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NEW DEVELOPMENTS IN SCIENTIFIC EVIDENCE

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Justice Breyer, in an address to the American Association for the Advancement of Science, noted the pervasive use of expert witnesses in modern litigation: "My own Court's docket is illustrative, for scientific issues permeate the law. Criminal courts consider the scientific validity of, say, DNA sampling, ... voice prints, or expert predictions of defendants' 'future dangerousness' which can lead courts or juries to authorize or withhold the death penalty." As the Justice's remarks suggest, the U.S. Supreme Court is playing a prominent role in shaping the law governing the introduction of scientific testimony.

This article discusses this development, especially in light of the Court's latest decision, *Kumho Tire Co. v. Carmichael*, 119 S.Ct. 1167 (1999), and its impact on criminal trials under Ohio Evidence Rule 702. Even before *Kumho Tire*, many courts began a reevaluation of a number of types of scientific evidence, such as hair comparisons, firearms identification, questioned document examinations, and polygraph results. In addition, a number of courts have confronted the admissibility of evidence based on social science research — e.g., repressed memories and false confessions.

THE DAUBERT STANDARD

In 1993, the U.S. Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), adopted a reliability test for determining the admissibility of scientific evidence and overruled the traditional general acceptance standard set forth in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923). The *Frye* standard had been the majority rule in both federal and state courts until *Daubert*. See Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 Colum. L. Rev. 1197 (1980).

The Supreme Court's decision rested on an interpretation of Federal Rule of Evidence 702, the principal provision governing the admissibility of expert testimony. The rule 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." The *Daubert* Court wrote: "[I]n order to qualify as 'scientific knowledge,' an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation—i.e., 'good grounds,' based on what is known. In short, the requirement that an expert's testimony pertain to 'scientific knowledge' establishes a standard of evidentiary reliability." *Id.* at 590.

Reliability Factors

In describing the trial judge's screening or "gatekeeping function," the *Daubert* Court identified a number of factors. First, in evaluating reliability, a judge 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, whether a theory or technique has been subjected to peer review and publication is "a relevant, though not dispositive, consideration in assessing ... scientific validity." *Id.* at 594. 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 a pertinent factor. Fourth, the "existence and maintenance of standards controlling the technique's operation" are other indicia 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—at least, circumstantially. These enumerated factors, however, are neither dispositive nor exhaustive. The *Daubert* Court cautioned: "Many factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test." *Id.* at 593. Indeed, the Court emphasized that the standard is "a flexible one." *Id.* at 594.

In a footnote, the Supreme Court noted that several authorities had proposed additional factors for assessing reliability. *Id.* at 595 n.12. The Court cited Judge Weinstein and Professor Berger's treatise; those authors listed the following factors: (1) the technique's general acceptance in the field, (2) the expert's qualifications and stature, (3) the use to which the new technique has been applied, (4) the potential rate of error, (5) the existence of specialized literature, (6) the novelty of the new invention, and (7) the extent to

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which the technique relies on the subjective interpretation of the expert. 3 J. Weinstein & M. Berger, Weinstein's Evidence 702[03], at 702-41 to -42 (1988). Finally, the Court cited Justice Mark McCormick's article, which had specified eleven factors. McCormick, Scientific Evidence: Defining a New Approach to Admissibility, 67 Iowa L. Rev. 879, 911-12. (1982)(including the presence of safeguards in the characteristics of the technique, analogy to other scientific techniques whose results are admissible, the nature and breadth of the inference adduced, the clarity and simplicity with which the technique can be described and its results explained, the extent to which the basic data are verifiable by the court and the jury, and the availability of other experts to test and evaluate the technique). In sum, the Court made it clear that the *Daubert* factors were never intended as an exhaustive, mechanical "checklist"—even with respect to "scientific" evidence.

OHIO RULE 702

The Ohio Supreme Court anticipated the U.S. Supreme Court's decision in *Daubert* by a decade. The Court had cited the *Frye* general acceptance test in several pre-Rules cases. E.g., *State v. Thomas*, 66 Ohio St.2d 518, 423 N.E.2d 137 (1981); *Trebotich v. Broglio*, 33 Ohio St.2d 57, 59-60, 294 N.E.2d 669 (1973); *State v. Holt*, 17 Ohio St.2d 81, 85, 246 N.E.2d 365 (1969). However, in *State v. Williams*, 4 Ohio St.3d 53, 58, 446 N.E.2d 444 (1983)(voice-prints), the Ohio Supreme Court rejected the *Frye* test, holding that the admissibility of novel scientific evidence should be governed by Rule 702 and Rule 403. According to the Court, "the Rules of Evidence establish adequate preconditions for admissibility of expert testimony, and we leave to the discretion of this state's judiciary, on a case by case basis, to decide whether the questioned testimony is relevant and will assist the trier of fact to understand the evidence or to determine a fact in issue." In *State v. Pierce*, 64 Ohio St.3d 490, 597 N.E.2d 107 (1992), the Court affirmed its prior position rejecting the *Frye* test, while upholding the admissibility of DNA evidence.

In 1994, Rule 702 was amended. Rule 702(C)(1) offers alternative ways to establish the validity of a scientific theory; the theory may either be "objectively verifiable" or "widely accepted." The "objectively verifiable" language codifies the approach adopted by the Ohio Supreme Court in *Williams* and *Pierce*, as well as the U.S. Supreme Court's approach in *Daubert*. The phrase "widely accepted" was taken from an executive order issued by President Bush. Civil Justice Reform, Exec. Order No. 12,778, 56 Fed. Reg. 55,195 (1991). Under this order, a theory is considered "widely accepted" if it is accepted by at least a substantial minority of experts in the relevant field.

The Ohio Supreme Court has since cited *Daubert* on several occasions. In *Wagner v. Roche Laboratories*, 77 Ohio St.3d 116, 124, 671 N.E.2d 252 (1996) (effects of acne drug, Accutane), the Court rejected a party's contention that *Daubert* "requires a finding that appellant did not create a jury question because the opinions elicited during testimony of appellant's experts were not scientifically valid. Our review of the record of this case in its entirety convinces us that appellant's experts' opinions were sufficiently grounded in credible reasoning and scientific methodology to validly support appellant's theory of recovery."

In *Miller v. Bike Athletic Co.*, 80 Ohio St.3d 607, 613, 687 N.E.2d 735 (1998), the Supreme Court noted that neither

general acceptance nor peer review are "prerequisites to admissibility under *Daubert*." The Court stated:

[A] trial court's role in determining whether an expert's testimony is admissible under Evid.R. 702(C) focuses on whether the opinion is based upon scientifically valid principles, not whether the expert's conclusions are correct or whether the testimony satisfies the proponent's burden of proof at trial. . . .

Furthermore, the reliability requirement of *Daubert* should not be used to exclude all evidence of questionable reliability, nor should a court exclude such evidence simply because the evidence is confusing. . . . Instead, there must be something that makes the scientific technique particularly overwhelming to laypersons for the court to exclude such evidence. . . . Thus, the "ultimate touchstone is helpfulness to the trier of fact, and with regard to reliability, helpfulness turns on whether the expert's 'technique or principle [is] sufficiently reliable so that it will aid the jury in reaching accurate results.'" *Id.* at 613-14 (citations omitted).

The Court commented again on this issue in *State v. Nemeth*, 82 Ohio St.3d 202, 211, 694 N.E.2d 1332 (1998).

In *Miller*, the court designated the following four factors to be considered in evaluating the reliability of scientific evidence: (1) whether the theory or technique has been tested, (2) whether it has been subjected to peer review, (3) whether there is a known or potential rate of error, and (4) whether the methodology has gained general acceptance.

These factors were adopted from *Daubert* . . . Both the United States Supreme Court in *Daubert* and this court in *Miller* were careful to emphasize that none of these factors is a determinative prerequisite to admissibility.

Relevant evidence based on valid principles will satisfy the threshold reliability standard for the admission of expert testimony. The credibility to be afforded these principles and the expert's conclusions remain a matter for the trier of fact. The reliability requirement in Evid.R. 702 is a threshold determination that should focus on a particular type of scientific evidence, not the truth or falsity of an alleged scientific fact or truth.

In *State v. Stowers*, 81 Ohio St.3d 260, 261, 690 N.E.2d 881 (1998), the Ohio Supreme Court noted that the requirements of Rule 702(C)(1), (2), and (3) do not apply when expert testimony "did not involve scientific or technical testing or procedures."

NON-SCIENTIFIC EXPERT TESTIMONY

In interpreting Rule 702, the Court in *Daubert* dealt only with "scientific" knowledge. The plaintiffs had expressly proffered their epidemiological testimony as scientific evidence. Rule 702, however, also refers in the alternative to "technical" and "specialized" knowledge. That alternate phrasing raised two issues: (1) whether *Daubert*'s reliability requirement extends to these other types of expert testimony, and (2) if so, whether the factors set forth in *Daubert* for assessing reliability apply in this context.

The U.S. Supreme Court in *Kumho Tire Co. v. Carmichael*, 119 S.Ct. 1167 (1999), answered both questions in the affirmative. *Kumho Tire* involved a civil case—a tire blow-out accident, in which the Court upheld the trial court's decision to exclude engineering testimony concern-

ing the cause of the blowout. However, the decision applies to criminal cases as well.

Prior to *Kumho Tire*, most courts had held that some type of reliability standard applied to "technical" evidence, but they often differed on how reliability should be determined. *Kumho Tire* resolved this split of authority, at least in federal practice. The Supreme Court announced: "[A] trial court may consider one or more of the specific factors that *Daubert* mentioned when doing so will help determine that testimony's reliability. But, as the Court stated in *Daubert*, the test of reliability is 'flexible,' and *Daubert's* list of specific factors neither necessarily nor exclusively applies to all experts or in every case." 119 S.Ct. at 1171. The Court added:

[W]e can neither rule out, nor rule in, for all cases and for all time the applicability of the factors mentioned in *Daubert*, nor can we now do so for subsets of cases categorized by category or expert or by kind of evidence. ...

Daubert itself is not to the contrary. It made clear that its list of factors was meant to be helpful, not definitive. Indeed, those factors do not all necessarily apply even in every instance in which the reliability of scientific testimony is challenged. It might not be surprising in a particular case, for example, that a claim made by a scientific witness has never been the subject of peer review, for the particular application at issue may never previously have interested any scientist. Nor, on the other hand, does the presence of *Daubert's* general acceptance factor help show that an expert's testimony is reliable where the discipline itself lacks reliability, as, for example, do theories grounded in any so-called generally accepted principles of astrology or necromancy. Id. at 1175.

Procedural Issues

The Supreme Court also addressed related procedural issues. The Court had previously ruled that a trial court's decision concerning the *Daubert* reliability requirement was subject to appellate review only for an abuse of discretion. See *General Electric Co. v. Joiner*, 522 U.S. 136, 138-39 (1997). In *Kumho Tire*, the Court ruled that appellate courts must accord trial judges discretion in other respects. There are two aspects to this ruling. First, substantively, "whether *Daubert's* specific factors are, or are not, reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine." Id. at 1176. Second, the judge enjoys discretion concerning the procedural aspects of this inquiry. The trial court is not required to hold a "*Daubert* hearing" every time expert testimony is challenged. See Berger, *Procedural Paradigms for Applying the Daubert Test*, 78 Minn. L. Rev. 1345 (1994).

Proposed Federal Rule

A proposed 1998 amendment to Rule 702 adds the following clause: "provided that (1) the testimony is sufficiently based upon reliable facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case." 181 F.R.D. 144 (1999). The advisory committee note states that the "amendment does not distinguish between scientific and other forms of expert testimony. The trial court's gatekeeping function applies to testimony by any expert." Id. at 149. This proposal with a few modifications, and an advisory committee note redrafted in light of *Kumho Tire*, was submitted to the Supreme Court by the Judicial Conference. If the Court accepts the proposal, it will become effective on December 1, 2000 — unless

Congress intervenes.

HAIR COMPARISONS

A significant post-*Daubert* attack on a well-accepted technique was launched in *Williamson v. Reynolds*, 904 F. Supp. 1529, 1552 (E.D. Okl. 1995), a federal habeas corpus case. In this case an expert testified that hair samples were "microscopically consistent." However, the "expert did not explain which of the 'approximately' 25 characteristics were consistent, any standards for determining whether the samples were consistent, how many persons could be expected to share this same combination of characteristics, or how he arrived at his conclusions." Id. at 1554. Moreover, the district court professed that it had "been unsuccessful in its attempts to locate any indication that expert hair comparison testimony meets any of the requirements of *Daubert*." Id. at 1558. The court observed: "Although the hair expert may have followed procedures accepted in the community of hair experts, the human hair comparison results in this case were, nonetheless, scientifically unreliable." Id. at 1558. Finally, the prosecutor exacerbated the problem by stating in closing argument, "[T]here's a match." Id. at 1557. Even the state court misinterpreted the evidence, writing that the "hair evidence placed [petitioner] at the decedent's apartment." Id. The district court decision was subsequently reversed on other grounds. *Williamson v. Ward*, 110 F.3d 1508, 1523 (10th Cir. 1997) (due process, not *Daubert*, standard applies in habeas proceedings). Significantly, however, the defendant was later exonerated by exculpatory DNA evidence.

Williamson is not an isolated case, as demonstrated by a 1996 Department of Justice report discussing the exoneration of 28 convicts through the use of DNA technology—some of whom had been sentenced to death. Connors et al., *Convicted by Juries, Exonerated by Science: Case Studies in the Use of DNA Evidence to Establish Innocence After Trial* 58 (1996). In several of these prosecutions, hair analysis was used to obtain the conviction. In one case, the expert testified that the crime scene hair sample "was unlikely to match anyone" other than the defendant, Edward Honaker. DNA proved otherwise. See generally 2 Giannelli & Imwinkelried, *Scientific Evidence* § 24-2 (3d ed. 1999) (hair analysis).

FIREARMS IDENTIFICATIONS

Another traditional technique now coming under fire is firearms identification ("ballistics"). Such evidence has been accepted as a matter of course by courts since the 1930s. However, in *People v. Hawkins*, 42 Cal. Rptr. 2d 636 (Cal. 1995), cert. denied, 116 S.Ct. 1685 (1996), the defendant attacked the scientific basis of firearms identification evidence. The prosecution experts "conceded that ballistics identification is not an exact science. Rather, ballistics experts develop proficiency by microscopically observing a large number of bullets known to have been fired from the same gun, and from different guns, so that they acquire knowledge of when the similarities of the bullets' striations are sufficient to establish that the bullets were discharged from the same firearm." Id. at 650.

In rebuttal in *Hawkins*, the defense introduced two articles by Alfred Biasotti that call for the reform of firearms identifications by developing a statistical data base. One expert "conceded that ballistics identification was to some extent more of a skill than a science, an intuition informed

by extensive experience.” *Id.* Although the *Hawkins* court upheld admissibility under *Frye*, this marks one of the first attacks on firearms identification evidence in half a century, and the opinion was rendered before *Kumho* was handed down. *Kumho* will likely encourage the defense to continue to the attack on firearms identification testimony. See generally 1 Giannelli & Imwinkelried, *Scientific Evidence* ch. 14 (3d ed. 1999)(firearms & toolmarks).

BITEMARK COMPARISONS

Until recently, expert testimony concerning bitemark comparisons had been routinely admitted into evidence, even to the extent of enjoying judicial notice. Nevertheless, a recent case questioned the judicial acceptance of such testimony. In *Howard v. State*, 697 So. 2d 415 (Miss. 1997), Dr. Michael West purportedly made a “positive match” between a bitemark on the victim and the defendant’s teeth. “Dr. West testified that the science of dentistry recognized that teeth are unique, and that bite marks can ‘be identified back to the perpetrator or biter.’ Dr. West also stated that bitemark evidence is similar to fingerprint identification.” *Id.* at 428. The Mississippi Supreme Court reversed, apparently unimpressed. The court noted:

While few courts have refused to allow some form of bite-mark comparison evidence, numerous scholarly authorities have criticized the reliability of this method of identifying a suspect There is little consensus in the scientific community on the number of points which must match before any positive identification can be announced. ... Suffice it to say that testimony concerning bite marks in soft, living flesh has not been scientifically accredited at this time. *Id.* at 429.

See generally 1 Giannelli & Imwinkelried, *Scientific Evidence* ch.13 (3d ed. 1999).

HANDWRITING COMPARISONS

The challenge to handwriting comparison testimony is perhaps the most prominent example of *Daubert*’s influence in criminal cases. This challenge can be traced to a seminal 1989 article written by Professors Risinger, Denbeaux and Saks, and entitled, *Exorcism of Ignorance as a Proxy for Rational Knowledge: The Lessons of Handwriting Identification “Expertise,”* 137 U. Pa. L. Rev. 731 (1989). The article directly attacked the conventional wisdom, presenting a devastating critique of handwriting analysis and arguing that the reliability of such comparisons lacks validation: “Our literature search for empirical evaluation of handwriting identification turned up one primitive and flawed validity study from nearly 50 years ago, one 1973 paper that raises the issue of consistency among examiners but that presents only uncontrolled impressionistic and anecdotal information not qualifying as data in any rigorous sense, and a summary of one study in a 1978 government report. Beyond this, nothing.” *Id.* at 738 (citations omitted). Not only was validation lacking; worse still, there were indications of a troubling error rate in handwriting analysis. According to the authors, a review of five handwriting comparison proficiency tests showed that at best “[d]ocument examiners were correct 57% of the time and incorrect 43% of the time.” *Id.* at 748.

This article had little impact until *Daubert* was decided. However, in 1995 a federal district court concluded that “the testimony at the *Daubert* hearing firmly established that forensic document examination, despite the existence of a

certification program, professional journals and other trappings of science, cannot, after *Daubert*, be regarded as ‘scientific ... knowledge.’” *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1038 (S.D.N.Y. 1995). The court further stated that “while scientific principles may relate to aspects of handwriting analysis, they have little or nothing to do with the day-to-day tasks performed by [Forensic Document Examiners] [T]his attenuated relationship does not transform the FDE into a scientist.” *Id.* at 1041. Nevertheless, the court did not exclude handwriting comparison testimony. Instead, the court pointed out that Rule 702 also permits expert testimony based on “technical” or “other specialized knowledge.” In the court’s view, while *Daubert* did not apply to nonscientific experts falling within these categories, Rule 702’s requirement that expert testimony assist the trier of fact mandated its own reliability analysis.

The court proceeded to find the testimony sufficiently reliable as technical evidence but placed conditions on its admissibility. Because FDE’s use terms such as “laboratory” and refer to authorities with titles containing the words “science” or “scientific,” there is a risk that jurors may bestow upon FDE’s the aura of the infallibility of science. Consequently, these terms should not be used in the testimony, and the jury ought to receive a cautionary instruction that the testimony is based on experience, not science. Moreover, use of a nine-level scale of probability to express an opinion regarding genuineness appeared, in the court’s view, to be misleadingly precise. “Such [overly fine] distinctions are certainly improper in forensic document examination, where it is conceded that conclusions are drawn, in large part, on subjective criteria.” *Id.* at 1048. *Starzecpyzel* sent shockwaves through the FDE field.

The issue surfaced again in the Oklahoma bombing case. In *United States v. McVeigh*, 11 BNA Criminal Practice Manual 88 (No. 5, Feb. 26, 1997), Judge Matsch expressed serious reservations about questioned document examination testimony: “I don’t think there is any such scientific knowledge. And that’s why I don’t think that ... these people can express such opinions.” Rudolf & Widenhouse, *Daubert Redux: Oklahoma City Bomb Case*, 21 Champion 24, 25-26 (May 1997). The judge added:

There are no agreed standards for the terminology. There is no confidence level that’s been agreed upon We do not have any body of scientific knowledge of which I am aware that says that there are such identifying characteristics every time a person puts pencil or pen to paper that you can say that’s who it is And they do it by experience. There is no academy of training for these people. They just say, I’ve done enough of that that now, I’m a self-declared expert at it.

See also *United States v. Rosario*, 118 F.3d 160, 168 (3d Cir. 1997)(dissent)(“Handwriting analysis is at best an inexact science, and at worst mere speculation itself. ... As such, I do not believe that wholly ambiguous testimony from a handwriting ‘expert’ ... can satisfy the government’s burden of proof.”).

This litigation has had the salutary effect of encouraging new research in this area, principally by Professor Moshe Kam of Drexel University. To date, Kam has published three studies on questioned documents. This research will become ammunition in the battle under *Kumho*. See Kam et al., *Proficiency of Professional Document Examiners in Writer Identification*, 39 J. Forensic Sci. 5, 6 (1994)(“In our tests, the professional document examiners performed sig-

nificantly better than members of the control group"); Kam et al., *Writer Identification by Professional Document Examiners*, 42 J. Forensic Sci. 778 (1997) ("The results of our test lay to rest the debate over whether or not professional document examiners possess writer-identification skills absent in the general population. They do."); Kam et al., *Effects of Monetary Incentives on Performance of Nonprofessionals in Document-Examination Proficiency Tests*, 43 J. Forensic Sci. 1000 (1998).

The Eleventh Circuit addressed the admissibility issue in *United States v. Paul*, 175 F.3d 906, 911 (11th Cir. 1999), which was decided after *Kumho* had been handed down. The court found that the prosecution expert was qualified and that his testimony assisted the trier of fact. The court concluded "that the ability of the jury to perform the same visual comparisons as the expert 'cuts against the danger of undue prejudice from the mystique attached to "experts." [The expert] specifically identified points of comparison that he recognized between the writing of the extortion note and the handwriting examples that Paul provided. The jury was free to conduct its own comparison and reach its own conclusion regarding the author of the extortion note." Moreover, the expert "acknowledged on cross-examination that no licensing board existed for questioned documents examiners, and the profession is not subject to standards that quantify or measure the work of individual examiners. Given [the expert's] admissions, the jury would not have been confused whether handwriting analysis is scientific or is unassailable."

Paul is in accord with the Sixth Circuit's earlier decision in *United States v. Jones*, 107 F.3d 1147, 1160 (6th Cir. 1997), in which that court wrote: "[The defendant] is, therefore, asking us to do what no other court that we have found has done—hold that expert handwriting analysis is inadmissible under the Federal Rules of Evidence." *Id.* at 1159. The *Jones* court upheld the admissibility of the evidence. Of particular interest is the stress *Jones* placed on the qualifications issue, specifying in great detail the expert's background. The court concluded: "To put it bluntly, the federal government pays him to analyze documents, the precise task he was called upon to do in the district court." *Id.* at 1160.

In *Paul* the Eleventh Circuit also ruled that the trial court had not abused its discretion in barring Professor Denbeaux, one of the authors of the Pennsylvania Law Review article, as a defense witness. In the court's view, "[h]is skill, experience, training and education as a lawyer did not make him any more qualified to testify as an expert on handwriting analysis than a lay person who read the same articles." In contrast, the Third Circuit reached the opposite conclusion in *United States v. Velasquez*, 64 F.3d 844, 846 (3d Cir. 1995) (finding that the trial judge "erred as a matter of law in denying the defense the opportunity to criticize the standards employed in that field of expertise." Denbeaux would have testified that "handwriting analysis is not a valid field of scientific expertise because it lacks standards to guide experts in weighing the match or non-match of particular handwriting characteristics.").

In another post-*Kumho* case, *United States v. Hines*, 55 F.Supp.2d 62 (D. Mass. 1999), the court asserted that *Kumho* "plainly invit[es] a reexamination even of 'generally accepted' venerable, technical fields." As a result, expert testimony concerning the general similarities and differences between a defendant's handwriting exemplar and a stick up note was admissible but not the specific conclusion

that the defendant was the author, because such an opinion lacked empirical validation.

Just as an article prompted the cases, in turn the cases spawned several articles. Risinger and Saks released a second article in 1996: *Science and Nonscience in the Courts: Daubert Meets Handwriting Identification Expertise*, 82 Iowa L. Rev. 21 (1996). Professor Andre Moenssens published a rebuttal article: *Handwriting Identification Evidence In the Post-Daubert World: Identifying the Genuine Article and the Genuine Legal Issue: Broader Standards Needed for "Scientific Knowledge,"* 66 U.M.K.C. L. Rev. 251 (1997). Not surprisingly, Risinger, Denbeaux, and Saks were not in full agreement with Moenssens's analysis. Indeed, they promptly rejoined with a 1998 article, disagreeing with his "bottom line" and critiquing his analysis. *Brave New "Post-Daubert World"—A Reply to Professor Moenssens*, 29 Seton Hall L. Rev. 405 (1998). This battle is ongoing. See generally 2 Giannelli & Imwinkelried, *Scientific Evidence* ch. 21 (3d ed. 1999).

POLYGRAPH EVIDENCE

The Fifth Circuit in *United States v. Posado*, 57 F.3d 428 (5th Cir. 1995), stated that "the rationale underlying this circuit's per se rule against admitting polygraph evidence did not survive *Daubert*." *Id.* at 429. The court went on to comment that "[t]here can be no doubt that tremendous advances have been made in polygraph instrumentation and technique in the years since *Frye* [1923]. . . . Current research indicates that, when given under controlled conditions, the polygraph technique accurately predicts truth or deception between seventy and ninety percent of the time." *Id.* at 434. The court, however, limited its ruling, commenting that "we do not now hold that polygraph examinations are scientifically valid or that they will always assist the trier of fact We merely remove the obstacle of the per se rule against admissibility, which was based on antiquated concepts about the technical ability of the polygraph and legal precepts that have been expressly overruled by the Supreme Court." *Id.* See also *United States v. Pettigrew*, 77 F.3d 1500, 1515 (5th Cir. 1996) (trial court did not abuse its discretion in excluding polygraph evidence).

The Ninth Circuit adopted the same position. See *United States v. Cordoba*, 104 F.3d 225, 227-28 (9th Cir. 1997) (noting that its former per se rule of exclusion is inconsistent with *Daubert*). Two other circuits had embraced this position prior to *Daubert*; the Seventh Circuit had long abandoned the per se rule. See *United States v. Pulido*, 69 F.3d 192, 205 (7th Cir. 1995) ("Our decisions acknowledge the considerable scientific and legal debate over polygraph testing and recognize that a trial court deciding whether to admit polygraph evidence 'must engage in a delicate balancing of many factors including probative value, prejudicial effect, confusion of the issues, misleading the jury, and undue delay.") (quoting *United States v. Olson*, 978 F.2d 1472, 1480 (7th Cir. 1992), cert. denied, 507 U.S. 997 (1993)). In 1989 the Eleventh Circuit followed suit. *United States v. Piccinonna*, 885 F.2d 1529 (11th Cir. 1989).

Admissibility Decisions

These decisions lead some commentators to believe that *Daubert* had changed the legal landscape. The "trend appears to be moving toward admissibility." Zehnle, *Polygraph Admissibility in the Post-Daubert Era*, ABA Criminal Justice 11, 13 (Summer 1997). In this altered climate, some district courts admitted polygraph evidence. See *United States v.*

Padilla, 908 F. Supp. 923 (S.D. Fla. 1995) (admitting polygraph evidence offered by the defense); State Farm Fire & Cas. Co., 897 F. Supp. 299 (W.D. La. 1995) (admitting polygraph evidence in a civil case).

Two cases are of particular note. In *United States v. Crumby*, 895 F. Supp. 1354 (D.C. Ariz. 1995), the court ruled the evidence admissible:

A polygrapher is an expert in determining credibility. If a party can lay the proper foundation to qualify such a witness, then the requirements of Rule 608(a) will be met. The polygrapher will not testify that he knows of the subject's reputation for honesty, but that as an expert in determining credibility, with respect to this case, the subject has demonstrated a character for truthfulness.... [Although] the polygraph evidence's primary purpose is to show credibility, ... it also is evidence that shows Defendant was willing to take a polygraph and, in fact, passed the examination. *Id.* at 1363.

United States v. Galbreth, 908 F. Supp. 877 (D.N.M. 1995), is another illustration. The court noted: "It is not entirely clear whether *Daubert* requires as a prerequisite to admissibility that the proponent establish the validity of the specific application of a scientific technique." *Id.* at 880-81. "[A]fter reviewing the case law addressing this issue in the context of other forensic laboratory techniques and after careful consideration of the testimony presented at the hearing regarding the polygraph technique, the Court holds that in the context of polygraph evidence, such scrutiny is imperative to a faithful application of *Daubert*." The court went on to rule "that in addition to establishing the scientific validity of the polygraph technique in the abstract, the proponent of the proposed testimony must also prove that the specific examination was conducted properly by a competent examiner." *Id.* at 895. "In conclusion, having determined that Dr. Raskin's testimony is based on 'scientific knowledge' that 'will assist the trier of fact' the Court finds that such testimony is sufficiently reliable and relevant to be admissible under Fed. R. Evid. 702."

Opposing Views

Other federal circuit courts took a more cautious approach. See *Conti v. Commissioner*, 39 F.3d 658, 663 (6th Cir. 1994) (noting that "unilaterally obtained polygraph evidence is almost never admissible under Evidence Rule 403"), cert. denied, 514 U.S. 1082 (1995); *United States v. Sherlin*, 67 F.3d 1208, 1216-17 (6th Cir. 1995) ("A privately commissioned polygraph test, which was unknown to the government until after its completion, is of extremely dubious probative value."); *United States v. Williams*, 95 F.3d 723, 729 (8th Cir. 1996) (defendant failed to lay a foundation for polygraph admissibility).

Indeed, the Second Circuit wrote that "the 'legal Pandora's box' which the Fifth Circuit opened in *United States v. Posado* ... is not yet agape in this Circuit." *United States v. Kwong*, 69 F.3d 663, 668-69 (2d Cir. 1995) ("The record before us simply does not provide the proper opportunity to explore the validity of polygraph evidence under Rule 702."). See also *United States v. Pitner*, 969 F. Supp. 1246 (W.D. Wash. 1997); *United States v. Castillo*, 1997 WL 83746 (E.D. Pa. 1997) (polygraph evidence not admissible under Evid. R. 608); *Meyers v. Arcudi*, 947 F. Supp. 581, 587 (D. Conn. 1996) ("[W]hile the accuracy of the CQT polygraph exam has been tested, there are serious flaws which may underestimate the error rates . . ."); *Miller v. Heaven*, 922 F. Supp. 495, 503 (D. Kan. 1996) (insufficient showing

under *Daubert* and excludable under Rule 403); *United States v. Dominguez*, 902 F. Supp. 757, 740 (E.D. Mich. 1995) (excluding evidence); *United States v. Lech*, 895 F. Supp. 582, 585 (S.D.N.Y. 1995) ("[T]he polygraph results here are properly excluded under Rule 403."); *United States v. Black*, 831 F. Supp. 120, 123 (E.D.N.Y. 1993) ("After evaluating the standard set forth in the *Daubert* case, premised on Rule 702 ..., the Court believes that nothing in *Daubert* would disturb the settled precedent that polygraph evidence is neither reliable nor admissible.").

Recently, in *United States v. Cordoba*, 194 F.3d 1053 (9th Cir. 1999), the Ninth Circuit considered Cordoba's appeal from the district court's decision after remand. See *United States v. Cordoba*, 104 F.3d 225, 227-28 (9th Cir. 1997). Instead of excluding polygraph evidence based on the per se rule of exclusion, the district court (after a two-day hearing) excluded the evidence under the *Daubert* analysis. The appellate court upheld this decision.

State Cases

In addition, the state cases have not been influenced by this development; several have reaffirmed the rule of categorical inadmissibility. E.g., *People v. Gard*, 632 N.E.2d 1026, 1032 (Ill. 1994) ("[T]he use of polygraph evidence ... is no less repugnant to and no less an affront to the integrity of the judicial process when the examination has been given to a witness ... than it is when the examination has been given to the defendant himself.").

Even while citing *Daubert*, courts have rejected polygraph evidence. E.g., *State v. Porter*, 694 A.2d 1262 (Conn. 1997) (adopting *Daubert* and excluding polygraph results under Rule 403); *State v. Beard*, 461 S.E.2d 486, 493 (W. Va. 1995) ("[W]e remain convinced that the reliability of such examinations is still suspect and not generally accepted within the relevant scientific community. Therefore, any speculation that our position in *Frazier* regarding polygraph admissibility is in question due to the *Daubert/Wilt* rulings is put to rest today."). Other courts have continued to require stipulations. E.g., *State v. Webber*, 918 P.2d 609, 619-20 (Kan. 1996) (citing "the ironclad rule that the results of such examinations are inadmissible absent a stipulation between the parties"); *State v. Cosby*, 927 P.2d 638, 642 (Utah 1996) (reaffirming the need for a stipulation).

Constitutional Issues

In *United States v. Scheffer*, 523 U.S. 303, 118 S.Ct. 1261 (1998), the U.S. Supreme Court held that the per se rule of exclusion was not unconstitutional. The Court acknowledged once more the right to present a defense, albeit a qualified right. "A defendant's right to present relevant evidence is not unlimited, but rather is subject to reasonable restrictions." 118 S.Ct. at 1264. In the Court's view, evidence "rules do not abridge an accused's right to present a defense so long as they are not 'arbitrary' or disproportionate to the purposes they are designed to serve. Moreover, we have found the exclusion of evidence to be unconstitutionally arbitrary or disproportionate only where it has infringed upon a weighty interest of the accused." *Id.*

Justice Thomas's majority opinion identified three interests that support the per se rule of exclusion: (1) ensuring that only reliable evidence is introduced at trial, (2) preserving the jury's role in determining credibility, and (3) avoiding litigation of collateral issues. As to reliability, the opinion noted that "the scientific community remains extremely polarized about the reliability of polygraph techniques." *Id.* at 1265. The opinion also observed that "[n]othing in *Daubert* fore-

closed, as a constitutional matter, per se exclusionary rules for certain types of expert or scientific evidence." *Id.* at 1266 n. 7. Justice Thomas also cited the jury's role in determining credibility: "By its very nature, polygraph evidence may diminish the jury's role in making credibility determinations." *Id.* at 1267. A third reason, in Justice Thomas's view, is the avoidance of litigation on collateral issues, which "prolongs criminal trials and threatens to distract the jury from its central function of determining guilt or innocence." *Id.*

Justice Kennedy along with three other Justices rejected the second and third interest. In his concurring opinion, Justice Kennedy pointed out that Federal Rule 704 abolishes the ultimate issue rule and thus the invading-the-province-of-the-jury argument had been rejected under most modern evidence codes. Significantly, he also wrote:

I doubt, though, that the rule of per se exclusion is wise, and some later case might present a more compelling case for introduction of the testimony than this one does. Though the considerable discretion given to the trial court in admitting and excluding scientific evidence is not a constitutional mandate, see *Daubert* ... there is some tension between that rule and our holding today. And, as Justice Stevens points out [in dissent], there is much inconsistency between the Government's extensive use of polygraph to make vital security determinations and the argument it makes here, stressing the inaccuracy of these tests. *Id.* at 1269.

Indeed, the extensive use of the polygraph by the government is well documented. For example, in 1996, the Department of Defense (DoD) conducted 12,548 polygraph examinations. Sixty-three percent (7,945) involved the DoD Counterintelligence-Scope Polygraph (CSP) Program. The other categories include 21.5% criminal investigations (2,696), 4.6% exculpatory (579), and 10.6% miscellaneous (1,328). The latter includes security investigations, counterintelligence and intelligence operations, and assistance to non-DoD federal agencies. Department of Defense, Polygraph Program, Annual Report to Congress 1 (1996). Further, the Department of Defense Polygraph Institute (DoDPI) trains 100 federal examiners a year in a masters level program, as well as allocates funds for polygraph research. The DoDPI trains all federal polygraph examiners. See also Ronald M. Furgerson, Perspectives on Polygraphs: A Guide to Survival, 21 Polygraph 164, 164 (1992) (from 1977 to 1992, 115 FBI agents have attended the DoD Polygraph Institute (or its predecessor); they have conducted over 40,000 polygraph exams).

Moreover, the polygraph is frequently used in criminal cases. For example, many jurisdictions admit polygraph evidence upon stipulation, even though the stipulation does nothing to enhance the reliability of the evidence, which is the principal reason for exclusion. Similarly, courts have admitted polygraph evidence in suppression hearings, sentencing hearings, motions for new trial proceedings, and prison disciplinary hearings. In addition, some courts have enforced plea bargains based on polygraph evidence. In some cases prosecutors have gone beyond stipulating to the admissibility of test results and have agreed to dismiss charges if the defendant passes a polygraph examination. See also *United States v. Santiago-Gonzales*, 66 F.3d 3, 6 n. 1 (1st Cir. 1995) (polygraph used to measure defendant's requirement to be truthful under a plea agreement). See generally Giannelli, Polygraph Evidence: Post-*Daubert*, 49 Hastings L.J. 895 (1998).

Another category of cases vulnerable to re-examination under *Kumho* concerns so-called "syndrome" evidence—e.g., battered woman syndrome (BWS), rape trauma syndrome (RTS), and child sexual abuse accommodation syndrome (CSAAS).

Rape Trauma Syndrome

The initial research on rape trauma syndrome was developed to aid rape victims: "[R]ape trauma syndrome was not devised to determine the 'truth' or 'accuracy' of a particular past event—i.e., whether, in fact, a rape in the legal sense occurred—but rather was developed by professional rape counselors as a therapeutic tool, to help identify, predict and treat emotional problems experienced by the counselor's clients or patients." *People v. Bledsoe*, 681 P.2d 291, 300 (Cal. 1984). In therapy, what the patient thinks happened is often more important than what actually happened.

This research may still, however, be useful at trial for non-substantive purposes. RTS evidence may be helpful on a credibility theory if the defendant suggests to the jury that the victim's conduct after the incident, such as a delay in reporting the assault, is inconsistent with the claim of rape. In this situation, "expert testimony on rape trauma syndrome may play a particularly useful role by disabusing the jury of some widely held misconceptions about rape and rape victims, so that it may evaluate the evidence free of ... popular myths." *Id.* at 298. Most courts accept this view, admitting expert testimony to account for a victim's (1) passive resistance during a rape, (2) delay in reporting the crime, (3) failure to attempt to escape, and (4) calm demeanor after an attack. RTS evidence has also been introduced to explain that "in the context of a trust relationship, such as a doctor-patient relationship, some victims may return to the trusted relationship for further contact with the perpetrator of the assault." *Commonwealth v. Mamay*, 553 N.E.2d 945, 951 (Mass. 1990).

Repressed Memories

Similarly, repressed memories and hypnotically enhanced testimony are subject to challenge. In *Borawick v. Shay*, 68 F.3d 597 (2d Cir. 1995), cert. denied, 517 U.S. 1219 (1996), a civil case, the plaintiff had no memory of child abuse for 20 years. Then after hypno-therapy, she claimed to recall that her aunt and uncle had sexually abused her when she was age 4 and 7. The Second Circuit, in a case of first impression, ruled the repressed memory evidence inadmissible. The court conceded: "We do not believe that *Daubert* is directly applicable to the issue here since *Daubert* concerns the admissibility of data derived from scientific techniques or expert opinions." *Id.* at 610. Nevertheless, "[e]ven though *Daubert* does not provide direct guidance, our decision today is informed by the principles underlying the Supreme Court's holding." *Id.*

False Confessions

Re-evaluation under *Kumho* does not, however, necessarily mean exclusion; social science research may offer valuable insights—if based on methodologically sound studies. Hence, in *United States v. Hall*, 93 F.3d 1337 (7th Cir. 1996), the Seventh Circuit ruled that the trial court erred when it excluded expert testimony on false confessions:

[The trial court] ruling overlooked the utility of valid social science. Even though the jury may have had beliefs about the subject, the question is whether those beliefs were correct. Properly conducted social science research often shows that commonly held beliefs are in

error. Dr. Ofshe's testimony, assuming its scientific validity, would have let the jury know that a phenomenon known as false confessions exists, how to recognize it, and how to decide whether it fits the facts of the case being tried. *Id.* at 1345.

Similarly, in *United States v. Shay*, 57 F.3d 126 (1st Cir. 1995), the First Circuit reversed the trial court's exclusion of psychiatric testimony that the defendant's inculpatory statements were caused by *pseudologia fantastica*, a mental disorder rendering the person a pathological liar who makes false statements without regard to their consequences.

The Tennessee Supreme Court in *State v. Shuck*, 953 S.W.2d 662 (Tenn. 1997), reached a similar result. The *Shuck* court ruled admissible a neuropsychologist's testimony concerning a defendant's acute susceptibility to inducement in support of an entrapment defense.

CONCLUSION

In *Kumho Tire* the Supreme Court once again affirmed its determination to improve the quality of expert testimony in federal trials: "The objective of [*Daubert's* gatekeeping] requirement is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." 119 S.Ct. at 1176. As forceful as these words are, the Court's actions may speak even louder: When the dust settled at the end of each case in its expert testimony trilogy—*Daubert*, *Joiner*, and *Kumho*, the Court had upheld the exclusion of the proffered expert testimony. It is true that in *Daubert*, the Court remanded. However, on remand, the court of appeals again excluded the evidence, and the Supreme Court denied certiorari. 43 F.3d 1311 (9th Cir.), cert. denied, 516 U.S. 869 (1995).