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"Junk Science": The Criminal Cases

Paul C. Giannelli

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PAUL C. GIANNELLI*

I. INTRODUCTION

Currently, the role of expert witnesses in civil trials is under vigorous attack. "Expert testimony is becoming an embarrassment to the law of evidence," notes one commentator.[1] Articles like those entitled "Experts up to here"[2] and "The Case Against Expert Witnesses"[3] appear in *Forbes* and *Fortune*. Terms such as "junk science," "litigation medicine," "fringe science," and "frontier science" are in vogue.[4] Physicians complain that "[l]egal cases can now be decided on the type of evidence that the scientific community rejected decades ago."[5]

A. THE FEDERAL RULES OF EVIDENCE

The expert testimony provisions of the Federal Rules of Evidence are the focal point of criticism. Adopted in 1975, the Federal Rules "revolutionized"[6] the role of experts by "sweep[ing] away the restrictive dogma that curtailed expert proof."[7] By 1986, however, a backlash against the expanded role of experts had developed. Judge Higginbotham of the Fifth Circuit Court of Appeals wrote that it "is time to take hold of expert testimony in federal trials."[8]

* Albert J. Weatherhead III & Richard W. Weatherhead Professor of Law, Case Western Reserve University.

1 James W. McElhaney, *The 1992 All-Angus Rules*, 19 LITIG. 19, 21 (Fall 1992).

2 Deirdre Fanning, *Experts up to here*, FORBES, July 13, 1987, at 378.

3 Walter Olson, *The Case Against Expert Witnesses*, FORTUNE, Sept. 25, 1989, at 133.

4 Clifford J. Zatz, *Defenses on the Frontiers of Science*, 19 LITIG. 13 (Fall 1992).

5 James L. Mills & Duane Alexander, *Teratogens and "Litogens"*, 315 NEW ENG. J. MED. 1234, 1235 (1986).

6 Michael H. Graham, *Expert Witness Testimony and the Federal Rules of Evidence: Insuring Adequate Assurance of Trustworthiness*, 1986 U. ILL. L. REV. 43 ("Ten years after the revolution in expert witness testimony, the legal community has not yet fully appreciated the true impact of the new approach and attitude of the Federal Rules of Evidence on trial practice.").

7 Margaret B. Berger, United States v. Scop: *The Common-Law Approach to an Expert's Opinion About a Witness's Credibility Still Does Not Work*, 55 BROOK. L. REV. 559, 559 (1989).

8 *In re* Air Crash Disaster at New Orleans, 795 F.2d 1230, 1234 (5th Cir. 1986).

There are two aspects to his criticism. First, "experts whose opinions are available to the highest bidder have no place testifying in a court of law."[9] Second, courts should reject "opinions of experts not based upon a generally accepted scientific principle."[10]

The general acceptance standard for the admissibility of novel scientific evidence is derived from *Frye v. United States*,[11] a 1923 decision prohibiting the admissibility of polygraph evidence. The *Frye* test requires that scientific evidence be generally accepted in the scientific community as a prerequisite to admissibility; it is more restrictive than Federal Rule 702,[12] a deceptively simple provision. Rule 702 provides:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.[13]

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9 *Id.* For an insightful discussion of the "hired gun" problem, see Samuel R. Gross, *Expert Evidence*, 1991 WIS. L. REV. 1113 (proposing several changes to ensure the appointment of neutral experts).

10 Brock v. Merrell Dow Pharmaceuticals, Inc., 884 F.2d 167, 168 (5th Cir. 1989) (Higginbotham, J., dissenting from denial of en banc review). Judge Higginbotham also wrote that the "role of experts" is "one of the more vexing problems currently facing the federal courts." *Id. See also* Chaulk v. Volkswagen of Am., Inc., 808 F.2d 639, 644 (7th Cir. 1986) (commenting that "[t]here is hardly anything, not palpably absurd on its face, that cannot now be proved by some so-called 'experts.' ") (citation omitted).

11 293 F. 1013 (D.C. Cir. 1923).

12 The *Frye* standard places a special burden on the admissibility of novel scientific evidence. It is not enough that a qualified expert testify to the validity of a novel technique; general acceptance in the scientific community is required. This conservative standard is thought to be more demanding than an opposing approach, which treats scientific evidence no differently than other types of evidence—balancing its probative value against the risks of unfair prejudice and misleading the jury. *See* 1 PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, SCIENTIFIC EVIDENCE ch. 1 (2d ed. 1993) (discussing the admissibility of novel scientific evidence, including the *Frye* test).

13 FED. R. EVID. 702. Some commentators believe that there is no need for change. *See, e.g.*, Jack B. Weinstein, *Rule 702 of the Federal Rules of Evidence is Sound; It Should Not Be Amended*, 138 F.R.D. 631 (1991).

FED. R. EVID. 703, which governs the bases of expert testimony, is also a frequent target of criticism. *See* ABA SECTION OF LITIGATION, EMERGING PROBLEMS UNDER THE FEDERAL RULES OF EVIDENCE 176 (2d ed. 1991) ("Rule 703 was a controversial rule when enacted, and it remains controversial."). 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.

See also Paul C. Giannelli, *Expert Testimony and the Confrontation Clause*, 22 CAP. U. L. REV. 45 (1993) (discussing confrontation issues that arise under Rule 703 in criminal cases); Michael C. McCarthy, Note, *"Helpful" or "Reasonably Reliable"? Analyzing the Expert Witness's Methodology Under Federal Rules of Evidence 702 and 703*, 77 CORNELL L. REV. 350 (1992) (discussing the confusion between Rules 702 and 703).

Instead of *Frye*'s demand for general scientific acceptance, mere "assistance" to the jury is the touchstone of admissibility under Rule 702.[14]

Peter Huber, a prominent critic of the federal rules of evidence, coined the phrase "junk science" to describe judicial acceptance of unreliable expert testimony. His book, *Galileo's Revenge: Junk Science in the Courtroom*, sparked a heated debate about the nature and extent of the abuse of science in litigation.[15] Huber's most sensational example of junk science involved a "soothsayer" who "with the backing of expert testimony from a doctor and several police de-

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[14] On June 28, 1993, while this article was in press, the Court decided *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993), a case involving the admissibility of expert testimony in a civil trial. The Court ruled that the *Frye* test had not survived the adoption of the Federal Rules of Evidence. The Court, however, also held that scientific evidence must satisfy a reliability text.

Under the *Daubert* analysis, the trial court must make "a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." In performing this "gatekeeping function," the trial court may consider a number of factors. First, the court should determine whether the scientific theory or technique can be and has been tested. Citing scientific authorities, the Court recognized that a hallmark of science is empirical testing. Second, a relevant, though not dispositive, consideration in assessing scientific validity is whether a theory or technique has been subjected to peer review and publication. The peer review and publication process increases the likelihood that flaws in methodology will be detected. Third, a technique's known or potential rate of error is also a relevant factor. Fourth, the existence and maintenance of standards controlling the technique's operation is another indicium of trustworthiness. Finally, "general acceptance" remains an important consideration. Although the Court rejected "general acceptance" as the sole criterion for admissibility, it recognized its relevance in assessing the reliability of scientific evidence. These factors, however, are neither dispositive nor exhaustive. Indeed, the Court emphasized that the Rule 702 standard is "a flexible one."

A news report on *Daubert* described the case as "invit[ing] judges to be aggressive in screening out ill-founded or speculative scientific theories." Linda Greenhouse, *Justices Put Judges in Charge of Deciding Reliability of Scientific Testimony*, N.Y. TIMES, June 29, 1993, at A10. Nevertheless, whether the lower courts interpret *Daubert* in that fashion remains to be seen.

[15] PETER W. HUBER, GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM (1991) [hereinafter GALILEO'S REVENGE]. *See also* Peter W. Huber, *Medical Experts and the Ghost of Galileo*, 54 LAW & CONTEMP. PROBS., Summer 1991, at 119; Peter W. Huber, *Junk Science in the Courtroom*, FORBES, July 8, 1991, at 68.

For reviews of Huber's book, see Arthur Austin, *Book Review*, 29 HOUS. L. REV. 481 (1992); Robert F. Blomquist, *Science, Toxic Tort Law, and Expert Evidence: A Reaction to Peter Huber*, 44 ARK. L. REV. 629 (1991); Jeff L. Lewin, *Calabresi's Revenge? Junk Science in the Work of Peter Huber*, 21 HOFSTRA L. REV. 183 (1992); Anthony Z. Roisman, *Galileo's Revenge: Junk Science in the Courtroom*, TRIAL, Jan. 1992, at 76 ("Because Galileo's Revenge is written in an effective, entertaining style, it is particularly dangerous."); Book Note, *Rebel Without A Cause*, 105 HARV. L. REV. 935 (1992) (reviewing GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM) ("[I]t is imperative to disentangle Huber's two criticisms: one evidentiary, against junk science; the other policy-oriented, against modern substantive tort law.").

partment officials" won a million dollar jury award due to the loss of her "psychic powers following a CAT scan."[16] Huber advocates the *Frye* test as the way to curtail the use of junk science.[17]

These attacks on scientific evidence have not gone unheeded. Judges now feel compelled to justify their decisions to admit expert testimony by claiming that the evidence "is not 'junk science' " and that the expert "is no quack."[18] Furthermore, some courts are raising obstacles to the admissibility of scientific evidence. By 1991, the Fifth Circuit, sitting en banc, was prepared to apply the restrictive *Frye* test to civil cases, a significant departure from prior practice.[19]

In response to such developments, momentum for reform began with the Civil Rules Committee, which proposed an amendment to Federal Rule 702 in 1991. The proposal requires expert testimony to "substantially" assist, rather than merely "assist," the trier of fact, and then only if the testimony is based on "reasonably reliable" information.[20] The last provision apparently embodies a modified *Frye* rule.[21] The Committee also proposed more expansive discovery of expert testimony in civil cases, including disclosure of a detailed written report "previewing" the expert's testimony.[22] This

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16 GALILEO'S REVENGE, *supra* note 15, at 3-4. Vice President Quayle cites this example without including the next sentence. Huber's next sentence is: "The trial judge threw out *that* verdict." *Id.* at 4. Instead, the Vice President writes that such stories "are becoming almost commonplace." Dan Quayle, *Civil Justice Reform*, 41 AM. U. L. REV. 559, 566 (1992).

17 GALILEO'S REVENGE, *supra* note 15, at 14, 199.

18 Carroll v. Otis Elevator Co., 896 F.2d 210, 215 (7th Cir. 1990)(Easterbrook, J., concurring).

One commentator, however, uses *Carroll* to illustrate unnecessary expert testimony. The plaintiff was injured when an unidentified child pushed the emergency stop button on an escalator. "An 'elevator button expert'—a clinical psychologist —testified that 'red buttons attract small children, this button was unreasonably easy for a child to push, and that a covered stop button is less accessible to children than an uncovered stop button.' " McElhaney, *supra* note 1, at 21.

19 Christophersen v. Allied-Signal Corp., 939 F.2d 1106 (5th Cir. 1991) (en banc) (per curiam), *cert. denied*, 112 S. Ct. 1280 (1992). In an earlier case, a panel of the Fifth Circuit applied the *Frye* test in a civil case. Barrel of Fun, Inc. v. State Farm Fire & Cas. Co., 739 F.2d 1028 (5th Cir. 1984). For a further discussion of this point, *see infra* text accompanying notes 35-36.

See generally Recent Case, *Evidence—Admissibility of Scientific Evidence—Fifth Circuit Limits Permissible Scientific Evidence to Generally Accepted Theories*—Christophersen v. Allied-Signal Corp., 939 F.2d 1106 (5th Cir. 1991) (en banc) (per curiam), 105 HARV. L. REV. 791 (1992).

20 *Preliminary Draft of Proposed Amendments to the Federal Rules of Civil Procedure and the Federal Rules of Evidence*, 137 F.R.D. 53, 156 (1991) [hereinafter Preliminary Draft].

21 The accompanying Advisory Committee note states that this standard "does not mandate a return to the strictures of *Frye v. United States*. . . . However, the court is called upon to reject testimony that is based upon premises lacking any significant support and acceptance within the scientific community." *Id.* at 157 (Advisory Committee's note).

22 Proposed amendment, FED. R. CIV. P. 26(a)(2) (disclosure of expert testimony).

discovery provision is tied directly to Rule 702; failure to comply with the discovery rule renders the expert's testimony inadmissible.[23]

The impetus for reform, however, was not limited to the judicial arena. The President's Council on Competitiveness, chaired by former Vice President Dan Quayle, established a Civil Justice Reform Task Force.[24] Once again, expert testimony was targeted. Quayle declared that "it is time to reject the notion that 'junk science' is truly relevant evidence."[25] The Task Force offered its own amendment to Federal Rule 702. It tracked the proposal of the Civil Rules Committee, requiring expert testimony to provide "substantial" assistance to the trier of fact; the Task Force then added two new provisions. First, expert testimony must be "based on a widely accepted explanatory theory." Second, an expert receiving a contingent fee may not testify.[26] Not waiting for the amendment process, former President Bush imposed these requirements on

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Id. at 89. The parties must "provide other litigants with a written report from its expert. The report must be detailed and complete—in essence, a preview of the direct testimony from such person, including any exhibits to be used to summarize or support the person's opinions. After the report has been provided, the expert may be deposed. . . ." *Id.* at 67 (Letter to Chair, Standing Committee, from Chair, Civil Rules Committee, June 13, 1991).

[23] The proposed Rule provides:

> [If] *Testimony providing* scientific, technical, or other specialized [knowledge] *information, in the form of an opinion or otherwise, may be permitted only if (1) the information is reasonably reliable and* will *substantially* assist the trier of fact to understand the evidence or to determine a fact in issue, *and (2) the* [a] witness *is* qualified as an expert by knowledge, skill, experience, training, or education *to provide such testimony*, [may 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 Rules 26(a)(2) and 26(e)(1) of the Federal Rules of Civil Procedure.*

Id. at 156 (deleted material in brackets; new material in italics).

[24] Solicitor General Kenneth Starr chaired the Task Force. The Task Force report, *Agenda for Civil Justice Reform in America*, is reprinted in 60 U. CIN. L. REV. 977 (1992).

The Task Force prepared a number of documents: (1) proposed amendments to the Federal Rules, (2) the Access to Justice Act of 1992, which was transmitted to Congress, and (3) the Civil Justice Reform Model State Amendments. *Id.*

[25] *Junk Science or Junk Law?*, 3 THE EXPERT WITNESS J. (Aug./Sept. 1991).

[26] The proposed amendment to Rule 702 provides:

> *(a) Qualification of Expert Testimony.* If *the court finds (1) that* scientific, technical, or other specialized knowledge will *substantially* assist the trier of fact to understand the evidence or to determine a fact in issue;
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> (2) that a proffered witness *is* qualified as an expert *in the field for which the expert is called to testify* by knowledge, skill, experience, training, or education; *and*
>
> *(3) that the proffered witness' testimony is based on a widely accepted explanatory theory; then the witness* may testify thereto in the form of an opinion or otherwise.
>
> *(b) Prohibition on Contingent Fee for Expert Witness. A witness shall be qualified under Rule 702(a)(2) only if the court finds that any compensation to the witness directly or indirectly will not vary as a result of any outcome of the case.*

Agenda For Civil Justice Reform in American, *supra* note 24, at 1049 (new material in italics).

government attorneys in civil cases by executive order.[27] Under this order, a theory is considered "widely accepted" if it is propounded by at least a substantial minority of experts in the relevant field.[28]

With this backdrop, the U.S. Supreme Court took certiorari in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[29] to determine whether the *Frye* test survived the adoption of the Federal Rules of Evidence. *Daubert* involved the admissibility of expert testimony concerning whether Bendectin, an anti-nausea drug, causes birth defects.

B. THE CRIMINAL CASES

Despite the highly visible efforts to reform the rules governing experts in the civil arena, the "junk science" debate has all but ignored criminal prosecutions. With one exception, Huber's book focuses on only civil litigation.[30] Similarly, the proposed amendment to Rule 702 was promulgated by the Civil Rules Committee in order to combat perceived abuses in civil trials. The Committee wrote: "*Particularly in civil litigation* with high financial stakes, large expenditures for marginally useful expert testimony has become commonplace. Procurement of expert testimony is occasionally used as a trial technique to wear down adversaries."[31] The second sentence of the proposed rule applies only to civil cases: if a party fails to comply with the civil discovery rules, its expert is disqualified.[32] The Quayle proposals are also limited to civil litigation. Indeed, the Supreme Court chose a civil case to decide the *Frye* issue.[33]

This neglect of the problems of expert testimony in criminal

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[27] *Civil Justice Reform*, Exec. Order No. 12,778, 56 Fed. Reg. 55,195 (1991).

[28] *Id.* On Jan. 30, 1993, the Department of Justice issued preliminary guidelines on the implementation of this Executive Order. Department of Justice, Memorandum of Preliminary Guidance on Implementation of the Litigation Reforms of Executive Order No. 12,778, 57 FED. REG. 3640 (1992).

[29] 113 S. Ct. 320 (1992). For a discussion of *Daubert*, see *supra* note 14.

The Court had declined to grant certiorari to decide the issue on two prior occasions, one of which occurred only a year before. Christophersen v. Allied-Signal Corp., 112 S. Ct. 1280 (1992). In *Christophersen*, Justice White, along with Justice Blackmun, dissented from the denial of certiorari, commenting that "[i]t is an issue that has long divided the federal courts." *Id.* at 1281. *See also* Mustafa v. United States, 479 U.S. 953 (1986).

[30] The criminal case cited by Huber is Barefoot v. Estelle, 463 U.S. 880 (1983). GALILEO'S REVENGE, *supra* note 15, at 217-18. For a discussion of *Barefoot*, see *infra* text accompanying notes 49-72.

[31] *Preliminary Draft*, *supra* note 20, at 156 (emphasis added).

[32] *See supra* note 23. The result is perhaps explainable, if not justifiable, due to the committee structure. At the time the amendment was proposed, there were two committees, a Civil Rules Committee and a Criminal Rules Committee. The proposed amendments originated with the Civil Rules Committee. An Evidence Rules Committee has recently been appointed.

[33] The Court declined to decide the issue in United States v. Jakobetz, 955 F.2d 786

prosecutions is deplorable, if not inexplicable.[34] The *Frye* test, which has generated so much controversy, arose from a criminal case, and historically had been applied in only criminal cases.[35] Not until 1984 was the *Frye* test applied in a federal civil case.[36] The criticism of *Frye* in criminal cases had surfaced earlier.[37] Indeed, the National Conference of Lawyers and Scientists sponsored a conference on the *Frye* test in the early 1980s.[38] Building on this conference, the ABA Section of Science and Technology organized a symposium on the topic, focusing on proposed amendments to Rule 702.[39] Further, the ABA Criminal Justice Section issued a report

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(2d Cir.), *cert. denied*, 113 S. Ct. 104 (1992), a criminal case in which DNA evidence was admitted.

34 One explanation is politics. "The 1992 Republican platform included a promise to throw out 'junk science' from American courtrooms." Lewin, *supra* note 15, at 185. "Mr. Quayle's cause of reducing costs in civil litigation is taking on the aura of a campaign issue for next year." Randall Samborn, *VP Volleys Once More With the ABA*, NAT'L L.J., Nov. 11, 1991, at 1, 28.

35 *See* FAUST F. ROSSI, EXPERT WITNESSES 36 (1991) ("The *Frye* standard traditionally has been applied almost exclusively in criminal cases."); MICHAEL H. GRAHAM, HANDBOOK OF FEDERAL EVIDENCE § 703.02, at 651 (3d ed. 1991) ("The *Frye* test has been applied most frequently over the years in criminal cases . . . ."); 1 DAVID W. LOUISELL & CHRISTOPHER B. MUELLER, FEDERAL EVIDENCE 853 (1977) ("The *Frye* standard . . . is rarely applied in civil litigation; *Frye* itself has been cited only in a very few civil cases, principally in state courts in connection with blood tests to determine paternity.").

In advocating the general acceptance standard in his book, however, Peter Huber fails to acknowledge the fact that *Frye* had been applied almost exclusively to criminal cases.

36 Barrel of Fun, Inc. v. State Farm Fire & Cas. Co., 739 F.2d 1028 (5th Cir. 1984), appears to be the first case. The court excluded evidence based on voice stress analysis, a decision that followed earlier criminal cases. *See* 1 GIANNELLI & IMWINKELRIED, *supra* note 12, § 8-6 (discussing scientific and legal status of voice stress analysis).

37 *See* Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence:* Frye v. United States, *a Half-Century Later*, 80 COLUM. L. REV. 1197, 1207-08 (1980) ("[T]he problems *Frye* has engendered—the difficulties in applying the test and the anomolous results it creates—so far outweigh [its] advantages that the argument for adopting a different test has become overwhelming."); Mark McCormick, *Scientific Evidence: Defining a New Approach to Admissibility*, 67 IOWA L. REV. 879, 915 (1982) (*Frye*'s "main drawbacks are its inflexibility, confusion of issues, and superfluity."); John Strong, *Questions Affecting the Admissibility of Scientific Evidence*, 1970 U. ILL. L.F. 1, 14 ("The *Frye* standard, however, tends to obscure these proper considerations by asserting an undefinable general acceptance as the principal if not sole determinative factor.").

38 *Symposium on Science and the Rules of Evidence*, 99 F.R.D. 187 (1983). The National Conference of Lawyers and Scientists is a joint organization of the ABA and the American Association for the Advancement of Science.

39 *See* Fredric I. Lederer, *Resolving the* Frye *Dilemma—A Reliability Approach*, 26 JURIMETRICS J. 240 (1986); Margaret A. Berger, *A Relevancy Approach to Novel Scientific Evidence*, 26 JURIMETRICS J. 245 (1986); James E. Starrs, Frye v. United States *Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702*, 26 JURIMETRICS J. 249 (1986); Paul C. Giannelli, *Scientific Evidence: A Proposed Amendment to Federal Rule 702*, 26 JURIMETRICS J. 260 (1986).

Commentaries on the various proposals were later discussed at the ABA's annual

identifying the continued validity of *Frye* as an important unresolved issue.[40]

Moreover, the junk science opponents' failure to deal with criminal prosecutions cannot be explained by differences in the use of expert testimony in civil and criminal cases.[41] Scientific evidence has played a significantly greater role in criminal prosecutions in recent years. DNA profiling is only the latest example.[42] Sophisticated instrumental techniques such as neutron activation analysis, atomic absorption, mass spectrometry, and scanning electron microscopy are common.[43] Other examples include electrophoretic blood testing, voice prints, bite mark comparison, hypnotically refreshed testimony, trace metal detection, voice stress analysis, and horizontal gaze nystagmus.[44] In addition, the use of social science research, often in the form of "syndrome" evidence, has flooded the courts. For example, evidence of rape trauma syndrome, battered wife syndrome, and child abuse accommodation syndrome is now frequently admitted at trial.[45]

In addition, the failure to take account of scientific evidence in criminal litigation has led to some remarkable results. While former

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conference in August 1986. *Rules for Admissibility of Scientific Evidence*, 115 F.R.D. 79 (1987).

[40] ABA CRIMINAL JUSTICE SECTION, FEDERAL RULES OF EVIDENCE: A FRESH REVIEW AND EVALUATION 70 (Aug. 1987), *reprinted in* 120 F.R.D. 299, 368 (1988).

[41] Judge Becker and Professor Orenstein have commented:

> Some of the most important issues concerning expert testimony, such as the admissibility of DNA typing, voiceprints, and polygraphs, arise in criminal cases. The Civil Rules Committee proposals may not focus sufficiently upon the specialized needs of the prosecution or of criminal defendants. We note that the Criminal Rules Committee disapproved the Civil Rules Committee's initial Rule 702 proposal, but the Standing Committee nevertheless modified and submitted it for public comment.

Edward R. Becker & Avia 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, 861-62 (1992).

[42] For a discussion of DNA evidence, see articles in this symposium: William C. Thompson, *Evaluating the Admissibility of New Forensic Tests: Lessons from the "DNA War"*, 84 J. CRIM. L. & CRIMINOLOGY 22 (1993); Rockne Harmon, *Legal Criticisms of DNA Typing: Where's the Beef?*, 84 J. CRIM. L. & CRIMINOLOGY 175 (1993); Peter J. Neufeld, *Have You No Sense of Decency?*, 84 J. CRIM. L. & CRIMINOLOGY 189 (1993); *See also* 2 GIANNELLI & IMWINKELRIED, *supra* note 12 (DNA evidence).

[43] For a discussion of these techniques as well as the others cited in this essay, see GIANNELLI & IMWINKELRIED, *supra* note 12.

[44] *See* Stephanie Busloff, Comment, *Can Your Eyes Be Used Against You? The Use of the Horizontal Gaze Nystagmus Test in the Courtroom*, 84 J. CRIM. L. & CRIMINOLOGY 203 (1993).

[45] *See* 1 GIANNELLI & IMWINKELRIED, *supra* note 12, ch. 9 (discussing battered woman, rape trauma, and child sexual abuse accommodation syndromes); David L. Faigman, *To Have and Have Not: Assessing the Value of Social Science to the Law as Science and Policy*, 38 EMORY L.J. 1005 (1989).

President Bush's executive order required U.S. attorneys in civil cases to meet a heightened admissibility standard ("wide acceptance") when introducing scientific evidence,[46] federal prosecutors were left free in the DNA cases to argue for a lower standard, "urg[ing] that Rule 702 creates a liberal rule of admissibility which now supersedes *Frye*."[47] Similarly, while former Vice President Quayle was championing the need for liberal discovery in civil litigation, federal prosecutors were opposing discovery of the most elementary kind in DNA cases.[48]

This essay extends the junk science debate to criminal prosecutions. It examines three issues raised by this debate: (1) the necessity for use of a stringent standard when determining the admissibility of novel scientific evidence, (2) the need to secure the services of unbiased experts, and (3) the desirability of liberal pretrial discovery of expert testimony.

II. Novel Scientific Evidence

The impact of "junk science" in criminal cases is poignantly illustrated by *Barefoot v. Estelle*,[49] the only criminal case that Huber discusses. Thomas Barefoot was convicted of capital murder in Texas. In the penalty phase of the trial, the prosecution offered the testimony of two psychiatrists who testified about Barefoot's future dangerousness, a qualifying factor under the Texas death penalty statute.[50] One psychiatrist, Dr. James Grigson, without ever examining Barefoot, testified that there was a " '*one hundred percent and absolute*' chance that Barefoot would commit future acts of criminal violence."[51] Barefoot argued before the Supreme Court that, due to its unreliability, admission of this evidence violated the Due Process Clause and the Eighth Amendment's cruel and unusual punishment clause.

In an amicus brief, the American Psychiatric Association (APA) stated that the "unreliability of psychiatric predictions of long-term future dangerousness is by now an established fact within the pro-

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46 *See supra* text accompanying note 28.

47 United States v. Two Bulls, 918 F.2d 56, 59 (8th Cir. 1990) (vacated after death of defendant), 925 F.2d 1127 (8th Cir. 1991) (en banc). *See also* United States v. Yee, 134 F.R.D. 161, 188 (N.D. Ohio 1991) (prosecutors argued that *Frye* has been displaced).

48 *See infra* text accompanying notes 122-24.

49 463 U.S. 880 (1983).

50 Tex. Crim. Proc. Code Ann. art. 37.071 § 2(b)(1) (West 1993) (requiring a jury finding that "there is a probability that the defendant would commit criminal acts of violence that would constitute a continuing threat to society"). *See* Jurek v. Texas, 428 U.S. 262 (1976) (upholding the constitutionality of the Texas statute).

51 *Barefoot*, 463 U.S. at 919 (Blackmun, J. dissenting) (quoting from record).

fession," and the "APA's best estimate is that *two out of three* predictions of long-term future violence made by psychiatrists are wrong."[52] The APA position was supported by a substantial body of research[53] and misstated by Dr. Grigson at trial.[54] Nevertheless, the Court ruled that such testimony was not constitutionally infirm. Writing for the Court, Justice White noted that "[n]either petitioner nor the [APA] suggests that psychiatrists are always wrong with respect to future dangerousness, only most of the time."[55]

Given the context, such a standard—"not always wrong"—shocks the conscience.[56] One suspects that the Justices would not choose a neurosurgeon on such a basis, nor even a podiatrist. Thomas Barefoot was executed on October 24, 1984.[57] As Huber notes, one could favor the death penalty and "yet still recoil at the thought that a junk science fringe of psychiatry . . . could decide who will be sent to the gallows."[58]

Some commentators believe that testimony concerning future dangerousness is so lacking in reliability that it is unethical.[59] In-

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52 *Id.* at 920 (quoting brief).

53 *See* Charles Patrick Ewing, *Preventive Detention and Execution: The Constitutionality of Punishing Future Crimes*, 15 LAW & HUM. BEHAV. 139 (1991); Michael L. Radelet & James W. Marquart, *Assessing Nondangerousness During Penalty Phases of Capital Trials*, 54 ALBANY L. REV. 845 (1990); Christopher Slobogin, *Dangerousness and Expertise*, 133 U. PA. L. REV. 97 (1984).

54 Defense counsel cross-examined Dr. Grigson concerning studies that demonstrated the inherent unreliability of predictions of future dangerousness. In response, Dr. Grigson testified that only a small minority of psychiatrists accepted these studies and these studies did not represent the view of the APA. *Barefoot*, 463 U.S. at 919.

55 *Id.* at 901. At another point the Court wrote: "We are not persuaded that such testimony is almost entirely unreliable . . . ." *Id.* at 899.

56 The term "shocks the conscience" was used by Justice Frankfurter in Rochin v. California, 342 U.S. 165, 172 (1952), in which the Court condemned the stomach-pumping of a suspect to retrieve evidence. The term is even more apt here. In a scathing dissent in *Barefoot*, Justice Blackmun wrote:

> In the present state of psychiatric knowledge, this is too much for me. One may accept this in a routine lawsuit for money damages, but when a person's life is at stake . . . a requirement of greater reliability should prevail. In a capital case, the specious testimony of a psychiatrist, colored in the eyes of an impressionable jury by the inevitable untouchability of a medical specialist's words, equates with death itself.

Barefoot, 463 U.S. at 916. *See also* George E. Dix, *The Death Penalty, "Dangerousness," Psychiatric Testimony, and Professional Ethics*, 5 AM. J. CRIM. L. 151, 172 (1977) (commenting on Dr. Grigson's "willingness to operate at the brink of quackerty").

57 United Press International, *Placard-Wielding Crowds Cheer Twin Injections*, Oct. 30, 1984.

58 *Galileo's Revenge*, *supra* note 15, at 220.

59 "[There] is good reason to conclude that psychologists and psychiatrists act unethically when they render predictions of dangerousness that provide a legal basis for restricting another person's interest in life or liberty." Ewing, *supra* note 53, at 162. *See also* Thomas Grisso & Paul S. Appelbaum, *Is it Unethical to Offer Predictions of Future Vio-*

deed, the APA reprimanded Dr. Grigson for claiming 100% accuracy in capital cases in which he did not examine the defendant.[60] Nevertheless, Dr. Grigson continued to testify. By May 1990, juries had returned death penalties in 118 of the 127 cases in which he had testified.[61] It is essentially the same testimony in every case:

> He'll take the stand, listen to a recitation of facts about the killing and the killer, and then—usually without examining the defendant, without ever setting eyes on him until the day of the trial—tell the jury that, *as a matter of medical science*, he can assure them the defendant will pose a continuing danger to society as defined by [the Texas statute]. That's all it takes.[62]

Dr. Grigson apparently revels in selling his views to the jury and setting traps for defense counsel,[63] and when now questioned about the APA position on the unreliability of predictions of future dangerousness, he replies: "The Supreme Court disagreed with them."[64]

Dr. Grigson gained notoriety, if not fame, as "Dr. Death" in the documentary film, *The Thin Blue Line*, which concerned the capital trial of Randall Adams.[65] Grigson's testimony about Adams' future dangerousness helped put Adams on death row.[66] Even though Ad-

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lence?, 16 LAW & HUM. BEHAV. 621, 629 (1992) ("The ethics of predictions of future violence in such a context indeed are questionable.").

60 Radelet & Marquart, *supra* note 53, at 851 n.31; RON ROSENBAUM, TRAVELS WITH DR. DEATH 218 (1991) (The APA "sent me a letter saying that this will serve as a reprimand.") (quoting Dr. Grigson).

The chapter on Dr. Grigson in Rosenbaum's book was originally published as an article. Ron Rosenbaum, *Travels With Dr. Death*, VANITY FAIR, May 1990, at 141.

61 ROSENBAUM, *supra* note 60, at 206.

62 *Id.* at 210.

63 *See id.* at 211 ("And as a bonus for the prosecutors who hire him, the Doctor also does his lethal best to destroy defense attorneys and defense witnesses who challenge him."); *id.* at 211-12 ("[W]hat makes him popular with prosecutors is that he will go the extra mile; he will go for the jugular to score points to win."); *id.* at 220 ("The Doctor had told me of the particular relish he has for doing damage on cross-examination. 'I always hold something back for cross,' he said one evening in Lubbock."); *id.* at 228 ("It seemed to me . . . the Doctor brought more than his usual competitive zeal to this case—he brought something extra, an almost personal animus, to the crusade to get Gayland Bradford executed.").

64 *Id.* at 218.

65 *The Thin Blue Line* (1988) was made by New York Filmmaker Errol Morris, who originally planned to do a film on Dr. Grigson but changed his mind after investigating the *Adams* case. ROSENBAUM, *supra* note 60, at 219.

66 Adam's death penalty was overturned by the U.S. Supreme Court because the jury selection process was defective. Adams v. Texas, 448 U.S. 38 (1980), *rev'g* Adams v. State, 577 S.W.2d 717 (Tex. Crim. App. 1979). The Governor commuted Adams' death penalty, thereby depriving Adams of a new trial. Adams v. State, 624 S.W.2d 568 (Tex. Crim. 1981). Adams eventually was granted a new trial. *Ex parte* Adams, 768 S.W.2d 281 (Tex. Crim. App. 1989).

Adams recounts his ordeal in RANDALL DALE ADAMS ET AL., ADAMS V. TEXAS (1991).

ams was subsequently released due to innocence,[67] the Doctor has not changed his mind. According to Grigson, "Adams 'will kill again.' "[68]

Barefoot cannot be discounted as a "constitutional case" that has limited precedential value in interpreting evidentiary rules. Had the Court relied on some constitutional provision other than the Eighth Amendment, such an argument would have much cogency. The Court's "cruel and unusual punishment" jurisprudence, however, has repeatedly emphasized that a heightened standard of reliability is required when the penalty is death. According to the Court, "the fundamental respect for humanity underlying the Eighth Amendment's prohibition against cruel and unusual punishment gives rise to a special 'need for reliability in the determination that death is the appropriate punishment' in any capital case."[69] In addition, prosecutors have argued that *Barefoot* is not limited to constitutional cases. For example, federal prosecutors asserted that *Barefoot*, not *Frye*, was the controlling evidentiary standard in *United States v. Yee*,[70] the first federal case considering the admissibility of the FBI's DNA procedure.

The Bush Administration had it backwards; if there is to be a stringent standard of admissibility, it should be applied in criminal, not civil, cases. The interests involved in criminal and capital prosecutions require a cautious approach, although not necessarily *Frye*. I have argued elsewhere that prosecutors should be required to satisfy a heavy burden before novel scientific evidence is admitted at trial.[71] Only the government has the resources to commission or

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[67] After an extensive Texas habeas proceeding, in which Adams again claimed his innocence, the judge wrote:

> Although the court cannot determine the applicant is "innocent" of the Wood murder ["Since innocence is not a basis in Texas for a new trial . . ."], on the basis of the evidence presented at the habeas corpus hearing, applying the law which places the burden of proof on the State beyond a reasonable doubt, the court would have found applicant not guilty at a bench trial.

Ex parte Adams, 768 S.W.2d at 285 (quoting habeas record).

[68] ROSENBAUM, *supra* note 60, at 220 (quoting Dr. Grigson).

[69] Johnson v. Mississippi, 486 U.S. 578, 584 (1988) (quoting Gardner v. Florida, 430 U.S. 349, 363-64 (1977), and Woodson v. North Carolina, 428 U.S. 280, 305 (1976) (White, J., concurring in judgment)).

See also Murray v. Giarratano, 492 U.S. 1, 8-9 (1989) ("The finality of the death penalty requires 'a greater degree of reliability' when it is imposed.") (quoting Lockhart v. Ohio, 438 U.S. 586, 604 (1978)); Beck v. Alabama, 447 U.S. 625, 637-38 (1980) (Because the death penalty is different, the Court has "invalidated procedural rules that tended to diminish the reliability of the sentencing determination.").

[70] 134 F.R.D. 161, 188 (N.D. Ohio 1991) (magistrate's report). The magistrate ruled that, with regard to DNA evidence, the *Frye* test was the applicable standard, and that the DNA evidence satisfied the *Frye* test.

[71] Giannelli, *supra* note 37, at 1248 ("The prosecution in a criminal case should be

conduct the necessary validity studies for this type of evidence.

If we are going to make mistakes in assessing the validity of a novel technique, they should be mistakes delaying the admission of reliable evidence and not mistakes of admitting unreliable evidence. Professor Berger has put the question starkly: "[W]hat error rate are we willing to tolerate when we might be sending someone to the electric chair?"[72]

The Court in *Barefoot* justified its lax evidentiary standard, in part, by relying on the adversary system to "uncover, recognize, and take due account of [the] shortcomings" of expert testimony.[73] Determining whether the adversary system is up to this task requires an examination of a number of procedural rules, such as those governing the appointment of defense experts and pretrial discovery. These issues are discussed in the following sections of this article.

III. Defense Experts

The former Vice President's Task Force proposed an amendment to Rule 702, which prohibits the payment of contingent fees to expert witnesses. The prohibition is broadly phrased. An expert is disqualified if any compensation, "directly or indirectly," would vary as a result of the outcome of the case.[74] The rule is intended to preclude the use of biased experts and might even extend to Dr. Grigson, who reportedly earned $200,000 a year from expert-witness fees ($150 an hour) and from a limited private practice.[75]

This proposal, however, does not deal with problems of *institutional* bias—the control of crime laboratories by the police.[76] Problems in relying on police-controlled crime laboratories have arisen in politically sensitive cases. For example, a federal grand jury investigating the deaths of Black Panther leaders in a police raid reported that the "testimony of the firearms examiner that he could not have refused to sign what he believed was an inadequate and

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required to establish the validity of a novel scientific technique beyond a reasonable doubt.").

72 Katherine Bishop, *Leaps of Science Create Quandaries on Evidence*, N.Y. Times, Apr. 6, 1990, at B6, col. 3.

73 Barefoot v. Estelle, 463 U.S. 880, 898-89 (1983).

74 *See supra* note 26.

75 Rosenbaum, *supra* note 60, at 231. *See also* John Bloom, *Doctor For the Prosecution*, Am. Law., Nov. 1979, at 25 ("[L]ast year he earned more than $67,034 in fees from Dallas County alone, a figure that doesn't include murder cases in other Texas cities.").

76 *See* Peterson et al., *The Capabilities, Uses, and Effects of the Nation's Criminalistics Laboratories*, 30 J. Forensic Sci. 10, 11 (1985) ("Seventy-nine percent of all [257 out of 319] laboratories responding to our survey are located within law enforcement/public safety agencies.").

preliminary report on pain of potential discharge is highly alarming."[77] Similarly, the prosecution of the Maguires as IRA terrorists in Britain rested on evidence that was not only "scientifically false but also known to be by all concerned parties and scientists."[78] As discussed below, the problem of biased experts, although present in criminal cases, is outweighed by far more serious systemic problems.

A. EXPERT ASSISTANCE FOR INDIGENTS

Those familiar with criminal prosecutions might be bemused by a discussion of the contingent fee issue—not because they favor such fees, but because obtaining the services of *any* defense expert in criminal litigation is so difficult. Obtaining expert assistance is generally not a problem for the prosecution, which has access to the services of state, county, or metropolitan crime laboratories. In addition, federal forensic laboratories often provide their services to state law enforcement agencies. For example, the services of the FBI Laboratory are available to all duly constituted state, county, and municipal law enforcement agencies in the United States.[79] These services, which are provided without charge, include both the examination of evidence and the court appearance of the expert.

Forensic laboratory services, however, are not generally available to criminal defendants. A survey of approximately 300 crime laboratories revealed that "fifty-seven percent . . . would only examine evidence submitted by law enforcement officials."[80] It is not surprising, then, that Harry Kalven, Jr. and Hans Zeisel in their 1966 jury study commented: "Again, the imbalance between the prosecution and defense appears. In 22 percent of the cases the prosecution has the only expert witness, whereas in only 3 percent of the cases does the defense have such an advantage."[81] Ten years

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77 Lowell W. Bradford, *Problems of Ethics and Behavior in the Forensic Sciences*, 21 J. FORENSIC SCI. 763, 767 (1976) (quoting U.S. Dist. Ct., N.D. Ill., E. Div., *Report of January 1970 Grand Jury* 121).

78 The Maguires were accused of possessing an explosive as part of the IRA's terrorism campaign. The government's case rested on the presence of nitroglycerine on the defendants' fingernails and gloves. Thin layer chromatography was used to detect the nitroglycerine: "The tests were said to be as conclusive and irrefutable as fingerprints. The entire underpinning for this assertion were proved not only to be scientifically false but also known to be by all concerned parties and scientists . . . ." *See* James E. Starrs, *The Forensic Scientist and the Open Mind*, 31 J. FORENSIC SCI. SOC'Y 111, 141-42 (1991) (citing May et al., Interim Report on the Maguire Case, London: HMSO (July 12, 1990)).

79 FEDERAL BUREAU OF INVESTIGATION, HANDBOOK OF FORENSIC SCIENCE 7 (rev. ed. 1984).

80 Peterson et al., *supra* note 76, at 13.

81 HARRY KALVEN, JR. & HANS ZEISEL, THE AMERICAN JURY 139 (1966). *See also* Daniel

later, the issue resurfaced in the voiceprint cases. As a National Academy of Sciences report noted, a "striking fact about the trials involving voicegram evidence to date is the very large proportion in which the only experts testifying were those called by the state."[82]

Although a number of federal and state statutes attempt to provide expert assistance, the coverage of these provisions is frequently quite limited.[83] Some are restricted to capital cases[84] or drug prosecutions.[85] Others impose unrealistic limitations on the amount that may be expended for this purpose, such as $250 or $300.[86] Until 1986, when the ceiling was raised to $1000, the federal statute also contained a $300 maximum.[87]

B. *AKE V. OKLAHOMA*

In *Barefoot*, the Court noted that although the accused had not offered the testimony of an opposing expert, there was no claim that the trial court had "refused to provide an expert for petitioner."[88] Nevertheless, it was not until two years later, in *Ake v. Oklahoma,*[89] that the Court for the first time recognized a due process right to expert assistance for indigents. Ake's attorney requested a psychiatric evaluation at state expense to prepare an insanity defense. The trial court refused, and although insanity was the only contested issue at trial, no psychiatrist testified on this issue. The Court reversed:

> We hold that when a defendant has made a preliminary showing that his sanity at the time of the offense is likely to be a significant factor at

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A. Rezneck, *The New Federal Rules of Criminal Procedure*, 54 GEO. L.J. 1276, 1278 (1966) (The disparity of investigative resources between the defense and prosecution "is likely to have its maximum impact in the presentation of evidence which must be analyzed and developed in the laboratory or hospital.").

82 NATIONAL ACADEMY OF SCIENCES, ON THE THEORY AND PRACTICE OF VOICE IDENTIFICATION 49 (1979). *See also* People v. Chapter, 13 CRIM. L. REP. (BNA) 2479 (Cal. Super. 1973) ("In approximately eighty percent of the twenty-five [voiceprint] cases in which such expert testimony/opinion was admitted there was no opposing expert testimony on the issue of reliability and general acceptability of the scientific community . . . .").

83 1 GIANNELLI & IMWINKELRIED, *supra* note 12, ch. 4 (discussing the constitutional and statutory provisions on expert assistance for indigent defendants).

84 *E.g.*, ARIZ. REV. STAT. ANN. § 13-4013(B) (1989); ILL. ANN. STAT. ch. 38, § 113-3(d) (Smith-Hurd Supp. 1992); TENN. CODE ANN. § 40-14-207(b) (1990).

85 OHIO REV. CODE ANN. § 2925.51 (Baldwin 1992) (controlled substance cases).

86 *E.g.*, ILL. ANN. STAT. ch. 38, § 113-3(d) (Smith-Hurd Supp. 1992) ($250 maximum in capital cases); N.Y. COUNTY LAW § 7-22-c (McKinney 1991) ($300 maximum unless extraordinary circumstances shown).

87 18 U.S.C. § 3006(A)(e)(1) (1985). *See* H.R. REP. No. 417, 99th Cong., 2d Sess. 6, *reprinted in* 1986 U.S.C.C.A.N. 6165, 6178.

88 Barefoot v. Estelle, 463 U.S. 880, 899 n.5 (1983).

89 470 U.S. 68 (1985).

trial, the Constitution requires that a State provide access to a psychiatrist's assistance on this issue, if the defendant cannot otherwise afford one.[90]

Unfortunately, many courts have interpreted *Ake* restrictively, thereby undercutting its potential as a way of lessening the disparity between prosecution and defense access to expert assistance. For example, some courts have held that "*Ake* does not reach noncapital cases."[91] Although *Ake* involved a capital defendant and Chief Justice Burger, in a concurring opinion,[92] attempted to impose a "death penalty" limitation on the right to expert assistance, there is nothing in the majority opinion that supports such a limitation.[93] Indeed, the Court in *Little v. Streater*,[94] a prior civil case, had ruled that an indigent defendant in a paternity action had the right to a blood grouping test at state expense. Therefore, the "capital trial" limitation appears to be nothing more than a transparent attempt to circumvent *Ake*.

Other courts limit *Ake* to psychiatric experts. According to the Alabama Supreme Court, "there is nothing contained in the *Ake* decision to suggest that the United States Supreme Court was addressing anything other than psychiatrists and the insanity defense."[95] Consequently, the defendant's request for a forensic pathologist was denied. Here, again, the reach of *Ake* is artificially restricted.[96]

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90 *Id.* at 74.

91 Isom v. State, 488 So. 2d 12, 13 (Ala. Crim. App. 1986). *Accord* McCord v. State, 507 So. 2d 1030, 1033 (Ala. Crim. App. 1987). *But see* Little v. Armontrout, 835 F.2d 1240, 1243 (8th Cir. 1987) (en banc) ("Nor do we draw a decisive line for due-process purposes between capital and noncapital cases."), *cert. denied*, 487 U.S. 1210 (1988).

92 The Chief Justice wrote, "The facts of the case and the question presented confine the actual holding of the Court. In capital cases the finality of the sentence imposed warrants protection that may or may not be required in other cases." *Ake*, 470 U.S. at 87 (Burger, C.J., concurring).

93 Justice Rehnquist, the lone dissenter, acknowledged that the majority opinion was not so limited. He criticized the majority because "the constitutional rule announced by the Court is far too broad. I would limit the rule to capital cases." *Ake*, 470 U.S. at 87 (Rehnquist, J., dissenting).

94 452 U.S. 1 (1981).

95 *Ex parte* Grayson, 479 So. 2d 76, 82 (Ala.), *cert. denied*, 474 U.S. 865 (1985). *Accord* Stafford v. Love, 726 P.2d 894, 896 (Okla. 1986); Plunkett v. State, 719 P.2d 834, 839 (Okla. Crim. App. 1986) (no right to bloodstain expert) ("Such a risk [of error] in other areas of scientific evidence is not necessarily present because the scientific expert is often able to explain to the jury how a conclusion was reached, the defense counsel can attack that conclusion, and the jury can decide whether the conclusion had a sound basis."), *cert. denied*, 479 U.S. 1019 (1986).

96 Some courts have ruled that *Ake* covers nonpsychiatric experts. For example, the Eighth Circuit has ruled that "there is no principled way to distinguish between psychiatric and nonpsychiatric experts. The question in each case must be not what field of science or expert knowledge is involved, but rather how important the scientific issue is in the case, and how much help a defense expert could have given." Little v. Armon-

While the critical role of psychiatry in insanity defense cases played an important part in the decision, the Court's rationale extends to other types of experts.[97] Experts other than psychiatrists often play pivotal roles in criminal cases—for example, questioned document examiners in forgery cases.[98] Indeed, the Court not only held that Ake had a right to expert assistance in preparing an insanity defense (a trial issue) but also on the issue of "future dangerousness," which was raised in the penalty phase as in *Barefoot*.[99] Again, *Little v. Streater* is informative because it involved a blood test in a civil paternity action.[100] Here again, an unjustifiable limitation is used to undercut *Ake*.

Another post-*Ake* issue concerns the threshold standard for determining when the appointment of a defense expert is constitutionally required. Unlike the above issues, this one raises a legitimate dispute. According to *Ake*, the accused must make a "preliminary showing" that expert assistance is "likely to be a significant factor at trial."[101] In a later case, *Caldwell v. Mississippi*,[102] the Court declined to consider a trial court's refusal to appoint fingerprint and ballistics

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trout, 835 F.2d 1240, 1243 (8th Cir. 1987) (en banc) (error to fail to appoint hypnotist), *cert. denied*, 487 U.S. 1210 (1988).

See also Dunn v. Roberts, 963 F.2d 308, 314 (10th Cir. 1992) (error to fail to appoint expert on battered woman syndrome); State v. Carmouche, 527 So. 2d 307 (La. 1988) (serologists appointed); State v. Bridges, 385 S.E.2d 337, 339 (N.C. 1989) (error to fail to appoint fingerprint expert).

97 The commentary to the ABA Standards provide:

> [T]he Court's test [in *Ake*] for access to "basic tools of an adequate defense" has potentially broad application in all contexts regarding the provision of support services.
>
> The courts of a number of states have recognized a defendant's constitutional right to a broad range of supporting services, including such diverse issues as forensic dental records, fingerprints, firearms, jury selection and demography.

ABA STANDARDS FOR CRIMINAL JUSTICE: PROVIDING DEFENSE SERVICES 5-1.4 commentary at 23 (3d ed. 1992).

98 As early as 1929, then-Judge Cardozo commented: "[U]pon the trial of certain issues, such as insanity or forgery, experts are often necessary both for the prosecution and for defense. . . . [A] defendant may be at an unfair disadvantage, if he is unable because of poverty to parry by his own witnesses the thrusts of those against him." Reilly v. Berry, 166 N.E. 165, 167 (N.Y. 1929).

See also ABA STANDARDS, *supra* note 97, at 22 ("The quality of representation at trial . . . may be excellent and yet unhelpful to the defendant if his defense requires assistance of a psychiatrist or handwriting expert and no such services are available.").

99 "[D]ue process requires access to a psychiatric examination on relevant issues, to the testimony of the psychiatrist, and to assistance in preparation at the sentencing phase." Ake v. Oklahoma, 470 U.S. 68, 84 (1985).

100 In a later case, Caldwell v. Mississippi, 472 U.S. 320, 323 n.1 (1985), the Court declined to consider a trial court's refusal to appoint fingerprint and ballistics experts because the defendant had not made a sufficient showing of need. The Court, however, gave no indication that fingerprint or ballistics experts were beyond the scope of *Ake*.

101 *Ake*, 470 U.S. at 74.

102 472 U.S. 320 (1985).

experts because the defendant had "offered little more than undeveloped assertions that the requested assistance would be beneficial."[103] *Ake* and *Caldwell* represent the extremes; the former involved compelling facts, while the latter involved the barest of assertions.[104] Thus, there is no "bright line test" for determining when the requisite showing has been made.[105]

Nevertheless, many courts have required defendants to shoulder near impossible burdens in this context. According to the Eleventh Circuit, a two-pronged test must be satisfied: the defendant must establish a reasonable probability that (1) an expert would be of assistance to the defense *and* (2) the denial of an expert would result in a fundamentally unfair trial.[106] The second prong erects a substantial barrier, certainly one that the prosecution need not surmount when deciding whether to use expert testimony. To satisfy this burden in a case where the defense seeks to challenge a prosecution expert, the defense "must inform the court of the nature of the prosecution's case and how the requested expert would be useful. At the very least, [counsel] must inform the trial court about the nature of the crime and the evidence linking [the accused] to the crime."[107] As explained below, the lack of adequate discovery often makes this burden impossible to meet. If the threshold standard is set too high, the defendant is placed in a "catch-22" situation, in which the standard "demand[s] that the defendant possess already the expertise of the witness sought."[108]

In sum, the promise of *Ake* remains largely unfulfilled.[109] With-

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103 *Id.* at 323 n.1.

104 Ake's only defense was insanity. His bizarre behavior at the arraignment, just four months after the crime, prompted the trial judge to order sua sponte a mental examination. Initially, the state psychiatrist declared Ake incompetent to stand trial, but six weeks later Ake was determined to be competent—provided he stayed on Thorazine, an antipsychotic drug. The state psychiatrist acknowledged the severity of Ake's mental illness and the possibility that it "might have begun many years earlier." Finally, the burden of producing evidence of insanity rested, under state law, with the defendant. *Ake*, 470 U.S. at 87.

105 *See* Volson v. Blackburn, 794 F.2d 173, 176 (5th Cir. 1986) ("[T]he Ake decision fails to establish a bright line test for determining when a defendant has demonstrated that sanity at the time of the offense will be a significant factor at the time of trial.").

106 Moore v. Kemp, 809 F.2d 702, 712 (11th Cir.) (en banc), *cert. denied*, 481 U.S. 1054 (1987).

107 *Id.* at 712.

108 State v. Moore, 364 S.E.2d 648, 657 (N.C. 1988) (error to fail to appoint fingerprint expert).

109 *See* STEPHEN A. SALTZBURG & DANIEL J. CAPRA, AMERICAN CRIMINAL PROCEDURE 651 (4th ed. 1992) ("Generally speaking the courts have read *Ake* narrowly, and have refused to require appointment of an expert unless it is absolutely essential to the defense."); David A. Harris, *The Constitution and Truth Seeking: A New Theory on Expert Services for Indigent Defendants*, 83 J. CRIM. L. & CRIMINOLOGY 469 (1992); David A. Harris, Ake

out an effective right to defense experts, the accused often lacks the resources to combat junk science. Recent bite mark cases illustrate this point.[110]

C. BITE MARK CASES

In *Washington v. State*,[111] a capital case, the Oklahoma Court of Criminal Appeals ruled that a defendant was not entitled to the appointment of a defense expert, even though a prosecution expert had testified that the defendant had made the bite mark found on a murder victim. Moreover, the prosecution expert conceded that he had used a novel method of comparison that no one else had ever used, and he also testified that only "one in a billion people" had a particular characteristic shared by the defendant.[112] The basis for this astounding statistic is not revealed and is suspect.

Another bite mark case, *Harrison v. State*,[113] involved the death penalty for the murder of a ten year-old girl. A prosecution expert testified that the defendant had bit the victim more than forty times, but the trial court nevertheless rejected a defense request for an expert. To demonstrate a "particularized need" for a defense expert, the trial judge required that the expert first review the evidence and write an affidavit. Without pay, however, most experts will not review the evidence nor prepare an affidavit. By the time of the appeal, an expert had been found, and he concluded that the "marks were not from bites."[114]

Revisited: Expert Psychiatric Witnesses Remain Beyond Reach For the Indigent, 68 N.C. L. REV. 763,769 (1990) ("Lower courts often have interpreted *Ake* less than generously, unduly constricting the availability of the right.").

110 For a discussion of bite mark evidence, see 1 GIANNELLI & IMWINKELRIED, *supra* note 12, ch. 13.

111 836 P.2d 673 (Okla. Crim. App. 1992).

112 The prosecution's expert testified that:

> [H]e used two types of analyses to identify appellant as the assailant: bitemark/dentition comparison and a comparison of microorganisms found in the wound and in appellant's mouth. The doctor placed primary identification emphasis on the microorganism "aspergillus" being present in both the bitemark and in appellant's mouth. At trial the doctor testified that aspergillus would be found in the mouths of only "one in a billion people." Although the doctor claimed that his tests were "accepted," he admitted that he was aware of no other persons who either used or advocated the use of microbiological analysis in bitemark comparisons. *Id.* at 678 (Parks, J., concurring in part, dissenting in part).

113 The Henry Lee Harrison case (No. 90DP1345) in now before the Mississippi Supreme Court. Telephone interview with John Holdridge of the Mississippi and Louisiana Capital Trial Assistance Project in New Orleans (Apr. 22, 1993). For a further discussion, see Debra Cassens Moss, *Death, Habeas and Good Lawyers: Balancing Fairness and Finality*, 78 A.B.A.J. 83, 85 (Dec. 1992). John Holdridge also noted that it is difficult to obtain good lawyers for three reasons: "Fees may be restricted, judges are reluctant to spend money on experts, and standards are lax for trial counsel." *Id.* at 84.

114 *Id.* at 85.

Although bite mark comparisons are based on objective data, the comparison itself involves an essentially subjective judgment. Thus, disagreements between bite mark experts is not unexpected.[115] Even proponents acknowledge that this type of evidence is "hotly contested."[116] Indeed, a surprising number of cases have involved disagreements where prosecution experts make a positive identification but defense experts testify that the mark "was not a bite mark at all."[117] Under these circumstances, the appointment of a defense expert, especially in capital cases, should be almost automatic.

D. OTHER RECENT EXAMPLES

Other sources also indicate that the lack of defense experts continues to be a problem. In 1990, the *National Law Journal* published the results of a six-month investigation of the defenses of capital murders in the South. One of the "key findings" of this investigation concerned defense experts: "Judges routinely deny lawyers' requests for expert/investigative fees."[118] Another article reports:

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[115] People v. Milone, 356 N.E.2d 1350 (Ill. App. 1976), is an example. Three experts testified for the prosecution and four testified for the defense. The prosecution experts all positively identified the defendant's teeth as the source of the bite mark found on the murder victim. The defense experts testified either that a positive identification could not be made, or that Milone's teeth did not make the mark. *Id.* at 1356.

Other cases in which experts disagreed include: State v. Sager, 600 S.W.2d 541, 563-67 (Mo. Ct. App. 1980), *cert. denied*, 450 U.S. 910 (1981); People v. Bethune, 484 N.Y.S.2d 577, 580-83 (App. Div. 1984); Spence v. State, 795 S.W.2d 743, 750-52 (Tex. Crim. App. 1990); State v. Howe, 386 A.2d 1125, 1132 (Vt. 1978).

[116] Raymond D. Rawson et al., *Analysis of Photographic Distortion in Bite Marks: A Report of the Bite Mark Guidelines Committee*, 31 J. FORENSIC SCI. 1261, 1261-62 (1986) ("Although bite mark evidence has demonstrated a high degree of acceptance, it continues to be hotly contested in 'battles of the experts.' Review of trial transcripts reveals that distortion and the interpretation of distortion is a factor in most cases.").

[117] People v. Smith, 468 N.E.2d 879, 886 (N.Y. 1984) (four prosecution experts and three defense experts testified), *cert. denied*, 469 U.S. 1227 (1985).

Other examples include: State v. Holmes, 601 N.E.2d 985, 991-93 (Ill. App. 1992) (two prosecution experts testified that defendant inflicted bite marks found on victim; two defense experts testified that marks were not bite marks and not made by defendant); Davis v. State, 611 So. 2d 906, 910 (Miss. 1992) (prosecution expert had "no doubt" that defendant's teeth made bite mark; defense expert testified that mark on defendant's arm was not a bite mark, but even if it were, it was inconsistent with Davis' teeth); Kris Sperry & Homer R. Campbell, Jr., *An Elliptical Incised Wound of the Breast Misinterpreted as a Bite Injury*, 35 J. FORENSIC SCI. 1226 (1990) (Two odontologists made a positive identification of bite marks in a murder trial, and then defense experts showed that the mark had been misinterpreted—that it was not "even" a bite mark. The jury acquitted.).

[118] Marcia Coyle et al., *Fatal Defense: Trial and Error in the Nation's Death Belt*, NAT'L L.J., June 11, 1990, at 30. As part of the investigation, 60 death-row trial lawyers were interviewed. "54.2% felt court provided inadequate investigation and expert funds." *Id.* at 40. One attorney, who was appointed to represent a death row inmate in Georgia, had

"In recent DNA cases in Oklahoma and Alabama, . . . the defense did not retain any experts, because the presiding judge had refused to authorize funds."[119] In addition, a 1992 study of indigent defense systems noted that the "greatest disparities occur in the areas of investigators and expert witnesses, with the prosecutors possessing more resources."[120]

In sum, the problem of "contingent fee" experts seems rather minor when compared to a death penalty case without any expert to rebut the prosecution's scientific evidence.

IV. DISCOVERY

The junk science opponents also advocate expanded pretrial discovery of expert testimony as a way to ferret out bad science. Former Vice President Quayle asserted that:

> More comprehensive inquires should be permitted of proposed 'expert' witnesses through interrogatories and depositions. . . . Litigants should be able to scrutinize experts by obtaining more information about them. To this end, disclosure of additional core data should be required—namely, a list of the expert's publications and a description of the expert's compensation arrangement—without cost to the opposing party.[121]

At the same time that the former Vice President was trumpeting the virtues of expanded discovery in civil litigation, federal prosecutors were opposing discovery in the first major DNA case using the FBI procedure. In *United States v. Yee*,[122] the government opposed discovery of matching criteria, environmental insult studies, popula-

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his request for the appointment of an expert denied. He commented: "There's an economic presumption of guilt. . . . The district attorney has all the resources of the state crime lab, and we have to go hat in hand to the judge and the DA on every request." *Id.* at 38.

See also A Study of Representation in Capital Cases in Texas, 56 TEX. B.J. 333, 408 (Apr. 1993) (Report of The Spangenberg Group prepared for the Texas State Bar) ("There is a serious underfunding of essential expert services and other expenses in capital trials and appeals.")

119 Peter J. Neufeld & Neville Colman, *When Science Takes the Witness Stand*, 262 SCI. AM. 46, 53 (May 1990).

See also Andrews v. State, 533 So. 2d 841 (Fla. Dist. Ct. App. 1988)(no defense expert testified in first appellate case considering the admissibility of DNA evidence); Spencer v. Commonwealth, 384 S.E.2d 785 (Va. 1989) (no defense expert testified in an early DNA case); NAT'L RES. COUNCIL, COMMITTEE ON DNA TECH. IN FORENSIC SCIENCE, DNA TECHNOLOGY IN FORENSIC SCIENCE 149 (1992) ("Because of the potential power of DNA evidence, authorities must make funds available to pay for expert witnesses . . . .").

120 ROGER A. HANSON, INDIGENT DEFENDERS: GET THE JOB DONE AND DONE WELL 100 (1992) (study by the National Center for State Courts).

121 Quayle, *supra* note 16, at 566.

122 129 F.R.D. 629 (N.D. Ohio 1990), *adopted by* 134 F.R.D. 161 (N.D. Ohio 1991).

tion data, and proficiency tests.[123] In contrast, the National Academy of Sciences DNA report unequivocally recommends extensive discovery.[124]

In addition, the former Vice President was apparently unaware that the information he sought disclosed in civil trials was typically not subject to discovery in criminal litigation.[125] Indeed, criminal discovery does not even match what was available under the *current* civil rule, the one Quayle found so deficient. Typically, there are no discovery depositions or interrogatories in criminal prosecutions,[126] and in many jurisdictions, the defense does not have a right to a list of the prosecution witnesses, including experts.[127]

The most common discovery provision in criminal litigation concerns scientific reports. There is, however, often no requirement that a report be prepared, and oral reports may not be discoverable.[128] Consequently, the defense may not learn that a prosecution expert will testify *until* that expert takes the stand at trial. Moreover, the typical lab report is grossly inadequate—often providing only a "summary of the results of an unidentified test conducted by an anonymous technician."[129] For example, a report containing the results of a gunshot residue test may not specify the methodology used—for example, neutron activation analysis, atomic absorption, the paraffin test, scanning electron microscopy, or another technique. Some of these procedures are valid, but

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123 The U.S. Magistrate eventually ruled in favor of the defense, but had to resort to a creative interpretation of Criminal Rule 16, the federal discovery provision, to reach this result. The discovery argument initially focused on whether these documents were discoverable scientific reports within the meaning of FED. R. CRIM. P. 16(a)(1)(D). The magistrate ultimately ruled these documents were "predicate materials" under FED. R. CRIM. P. 16(a)(1)(C), which governs the inspection of documents and tangible objects. *Id.* at 635.

124 "The prosecutor has a strong responsibility to reveal fully to defense counsel and experts retained by the defendant all material that might be necessary in evaluating the evidence." NAT'L RES. COUNCIL, *supra* note 119, at 145.

125 For a detailed discussion, see Paul C. Giannelli, *Criminal Discovery, Scientific Evidence, and DNA*, 44 VAND. L. REV. 791 (1991).

126 Depositions are generally limited to the preservation of the testimony of a witness who will be unavailable at trial. *See* FED. R. CRIM. P. 15. In other words, the parties may depose their own witnesses but not the opposing witnesses.

127 *See* FED. R. CRIM. P. 16.

128 Under current Fed. R. Crim. P. 16, oral reports are not discoverable. *See* United States v. Shue, 766 F.2d 1122, 1135 (7th Cir. 1985) (defendant not entitled to discovery of verbal report of FBI photographic expert), *cert. denied*, 484 U.S. 956 (1987); United States v. Johnson, 713 F.2d 654, 659 (11th Cir. 1983) (police officer testified as an emergency medical technician without notice to defense; Rule 16 not implicated because "no . . . reports were made in th[e] case."), *cert. denied*, 465 U.S. 1030 (1984).

129 United States v. Bentley, 875 F.2d 1114, 1123 (5th Cir. 1989) (Williams, J., dissenting).

others are not.[130] In addition, the qualifications of the expert, the ultimate conclusion reached,[131] and the bases for the conclusion typically are not reported. Other important documents, such as bench notes[132] and graphs,[133] may not be subject to discovery.

Finally, none of the typical reasons for distinguishing civil and criminal discovery apply in this context.[134] The ABA Standards note: "The need for full and fair disclosure is especially apparent with respect to scientific proof and the testimony of experts. . . . [I]t is virtually impossible for evidence or information of this kind to be distorted or misused because of its advance disclosure."[135]

An amendment to Criminal Rule 16, currently under consideration, would rectify most the problems discussed in this section. The amendment reads:

> (E) Expert Witnesses: At the defendant's request, the government shall disclose to the defendant a written summary of testimony the government intends to use under Rules 702, 703, or 705 of the Federal Rules of Evidence during its case in chief at trial. This summary must describe the witnesses' opinions, the bases and the reasons therefor, and the witnesses' qualifications.[136]

The junk science opponents played no part in the promulgation of this amendment.[137] Instead, the Bush administration advocated ex-

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130 1 GIANNELLI & IMWINKELRIED, *supra* note 12, ch. 14 (discussing the various tests, including defects in the paraffin test).

131 *See* Pierce v. State, 786 P.2d 1255, 1263 (Okla. Crim. App. 1990) (no error where serologist report contained specific findings but not conclusions drawn from findings). *See also* United States v. Cole, 707 F. Supp. 999, 1004 (N.D. Ill. 1989) (ruling that Fed. R. Crim. P. 16 entitled the accused to lab report but not to a "comprehensive preview of the government's [expert] opinion testimony.").

132 *See* United States v. Iglesias, 881 F.2d 1519, 1523-24 (9th Cir. 1989) (holding chemist's bench notes concerning heroin analysis are not discoverable), *cert. denied*, 493 U.S. 1088 (1990); United States v. Berry, 636 F.2d 1075, 1082 (5th Cir. 1981) (holding DEA chemist's work notes are not discoverable); Spencer v. Commonwealth, 384 S.E.2d 785, 791 (Va. 1989) (holding DNA expert's work notes are not discoverable), *cert. denied*, 493 U.S. 1093 (1990).

133 *See* Williams v. State, 312 S.E.2d 40, 51 (Ga. 1983) (microspectrophotometer graphs used in fiber analysis not discoverable even though 13 graphs admitted at trial as prosecution exhibits).

134 Opponents of liberal discovery in criminal cases argue that discovery will encourage perjury, will lead to the intimidation of witnesses, and because of the Fifth Amendment, will be a one-way street. *See* 2 CHARLES A. WRIGHT, FEDERAL PRACTICE & PROCEDURE § 252, at 36-37 (2d ed. 1982).

135 ABA STANDARDS RELATING TO DISCOVERY AND PROCEDURE BEFORE TRIAL 66-67 (Approved Draft 1970).

136 FED. R. CRIM. P. 16(a)(1)(E) (proposed amendment). On April 22, 1993 the Supreme Court approved this proposal and transmitted it to Congress. Unless Congress disapproves, this provision will become effective on Dec. 1, 1993.

137 The amendment is based on a proposal made by Professor Eads. Linda Eads, *Adjudication by Ambush: Federal Prosecutors' Use of Nonscientific Experts in a System of Limited*

pansive discovery in civil cases, and opposed discovery in the DNA cases.

V. CONCLUSION

The "junk science" debate and the Supreme Court's decision in *Daubert* have cast a spotlight on the problems associated with the use of expert testimony and scientific evidence. Unfortunately, the criminal side of the docket has remained in the shadows. It is time to shift the spotlight.

The use of scientific evidence in criminal trials should be encouraged. It is often better than other types of evidence typically used in criminal prosecutions—for example, eyewitness testimony. The present adversary system, however, does not contain sufficient safeguards to protect against the misuse of scientific evidence. There is a critical need for a heightened standard which demands demonstration of reliability before novel scientific evidence is admitted in criminal trials. A better system for providing defense experts also must be developed. Finally, criminal discovery should be expanded; the proposed amendment to Federal Criminal Rule 16 is an important step in the right direction.

Criminal Discovery, 67 N.C. L. REV. 577, 622 (1989). The other article cited by the advisory committee was Giannelli, *supra* note 125.

The problems of discovery of scientific evidence were discussed earlier in *Symposium on Science and the Rules of Legal Procedure*, 101 F.R.D. 599 (1983), which included Paul C. Giannelli, *Observations on Discovery of Scientific Evidence*, 101 F.R.D. 622 (1983), and James E. Starrs, *Comments on Discovery and Its Application to the Lindbergh Kidnapping Case*, 101 F.R.D. 625 (1983).