expert witness practice. Indeed, abuse, like it or not, is often imbedded in the human character. However, as contemplated by the above discussion, the adversarial process was designed to reveal abuses of the system: perjury, bias, and inconsistent statements of witnesses to name just a few. Inflexible rules of law, whether they be independent, judicially-created pronouncements, or carefully and selectively crafted statutory enactments, add nothing to a system often heralded for its problem-solving nature.

As advances in scientific techniques continue with awe-inspiring speed, the current federal judicial practice of strict judicial scrutiny of scientific evidence ensures that the legal system lags sadly behind. As one commentator poignantly remarked:

When we are in the legal realm, where we need answers, you can't tell the people of the country, . . . "we don't know to a scientific certainty beyond all reasonable doubt exactly what did this, and another 50 years worth of exposures will produce enough bodies for us to be certain." That's not an answer. The law is more humane than that, and the law says we've got to answer the question now.²⁰⁴

Allowing this trend to continue will further erode the values of a neglected adversarial system and ensure a rapid growth of industry at the expense of the voluntary, as well as the involuntary, consumer. That will be no consolation to those who have meritorious claims, stopped at the courthouse door holding a late-breaking scientific methodology in hand that a jury was not allowed to consider—especially if a few years later a conclusive study emerges revealing causation *beyond a reasonable doubt*.²⁰⁵

be effectively handled by techniques presently available to the courts without amending Rule 702. We ought not continue to succumb to a tendency to inflate the size of problems and then to devise harsh and unnecessary remedies that create far more harmful side effects than advantages.

Weinstein, *supra* note 12, at 637-38.

²⁰⁴Blomquist, *supra* note 4, at 653 (quoting *Toxic Trials* (P.B.S. television broadcast, Feb. 25, 1986, statement of Tony Roisman at 24)).

²⁰⁵*See Brock v. Merrell Dow Pharmaceuticals, Inc.*, 874 F.2d 307, 315 (5th Cir. 1989). After announcing that plaintiff's expert should have been excluded and entering j.n.o.v., the court dauntingly stated: "However, we do not wish this case to stand as a bar to future Bendectin cases in the event that new and *conclusive* studies emerge which would give a jury a firmer basis on which to determine the issue of causation." *Id.* (emphasis added).

ADDENDUM

On the eve of the publication of this Note, the United States Supreme Court announced its landmark decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*²⁰⁶ In a remarkable, unanimous decision,²⁰⁷ penned by the Honorable Justice Harry A. Blackmun, the Court reversed the decision of the United States Court of Appeals for the Ninth Circuit.²⁰⁸ Accordingly, the Court held that the "general acceptance" test of *Frye v. United States* can no longer stand as an independent bar to the introduction of novel scientific evidence, and declared Federal Rule of Evidence 702 as the overriding source for determining whether such evidence may be introduced at trial.²⁰⁹

Nevertheless, both sides in the dispute immediately claimed victory after the High Court proclamation.²¹⁰ Because the Court's opinion leaves a host of unanswered questions, perhaps the confusion is apt. Although the opinion clearly removes the *Frye* talisman from the courthouse door, it is far from providing future plaintiffs carte blanche with respect to advancing an expert opinion to the jury's ear. In what will surely remain a divisive issue surrounding expert evidence debates, the Court declared that the trial judge maintain a role as "gatekeeper" when faced with contested scientific testimony.²¹¹ Thus, as one commentator has noted, "the unmistakable victor for now is the federal district court judge who wishes to exercise firm control over dubious expert testimony."²¹²

At the outset, the Court made two explicit findings regarding the Federal Rules of Evidence which refine their scope and silence a few peripheral debates. First, while reaffirming the "plain meaning" approach²¹³ to the interpretation

²⁰⁶113 S. Ct. 2786 (1993).

²⁰⁷Chief Justice Rehnquist, joined by Justice Stevens, while concurring in the main body of the decision, filed a dissenting opinion attacking part C, which sets forth "general observations" for the trial court to consider. See *infra* notes 226-37 and accompanying text.

²⁰⁸*Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 951 F.2d 1128 (9th Cir. 1991).

²⁰⁹113 S. Ct. at 2794-95.

²¹⁰Marion Merrell Dow released this statement: "The United States Supreme Court ... today agreed with the legal position of Marion Merrell Dow ... that expert witnesses testify only to claims that are scientific knowledge and not mere hypotheses or subjective opinions." *Marion Merrell Dow Comments On Court Case*, PR NEWSWIRE, June 28, 1993. In stark contrast, plaintiffs' attorney Barry Nace stated: "What the Court is saying is you put together the right kind of experts, and you've got a fact question for the jury." "General Acceptance" *Theory of Evidence No Longer Good Law, Supreme Court Rules*, BNA WASHINGTON INSIDER, June 29, 1993.

²¹¹113 S. Ct. at 2798.

²¹²Margaret A. Berger, *Supreme Court Deals Blow to Venerable Frye Standard*, N.Y.L.J., July 19, 1993, at S3.

²¹³See *supra* notes 166-73 and accompanying text.

of legislatively-enacted Federal Rules,²¹⁴ the Court confirmed, in unmistakable terms, that the Federal Rules of Evidence are to be construed as liberal in thrust, with Federal Rule of Evidence 402 providing the "baseline" for the determination of admissibility issues.²¹⁵ Second, the Court rejected the Respondent's contention that the language of Federal Rule of Evidence 703 represented an assimilation of *Frye*,²¹⁶ thus possibly ending residual doubt as to whether any common law evidentiary standards survived the enactment of the Federal Rules of Evidence in 1975.²¹⁷

The inquiry under Federal Rule of Evidence 702 propounded by the Court begins with an initial two-pronged finding by the trial court that the scientific testimony at issue be reliable and relevant.²¹⁸ First, the Court explains that the requirement that "'scientific knowledge'" be the subject of an expert's testimony, "establishes a standard of evidentiary reliability."²¹⁹ Within this context the Court noted that the word "knowledge" "connotes more than subjective belief or unsupported speculation."²²⁰ However, so-called "Junk Science" alarmists should be careful to note that the Court stopped well short of declaring that such "knowledge" be "known" to a certainty. Such a rigid requirement, stated the Court, would be unreasonable inasmuch as "there are no certainties in science."²²¹

Second, the Court explains that Rule 702's mandate that the evidence or testimony "assist the trier of fact to understand the evidence or to determine a fact in issue" requires that the trial judge find a "fit" between the facts of the case and the evidence at issue, otherwise known as "relevance."²²² The Court used the study of the phases of the moon for illustration. Such a study may provide valid scientific knowledge about whether it was dark on a given night,

²¹⁴113 S. Ct. at 2793 (citing *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 163 (1988)).

²¹⁵*Id.*

²¹⁶*See supra* notes 180-86 and accompanying text.

²¹⁷113 S. Ct. at 2792. "*Frye* made 'general acceptance' the exclusive test for admitting expert scientific testimony. That austere standard, absent from and incompatible with the Federal Rules of Evidence, should not be applied in federal trials." *Id.* at 2794.

²¹⁸*Id.* at 2795.

²¹⁹*Id.* It is also important to note that in a footnote, the Court explained that the discussion is limited solely to the scientific context. This raises interesting questions as to whether the holding in *Daubert* will apply to expert testimony that is "'technical, or other specialized knowledge'" as contemplated by Rule 702 itself. *Id.* at 2795, n.8. It is almost certain that this footnote will create satellite litigation. Perhaps a different evidentiary standard will evolve regarding this rare type of expert testimony.

²²⁰*Id.* at 2795.

²²¹*Id.* (citing *Amici Curiae Brief for Nicolaas Bloembergen et al.* at 9 stating "Indeed, scientists do not assert that they know what is immutably 'true'-they are committed to searching for new, temporary theories to explain, as best they can, phenomena".)

²²²113 S. Ct. at 2795-96.

and if darkness is a fact in issue, the knowledge will assist the trier of fact.²²³ However, evidence of a full moon "will not assist the trier of fact in determining whether an individual was unusually likely to have behaved irrationally on that night."²²⁴ Expert testimony supporting a link between a full moon and irrational behavior is not likely to be characterized as credible evidence for the fact-finder's consideration.²²⁵

While declining to "set out a definitive checklist or test,"²²⁶ the Court announced some "general observations"²²⁷ which are likely to generate, rather than settle, controversy. The Court observes that a key question for the trial judge to consider is whether the theory or technique at issue "can be (and has been) tested."²²⁸ Similarly, the Court encourages trial judges to consider whether, in the case of a particular scientific technique, a rate of error is known or can be known.²²⁹ In his dissent attacking this portion of the Court's opinion, Chief Justice Rehnquist fears that trial judges must become "amateur scientists" in order to fulfill their role.²³⁰ Citing a quote which was meant to explain the Court's statement,²³¹ Chief Justice Rehnquist asserts: "I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its 'falsifiability,' and I suspect some of them will be, too."²³²

The Court also notes that an important consideration for the trial court should be whether the theory or technique at issue has been subjected to peer review and publication. This "observation" is likely to become the crux of future

²²³*Id.*

²²⁴*Id.* at 2796.

²²⁵This particular passage may spawn some confusion as well. In using this illustration, the Court unfortunately uses "irrational behavior" as the conclusion to be reached through "evidence of a full moon." Although one would hardly dispute that such evidence would be inadmissible in any forum, clever lawyering might allow this discussion to be injected, by analogy, into a criminal trial. Such an attempt, if accepted by a judge, would be a grave mistake and could lead to the exclusion, for example, of psychiatric testimony offered by a criminal defendant in his defense. Perhaps the Court would have been clearer in limiting the decision in *Daubert* to the civil context by stating, for example, that "evidence that the moon was full on a certain night will not assist the trier of fact in determining whether a manufacturer's tire was unusually likely to have blown out on that night."

²²⁶113 S. Ct. at 2796.

²²⁷*Id.*

²²⁸*Id.*

²²⁹*Id.*

²³⁰*Id.* at 2800.

²³¹See 113 S. Ct. at 2796-97 (citing KARL R. POPPER, CONJECTURES AND REFUTATIONS: THE GROWTH OF SCIENTIFIC KNOWLEDGE 37 (5th ed. 1989) ("[T]he criterion of the scientific status of a theory is its falsifiability, or refutability, or testability").

²³²*Id.* at 2800.

litigational outcomes; and it will certainly be presented to courts of appeals as an inappropriate factor to consider for purposes of determining the admissibility of scientific evidence. Peer review, as previously noted,²³³ is at odds with the truth seeking function of courts of law. Peer review is appropriate as an avenue for academicians and scientists to engage in fruitful debate, and perhaps to improve the quality of published literature. Subjecting an opinion or technique to peer review, however, is not likely to significantly recast the accuracy of the subject matter on the altar. Whether a majority of scientists agree or disagree with particular opinions or techniques is simply a matter of intellectual approbation, not axiomatic verity. As noted astronomer Carl Sagan has stated, "majority science today may be minority science tomorrow."²³⁴

Finally, just when one thinks *Frye* can be safely relegated to the trash bin of antiquated common law doctrine, the Court declares that "'general acceptance' can yet have a bearing on the inquiry."²³⁵ Although the Court emphasizes that the inquiry under Rule 702 is to be "a flexible one,"²³⁶ the inclusion of "general acceptance" as an "observation" is perplexing after the Court's explicit holding that the *Frye* standard is "austere . . . and . . . should not be applied in federal trials."²³⁷ Although *Frye* operated as an exclusive bar to the introduction of scientific testimony, it is highly doubtful that judges who once supported *Frye* will be able to resist the temptation of excluding expert evidence because of the lack of "general acceptance" of the opinion or technique, while conveniently couching the decision among other "*Daubert* observations." Courts of Appeals have, therefore, not seen the last of *Frye*.

In sum, while representing an expedient compromise between warring factions, the United States Supreme Court decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, begs more questions than it answers. As Chief Justice Rehnquist notes, "countless . . . questions will surely arise when hundreds of district judges try to apply its teaching to particular offers of expert testimony."²³⁸ Expert witness practice after *Daubert* will surely be as complex as it was under *Frye*, which in turn leaves unanswered the question as to whether Congress will reconsider the movement to amend Federal Rule of Evidence 702.²³⁹

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²³³See *supra* notes 187-89 and accompanying text.

²³⁴Tim Cornwell, *How "Junk Science" Has Been Put On Trial*, THE INDEPENDENT, May 28, 1993, at 22.

²³⁵113 S. Ct. at 2797.

²³⁶*Id.*

²³⁷*Id.* at 2794.

²³⁸*Id.* at 2800.

²³⁹See *supra* note 18.