Denver Law Review

Volume 67
Issue 4 *Tenth Circuit Surveys*

Article 10

February 2021

Through the Looking Glass: Head v. Lithonia, Scrutiny of the Underlying Bases of an Expert Opinion

L. Joane Garcia-Colson

THROUGH THE LOOKING GLASS: *HEAD V. LITHONIA*, SCRUTINY OF THE UNDERLYING BASES OF AN EXPERT OPINION

I. INTRODUCTION

The use of "science" and scientific evidence in the courtroom can be traced as far back as fourteenth century England.[1] "Scientific evidence has always posed special problems for the law, and in recent years these problems have become increasingly difficult."[2]

In today's litigious society, individuals are clamoring to find someone to blame for all the evils that beset their lives. In the course of their quest, these individuals are consistently turning to experts as a source of support for their positions. The complexity of lawsuits is continuously increasing. More and more lawsuits are being brought in the area of products liability and toxic torts by individuals who feel victimized. There is also growing concern over the evolution of cases based on the fear of contracting cancer or another disease years after the alleged exposure to a chemical or other agent.[3]

In the face of this current trend, courts are being presented with complex issues requiring the use of scientific evidence in greater frequency.[4]

> The use of statistics, risk assessment, animal studies, epidemiological data, regulatory or statutory findings, and various theories of carcinogenesis in the courtroom have revolutionized tort litigation practice, resulting in a proliferation of . . . judicial pronouncements and rulings on the value, use, and misuse of science and science policy in the courtroom.[5]

As a result, being an expert has become big business. Courts are becoming increasingly concerned that, for a price, litigants can hire an expert to say virtually anything that is advantageous to the litigant's claim or defense. There is a growing suspicion that experts can be found to support any position in a trial.[6] Against this backdrop, reliance on expert witnesses is increasing in legal decision making.[7]

---

1. Black, *A Unified Theory of Scientific Evidence*, 56 FORDHAM L. REV. 595, 597 at n.1 (1988).

2. *Id.*

3. *Summary of Developments*, 3 Toxics L. Rep. (BNA) No. 45, at 1448 (Apr. 12, 1989) (comment by Rene Tatro, partner in the law firm of Heller, Ehrman, White & McAuliffe).

4. Note, *Different Standards and Conflicting Results: A Re-Evaluation of the Frye Test for Admitting Novel Scientific Evidence in Light of Decisions Involving Spectrographic Evidence Introduction*, 5 REV. OF LITIG. 327, 329 (1986).

5. *Courtroom Science: Toxic Tort Battleground*, 3 Toxics L. Rep. (BNA) No. 42, at 1336 (Mar. 22, 1989) ("Because of the complexity and uncertainty inherent in toxic tort cases, the role of scientific and statistical evidence has become increasingly important.").

6. *Summary of Developments*, *supra* note 3, at 1444 (comment by Judge H. Lee Sarokin, United States District Court for the Eastern District of New York).

7. R. GIVENS, DEMONSTRATIVE EVIDENCE § 7.07, at 197 (1989).

Judicial concern about the reliability of expert opinions also appears to be on the rise, especially in the face of scientific uncertainty.[8] Additionally, the judiciary is concerned that the perceived erosion of impartiality in the use of experts is lowering confidence in the credibility of the judicial system.[9]

To curb this "expert shopping" and the abuses caused by the use of expert witnesses who are paid to assert the position most advantageous to the litigant who has hired them, courts are looking behind expert opinions.[10] It is becoming commonplace for courts to scrutinize the underlying sources and bases of expert opinions to determine whether any factual foundation exists for an opinion the expert is espousing.[11]

The tendency of lay jurors to give considerable weight to scientific evidence presented by experts with impressive credentials also causes the judiciary concern.[12] "[T]here is always a danger that a jury may attach too great a weight to expert testimony because of the person offering it."[13]

Lay people also have the idea that science is reliable and often infallible.[14] The traditional view of the scientific method is that it is exact and certain. Examples of this mentality can be seen every day. How many people stopped eating bacon because of the scientific reports that the nitrates in bacon cause cancer? This is just one example of society's willingness to accept as truth whatever scientists say. "The court[s] will have to evaluate the degree to which the jurors might be overimpressed by the aura of reliability surrounding the evidence, thereby leading them to abdicate their role of critical assessment."[15] Appellate courts have routinely manifested a thorough, ongoing skepticism of the jury's ability to cope with the complexities of scientific evidence.[16]

This Comment examines the history of the admissibility of scientific evidence beginning with *Frye v. United States*[17] and explores the solutions and alternatives modern courts have adopted to deal with the concerns attendant with the increased use of scientific evidence. This background is the precedent for the Tenth Circuit's recent decision in *Head v. Lithonia*,[18] which enunciates this circuit's answer to the problems associ-

8. *Id.*

9. *Summary of Developments*, *supra* note 3, at 1447.

10. R. GIVENS, *supra* note 7, § 7.07, at 197-98.

11. *See* Viterbo v. Dow Chem. Co., 826 F.2d 420 (5th Cir. 1987); Lynch v. Merrel-National Laboratories, 830 F.2d 1190 (1st Cir. 1987) (summary judgment granted contrary to experts' contentions).

12. *See* Arnett v. Dow Chem. Co., 6 CHEM. & RADIATION WASTE LITIG. REP. No. 3, at 383 (Aug. 1983) (Cal. Super. Ct. 1983). In *Arnett*, the court made an inquiry into the underlying facts and data upon which the expert based his conclusion.

13. F. Haddad, *Admissibility of Expert Testimony*, 1 FORENSICS SCIENCES 1-4 (1987).

14. *See* United States v. Addison, 498 F.2d 741, 744 (D.C. Cir. 1974) (scientific evidence may "assume a posture of mystic infallibility in the eyes of a jury of laymen").

15. 3 J. WEINSTEIN & M. BERGER, WEINSTEIN'S EVIDENCE, ¶ 702[03], at 702-42 to -43 (1982).

16. Rules for Admissibility of Scientific Evidence, 115 F.R.D. 79, 92 (1987).

17. 293 F. 1013 (D.C. Cir. 1923).

18. 881 F.2d 941 (10th Cir. 1989).

ated with the use of scientific evidence. It can reasonably be expected that this decision will resolve the confusion and abuses that permeate the use of expert testimony based on scientific evidence.

II. BACKGROUND

A. *Frye v. United States*

Historically, courts have been suspicious of scientific evidence, even when it is supported by expert opinion. Prior to the enactment of the Federal Rules of Evidence ("Rules"), the practice was to screen purported scientific studies and expert testimony in order to determine whether such evidence had "general acceptance" in the scientific community.[19] This became known as the *Frye* rule, or the "general acceptance test."[20]

Frye was decided in 1923 by the United States Court of Appeals for the District of Columbia and marked the first judicial recognition of the need for special rules for scientific evidence.[21] The defendant in *Frye* attempted to introduce results of a systolic blood pressure deception test, an early form of the lie-detector test, and an expert's opinion that, when tested, the defendant had been truthful in denying any involvement in the crime for which he was charged.[22]

Under *Frye*, if the proponent failed to establish the "general acceptance" of the evidence, it was not considered reliable evidence for the jury to consider.[23] In the court's words:

> 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 principal 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.[24]

Although the *Frye* court did not cite authority or offer any explanation for adopting the general acceptance theory, it was the dominant test for admissibility of scientific evidence from the early twentieth century until the last quarter of that century.[25]

Since the advent of *Frye*, scientific knowledge has expanded significantly. This growth has eroded the simplistic notion that the most important scientific facts are known and accepted by everyone in a

19. Frye v. United States, 293 F. 1013, 1014 (D.C. Cir. 1923).
20. *Id.*
21. Black, *supra* note 1, at 629.
22. *Frye*, 293 F. at 1014.
23. *Id.*
24. *Id.*
25. R. GIVENS, *supra* note 7, § 7.02, at 187. *See generally* Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 COLUM. L. REV. 1197 (1980).

particular field, whereas facts outside this realm are too speculative to be considered.[26] Because of this growth, whether *Frye* remains as the controlling standard for scientific evidence is hotly debated among courts and commentators alike.

Even before the adoption of the Federal Rules of Evidence, *Frye* did not stand uncriticized. Emerging as the chief critic of the general acceptance standard, Professor McCormick wrote:

> "General scientific acceptance" is a proper condition for taking judicial notice of scientific facts, but not a criterion for the admissibility of scientific evidence. Any relevant conclusions which are supported by a qualified expert witness should be received unless there are other reasons for exclusion. Particularly, probative value may be overborne by the familiar dangers of prejudicing or misleading the jury, and undue consumption of time. If the courts used this approach, instead of repeating a supposed requirement of "general acceptance" not elsewhere imposed, they would arrive at a practical way of utilizing the results of scientific advances.[27]

Professor McCormick, therefore, advocated a relevancy approach to determine the admissibility of scientific evidence, which was later adopted in the Rules.[28] One of the questions debated by the courts today is whether the Rules supersede the *Frye* test.[29] The Rules are silent on this point, which only complicates the controversy surrounding *Frye*'s current status.[30]

B. *The Federal Rules of Evidence Relevancy Approach*

When the Federal Rules of Evidence became effective in 1975,[31] they further complicated the standards for the admissibility of scientific evidence. Neither the advisory committee notes nor the legislative history of the Rules specifically discuss *Frye*, nor do they mention the general acceptance test.[32] Both courts and commentators are divided over whether the Rules supersede *Frye*'s general acceptance test.[33] While some circuits continue to apply *Frye*, others have either expressly rejected *Frye* as the test for determining admissibility of scientific evidence[34] or have not made a determination one way or the other.[35]

---

26. R. GIVENS, *supra* note 7, § 7.02, at 185.

27. C. MCCORMICK, EVIDENCE § 203, at 491 (2d ed. 1972).

28. Act of Jan. 2, 1975, Pub. L. No. 93-595, 88 Stat. 1926 (1975) (codified at 28 U.S.C. app. (1982)).

29. *See* United States v. Downing, 753 F.2d 1224 (3d Cir. 1985).

30. *See generally* Note, *supra* note 4, at 330.

31. Act of Jan. 2, 1975, Pub. L. No. 93-595, 88 Stat. 1926 (1975) (codified at 28 U.S.C. app. (1982)).

32. *See* Giannelli, *supra* note 25, at 1228-29.

33. *See* P. GIANNELLI & E. IMWINKLEREID, SCIENTIFIC EVIDENCE § 1-5(f), at 28 (1986) [hereinafter GIANNELLI & IMWINKLEREID]. *Compare* 22 C. WRIGHT & K. GRAHAM, FEDERAL PRACTICE AND PROCEDURE 92 (1977) (*Frye* has been abandoned and repealed by the Federal Rules of Evidence) with 1 D. LOUISELL & C. MUELLER, FEDERAL EVIDENCE 818 (1977) (*Frye* has survived the Federal Rules of Evidence).

34. *See* United States v. Luschen, 614 F.2d 1164, 1169 (8th Cir. 1980) (court stated that it had not adopted "generally accepted explanatory theory"), *cert. denied*, 446 U.S. 939

It can be argued that the Rules' silence as to *Frye* is tantamount to abandonment of the general acceptance test. On the other hand, it also can be argued that because *Frye* was the established rule prior to enactment of the Rules, and no statement repudiating *Frye* appears in the legislative history, the general acceptance standard remains intact.[36] Regardless of which position a court may choose, the language of the Rules adopts the reasoning of Professor McCormick, who advocated the relevancy approach to the admissibility of scientific evidence.[37]

The relevancy approach of the Rules is the primary alternative to the *Frye* test.[38] This approach examines scientific evidence as it would any other evidence[39] by determining relevance and then applying the balancing test of Rule 403.[40] Those who advocate that the Rules supersede *Frye* focus on the language of the Rules.[41]

Rule 402 specifically states that "[a]ll relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules proscribed by the Supreme Court pursuant to statutory authority."[42] Rule 401 defines relevant evidence as evidence "having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence."[43]

Because scientific evidence can be reliable and therefore relevant under Rule 401 without regard to general acceptance in the scientific community, the Rules provide a standard of admissibility inconsistent

---

(1980); United States v. Williams, 583 F.2d 1194 (2d Cir. 1978) (court held that the general acceptance test of *Frye* did not survive enactment of the Federal Rules of Evidence and that the court should assess reliability and helpfulness, and balance these against countervailing considerations expressed in Rule 403), *cert. denied*, 439 U.S. 1117 (1979); United States v. Baller, 519 F.2d 463, 466 (4th Cir. 1974) ("Unless an 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."), *cert. denied*, 423 U.S. 1019 (1975).

35. *See* Ellis v. International Playtex, Inc., 745 F.2d 292, 304 n.15 (4th Cir. 1984) (despite expressed concerns about *Frye*, the Fourth Circuit continues to apply it in certain circumstances); Barrel of Fun, Inc. v. State Farm Fire & Casualty Co., 739 F.2d 1028, 1031 n.9 (5th Cir. 1984) (Fifth Circuit continues to apply *Frye* even if its applicability after the Federal Rules of Evidence is unresolved); United States v. Hope, 714 F.2d 1084, 1087-88 n.3 (11th Cir. 1983) (the Eleventh Circuit has yet to decide whether *Frye* survives the Federal Rules).

36. *See* Giannelli, *supra* note 25, at 1229.

37. *See supra* note 27 and accompanying text.

38. *See* GIANNELLI & IMWINKLEREID, *supra* note 33, § 1-6, at 31.

39. *Defending Immunotoxicity Claims*, 3 Toxics L. Rep. (BNA) No. 39, at 1223 (Mar. 1, 1989).

40. *Id.* The Rule 403 balancing test involves weighing the probative value of the evidence against the countervailing considerations expressed in the rule. Federal Rules of Evidence 403 specifically provides: "Although 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."

41. *See* Giannelli, *supra* note 25, at 1230.

42. FED. R. EVID. 402.

43. FED. R. EVID. 401.

with the *Frye* test.[44] Under the clear language of the Rules, *Frye* is inapplicable. Rather, it is a relevancy test which is employed to determine whether expert opinion based on scientific evidence is admissible.

In *United States v. Downing*,[45] the court opined that the Rules suggest, if not mandate, a relevancy approach:

> In our view, Rule 702 requires that a district court ruling upon the admission of [novel] scientific evidence, i.e., evidence whose scientific fundaments are not suitable candidates for judicial notice, conduct a preliminary inquiry focusing on (1) the soundness and reliability of the process or technique used in generating the evidence, (2) the possibility that admitting the evidence would overwhelm, confuse, or mislead the jury, and (3) the proffered connection between the scientific research or test result to be presented, and particular disputed factual issues in the case.[46]

This is akin to the balancing test of Rule 403.[47] The premise espoused in *Downing* is further supported by Rule 702, which governs the admissibility of expert testimony. Rule 702 provides that "[i]f scientific, technical or other specialized knowledge will assist the trier of fact to understand the evidence or to determine the fact in issue, a witness may testify thereto in the form of an opinion or otherwise."[48]

In sum, the relevancy approach of the Rules can be broken down into three steps.[49] The first step is to assess the probative value of the proffered scientific evidence.[50] The next step is to identify any countervailing dangers.[51] The final step is to balance the probative value of the proffered evidence against the identified dangers or other considerations.[52] A similar balancing test is used by courts that follow the reliability approach to determine admissibility of scientific evidence.

C. *The Reliability Approach*

The reliability approach is a third method of determining the admissibility of scientific evidence via expert opinion. The massive toxic tort litigation case *In re Agent Orange Product Liability Litigation*[53] discusses this third method of analysis, which is a hybrid of the Federal Rules of Evidence relevancy approach and the *Frye* general acceptance test. The reliability approach involves a balancing of the relevance, reliability, and

---

44. GIANNELLI & IMWINKLEREID, *supra* note 33, § 1-5(f), at 29-30. *See also* Giannelli, *supra* note 25, at 1230.

45. 753 F.2d 1224 (3d Cir. 1985).

46. *Id.* at 1237.

47. *See* FED. R. EVID. 403. *See also supra* note 40.

48. FED. R. EVID. 702.

49. *See generally* GIANNELLI & IMWINKLEREID, *supra* note 33, § 1-6(A-C), at 31-34.

50. *Id.*

51. *Id.*

52. *Id.* § 1-6(C), at 34. *See* United States v. Downing, 753 F.2d 1224, 1241 (3d Cir. 1985) (court noted that the most efficient procedure for determining admissibility under the relevancy approach is the *in limine* hearing).

53. 611 F. Supp. 1223 (E.D.N.Y. 1985), *aff'd*, 818 F.2d 197 (2d Cir. 1987), *cert. denied sub nom.* Lombardi v. Dow Chem. Co., 487 U.S. 1234 (1988).

helpfulness of the evidence against the likelihood of confusion, waste of time, and prejudice.[54]

This approach focuses primarily on a preliminary inquiry into the underlying bases and sources of an expert's opinion to determine its reliability. The inquiry does not go as far as *Frye* to require general acceptance of the scientific theory, but requires only that the methods used to reach the opinion are those on which others in the scientific community reasonably rely in reaching their own, possibly different conclusions.

Courts that have abandoned *Frye* for the reliability approach stress Rule 702's liberal attitude toward the admissibility of relevant expert testimony whenever it would be helpful to the jury.[55] Although Rule 702 sets forth this liberal policy toward qualification of an expert witness, compliance with the rule does not automatically guarantee the admissibility of such expert testimony.[56]

The *Agent Orange* court recognized that Rule 703 limits the bases upon which an expert may rely in rendering an opinion to those which are "reasonably relied" upon by "experts in the field."[57] Rule 703 provides:

> The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert 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.[58]

When expert testimony is derived from novel scientific theories, the courts will make a determination as to the admissibility of the underlying bases and sources of the opinion.[59]

The preliminary inquiry was further discussed with some vehemence in *In re Paoli Railroad Yard PCB Litigation*.[60] *Paoli* involved a suit by residents who claimed personal injuries from exposure to a nearby railroad's storage area for polychlorinated biphenyls ("PCBs").[61] At issue was whether the court was permitted to look behind the experts'

54. *In re* Agent Orange, 611 F. Supp. at 1242.
55. *Id.*
56. *Id.*
57. *Id.* at 1243.
58. FED. R. EVID. 703.
59. In a study released on March 29, 1990, the Center for Disease Control ("CDC") specifically denied a link between Agent Orange exposure and incidence of cancer. Denver Post, Mar. 30, 1990, at A2. The results of the CDC study provide further support for the reliability approach. Specifically at issue in *In re* Agent Orange was whether Agent Orange caused disease, particularly cancer in servicemen who were in Vietnam. The expert testimony on this point was focused on by the court in its discussion of scientific evidence. It should be noted that the *Agent Orange* cases never proceeded to trial. *See generally In re* Agent Orange Prod. Liab. Litig., 611 F. Supp. 1223 (E.D.N.Y. 1985), *aff'd*, 818 F.2d 187 (2d Cir. 1987), *cert. denied sub nom.* Lombardi v. Dow Chem. Co., 487 U.S. 1234 (1988).
60. 706 F. Supp. 358 (E.D. Pa. 1988).
61. *Id.*

statements or whether the court was bound by the experts' assertions.[62] On this point, the court stated:

> If Rule 703 is to be any limit on the ability of expert witnesses to give their opinions, a court must be permitted to examine the bases of the proffered opinions. Otherwise, any case in which an expert was willing to use two sets of magic words would always survive motions for summary judgment and directed verdict. As long as the expert was willing to say "to a reasonable degree of scientific certainty" and "the basis of my opinion is X, on which experts in my field reasonably rely," every case requiring expert testimony would get to the jury. If a court is not permitted to examine the basis of an expert's opinion in order to rule on the admissibility of that opinion, then Rule 703 should read: "An expert may cite as the basis of his opinion anything he likes."[63]

The *Paoli* court engaged in a preliminary inquiry and, relying on the reasoning of *Agent Orange*, held that the expert testimony was inadmissible.

Agent Orange specifically determined that "Rule 104(a) of the Federal Rules of Evidence requires a court to make a preliminary inquiry into the admissibility of expert testimony."[64] It was this limitation that was recently recognized by the Tenth Circuit in *Head v. Lithonia*.[65]

III. *HEAD V. LITHONIA*

A. *Facts*

In November of 1985, plaintiff Barbara Head was injured at work when the reflector portion of a hanging fluorescent light fixture fell and struck her on the side of her head.[66] Although the plaintiff was neither knocked to the ground nor knocked unconscious, she felt a knot raised on the right side of her head. Three weeks later, she reported the incident to her employer and visited the company doctor, complaining of dizziness, headaches, and occasional blackouts. Thereafter, the plaintiff was placed on medical leave and was subsequently terminated.

The plaintiff brought an action against Lithonia Corporation, alleging the quarter-turn fastener on the light was defective in design and failed to secure the reflector properly in place in its grooved channel. She claimed that this defect made the product unreasonably dangerous. The plaintiff sought $1,250,000 for the permanent injuries to her head and neck, while her husband sought $100,000 for loss of consortium.

---

62. *Id.*

63. *Id.* at 368. *In re* Paoli is currently pending before the Third Circuit Court of Appeals.

64. *In re* Agent Orange, 611 F. Supp. at 1239. Rule 104(a) specifically provides in pertinent part: "Preliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by the court . . . ."

65. 881 F.2d 941 (10th Cir. 1989).

66. *Id.* at 942.

During trial, the plaintiff called her treating neurologist, Dr. Michael Haugh, as a medical expert to support her claims of injury to her head and neck. Dr. Haugh testified by videotaped deposition and explained his conclusions, which were based on the plaintiff's medical history, clinical exam, and various tests. The results of the electroencephalogram ("EEG"), computerized axial tomography ("CAT-scan"), and clinical exam were normal. One test, however, topographical brain mapping, apparently pinpointed the location of her injury. Dr. Haugh concluded on the bases of the plaintiff's history and the topographical brain mapping that she suffered from postconcussive syndrome and prescribed medication to alleviate the headaches.

During his testimony, "Dr. Haugh described the topographical brain map test he performed which, he explained, was a computerized enhancement of the EEG, using stimulation techniques 'to bring out abnormalities on the EEG.' "[67] When asked when he first began using topographical brain mapping, Dr. Haugh explained that he was the first neurologist in the Tulsa area to use the test and maintain the equipment in his office.[68] Over defense objection, the doctor offered his personal opinion as to the value of topographical brain mapping compared with traditional EEG methods. Aside from this testimony and his description of the brain mapping test, Dr. Haugh offered no other information from which the jury could understand the reliability of the test; that is, he offered no information on whether the scientific community had accepted topographical brain mapping.

When the plaintiff attempted to introduce exhibits representing the results of the topographical brain map tests, the defendant objected, contending that a proper foundation had not been offered for the test.[69] After the jury viewed the videotape, the defense renewed its objection, which was overruled without explanation.

On cross-examination, Dr. Haugh admitted that much controversy surrounds topographical brain mapping.[70] While recognizing that the procedure may be beyond the experimental stage, the doctor could not explain the methodology in the clinical setting.

Dr. Haugh also testified on cross-examination that all of his findings based on the clinical examination and other test results were normal and did not substantiate the plaintiff's complaint. It was only when these results were coupled with the topographical brain mapping that the doctor was able to conclude that the plaintiff suffered from postconcussive syndrome.[71]

Despite the propriety of the defendant's objections, the district court did not examine the reliability of the foundation of the expert's

67. *Id.*
68. *Id.* at 944.
69. *Id.*
70. *Id.* at 942-43.
71. *Id.* at 943.

opinion to determine its admissibility.[72] Ultimately, the jury returned a verdict in favor of the plaintiff and awarded her $100,000, but did not award anything to the plaintiff's husband.

On appeal, the defendant contended that the trial court erred in permitting the plaintiff to introduce the topographical brain mapping test results without establishing the necessary foundation for the reliability of the test.[73]

B. *The Tenth Circuit's Opinion*

At the outset of its analysis, the Tenth Circuit cited *Barrel of Fun, Inc. v. State Farm Fire & Casualty Co.*,[74] which held that the proponent of scientific evidence "has the burden of showing as a predicate to its admission that the proffered test has achieved scientific acceptability and that the test has a reasonable measure of trustworthiness."[75] The court recognized that Dr. Haugh offered no information on the test's reliability, other than his personal opinion as to the value of topographical brain mapping and a description of the test itself.[76]

In a detailed analysis of the Federal Rules of Evidence, the court recognized that Rule 703[77] gives experts wide latitude to testify on facts otherwise not admissible and broadens the bases on which expert opinions may be offered.[78] The purpose of this broadening was to "bring the judicial practice into line with the practice of the experts themselves when not in court."[79] The court pointed out, however, that although Rule 703 performs this broadening function, the advisory notes caution:

> If it be feared that enlargement of permissible data may tend to break down the rules of exclusion unduly, notice should be taken that the rule requires that the facts or data "be of a type reasonably relied upon by experts in the particular field." This language would not warrant admitting in evidence the opinion of an "accidentologist" as to the point of impact in an automobile collision based on statements of bystanders, since this requirement is not satisfied.[80]

In commenting on Rule 703 as elaborated by the advisory committee notes, the court stated that the Rule's limitation provides courts with a mechanism to evaluate the trustworthiness and reliability of the underlying data and sources on which experts rely.[81] This does not mean,

72. *Id.* at 944.
73. *Id.* at 942-43.
74. 739 F.2d 1028, 1033 (5th Cir. 1984) (expert testimony based on psychological stress evaluation ("PSE") was offered).
75. *Id.* at 1032 (citation omitted). In *Barrel of Fun, Inc.*, 739 F.2d 1033, the Fifth Circuit found that the burden was not met by simply stating that the PSE test was used by the fire marshall's office.
76. *Head*, 881 F.2d at 944.
77. *See supra* text accompanying note 58.
78. *Head*, 881 F.2d at 944.
79. *Id.* at 943.
80. *Id.* (quoting advisory comments to FED. R. EVID. 703).
81. *Id. See also Barrel of Fun, Inc.*, 739 F.2d at 1033.

however, "that the expert's opinion must be generally accepted in the scientific community to be 'sufficiently reliable and probative to support a jury finding.' "[82] The court goes on to conclude: "What is necessary is that the expert arrived at his . . . opinion by relying upon *methods* that other experts in his field would reasonably rely upon in forming their own, possibly different opinions, about what caused the patient's disease."[83]

Although the court acknowledged that experts are given wide latitude to testify to facts that are otherwise inadmissible and "to broaden the acceptable bases of expert opinion,"[84] the court stated that Rule 703 implicitly requires the trial judge to make a preliminary determination pursuant to Rule 104(a)[85] as to whether the underlying data is of a kind reasonably relied upon by experts in the field.[86]

The court specifically noted that cross-examination testimony at trial revealed that topographical brain mapping is relatively experimental and that the technique has not been accepted by other neurologists or the American Academy of Neurology.[87] Disturbed by the trial judge's failure to make the required preliminary inquiry into the reliability of the foundation of the expert's opinion,[88] the court concluded that this omission amounted to an abuse of discretion which mandated reversal.[89]

In discussing the preliminary inquiry in which courts must engage, the court pointed out that the "determination must be made on 'a case-by-case basis and should focus on the reliability of the opinion and its foundation.' "[90] Based on this requirement, the court stated that a "district court 'may not abdicate its independent responsibilities to decide if the bases meet minimum standards of reliability as a condition of admissibility.' "[91] Therefore, the Tenth Circuit vacated the judgment of the trial court and remanded the case for a new trial.[92]

IV. ANALYSIS

The debate surrounding the admissibility of scientific evidence has been raging since the enactment of the Federal Rules of Evidence in

82. *Head*, 881 F.2d at 943 (quoting Osburn v. Anchor Laboratories, 825 F.2d 908, 915 (5th Cir. 1987) (citations omitted)).

83. *Id.* (emphasis in original).

84. *Id.* at 944 (quoting Merit Motors, Inc. v. Chrysler Corp., 569 F.2d 666, 672-73 (D.C. Cir. 1977)).

85. *See supra* note 64 and accompanying text.

86. *Id. See also* 3 J. WEINSTEIN & M. BERGER, WEINSTEIN'S EVIDENCE, ¶ 702[03], at 703-16 (1982).

87. *Head*, 881 F.2d at 943.

88. *Id.* at 944.

89. *Id.*

90. *Id.* (quoting Soden v. Freightliner Corp., 714 F.2d 498, 503 (5th Cir. 1983)).

91. *Id.* (quoting *In re* Agent Orange Prod. Liab. Litig., 611 F. Supp. 1223, 1245 (E.D.N.Y. 1985), *aff'd*, 818 F.2d 187 (2d Cir. 1987), *cert. denied sub nom.* Lombardi v. Dow Chem. Co., 108 S. Ct. 2898 (1988)).

92. *Id.*

1975.[93] It is clear from *Head v. Lithonia*[94] that the Tenth Circuit joined ranks with those who support the reliability approach, albeit the court did not specifically state this circuit's position regarding *Frye*.

In fact, the Tenth Circuit has not expressly stated whether *Frye* is to be followed in this jurisdiction. In *Marks v. United States*,[95] the Tenth Circuit had before it a criminal case where, as in *Frye*, the defendant proffered the results of a lie-detector test.[96] The court discussed *Frye* insofar as it discussed lie-detector tests, but did not elaborate on the general acceptance test.[97]

In its discussion, the court noted numerous decisions from other jurisdictions which refused to accept lie-detector evidence.[98] "We have considered the question and are inclined to hold to the reasoning of the courts which have refused to receive such evidence."[99] The *Marks* court never made a determination as to whether the Tenth Circuit had adopted *Frye* as the test for determining the admissibility of scientific evidence.[100] Whether the court intended its decision in *Marks* to adopt *Frye* as the standard to be applied when determining admissibility of scientific evidence is debatable.

If *Marks* is construed as adopting *Frye* as the rule in the Tenth Circuit, *Head* abandons that construction. In its initial discussion in *Head*, the court cited *Barrel of Fun, Inc. v. State Farm Fire & Casualty Co.*,[101] from the Fifth Circuit, which continues to apply *Frye* even if its applicability after adoption of the Rules is unresolved.[102] This fact alone would seem to lend support to the argument that the Tenth Circuit agrees with the Fifth and also continues to apply *Frye*'s general acceptance test. The court's language in *Head* indicates, however, that the Tenth Circuit has abandoned *Frye* for the reliability approach.[103]

Nevertheless, the reliability approach is not a pure abandonment of *Frye*; rather, it is a hybrid of the general acceptance test of *Frye* and the relevancy approach of the Federal Rules of Evidence.[104] As such, the reliability approach is better suited for the modern court than is either the *Frye* test or the relevancy test, given society's technological advances and the judiciary's concern with the abuses associated with using expert witnesses.

Support for the Tenth Circuit's adoption of the reliability approach

93. Act of Jan. 2, 1975, Pub. L. No. 93-595, 88 Stat. 1926 (1975) (codified at 28 U.S.C. app. (1982)).
94. 881 F.2d 941 (10th Cir. 1989).
95. 260 F.2d 377 (10th Cir. 1958), *cert. denied*, 358 U.S. 929 (1959).
96. *Id.* at 382.
97. *Id.*
98. *Id.* at n.3.
99. *Id.* at 382.
100. It must be noted, however, that *Marks* was decided prior to the enactment of the Federal Rules of Evidence and, thus, the court was not in a position where it needed to take a stand as to *Frye*.
101. 739 F.2d 1028 (5th Cir. 1984).
102. *Id.* at 1031, n.9.
103. *Head*, 881 F.2d at 943-44.
104. *See supra* Part II, section C.

can be found in the language of Rule 703,[105] which was discussed by the court. Rule 703 provides as a limitation on expert opinions that the facts and data "be of a type reasonably relied upon by experts in the field."[106] This requirement is somewhat akin to the general acceptance test of *Frye*, but is not as strict.[107]

Frye requires that there be general acceptance in the scientific community of the scientific theory in order for it to be admissible.[108] The approach advocated in *Head* does not require that the expert opinion be generally accepted in the scientific community in order to be "sufficiently reliable and probative to support a jury finding."[109] Rather, it is only the *methods* used by the expert in formulating an opinion that other experts in the field must reasonably rely upon in forming their own, possibly different, opinions.[110] In sum, it is not the expert's opinion itself which must be generally accepted or reasonably relied upon by others in the scientific community, but only the methods used in reaching that opinion.

Head is not the first case to require a court to make a preliminary determination[111] as to the reliability of the underlying bases and sources of an expert opinion.[112] Courts are more frequently turning to the preliminary inquiry to prevent litigants from hiring an expert for the sole purpose of saying whatever is most advantageous to the litigant's claim or defense.[113] "Without more than credentials and a subjective opinion, an expert's testimony that 'it is so' is not admissible."[114] Several courts have determined that the preliminary inquiry is especially important in complex cases because of the need to rely on expert opinions to prove the litigant's claims.[115]

The trend towards scrutinizing the underlying bases and sources of an expert opinion is appropriate in that it effectively curbs the abuses

105. FED. R. EVID. 703. *See supra* text accompanying note 58.
106. *Head*, 881 F.2d at 943.
107. *See supra* text accompanying notes 19-25.
108. *Id.*
109. *See generally Head*, 881 F.2d 941 (10th Cir. 1989).
110. *Id.* at 943.
111. *See supra* text accompanying notes 60-65.
112. *See* Sterling v. Velsicol Chem. Corp., 855 F.2d 1188 (6th Cir. 1988); Viterbo v. Dow Chem. Co., 826 F.2d 420 (5th Cir. 1987); United States v. Downing, 753 F.2d 1224 (3d Cir. 1985); Barrel of Fun, Inc. v. State Farm Fire & Casualty Co., 739 F.2d 1028 (5th Cir. 1984); Ferebee v. Chevron Chem. Co., 736 F.2d 1529 (D.C. Cir. 1984); *In re* Japanese Elec. Prods. Antitrust Litig., 723 F.2d 238 (3d Cir 1983), *rev'd on other grounds sub nom.* Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574 (1986); Villari v. Terminix Int'l Inc., 692 F. Supp. 568 (E.D. Pa. 1988); *In re* Agent Orange Prod. Liab. Litig., 611 F. Supp. 1223 (E.D.N.Y. 1985), *aff'd*, 818 F.2d 187 (2d Cir. 1987), *cert. denied sub nom.* Lombardi v. Dow Chem. Co. 487 U.S. 1234 (1988).
113. *See generally* Viterbo v. Dow Chem. Co., 826 F.2d 420, 423-24 (5th Cir. 1987).
114. *Id.* at 424.
115. *See* Sterling v. Velsicol Chem. Corp., 855 F.2d 1188, 1200 (6th Cir. 1988) (this is particularly important "when dealing with injuries or diseases of a type that may inflict society at random, often with no known specific origin"); *In re* Agent Orange, 611 F. Supp. at 1244, (" 'Rigorous examination' is especially important in the mass toxic tort context where presentation to the trier of theories of causation depends almost entirely on expert testimony.").

caused by "expert shopping." If the courts undertake a preliminary inquiry of the underlying bases and sources of an expert's opinion, only scientific evidence that is sufficiently reliable will be presented to the jury for its consideration.

In *Head*, the Tenth Circuit found the plaintiff's evidence on topographical brain mapping to be inadmissible.[116] The court was not convinced that the trustworthiness of topographical brain mapping or its acceptance in the relevant scientific community was established at trial.[117] Had the trial court engaged in the preliminary inquiry which is the main thrust of the reliability approach, *Head v. Lithonia* might never have been litigated.

V. CONCLUSION

There has been much trial and error in the evolution of the law concerning the admissibility of scientific evidence. The reliability approach adopted by *Head v. Lithonia*[118] is an effective test for courts confronted with this issue. The two alternatives, *Frye*'s general acceptance test and the relevancy approach, are not as complete or as thorough as the reliability approach.[119] The reason for this is that the reliability approach takes into consideration the concerns of both *Frye* and the relevancy approach.

Frye stands at one end of the spectrum and leads to harsh results, which derive from its strict requirement that the expert's opinion be generally accepted in the scientific community.[120] If science is to be used in the courtroom at a pace in step with scientific developments, requiring general acceptance is overly burdensome. Presently, the general acceptance requirement is difficult to overcome, and a litigant may be prevented from introducing sound evidence as a result. Even though the expert's opinion is based on methodologies which are accepted in the scientific community, the opinions formed using those methodologies will not be admissible unless generally accepted.

The relevancy approach, on the other hand, stands at the opposite end of the spectrum and is too lenient when it comes to admission of scientific evidence. Under this approach, a litigant need only show that the proffered scientific evidence is relevant and that its probative value substantially outweighs its prejudicial effect.[121] The Federal Rules of Evidence themselves favor admissibility; therefore, establishing relevance is a rather simple task. Courts will be required to spend a tremendous amount of time allowing litigants to present the multitude of evidence permitted under this method. The relevancy approach also fails to consider the reliability of the proffered evidence, and is at the

116. *Head*, 881 F.2d at 944.
117. *Id.*
118. *Id.*
119. *See supra* Part II, sections A and B.
120. *See supra* text accompanying notes 19-25.
121. *See supra* Part II, section B.

opposite end of the spectrum from *Frye*, which was overly concerned with the reliability of the evidence.

By taking what is best from each of the alternatives, the reliability approach offers a fair, evenhanded method of determining the admissibility of scientific evidence. It balances the concerns of both *Frye* and the relevancy approach without abandoning the goals of either.

Because the reliability approach focuses on the underlying bases and sources of an expert's opinion, a court can ensure that experts are not simply espousing whatever they are being paid to say. The preliminary inquiry, which is the main thrust of the reliability approach,[122] has undertones of *Frye*, in that a court must first determine the reliability of the underlying bases and sources of an expert's opinion. It does not, however, go as far as *Frye* to require general acceptance of the expert's opinion in the scientific community.[123] Rather, only the expert's methodology in reaching an opinion need be of a type that experts in the field would reasonably rely upon in reaching their own conclusions.[124] This is a workable approach, neither overly strict, as is *Frye*, nor too lenient, as is the relevancy approach.

Moreover, the reliability approach borrows the balancing test of the relevancy approach to serve the same basic function.[125] Even though an expert opinion may be found to be reliable through the preliminary inquiry, the court will still engage in the Rule 403 balancing test.[126]

Because the reliability approach borrows from both the *Frye* test and the relevancy approach, it provides the safeguards of each. This is especially important today in light of the increase in complex cases where scientific evidence has become commonplace as a method of proof.

The Tenth Circuit's decision in *Head v. Lithonia* accomplishes more than simply setting forth this circuit's position regarding the status of *Frye*. Questions concerning the admissibility of scientific evidence will now be determined using the reliability approach.[127] "Rule 703 contemplates that the court will play some role in the assessment of expert testimony offered to a jury. While the trial process can leverage the probative value of this testimony, the process presupposes the court's guidance."[128]

As a result of *Head*, the Tenth Circuit courts will conduct a preliminary inquiry into the underlying bases and sources of experts' opinions to determine whether the testimony is sufficiently reliable to be presented to the jury.[129] This should bridge the gap between the overly strict *Frye* test and the leniency of the relevancy approach. Since use of

122. *See supra* notes 53-64 and accompanying text.
123. *Id.*
124. *Id.*
125. *See supra* notes 51-52 and accompanying text.
126. Barrel of Fun, Inc. v. State Farm Fire & Casualty Co., 739 F.2d 1028, 1033 (5th Cir. 1984). *See also supra* note 40.
127. 881 F.2d 941 (10th Cir. 1989).
128. *Id.* at 944.
129. *Id.*

expert witnesses seems to be a permanent feature of today's litigious society, efforts like those of the Tenth Circuit in *Head v. Lithonia* will ease the judiciary's growing burden regarding the admissibility of expert testimony based on scientific evidence.

L. Joane Garcia-Colson