

Joseph A. Keierleber,¹ M.F.A. and Thomas L. Bohan,¹ Ph.D.

Ten Years After *Daubert*: The Status of the States*

ABSTRACT: This paper examines how many of the states have changed their respective scientific-evidence admissibility standards under the influence of the United States Supreme Court's 1993 *Daubert* decision. The authors offer a definition of what constitutes a *Daubert* state, and using this definition classify the fifty states into three categories. These are: *Frye* states (15 states, 10 with codified evidence rules patterned after the Federal Rules of Evidence (FRE)); *Daubert* states (26 states, 24 with FRE-based rules), and non-*Frye*/non-*Daubert* states (9 states, 7 with FRE-based rules). The authors discuss how the reliability requirement varies among the non-*Frye* states, and examine how particular types of evidence have fared in the *Daubert* era. Finally, the authors offer some predictions for the scientific evidence trends of the states.

KEYWORDS: forensic science, scientific evidence admissibility, scientific evidence reliability, *Frye*, *Daubert*, FRE 702, state courts, jurisprudence

On June 28, 1993, the United States Supreme Court handed down the standard that was to be followed from that date forward in determining whether particular scientific testimony was to be accepted as evidence in the federal courts of the United States (1). This standard immediately became known as the *Daubert*² standard. A 1995 paper in this journal discussed that standard and its effect on the states through the end of 1994 (2). After a brief review of the history of scientific-evidence standards in federal and state jurisdictions, the present discussion will address and tabulate the current scientific evidence standards of the fifty states and the District of Columbia. While recognizing that several such tabulations, including in particular that of Lustre (3), have been published in recent years, the authors feel that insufficient attention has been paid to the non-*Frye* states' varied approaches to scientific evidence reliability. This lack of scrutiny has led to some incorrect assignments of states to the *Daubert* category and, in a few instances, to incorrect exclusion from the *Daubert* category. The first error appears to have arisen from an over-emphasis on a state's reliance on its version of FRE 702 for its scientific evidence standard. The second error may arise from attributing too much significance to the fact that a state lacks an equivalent of FRE 702.³

The authors reason that it is not the presence or absence of FRE 702 from a state's scientific-evidence standard that separates *Frye* states from *Daubert* states, but rather the way in which the states assess reliability. A state with a standard based on reliability as determined solely by the "general acceptance" measure is a *Frye* state regardless of whether it also relies on FRE 702. A state with a standard requiring reliability to be measured using a number of non-exclusive criteria that include what have come to be called the "*Daubert* factors" is a *Daubert* state even if it lacks a state

equivalent of FRE 702 and even if its high court has not explicitly adopted the *Daubert* decision.

The paper will examine how the respective standards of the non-*Frye* states deal with the reliability requirement, and will allocate those states to the *Daubert* and non-*Frye*/non-*Daubert* categories on that basis. This approach provides useful information to those whose forensic work leads them to participate as attorneys or expert witnesses in a variety of states. Although competent scientists always have the reliability of their scientific conclusions foremost in mind, it is also important that in the forensic arena they know the importance a particular court places on reliability and the means by which that court assesses reliability of scientific testimony. For example, this knowledge can be crucial when making decisions based on whether one's testimony or that of an opposing expert can reasonably be excluded from evidence through pre-trial motions.

By fortuitous circumstance, seventeen states—five in the context of their scientific-standard-setting decisions—have ruled on the admissibility of scientific testimony based on the scientifically controversial use of "voiceprints." These results will be examined to compare how the differing scientific evidence standards "work," and to determine whether there was a correlation between the respective state standards and whether voiceprint evidence was found admissible.

Finally, some predictions will be made regarding future changes in the states' standards. In major part, this will consist of considering which *Frye* states and non-*Frye*/non-*Daubert* states may be expected to move to the *Daubert* category in the foreseeable future.

History of Scientific-Evidence-Admissibility Standards

Before there was *Daubert*, there was *Frye*, the scientific-evidence standard set out in 1923 by the Court of Appeals for the District of Columbia as it affirmed the pre-trial exclusion of "lie detector" evidence by a lower court (4). Although that ruling did not constitute legal precedent in any jurisdiction outside the District of Columbia, the rule it stated eventually was adopted by most state and federal jurisdictions throughout the United States. It said that proffered scientific testimony, in order to be admissible as evidence in court,

¹ MTC Forensics, Peaks Island, ME.

² Unless otherwise stated, "*Daubert*" will refer either to the *Daubert* standard or to the decision of United States Supreme Court that first stated this standard.

³ This paper will occasionally use "FRE 702" to stand for "state rule of evidence based on FRE 702."

* This paper is based on a talk presented by Joseph Keierleber at the 56th Annual Meeting of the American Academy of Forensic Sciences, February 2004.

Received 13 June 2004; and in revised form 19 Nov. 2004 and 24 March 2005; accepted 26 March 2005; published 3 Aug. 2005.

[must be based on a theory or technique that is] sufficiently established to have gained general acceptance in the particular field in which it belongs. (5)

This is the *Frye* standard, often referred to as the “general acceptance” standard.

The United States Supreme Court’s *Daubert* decision (*Daubert v. Merrell Dow Pharmaceuticals, Inc.*) issued on June 28, 1993 (1). The underlying action, in Federal District Court for the Southern District of California, was based on a claim that the defendant’s drug Bendectin had caused birth defects in the plaintiffs’ children. After granting pre-trial motions excluding all of the plaintiffs’ expert testimony relating to causation, the trial court granted Summary Judgment to the defendant. In doing this, the court made short shrift of all of the proffered expert testimony not based on human epidemiological studies. It rejected the sole expert testimony related to human epidemiological studies with the words:

The plaintiffs claim that Dr. Gross performed a new epidemiological study on Bendectin, but this is false. He simply recalculated a previously published study and tried to show that there actually was a significant relation between Bendectin and birth defects . . . Dr. Gross’ ‘study’ was apparently never published or subjected to peer review, . . . [and] nowhere does it [the proffered testimony] state that Bendectin sales increased the relative risk of limb reduction defects to a [level of statistical significance]. Dr. Gross alleges that this ‘study’ shows ‘a statistically significant association that is highly significant,’ but his allegation and this evidence is insufficient to take this matter to a jury. (6)

In relevant part, the plaintiffs’ appeal of the Summary Judgment, first to the Court of Appeals for the Ninth Judicial Circuit and then to the United States Supreme Court, was based on their claim that the Gross testimony had been wrongly excluded based on the *Frye* standard, since that standard had been superseded in 1975 by the Federal Rules of Evidence (FRE). More particularly, they argued that since FRE 702 said nothing about “general acceptance,” it was inappropriate for the trial court to have used that criterion for admissibility of the Gross testimony. Indeed, on its surface, FRE 702, as it stood from 1975 until several years after the *Daubert* decision, was permissive rather than restrictive, looking to the qualifications of the expert witness rather than to the proffered testimony.

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.⁴ (7)

In upholding the trial court, the Ninth Circuit Court of Appeals held in effect that the failure of the proffered expert to have published his study in a peer-reviewed journal made it impossible for a court to conclude that his study had general acceptance within the scientific community (8).

The appeal to the United States Supreme Court was also framed as *Frye* versus *FRE 702*. In agreeing to hear the plaintiffs’ appeal,

⁴ Incorporating the philosophy of the *Daubert* decision, FRE 702 now states that: “If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of this case. [Emphasis added]

the United States Supreme Court accepted its first case dealing with the admissibility of scientific evidence in federal courts – approximately 150 years after scientific evidence began to play a role in the trial courts of the United States. Pressures that presumably induced the Court finally to address the topic included a conflict of law among the federal circuits and also a perceived popular outcry against “junk science” in the courtroom.

In summary, the plaintiff-petitioners argued before the United States Supreme Court that “general acceptance” was too stringent a standard and that it had been inapplicable in federal courts since the adoption in 1975 of the FRE. The Supreme Court agreed, holding that *Frye* had been superseded by FRE 702 and that federal judges could no longer require that proffered testimony be based on a theory or technique having “general acceptance” within a scientific community. However, even though it removed “general acceptance” as the exclusive admissibility measure, a measure intended to ensure a minimum reliability, the Court read FRE 702 as implying that admissible scientific evidence *be* reliable. Most importantly, having just removed an absolute and exclusive criterion by which courts had gauged reliability, the Court suggested a number of criteria that federal judges could look to in evaluating the reliability of scientific evidence. Although these criteria have been stated in varying ways during the years since *Daubert* issued, it is suggested here that, framed as questions regarding the theory or technique underlying proffered testimony, they reduce to the following:

- 1) Does it have a reasonably low error rate?
- 2) Has it been peer reviewed?
- 3) Are there standards by which it is to be applied?
- 4) Does it have general acceptance within the relevant scientific community?(9)

Stated in this form, the list may appear unusual to those accustomed to the post-*Daubert* commentary and indeed to the text of *Daubert* itself, which emphasize the “testability” of the theory or technique. For example, *Daubert* states that

a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be *whether it can be (and has been) tested*. (9) [Emphasis added.]

This testability factor has subsequently been listed standing alone as one of the *Daubert* criteria. Indeed on occasion, one can see it listed as *two* of the criteria: (a) is the theory or technique testable?; (b) has the theory or technique been tested? The fact is that knowing the answer to this question (or these questions) contributes nothing to the reliability assessment of proffered testimony. In that regard the “testable and tested” question is only a preliminary, to which an affirmative response will bring forth the more important question: “Did the testing show it [the theory or technique] to be reliable?”, the equivalent of “Does it usually give the right answer to within a reasonable margin of error?” Indeed, that follow-up question is implied as part of a subsequent criterion mentioned by the Court:

[I]n the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error . . . (9)

In summary, it contributes nothing to know simply that a theory or technique is testable or even that it has been tested or to know what its expected error rate is. The point of the *Daubert* court, in listing these questions, is that for the testimony to be admissible, it must be

based on a theory or technique having an acceptably low error rate. For further discussion of this issue, see Part IV of Reference (2). It is refreshing to see that other authors have subsequently remarked on this obvious fact.⁵

Though the *Daubert* court stated that its illustrative criteria were not to be taken as exclusive measures of reliability, that no single one of them was to be taken as essential, and that, depending on circumstances, other reliability-measuring criteria might be more appropriate, the criteria listed in the *Daubert* decision quickly became known as “the *Daubert* factors.”

With the case remanded to it, the Court of Appeals for the Ninth Circuit again reviewed the plaintiffs’ proffered testimony, this time using the new standard—that the reliability of the testimony be evaluated without relying exclusively on “general acceptance”—and again upheld the trial court’s exclusion of the evidence (10). Thus, the plaintiffs, who had presumably based their hopes on FRE 702 being found to be the sole rule governing scientific evidence admissibility, and the fact that FRE 702 called for no reliability tests, won but a Pyrrhic victory in the United States Supreme Court. Arguments continue to this day as to whether the *Daubert* standard is more stringent than *Frye*, less stringent than *Frye*, or more or less the same. The answer, based on emerging federal and state case law on the admissibility of expert testimony, continues to be “it depends.”

The Effect of *Daubert* on the State Courts

The *Daubert* decision did not and does not govern the admissibility of evidence before state courts, where the majority of civil and criminal trials take place. It also does not govern the courts of the District of Columbia⁶—birthplace of *Frye*—in spite of the District of Columbia being a federal enclave ultimately controlled by the United State Congress. Consistent with its independence, the District of Columbia remains a *Frye* jurisdiction, as was reiterated recently by the Court of Appeals for the District of Columbia in pointing out the error of those who believe that it is controlled by *Daubert* (11). Although the authors have included District of Columbia in the tables of state cases, D.C. is not counted in any of the tallies of states in the tables or in the following discussion.

During the 70 years between *Frye* and *Daubert*, state high courts increasingly adopted the “general acceptance” standard, leading to a total of thirty-one *Frye* states shortly before *Daubert* issued (2). Subsequently, the states began to abandon *Frye* for *Daubert*, many changing within the first year (2). This abandonment was undoubtedly hastened by the fact that many states had already adopted their own codified rules of evidence closely tracking the FRE. In 1994, there were thirty-seven such states, including the first nine states to adopt *Daubert* (12). By mid-2004, forty-one states had adopted FRE-based rules of evidence (13).

In 1994, in addition to the nine states that had either adopted the *Daubert* standard or had explicitly recognized it as being consistent with the state’s existing standard, there were six states where the standard was FRE 702 plus a strong reliability requirement. Although it would appear that these were *Daubert* states before *Daubert*, the definition of a *Daubert* state used here prevents them from being so designated. Nevertheless, of these six states (listed in

Table 1 with a standard “RE [Rules of Evidence] plus reliability”), three eventually recognized *Daubert* as their scientific evidence standard.⁷ Of the forty-one non-*Daubert* states remaining by the end of 1994, twenty-six followed the *Frye* standard and fifteen, including the six states just discussed, followed a standard differing from both *Frye* and *Daubert* or had no well-defined standard, all as set out in Table 1.

Table 2 gives the breakdown as of late 2004: twenty-six *Daubert* states and fifteen *Frye* states. Many of the non-*Frye*/non-*Daubert* states are denoted “RE,” which means that they rely only on their state equivalents of the original FRE 702, which, apart from requiring the expert to be qualified as such, imposes only relevance and probative requirements on scientific opinion evidence.

Although there are 26 *Daubert* states, there are significant differences among them, primarily due to how narrowly they apply the reliability requirement. Those that limit it to only the most clearly novel theories and methods are, for the vast majority of proffered scientific evidence, no different from the states that use FRE 702 standing alone in evaluating proffered opinion testimony. For example, Montana applies *Daubert* so sparingly that for most purposes it can be considered a simple FRE 702 state; only very rarely is expert testimony excluded (14).⁸

Similarly, states are counted as *Frye* states even if they apply the reliability measure only to very narrowly defined “novel” evidence. Such states, which include Minnesota, are liberal in admitting scientific evidence, since the majority of such evidence is considered to be not subject to the *Frye* test. Another fine discrimination that is not detailed in these tables concerns the *Frye* states that apply *Frye*-1, *Frye*-2, and *Frye*-3, as opposed to the majority, which stop with *Frye*-1.⁹ These differences are explored in Reference (2), along with some other subtleties.

Alabama embraces both *Frye* and *Daubert*. For all scientific evidence except for that related to DNA, Alabama is a *Frye* state. Its standard is referred to as the *Frye-Peters* standard based on the Alabama case adopting *Frye*, and the *Frye-Peters* standard is actually “*Frye*-plus.” Alabama’s *Frye*-plus standard (tantamount to the “*Frye*-3” standard defined in Reference (2)), requires scrutiny of the proffered witness’s *application* of the generally-accepted theory or technique (15), something that in most *Frye* states goes to the weight of the evidence but not to its admissibility. However, when it comes to DNA evidence, the Alabama courts have been directed by its legislature to apply the *Daubert* standard (15). One might infer that this mandate arose from a perception that Alabama courts were too hostile to the introduction of DNA identification evidence in the early days of that technique.

The next state in Table 2 designated anomalous is Georgia, which, but for one peculiarity, would be a *Daubert* state, since it looks to reliability of the proffered scientific evidence. The peculiarity is that the Georgia Supreme Court has mandated that trial courts not look to the scientific community as one of the means of assessing reliability. It characterizes the “general acceptance” criterion

⁷ Nevada and Utah could probably be characterized as *Daubert* states today but for the fact that their high courts have stated explicitly that they have not adopted *Daubert*. Both of them look closely at the reliability of proffered scientific evidence, but only when the evidence is deemed to be truly novel.

⁸ *State v. Moore* 885 P.2d 457 (Mont. Supr. Ct., 1994) provides a good indication of the limited realm for *Daubert* in Montana.

⁹ The categories *Frye*-1, *Frye*-2 and *Frye*-3 refer to the varying depths to which courts extend the general acceptance requirement for proffered scientific testimony. As detailed in Reference (2), *Frye*-1 tests the fundamental scientific principle or discovery, *Frye*-2 tests the technique making use of the fundamental scientific principle or discovery, and *Frye*-3 tests the technique’s specific application on which the expert testimony is to be based.

⁵ See: Faigman DL, Kaye DH, Saks MJ, Sanders J. Modern scientific evidence: the law and science of expert testimony, admissibility of scientific evidence: testability (falsifiability), §1-3.4.1. St. Paul: West Publishing Co., 2002.

⁶ The Superior Court and the District of Columbia Court of Appeals, which handle local cases, are outside the Federal Court hierarchy. They are not, therefore, governed by the *Daubert* decision.

TABLE 1—The State Cases Governing Scientific Evidence as of December 31, 1994.

State	FRE	Governing Case	Evidence	Result	Standard of Admission
AL		Ex Parte Perry, 586 So.2d 242 (1991)	DNA	not reviewed	Frye
AK	X	Pulakis v. State, 476 P.2d 474 (1970)	polygraph	X	Frye
AZ	X	State v. Valdez, P.2d 894 (1962)	polygraph	X	Frye
AR	X	Prater v. State, 820 S.W.2d 429 (1991)	DNA	A	RE plus reliability
CA		People v. Kelly, 549 P.2d 1240 (1976)	voiceprint	X	Frye
CO	X	People v. Anderson, 637 P.2d 354 (1981)	polygraph	X	Frye
CT		Moore v. McNamara, 513 A.2d 660 (1986)	HLA paternity testing	A	Frye
DE	X	Nelson v. State, 628 A.2d 69 (1993)	DNA	X	Daubert
DC		Frye v. United States, 293 F. 1013 (D.C. Cir. 1923)	Polygraph	X	Frye
FL	X	Stokes v. State, 548 So.2d 188 (1989)	hypnosis	X	Frye
GA		Harper v. State, 292 S.E.2d 389 (1982)	truth serum	X	Anomalous; see text
HI	X	State v. Montalbo, 828 P.2d 1274 (1992)	DNA	A	Frye
ID	X	State v. Rodgers, 812 P.2d 1208 (1991)	blood spatter analysis	A	RE
IL		People v. Baynes, 430 N.E.2d 1070 (1981)	polygraph	X	Frye
IN	X	Peterson v. State, 448 N.E.2d 673 (1983)	hypnosis	X	Frye
IA	X	Hutchinson v. Am. Family Mut. Ins. Co., 514 N.W.2d 882 (1994)	brain injury causation	A	Daubert
KS		State v. Lowry, 185 P.2d 147 (1947)	polygraph	X	Frye
KY	X	Staggs v. Commonwealth, 877 S.W.2d 604 (1993)	abused-child syndrome	X	RE
LA	X	State v. Foret, 628 So.2d 1116 (1993)	abused-child syndrome	X	Daubert
ME	X	State v. Williams, 388 A.2d 500 (1978)	voiceprint	A	RE
MD	X	Reed v. State, 391 A.2d 364 (1978)	voiceprint	X	Frye
MA		Commonwealth v. Fatalo, 191 N.E.2d 479 (1963)	polygraph	X	Frye
MI	X	People v. Young, 340 N.W.2d 805 (1983)	serological electrophoresis	X	Frye
MN	X	State v. Schwartz, 447 N.W.2d 422 (1989)	DNA	X	Frye (but limited to "novel" techniques)
MS	X	House v. State, 445 So.2d 815 (1984)	post-hypnotic testimony	X	Frye
MO		State v. Stout, 478 S.W.2d 368 (1972)	neutron-activation blood	X	Frye
MT	X	Hart-Albin Co. v. McLees Inc., 870 P.2d 51 (1994)	human factors role	A	RE but Daubert for truly "novel" techniques
NE	X	State v. Reynolds, 457 N.W.2d 405 (1990)	psychiatric evaluation	X	Frye
NV	X	Santillanes v. State, 765 P.2d 1147 (1988)	serological electrophoresis	A	RE plus reliability
NH	X	State v. Cressey, 628 A.2d 696 (1993)*	sex-abuse syndrome	X	Frye
NJ	X	State v. Kelly, 478 A.2d 364 (1984)	battered-woman syndrome	A	Frye
NM	X	State v. Alberico, 861 P.2d 192 (1993)	PTSD after rape	A	Daubert
NY		People v. Hughes, 453 N.E.2d 484 (1983)	hypnosis	X	Frye
NC	X	State v. Peoples, 319 S.E.2d 177 (1984)	hypnosis	X	Frye
ND	X	State v. Morris, 331 N.W.2d 48 (1983)	profiling**	A	RE with reliability (but Frye for "real science")
OH	X	State v. Williams, 446 N.E.2d 444 (1983)	voiceprint	A	RE
OK		Plunkett v. State, 719 P.2d 834 (1986)	serological electrophoresis	A	Frye
OR	X	State v. Brown, 687 P.2d 751 (1984)	polygraph	X	RE plus reliability
PA		Commonwealth v. Topa, 369 A.2d 1277 (1977)	voiceprint	X	Frye
RI	X	State v. Dery, 545 A.2d 1014 (1988)	polygraph	X	Ad hoc***
SC		State v. Jones, 259 S.E.2d 120 (1979)	bite mark comparison	A	Ad hoc***
SD	X	State v. Hofer, 512 N.W.2d 482 (1994)	breath test for blood alcohol	A	Daubert
TN	X	State v. Sensing, 843 S.W.2d 412 (1992)	breath test for blood alcohol	A	Frye
TX	X	Kelly v. State, 824 S.W.2d 568 (1992)	DNA	A	RE plus reliability
UT	X	Kofford v. Flora, 744 P.2d 1343 (1987)	HLA paternity testing	X	RE plus reliability
VT	X	State v. Brooks, 643 A.2d 226 (1993)	breath test for blood alcohol	not reviewed	Daubert
VA		O'Dell v. Commonwealth, 364 S.E.2d 491 (1988)	serological electrophoresis	A	Ad hoc***
WA	X	State v. Riker, 869 P.2d 43 (1974)	battered-woman syndrome	X	Frye
WV	X	Wilt v. Buracker, 443 S.E.2d 196 (1993)	dollar value of hedonic loss	X	Daubert
WI	X	State v. Walstad, 351 N.W.2d 469 (1984)	aspect of blood-alcohol test	A	RE - reliability <i>not</i> to be a factor
WY	X	Springfield v. State, 860 P.2d 435 (1993)	DNA	A	Daubert

*This case clarified NH's application of Frye.

** Used to infer criminal intent.

*** low and variable level of reliability required.

as "counting heads" of scientists. In contrast, since it stated that a large number of judges having admitted a particular type of scientific evidence is an indication that the evidence is reliable, it apparently endorses "counting heads" of judges. As recently as 2000, the Georgia Supreme Court stated that its "no counting heads" 1982 decision continues to control (16). Because of the importance of trial judges having the freedom to use the "general acceptance" *Daubert* factor, it is not possible to list Georgia as a *Daubert* state. Nevertheless, a sign that changes may be coming is the Georgia Supreme

Court's acceptance in 2003 of an appeal seeking clarification of the state's scientific-evidence rule, and, in particular, whether the rule was in accord with *Daubert* (17). In granting the writ, the Georgia court stated:

The Court is particularly concerned with the following issue or issues: What standards or factors should govern the admissibility of expert scientific evidence in Georgia? Compare Harper v. State . . . with Daubert v. Merrell Dow

TABLE 2—The State Cases Governing Scientific Evidence as of November 1, 2004.

State	FRE	Case Name	Type	Evidence	Standard
AL	R	Turner v. State, 746 So.2d. 355 (1998)	Criminal	DNA	Frye†
AK*	X	State v. Coon, 974 P.2d 386 (1999)	Criminal	voiceprint	Daubert
AZ	X	State v. Johnson, 922 P.2d 294 (1996)	Criminal	DNA	Frye
AR*	X	Farm Bureau Mut. Ins. Co. v. Foote, 14 S.W.3d 512 (2000)	Civil	canine fire-accelerant detection	Daubert
CA		People v. Bolden 58 P.3d 931(2002)	Criminal	DNA	Frye
CO*	X	People v. Shreck, 22 P.3d 68 (2001)	Criminal	DNA	Daubert
CT*		State v. Porter, 698 A.2d 739 (1997)	Criminal	polygraph	Daubert
DE	X	Eskin v. Carden, 842 A.2d 1222 (2004)	Civil	medical testimony by bio-engineer	Daubert
DC		Reed v. United States, 828 A.2d 159 (DC 2003)	Criminal	drug trafficking practices	Frye
FL	X	Butler v. State, 842 So.2d 817 (2003)	Criminal	DNA	Frye
GA		Pullin v. State, 534 S.E.2d 69 (2000)	Criminal	localization of cell phone calls	Reliability†
HI*	X	State v. Vliet, 19 P.3d 42 (2001)	Criminal	BAC formula	Daubert
ID	X	Carnell v. Barker Management, 48 P.3d 651 (2002)	Civil	fire causation	RE
IL		Donaldson v. Cent. Ill. Pub. Serv. Co., 767 N.E.2d 314 (2002)	Civil	carcinogen	Frye
IN*	X	Steward v. State, 652 N.E.2d 490 (1995)	Criminal	abused-child syndrome	Daubert
IA	X	Mercer v. Pittway Corp., 616 N.W.2d 602 (2000)	Civil	smoke alarm design	Daubert
KS		Kuhn v. Sandoz Pharm. Corp., 14 P.3d 1170 (2000)	Civil	adverse drug effects	Frye†
KY*	X	Goodyear Tire & Rubber Co. v. Thompson, 11 S.W.3d 575 (2000)	Civil	wheel design defect	Daubert
LA	X	State v. Chauvin, 846 So.2d 697 (2003)	Criminal	PTSD in sexual abuse	Daubert
ME	X	State v. Irving, 818 A.2d 204 (2003)	Criminal	accident reconstruction	RE
MD	X	Wilson v. State, 803 A.2d 1034 (2002)	Criminal	SIDS probability	Frye
MA*		Commonwealth v. Lanigan, 641 N.E.2d 1342 (1994)	Criminal	DNA	Daubert
MI	X	Craig v. Oakwood Hospital, 684 N.W.2d 296 (2004)	Civil	medical expertise	Frye
MN	X	Goeb v. Tharaldson, 615 N.W.2d 800 (2000)	Civil	pesticide toxicity	Frye
MS	X	Gleaton v. State, 716 So.2d 1083 (1998)	Criminal	polygraph	Frye
MO		Smulls v. State, 71 S.W.3d 138 (2002)	Criminal	sociology of racial bias	Frye
MT	X	State v. Ayers, 68 P.3d 768 (2003)	Criminal	DNA	RE, but Daubert for "novel" science
NE*	X	Schafersman v. Agland Coop, 631 N.W.2d 862 (2001)	Civil	toxic animal feed	Daubert
NV	X	Dow Chem. Co. v. Mahlum, 970 P.2d 98 (1998)	Civil	breast implant illness	RE, but reliability for "novel" science
NH*	X	Baker Valley Lumber Inc v. Ingersoll-Rand Co., 813 A.2d 409 (2002)	Civil	fire causation	Daubert
NJ	X	Kemp v. State, 809 A.2d 77 (2002)	Civil	vaccine illness	Frye
NM	X	State v. Torres, 976 P.2d 20 (1999)	Criminal	HGN (sobriety test)	Daubert
NY		People v. Lee, 750 N.E.2d 63, (2001)	Criminal	eyewitness reliability	Frye
NC*	X	State v. Goode, 461 S.E.2d 631(1995)	Criminal	blood stain pattern	Daubert
ND	X	Langness v. Fencil, 667 N.W.2d 596 (2003)	Civil	toxicology	RE
OH*	X	State v. Hartman, 754 N.E.2d 1150 (2001)	Criminal	digitally enhanced fingerprint	Daubert
OK*	R	Christian v. Gray, 65 P.3d 591 (2003)	Civil	chemical injury	Daubert
OR	X	State v. O'Key, 899 P.2d 663 (1995)	Criminal	HGN (sobriety test)	Daubert
PA	R	Commonwealth v. Crews, 640 A.2d 395 (1994)	Criminal	DNA	Frye
RI*	X	DiPetrillo v. Dow Chem. Co., 729 A.2d 677 (1999)	Civil	herbicide injury	Daubert
SC	R	State v. Council, 515 S.E.2d 508 (1999)	Criminal	DNA (mitochondrial)	RE plus reliability
SD	X	State v. Hofer, 512 N.W.2d 482 (1994)	Criminal	bruise interpretation	Daubert
TN*	X	McDaniel v. CSX Transp., 955 S.W.2d 257 (1997)	Civil	chemical brain damage	Daubert
TX	X	E.I. DuPont De Nemours & Co. v. Robinson, 923 S.W.2d 549 (1995)	Civil	crop damage (fungicide)	Daubert
UT	X	Franklin v. Stevenson, 987 P.2d 22 (1999)	Civil	repressed memory recovery	RE plus reliability for "novel" science
VT	X	State v. Kinney, 171 Vt. 239 (2000)	Criminal	rape trauma syndrome	Daubert
VA		John v. Im, 559 S.E.2d 694 (2002)	Civil	QEEG test (brain injury)	RE
WA	X	In Re the Detention of Bernard Thorell, 72 P.3d 708 (2003)	Civil	actuarial recidivism prediction	Frye
WV	X	State ex rel. Weirton Med. Ctr. v. Mazzone, 584 S.E.2d 606 (2003)	Civil	viral test	Daubert
WI	X	State v. St. George, 643 N.W.2d 777 (2002)	Criminal	psychiatric expertise	RE
WY	X	Alexander v. Meduna, 47 P.3d 206 (2002)	Civil	structural damage	Daubert

* States that have adopted Daubert since 1994.

† Anomalous-see text.

Pharmaceuticals . . . and *Kumho Tire Co. v. Carmichael*. The Court is particularly concerned with the following issue or issues: What standards or factors should govern the admissibility of expert scientific evidence in Georgia? [citations omitted] (17)

On the other hand, a sign that change is not going to occur soon may have been given by the rescission of that acceptance just a few months later (18).

Kansas is the next state listed as anomalous in Table 2. Although it has been a *Frye* state for more than 50 years, it uses its “pure opinion” exception to exempt a large fraction of the scientific evidence before it from being tested by the *Frye* standard (19). If a witness testifies to conclusions based on that witness’s experience and education alone, it is not necessary to show that these conclusions were based on a theory having general acceptance. This is the exception many were urging on the federal courts in the years immediately following *Daubert*, an exception that the United States Supreme Court unambiguously ruled not to exist, in *Kumho* (20).

South Carolina is very close to being a *Daubert* state. Although the Supreme Court of that state, in setting out the standard for scientific evidence, emphasized the role to be played by the Rules of Evidence (21), it subsequently listed several factors to assist trial judges to determine whether scientific evidence is reliable: “publication of (sic) peer review,” “prior application of the method to the type of evidence involved in the case,” “quality control procedures,” and “consistency of the method with recognized laws and procedures” (22). All that is missing of the *Daubert* factors in this South Carolina reliability roadmap is “general acceptance.” However, as with Georgia, without that particular factor, it is difficult to place South Carolina in the *Daubert* camp at this time.

It is interesting to note that when Alabama applies the *Daubert* standard, it is applying a less stringent reliability measure than its default *Frye-Peters* standard, but that when Montana, applies *Daubert* it is applying a *more* stringent standard than its Rules-of-Evidence default.

Maine is one of the states that has been characterized as a *Daubert* state by a number of commentators including Lustre (3) and also by many Maine trial attorneys and a few Maine trial judges, presumably because of the Maine high court’s emphasis on FRE 702 and its occasional allusion to reliability. The present authors do not consider it to be a *Daubert* state but rather one of the non-*Frye*/non-*Daubert* states that looks only to the permissive original FRE 702 to determine admissibility of scientific evidence. This conclusion is compelled by a review of the Maine Supreme Judicial Court’s manner of dealing with the reliability issue over the past many years.

In 1978, two years after the adoption of the Maine Rules of Evidence (M. R. Evid.) modeled after the FRE, the Maine Supreme Judicial Court in *State v. Williams* explicitly rejected *Frye* with the comment that requiring general acceptance

would be at odds with the fundamental philosophy of our Rules of Evidence, as revealed more particularly in Rules 402 and 702, generally favoring the admissibility of expert testimony whenever it is relevant and can be of assistance to the trier of fact . . . (23)

With these words, *Williams* anticipated part of the language of *Daubert*. However, unlike the *Daubert* court, the *Williams* court failed to go on to find a reliability requirement in FRE 702 and then to suggest how to impose that requirement. Although *Williams* does allude to judges satisfying themselves of the reliability of evidence that is based on “newly ascertained, or applied, scientific principles which have not yet achieved general acceptance. . .”, it provides no

guidance to the judges in how to gain this satisfaction (24). In the opinion of the authors, this omission, which sets Maine apart from the *Daubert* jurisdictions, is neither minor nor inadvertent. During the twenty-six years since *Williams* and the ten since *Daubert*, the Maine Supreme Judicial Court has had ample opportunity to return to the reliability assessment and to suggest guidance, but it has not done so. Indeed, it has devoted very little ink to what it means for scientific evidence to be reliable. The authoritative treatise *Maine Evidence* has stated for years that Maine courts should not look beyond M. R. Evid. 702, and in particular they should not look to *Daubert* factors in evaluating scientific evidence admissibility (25). The fact is that in the many scientific-evidence cases it has reviewed in the years since *Daubert*, the Maine Court has managed to avoid even mentioning the admissibility standard set out in *Daubert*, except for language such as the following

The parties framed their arguments on the issue of expert evidence on the basis of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). That case interpreted the federal rule on expert evidence, Fed. R. Evid. 702, and requires¹⁰ the trial court to consider whether the science can be or has been tested; whether it has been subjected to peer review and publication; whether it has a known or potential rate of error; and whether it has been generally accepted. *Daubert*, 509 U.S. at 592–95. We need not address whether to adopt the *Daubert* standards because the interpretation of M. R. Evid. 702 in *Williams* is sufficient to guide our analysis. (26)

It is clear that by “standards,” the Court is referring to the factors quoted in the passage. One should not interpret “We need not address” language as indicating that the decision as to whether to adopt *Daubert* is not before the Court at this time, holding out the possibility that on a future occasion when it *is* before the Court, the Court might adopt that standard. The Court is clearly saying that attorneys who argue their appeals in terms of the framework set out by the *Daubert* factors are wasting their time; in Maine, the traditional approach to the admission of evidence based on relevance, probative value, and lack of prejudice will govern. Although *Williams* does allude to it being a good idea for the trial judge to look into general acceptability when the proffered evidence is new, the suggestions of the Maine Court stop at that point. Thus, as in *State v. Irving*, from which the above excerpt comes, the fact that the proffered evidence may be based on an unorthodox application of a previously accepted method gets short shrift.

Maine is not alone in minimizing by omission from its high court opinions dealing with scientific evidence the importance of scientific evidence reliability; Wisconsin goes much farther. It eliminates reliability completely as a factor in deciding whether scientific testimony is admissible into evidence. Wisconsin’s standard is that

Once the relevancy of the evidence is established and the witness is qualified as an expert, the reliability of the evidence is a weight and credibility issue for the fact finder and any reliability challenges must be made through cross-examination or by other means of impeachment (27).

Comparison of State Standards on Voiceprint Evidence

The case that set the still-controlling standard for scientific evidence in Maine dealt with voiceprint analysis, an aural-visual

¹⁰ Note the mistaken characterization of *Daubert* as requiring all of the *Daubert* factors to be considered. Passage misstates the *Daubert* decision, making it appear much more rigid than it is.

method of identifying the source of a recorded voice.¹¹ Voiceprint evidence has also been examined by the high courts of sixteen other states. In four of these states, like Maine, it was examined in the course of setting the state standard (28). This happenstance provides a means of comparing how many state high courts approach a particular type of scientific evidence.

Four of the five state standard-setting voiceprint decisions were handed down during the period 1976–78, shortly before the National Research Council published its study on the efficacy of voiceprint analysis (29). The first of these was *People v. Kelly* (30), which put California firmly in the *Frye* camp, where it remains (31). The *Kelly* court, in excluding voiceprint evidence, stated that:

the *Frye* test was not designed to eliminate reliance upon scientific evidence,¹² but to retard its admissibility until the scientific community has had ample opportunity to study, evaluate and accept its reliability (32)

The high courts of Maryland and Pennsylvania followed suit, by adopting *Frye* and using it to declare voiceprint evidence inadmissible. The Maryland court stated that

... we do not believe that “voiceprint” analysis has achieved the general acceptance in the scientific community, at this time, which is required under *Frye*. . . , (33)

and the Pennsylvania court that

... the reliability of the sound spectrograph and voiceprint identification has not, as yet, been generally accepted by the scientific community concerned with acoustical science (34).

Next, the Maine Supreme Judicial Court in *Williams* rejected *Frye* and broke the pattern. With no requirement of “general acceptance,” voiceprints were found to be admissible scientific evidence. The *Williams* court declared that in Maine,

[The presiding justice is not] bound by an additional, independently controlling standard which exists over and above relevance (Rule 401 M. R. Evid.) and the capability of the expert testimony to assist the trier of fact (Rule 702 M. R. Evid.) [Emphasis in original] (35).

Alaska, the last of the five states to adopt its present admissibility standard while considering voiceprints, was the only one to do so after the National Research Council voiceprint study had issued.¹³ Until then an explicit *Frye* state, Alaska adopted *Daubert* in 1999, upholding the admission of voiceprint evidence (36).

Thus, the three high courts that embraced *Frye* in the course of evaluating voiceprint-evidence admissibility excluded the evidence and the two that rejected *Frye* while examining voiceprint evidence declared that evidence admissible. This breakdown is consistent with the decisions in the rest of the state high courts confronted with voiceprints. One could practically predict the outcome by knowing

whether the state followed *Frye* or *Daubert*.¹⁴ The authors consider this to be significant, given the status of voiceprints in the scientific community, which, to say the least, is quite low, and it has been for a long time (37). This is reflected in the FBI’s request to the National Research Council to carry out a review of voiceprint reliability, a request that resulted in the 1979 report mentioned above (29). Reportedly, the FBI does not base any courtroom testimony on voiceprint evidence, though it continues to use voiceprints in its investigations (38).

The Tables

Table 1 sets out the scientific evidence standard of the fifty states in 1994, relying primarily on the material in Ref (2), including that reference’s Table 2. In the second column an “X” indicates those states that had their own codified rules of evidence similar to the FRE as of 1994. (Note that Ref (2) incorrectly indicated that Illinois was such a state.) The third column cites the case giving the governing standard as of 1994, along with the theory or device underlying the expert testimony proffered in that case. In most instances, the case listed is the seminal case for the state’s standard.

Table 1 also states, under “Result,” the disposition of the case with respect to the proffered evidence. The entry “X” means that the evidence was excluded, either through the appellate court upholding the trial court’s exclusion or by the appellate court reversing the trial court’s admission of evidence. The entry “A” indicates that the proffered testimony was approved as evidence. With the exception of New Jersey, in which the appellate court ruled that the trial court’s exclusion of expert testimony was improper, all these cases involve the appellate court upholding the trial court’s admission of evidence.

Table 2 brings the tabulation of the states’ status up to late 2004. The asterisks mark those states that have adopted *Daubert* since 1994. For each of those states, the case cited is the one that adopted the standard. For the other states, the case selected for citation is the most recent one that clearly articulates the standard. As in Table 1, the states with codified rules of evidence similar to the FRE with respect to the admission of scientific evidence are identified. Since 1994, four more states—marked by R rather than X in column 2—have joined this group (13). The other columns in Table 2 are also similar to those of Table 1 and the same explanatory comments apply: in particular, the assignment of a state to the *Daubert* category if its standard rests on its state equivalent to FRE 702 plus a reliability requirement accompanied by guidelines that include the *Daubert* factors, even if, as in the case of Hawaii and Iowa, the state high court has stated that it is not adopting the *Daubert* standard (39,40). For three states—Alabama, Georgia, and Kansas—the standard is noted to be anomalous. The anomalies were discussed in a previous section.

Table 3 lists twenty-six *Daubert* states identified by the authors as of September 2004. There is overlap with Table 1 (for the early *Daubert* states) and Table 2 (for the rest of the *Daubert* states). The seminal case by which each state adopted *Daubert* is given in Table 3, along with the nature of the evidence before the court at the time. Note the diversity of evidence types and also the fact that in contrast with the decisions defining scientific-evidence standards in the pre-*Daubert* era, many of these decisions arose in the context

¹¹ Voiceprints are discussed in more detail in Ref (2) and Ref (28).

¹² This language almost seems to have been framed in anticipation of those who would use as an argument against the *Frye* standard the assertion that *Frye* would exclude even Galileo from testifying about the sun-centered solar system.

¹³ The NRC report took no position on the admissibility of voice identification, but it did caution that if it were to be admitted, “the inherent limitations in the method and in the performance of examiners should be explained to the fact finder.” By “inherent limitations,” the authors were referring to the technique’s probability of error. The authors further explained that “[a]ll the scientific results and forensic experiences to date, taken together, do not constitute an adequate objective basis for determining the error rates to be expected for voice identification testimony given in forensic cases generally” (29).

¹⁴ Of the eight states recognizing voiceprint evidence to be admissible as of late 2004, only two were *Frye* states: Florida (1972), and Minnesota (2000). Furthermore, it appears that the Florida high court, which adopted *Frye* in 1994, has not dealt with the voiceprint issue since 1972. See Table 2 and n. 191 of (2).

TABLE 3—*Daubert-Adopting Evidence Cases of the States.*

State	Case	Type	Evidence	Standard	Result
AK	State v. Coon, 974 P.2d 386 (1999)	Criminal	voiceprint	Daubert	A
AR	Farm Bureau Mut. Ins. Co. v. Foote, 14 S.W.3d 512 (2000)	Civil	canine detection	Daubert	X
CO	People v. Shreck, 22 P.3d 68 (2001)	Criminal	DNA	Daubert	A
CT	State v. Porter, 698 A.2d 739 (1997)	Criminal	polygraph	Daubert	not reviewed
DE	Nelson v. State, 628 A.2d 69 (1993)	Criminal	DNA	Daubert	X
HI	State v. Vliet, 19 P.3d 42 (2001)	Criminal	BAC**	Daubert	A
IN	Steward v. State, 652 N.E.2d 490 (1995)	Criminal	abused-child syndrome	Daubert	X
IA	Hutchinson v. Amer. Fam. Mut. Ins. Co., 514 N.W.2d 882 (1994)	Civil	brain injury causation	Daubert	A
KY	Goodyear Tire & Rubber Co. v. Thompson, 11 S.W.3d 575 (2000)	Civil	wheel design defect	Daubert	X
LA	State v. Foret, 628 So.2d 1116 (1993)	Criminal	abused-child syndrome	Daubert	X
MA	Commonwealth v. Lanigan, 641 N.E.2d 1342 (1994)	Criminal	DNA	Daubert	A
MT	Hart-Albin Co. v. McLees Inc., 870 P.2d 51 (1994)	Civil	human factors testimony	Daubert	A
NE	Schafersman v. Agland Coop, 631 N.W.2d 862 (2001)	Civil	toxic animal feed	Daubert	X*
NH	Baker Valley Lumber Inc. v. Ingersoll-Rand Co., 813 A.2d 409 (2002)	Civil	fire causation	Daubert	not reviewed
NM	State v. Alberico, 861 P.2d 192 (1993)	Criminal	PTSD after rape	Daubert	A
NC	State v. Goode, 461 S.E.2d 631 (1995)	Criminal	blood stain pattern	Daubert	A
OH	State v. Hartman, 754 N.E.2d 1150 (2001)	Criminal	digitally enhanced fingerprint	Daubert	A
OK	Christian v. Gray, 65 P.3d 591 (2003)	Civil	chemical exposure injury	Daubert	not reviewed
OR	State v. O'Key, 899 P.2d 663 (1995)	Criminal	HGN (driver impairment test)	Daubert	A
RI	DiPetrillo v. Dow Chem. Co., 729 A.2d 677 (1999)	Civil	herbicide injury	Daubert	not reviewed
SD	State v. Hofer, 512 N.W.2d 482 (1994)	Criminal	BAC**	Daubert	A
TN	McDaniel v. CSX Transp., 955 S.W.2d 257 (1997)	Civil	chemical brain damage	Daubert	A
TX	E.I. DuPont De Nemours & Co. v. Robinson, 923 S.W.2d 549 (1995)	Civil	crop damage (fungicide)	Daubert	X
VT	State v. Brooks, 643 A.2d 226 (1993)	Criminal	BAC**	Daubert	not reviewed
WV	Wilt v. Buracker, 443 S.E.2d 196 (1993)	Civil	hedonic damages	Daubert	X
WY	Springfield v. State, 860 P.2d 435 (1993)	Criminal	DNA	Daubert	A

* The NE court found the evidence inadmissible under Frye, while announcing that NE would use the Daubert standard for cases tried on or after October 1, 2001

** BAC refers to evidence based on a method of determining blood-alcohol concentration

of civil rather than criminal litigation. Twenty-seven of the twenty-eight state adoptions of the *Frye* standard (all pre-1993) occurred in the context of criminal cases.¹⁵ As with Table 1, the “Results” column in Table 3 indicates whether the proffered evidence was excluded (X), approved (A), or not reviewed (N) by the listed decision. For the states in which the proffered evidence was approved, only one of them, Colorado, reversed a trial court’s exclusion of evidence.

Predictions

Although the *Daubert* trend among the states will continue, the more important question is how narrowly the states will choose to require proffered scientific evidence to pass a reliability check, whether it be the “general acceptance” test of *Frye* or the multiple criteria test of *Daubert*. If reliability tests are to be applied only to testimony based on “novel” scientific theories or techniques, how will “novel” be defined? For example, in the context of motor vehicle crash analysis, a court may reason that no testimony based on Newton’s Laws will be subject to a reliability test. This would mean that no testimony about vehicle dynamics or crush would ever be subject to reliability assessment. Even to require a profferer of

testimony purported to rely on Newton’s Equations to show that it is in fact based on Newton’s Equations would defeat the purpose of narrowing the evidence to be so examined. The better rule would seem to be to look not at the ultimate basis of the testimony, but rather to examine the method or theory lying immediately behind the testimony, which would be considered novel if it had not previously been admitted into evidence. Under this rule, there would be many types of calculations that would have to pass the reliability test, both with regard to theory and with regard to the real-world measurements on which the calculations are based.

In the main body of the discussion above, a number of states were identified by name as ones that had anomalies in their scientific evidence standards that may lead them to adopt *Daubert* in the near future. These included Georgia, Nevada, South Carolina, and Utah. On the other hand Maine (having a standard based strictly on original Rule 702 standing alone) and California (having a strong *Frye* state that does not have FRE-based codified rules), are likely to continue resisting the *Daubert* trend, if recent decisions are any guide.

If one looks to lower court rulings in some of the states not placed here in either the *Frye* or *Daubert* camps, one can find language that in fact tracks *Daubert*, including the listing of *Daubert* reliability factors. This is true of Maine and of Idaho, and probably of some of the others. It is submitted that such language probably reflects a misunderstanding by lower-court judges of their respective state standards.

¹⁵ The sole exception was a 1986 civil case in Connecticut, where the evidence was a human-leukocyte-antigen test (16).

Although the *Daubert* standard is generally considered a lower barrier to admission than *Frye*, the “*Daubert* era” has seen the critical examination of types of scientific evidence that had been accepted for decades and, in some cases, centuries, without question. Part of this has come about because of the United States Supreme Court’s *Kumho* decision stating that the strictures of *Daubert* applied to *all* specialized opinion testimony, and thus in effect to all expert testimony (20). Many types of evidence that had never been exposed to a *Frye* scrutiny because they could be interpreted, or *were* interpreted, as non-scientific, are now being examined in light of the *Daubert* reliability factors, at least in those states that do not limit that scrutiny to narrow categories they deem “novel” or exclude from review testimony based on “pure opinion” under whatever name.¹⁶

The *Daubert* factor that has caused the most disruption to traditional practice, and at the same time is the most reasonable sounding if not the most benign of the factors, is the query about the underlying technique’s error rate. Nearly everyone in the forensic field is aware of several major types of traditional evidence now embattled to varying degrees because of assertions that their underlying techniques have never been tested for error rate. When the evidence in question is based on an identification technique, the error rate is a measure of “false positives” produced by the technique, a non-trivial consideration when that evidence is the sole means by which a criminal defendant can be placed at the scene of a crime. Certain types of handwriting analysis fall into this category, as does the “gold standard” of forensic evidence—the identification of the source of partial fingerprints left at a crime scene. There are many other types of traditional evidence waiting to be scrutinized and potentially excluded as a class from trials. Probably the largest of these classes involves medical opinion testimony that plays a major role in criminal and civil trials.¹⁷ It will be interesting to see what happens as testimony based on traditional, but untested, approaches or techniques is confronted with the logic of *Daubert*. Will that testimony be excluded if it cannot pass the test, or will the evidence standard itself yield? The federal courts, because of *Kumho*, are fairly well constrained in this regard. The state courts, on the other hand, may solve the problem simply by not adopting *Kumho*, an omission that will allow them to exempt as non-novel or as “pure opinion” scientific testimony based on traditional techniques vulnerable to a *Daubert* reliability challenge. The non-novel exemption would permit fingerprint and handwriting evidence to continue to be introduced without challenge and the “pure opinion” exemption would shield medical opinion testimony from challenge. Whereas there are many states, as described above, that narrowly define what is novel, only one or two provide the “pure opinion” exemption. The prediction here is that number will increase if and when *Daubert* challenges to medical opinion testimony multiply.

Conclusions

The fifty United States and the District of Columbia have been discussed and categorized with respect to their respective standards for admitting scientific opinion testimony into evidence. Although the result is an update of the 1995 paper on this subject published

in the *Journal of Forensic Sciences* (2), the present treatment emphasized the degree to which the various states required scientific evidence to be reliable *and* how they required the assessment of reliability to be made. The discussion also emphasized the degree to which states that rely entirely or nearly entirely on rules of evidence similar to the original FRE 702 lean strongly toward the admission rather than the exclusion of forensic science testimony. To most attorneys and members of the judiciary, this is probably not a surprising result, since they would recognize the original FRE 702 as primarily a testimony-*enabling* rather than a testimony-blocking rule, since it required only that scientific opinion testimony be relevant and that its probative value outweigh its prejudicial effect. On the other hand, to many scientists this result may be surprising, at least to those who do not recognize a dichotomy between “relevant” and “reliable.” It may seem impossible that evidence can be found relevant without first being found reliable. But that is the way it is. The states that lean toward admitting opinion testimony, examining it only for relevance and probative value, leave it to cross examination at trial to test the reliability of the testimony. This approach knowingly allows a jury to be exposed to opposing expert testimony on a topic, one delivered by an individual who speaks in accord with most or all of the accepted opinion within his field, and the other of whom is regarded as a crackpot by his own field. The cross examination of the crackpot is supposed to cancel out the impression that the two experts represent equally respected views—always a danger when there are only two of them and the jury is forbidden to do any of their own literature research. Testing reliability through cross examination differs dramatically from the approach where testimony must be determined to be reasonably reliable, through a pre-trial *Frye* or *Daubert* hearing, before being allowed to be given in front of a jury or other fact-finder. The dichotomy between states following the first approach and those following the second approach is lessened when the courts of the latter states deliberately narrow the areas in which the test of reliability is applied. It has been the intention of the authors to provide information and leading cases that will allow the reader to see where each of the states falls with respect to 1) emphasis on effective reliability tests and 2) the breadth of testimony to which these tests are applied.

References

1. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).
2. Bohan TL, Heels EJ. The case against *Daubert*: The new scientific evidence “standard” and the standards of the several states. *J Forensic Sci* 1995;40:1030–44.
3. Lustre AB. Post-*Daubert* standards for admissibility of scientific and other expert evidence in state courts. *Am. Law Reports* 5th 2001;90:453–518.
4. *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).
5. *Frye*, 293 F. at 1014.
6. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 727 F.Supp. 570, 575 (S.D. Cal.1989).
7. Fed R Evid 702 (1975).
8. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 951 F.2d 1128, 1131 (9th Cir. 1991).
9. *Daubert*, 509 U.S. at 594.
10. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 43 F.3d 1311 (9th Cir. 1995).
11. *Reed v. United States*, 828 A.2d 159, 164, n.3 (D.C. 2003).
12. Bohan and Heels, 1036.
13. Weinstein JB, Berger MA. State adaptations of the federal rules of evidence. In: McLaughlin JM, editor. Weinstein’s federal evidence. New York: Matthew Bender, 2004;Chap. T.
14. *State v. Ayers*, 68 P.3d 768 (Mont. 2003).
15. *Turner v. State*, 746 So.2d 355 (Ala. 1998).
16. *Pullin v. State*, 534 S.E.2d 69 (2000).

¹⁶ The mere existence of such narrow approaches to assessing scientific testimony suggests that *Kumho* has been much less influential with the states than has been *Daubert*.

¹⁷ The fact that “evidence-based medicine” is considered a novel approach to medical evaluation and testimony is enough to convince oneself of the vulnerability of traditional medical testimony to reliability checks under *Daubert* and its progeny.

17. Orkin Exterminating Co. v. Carder, 2003 Ga. LEXIS 379.
18. Orkin Exterminating Co. v. Carder, 2003 Ga. LEXIS 1052.
19. Kuhn v. Sandoz Pharm. Corp., 14 P.3d 1170 (Kan. 2000).
20. Kumho Tire v. Carmichael, 526 U.S. 137 (1999).
21. State v. Council, 515 S.E.2d 508 (S.C. 1999). 1
22. State v. Ramsey, 550 S.E.2d 294, 298–299 (S.C. 2001).
23. State v. Williams, 388 A.2d 500, 503 (Me. 1978).
24. *Williams*, 388 A.2d at 504.
25. Murray PL. *Maine evidence*. 5th ed. Charlottesville: Lexis Law Publishing, 1999;346 *et seq.*
26. State v. Irving, 818 A.2d 204, n.3 (Me. 2003).
27. State v. Peters, 192 Wis.2d 674, 690 (Ct. App. 1995), cited in Conley Pub. v. Journal Comm., 665 N.W.2d 879, 892, n.21 (Wis. 2003).
28. Bohan TL. Scientific evidence and forensic science since *Daubert*: Maine decides to sit out the dance. *Maine L Rev* 2004;56:136, n.191, n.192.
29. Committee on Evaluation of Sound Spectrograms. *On the theory and practice of voice identification*. Washington D.C.: National Academy of Sciences, 1979.
30. *People v. Kelly*, 549 P.2d 1240 (Cal. 1976).
31. *People v. Bolden*, 58 P.3d 931 (Cal. 2002).
32. *Kelly*, 549 P.2d at 1251.
33. *Reed v. State*, 391 A.2d 364 (Md. 1978).
34. *Commonwealth v. Topa*, 369 A.2d 1277 (Pa. 1977).
35. *Williams*, 388 A.2d at 504.
36. *State v. Coon*, 974 P.2d 386 (Alaska 1999).
37. Hollien H. *Forensic voice identification*. San Diego: Academic Press, 2002.
38. Hollien, p.127.
39. *State v. Vliet*, 19 P.3d 42 (Haw. 2001).
40. *Mercer v. Pittway Corp.*, 616 N.W.2d 692 (Iowa 2000).

Additional information and reprint requests:
Thomas L. Bohan, Ph.D.
MTC Forensics
54 Pleasant Avenue
Peaks Island, Maine 04108