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How Long Do We Keep *Frye*?: The Future of Expert Scientific Evidence in California

Kerri N. Polizzi*

I. INTRODUCTION

The screening of expert scientific evidence at trial is anything but a new issue. However, changes in the law and science may now be calling for a new solution. The number of modern cases involving expert evidence is staggering. One study found that ninety-two percent of federal civil trials involved expert testimony with nearly eight percent of experts in those trials representing scientific fields.¹ This already striking number is exacerbated by the fact that the result of a hearing under either the *Kelly-Frye* or *Daubert* test is very often determinative of the survival and ultimate success of a case.² In addition to these factors, it has been found that in federal courts “[m]ore evidence is being challenged, more excluded, and more summary judgments are being granted post-*Daubert*. Pretrial admissibility hearings are now a common occurrence in civil cases.”³ Given the strong policy interest in deciding cases on the merits, the current state of these affairs only adds to the importance of making these determinations under the best standard available.

* J.D. candidate, Chapman University Dale E. Fowler School of Law, anticipated May 2017. I would like to thank my friends and family for their unending love and support in every challenge that I take on. Specifically, none of this would have been possible without the help of my mother, Chantel Polizzi, my father, Paul Polizzi, and my advisor, Professor Mario Mainero. These three incredible people taught me everything I know about writing, hard work, and Evidence, respectively.

¹ Carol Krafka, Meghan A. Dunn, Molly Treadway Johnson, Joe S. Cecil & Dean Miletich, *Judge and Attorney Experiences, Practices, and Concerns Regarding Expert Testimony in Federal Civil Trials*, 8 PSYCHOL. PUB. POL’Y & L. 309, 318–20 (2002).

² NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., DISCUSSIONS OF THE COMMITTEE ON DAUBERT STANDARDS: SUMMARY OF MEETINGS 1 (2006) (“In short, decisions on the admissibility of expert testimony can often determine the outcome of litigation.”).

³ Erica Beecher-Monas, *Expert Testimony in Civil Cases*, in THE FUTURE OF EVIDENCE: HOW SCIENCE & TECHNOLOGY WILL CHANGE THE PRACTICE OF LAW, 39 (Carol Henderson & Jules Epstein eds., 2011).

California courts currently apply the *Kelly-Frye* test, requiring “general acceptance” in the relevant scientific community of a novel scientific technique upon which expert evidence would be based.⁴ In applying this test, a trial judge’s role is to simply tally up the number of members of the relevant scientific community who accept the validity of a novel technique and weigh that directly against the number of members who reject it. One prominent problem with this bean-counting approach is determining whether a given scientific technique is novel, such that the test must be applied, or has been sufficiently established such that it is no longer novel. Bright lines rarely exist, and this preliminary determination is further complicated as scientific communities continue to rapidly advance. *Kelly-Frye* also presents concerns about defining the relevant scientific community to which a given technique belongs.⁵ This problem is particularly prevalent where multiple scientific communities claim a technique as their own. For example, a trial judge may first have to determine whether he should be considering members of the molecular genetics community, the forensic science community, or the statistics community when a party seeks to introduce evidence based on DNA fingerprinting techniques.

In light of these concerns, many scholars urge California courts to follow the pattern of widespread state adoption of the federal *Daubert* standard. This test requires judges to act as gatekeepers to ensure that expert evidence is not only accepted, but also substantively reliable.⁶ The *Daubert* standard does this by making the acceptance test required under *Kelly-Frye* just one of a number of flexible guidelines that the trial judge may consider when reaching his admissibility decision. In addition to this familiar prong, other non-exclusive guidelines include: (1) whether the technique can be tested; (2) whether the technique has been subjected to peer review and publication; and (3) the known or potential rate of error and the existence and maintenance of standards controlling the technique’s operation.⁷

However, this approach presents problems of its own, mostly stemming from the simple fact that judges are not scientists, nor are they jurors. Since they are not scientists, judges are not equipped with the empirical, methodological, and often particularized knowledge necessary to determine whether a given technique is substantively reliable. Furthermore, judges may be infringing upon the province of juries by making these determinations. While under any standard, a judge is required to

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

5 *See generally infra* Part II.B.

6 *Daubert v. Merrell Dow Pharm. Inc.*, 509 U.S. 579, 589 (1993).

7 *Id.* at 593–94.

determine the admissibility of evidence, it is the function of the jury to determine and weigh the credibility of witnesses, which the *Daubert* standard explicitly requires judges to do.

In light of these standards and the concerns each presents, this article considers whether California should retain the *Kelly-Frye* test for the admissibility of novel expert scientific evidence, adopt the federal *Daubert* standard, or implement a new method. While no small number of scholars have analyzed each standard, and many other articles have advanced new approaches to evaluating expert scientific evidence in this or other states, ultimately, each of these propositions fails to fully address the criticism raised, exacerbates one or more of those issues, or creates an entirely new set of concerns.

This article advocates for the use of an existing program—the American Association for the Advancement of Science’s Court-Appointed Scientific Experts (“CASE”)—in a novel and widespread way.⁸ Currently, the program experts’ participation in expert scientific evidentiary hearings serves as an optional resource available to judges at their election. This resource should instead be mandated under a new second prong of the *Kelly-Frye* test. This additional prong would require a trial judge to consult with a CASE expert before making any decision on the admissibility of expert scientific evidence. This approach in no way requires the judge to follow the advice of the CASE member, leaving the ultimate decision fully in the judge’s hands. Instead, this requirement injects the knowledge of an independently vetted, unbiased member of the scientific community at the pre-trial stage. Involving neutral experts at this stage allows the trial judge to gain a deeper understanding of both the scientific community’s acceptance or rejection of a given technique and its substantive reliability without making scientific judgments the judge is likely unqualified to make and uncomfortable with making.

Part II of this article looks into the establishment of California’s *Kelly-Frye* test through a triad of cases—*Frye v. United States*, *People v. Kelly*, and *People v. Leahy*—before delving into the most prominent criticism the *Kelly-Frye* test has since faced. This is then accompanied by an illustration of what it takes to meet the demands of the standard through the history of attempts to introduce DNA evidence and its eventual acceptance under *Kelly-Frye*.

⁸ *Court Appointed Scientific Experts (CASE)*, AM. ASS’N FOR THE ADVANCEMENT OF SCI., <http://www.aaas.org/page/court-appointed-scientific-experts-case> [http://perma.cc/RUU6-6E3E].

Part III explores the federal *Daubert* test, again taking note of the trilogy of cases comprising its background—*Daubert v. Merrell Dow Pharmaceuticals*, *General Electric Co. v. Joiner*, and *Kuhmo Tire Co. v. Carmichael*. The section then examines the major critiques of both its formulation and application that have arisen since its inception, and questions whether application in California courts would be desirable, or even viable.

Part IV considers changes that the standards themselves may have undergone over the years by scrutinizing a 2012 California Supreme Court case, *Sargon Enterprises Inc. v. Merrell Dow Pharmaceuticals*. In this case, the court called upon trial judges to engage in an inquiry that determines whether a study relied upon by an expert is valid as a matter of common sense. Prominent commentators have suggested that this case conflates the California and Federal standards, arguably reflecting the state's move toward becoming a *Daubert* jurisdiction.⁹ They note the court's use of "gatekeeper" language and argue that the opinion seems to be framed around the more complex *Daubert* standard rather than the simple *Kelly-Frye* single-prong test.¹⁰ However, this section ultimately concludes that any similarity between *Sargon* and the *Daubert* cases has been overstated, and that the *Kelly-Frye* test remains alive and well in California.

This article concludes with Part V, which begins in section A with a discussion of emerging alternatives and modifications to each of the current standards that seek to solve or mitigate their associated problems. These include the use of artificial intelligence, the move to a "substantial acceptance" test, and the adoption of a more flexible procedure, rather than the current static tests. These suggestions, taken together, make abundantly clear that the flaws in the current systems are cause for concern and, furthermore, that a solution is not likely to be found through stubborn adherence to either of these dated standards. Instead, in section B, this article ultimately advocates for the widespread incorporation of Court-Appointed Scientific Experts in all hearings regarding the admissibility of scientific expert evidence in California, and explains how this allows for the substantive reliability analysis envisioned by the *Daubert* court without requiring ill-equipped trial judges to make these determinations based on scientific knowledge they generally do not possess.

⁹ See *infra* Part IV.

¹⁰ See *id.*; *Sargon Enter., Inc. v. Univ. of S. Cal.*, 288 P.3d 1237, 1239–40, 1251 (Cal. 2012).

II. CALIFORNIA'S *KELLY-FRYE* TESTA. Three Core Cases Establishing and Strengthening the *Kelly-Frye* Test

In 1923, the Court of Appeals for the D.C. Circuit decided *Frye v. United States*, which reviewed James Alphonzo Frye's appeal of his conviction for murder in the second degree.¹¹ His single point on appeal was the lower court's denial of the admission of expert witness testimony relaying the results of a systolic blood pressure deception test, the predecessor to the modern polygraph test.¹² In affirming the judgment, the appellate court held that the evidence was properly excluded at trial because such a test was not "sufficiently established to have gained general acceptance in the particular field in which it belongs."¹³

The California Supreme Court then formally adopted the *Frye* holding in its 1976 decision, *People v. Kelly*.¹⁴ In reversing Robert Kelly's conviction for extortion, the court held that the state had not met its burden of establishing the reliability of the novel technique known as "voiceprint"¹⁵ by introducing the testimony of a single witness whose impartiality was questionable.¹⁶ The court referenced other cases considering the admissibility of voiceprint evidence and emphasized that in these cases, the trial courts were expected to undergo a "lengthy and comprehensive" preliminary hearing on the "general acceptance" issue.¹⁷

From this opinion, a set of guidelines has emerged for evaluating the general acceptance of a novel scientific technique.¹⁸ Pursuant to these guidelines, a court should: (1) consider the relevant qualifications of testifying experts, in particular whether the purported expert is himself a scientist or is instead a technician or law enforcement officer;¹⁹ (2) be careful not to overvalue the testimony of a single witness;²⁰ and (3) be careful not to overvalue the testimony of experts too close to the technique to assess it

¹¹ *Frye*, 293 F. at 1013.

¹² *Id.*

¹³ *Id.* at 1014.

¹⁴ *People v. Kelly*, 549 P.2d 1240, 1244 (Cal. 1976).

¹⁵ *Id.* at 1251.

¹⁶ *Id.* at 1248–49.

¹⁷ *Commonwealth v. Lykus*, 327 N.E.2d 671, 676 (Mass. 1975).

¹⁸ See MIGUEL A. MENDEZ, EVIDENCE: A CONCISE COMPARISON OF THE FEDERAL RULES WITH THE CALIFORNIA CODE 678–79 (2014) (summarizing guidelines and collecting cases in which they were established).

¹⁹ *Kelly*, 549 P.2d at 1250.

²⁰ *Id.* at 1248; see also *State v. Cary*, 230 A.2d 384, 389 (N.J. 1967) ("something more than the bare opinion of one man, however qualified, is required").

fairly and impartially—especially where an expert is the leading proponent of the technique.²¹

Almost twenty years later, in *People v. Leahy*, the California Supreme Court affirmed the Court of Appeal's reversal of William Leahy's conviction for driving under the influence of alcohol.²² Leahy's conviction had been based on testimony relating the results of defendant's horizontal gaze nystagmus field sobriety test.²³ In so holding, the court expressly refused to follow the new federal *Daubert* standard,²⁴ and instead reaffirmed the use of the *Kelly-Frye* test.²⁵ Notably, the court also clarified that under *Kelly*, general acceptance is defined as "a consensus drawn from a typical cross-section of the relevant, qualified scientific community."²⁶

B. Major Criticisms of *Kelly-Frye* and Its Continued Application

When properly applied, the *Kelly-Frye* test adds reliability and predictability to the admission of expert scientific evidence. However, determining the proper application of the test has become a widespread problem in and of itself. This key challenge can be broken down into the trouble presented by: (1) deciding whether the scientific technique at issue is novel and potentially misleading, and therefore subject to the test; and (2) defining the nature and breadth of the scientific community implicated by that evidence. As each of these components is crucial to the standard functioning properly, an inability to make these determinations consistently undermines the predictability that *Kelly-Frye* was designed to provide.

1. Is the Scientific Technique at Issue Novel or Established?

Because the *Kelly-Frye* test applies only to novel scientific techniques,²⁷ it is critical to distinguish "novel" from "established" techniques. This is often easier said than done. As the Illinois Supreme Court has recognized, "a 'new' or 'novel' scientific technique is not always easy to identify, especially in light of constant scientific

²¹ *Kelly*, 549 P.2d at 1249.

²² *People v. Leahy*, 882 P.2d 321 (Cal. 1994) (determining the admissibility of evidence based on this then-new field sobriety test, which purports to test a subject's intoxication based on involuntary eye movements caused by the inability of his eyes to maintain visual fixation as they are turned from side to side).

²³ *Id.*

²⁴ See generally *infra* Part III.

²⁵ *Leahy*, 882 P. 2d at 331.

²⁶ *Id.* at 337.

²⁷ See, e.g., *People v. Webb*, 862 P.2d 779, 798 (Cal. 1993); *People v. Stoll*, 783 P.2d 698, 710 (Cal. 1989); *Kelly*, 549 P.2d at 1244.

advances in our modern era.”²⁸ As scientific methodologies, studies, and communities advance at rapid paces, it becomes increasingly difficult to determine on which side of the novelty line a given technique falls, particularly for those outside of the relevant scientific communities.

This problem is in some ways alleviated by the guidance provided in additional case law following the landmark decisions discussed above. In *People v. Stoll*, the court acknowledged that the rule did not provide a clear definition of a “new scientific technique,” but identified two prominent themes that have emerged from the application of the test.²⁹ The first is that *Kelly-Frye* only applies to “that limited class of expert testimony which is based, in whole or part, on a technique, process, or theory which is *new* to science and, even more so, the law.”³⁰ The court stated that a key factor in determining a technique’s novelty for *Kelly-Frye* purposes is “repeated use, study, testing and confirmation by scientists or trained technicians.”³¹

The second theme is that the test only applies to those techniques that carry a “misleading aura of scientific infallibility” that leaves the jury effectively blindsided by the testimony.³² This potential for a misled jury, one of the primary motivations for the *Frye* court’s initial adoption of a conservative approach to admissibility, is just as strong today as it was in 1989. For example, a 2010 study found that a random sample of 1201 potential California jurors ranked “science-based” evidence an average of almost three times more reliable than police, victim, or eyewitness testimony.³³

Finally, the court in *People v. McDonald* noted, without explanation for the distinction, that *Kelly-Frye* has never been applied to expert medical testimony.³⁴ Subsequent cases have

²⁸ Donaldson v. Cent. Ill. Pub. Serv. Co., 767 N.E.2d 314, 325 (Ill. 2002).

²⁹ *Stoll*, 783 P.2d at 710.

³⁰ *Id.*

³¹ *Leahy*, 882 P.2d at 606 (Cal. 1994) (noting that this factor would be more significant in determining whether a technique was “new” than long-standing use by police officers).

³² *Stoll*, 783 P.2d at 710–11; *see also* *Huntingdon v. Crowley*, 414 P.2d 382, 390 (Cal. 1966).

³³ Deborah R. Baskin & Ira B. Sommers, *Crime-Show-Viewing Habits and Public Attitudes Toward Forensic Evidence: The “CSI Effect” Revisited*, 31 JUST. SYS. J. 97, 102–03 (2010). The study used data collected by the Field Research Corporation’s survey of California’s registered voters. The sample group was contacted by telephone and instructed to use a reverse-coded four-point scale to rank various types of evidence from four, indicating “not at all reliable,” to one, indicating “extremely reliable.” Collectively, the scientific types of evidence received an average 1.18 rating while the testimony types averaged a 3.07 rating. *Id.*

³⁴ *People v. McDonald*, 690 P.2d 709, 724 (Cal. 1984). *But see In re Lockheed Litigation Cases*, 192 P.3d 403 (Cal. 2007), in which the California Supreme Court certified the issue of the scope of a trial court’s power to evaluate medical opinion

echoed this proposition,³⁵ further narrowing the scope of techniques that must be evaluated for their novelty. These considerations ameliorate concerns about the difficulty of distinguishing novel from established scientific techniques in many cases, but the concepts themselves still must be applied in rapidly advancing areas that may not always fit nicely onto either side of this dividing line.

2. Which Scientific Field Applies?

Once it has been determined that the test should, in fact, be applied, a new obstacle arises in determining the “relevant” scientific community implicated by the purported evidence. The choice is not always self-evident, leading some trial courts to rely on “meta-experts”—groups of individuals from a variety of disciplines who, in turn, evaluate the validity of the claims made by other experts.³⁶ These groups must attempt to find some “rational, empirical standpoint” from which to judge the claims.³⁷ In this way, the court’s inability to identify which scientific community may be the most relevant to the proffered evidence can, in stark contrast to the test’s goals, serve to remove that community entirely from the validity determination.

Selection of the appropriate field may not only prove troublesome to a court, but may also be dispositive of the case, making this particular problem far more important than it is tricky.³⁸ Certain scientific communities may readily accept a new technique based not on its validity, but rather on its furtherance of the community’s overall objectives.³⁹ On the other hand, more conservative scientific communities may be biased against association with any technique seen as radical, regardless of

testimony but later withdrew its grant of certiorari, citing conflicts of interest for a majority of the justices. This decision resulted in a lack of guidance on the proper standard for admission of expert medical testimony. See CYNTHIA H. CWIK & CLIFTON T. HUTCHINSON, SCIENTIFIC EVIDENCE REVIEW: ADMISSIBILITY AND USE OF EXPERT EVIDENCE IN THE COURTROOM, MONOGRAPH NO. 8 507–08 (2008).

³⁵ See, e.g., *People v. Ward*, 83 Cal. Rptr. 2d 828, 831 (Cal. Ct. App. 1999); *People v. Mendibles*, 245 Cal. Rptr. 553, 562 (Cal. Ct. App. 1988).

³⁶ Simon A. Cole, *Out of the Daubert Fire and into the Fryeing Pan? Self-Validation, Meta-Expertise and the Admissibility of Latent Print Evidence in Frye Jurisdictions*, 9 MINN. J.L. SCI. & TECH. 453, 456–58 (2008).

³⁷ *Id.*

³⁸ See Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half Century Later*, 80 COLUM. L. REV. 1197, 1208 (1980); see also *United States v. Williams*, 583 F.2d 1194, 1198 (2d Cir. 1978) (“Selection of the ‘relevant scientific community,’ appears to influence the result.”).

³⁹ See Andre A. Moenssens, *Requiem for the “General Acceptance” Standard in Forensic Science – Some Whimsical Thoughts on the Battle of Frye v. The Federal Rules of Evidence*, in 1982 LEGAL MED. ANN. 275, 276 (C. Wecht ed., 1982).

whether it is supported by reliable underlying methodology.⁴⁰ Modern techniques can further exacerbate this problem by implicating elements of a variety of disciplines, especially where no single community “claim[s] the novel process as its own.”⁴¹

A subset of this conundrum is determining the breadth of a given community. If too broad a field is selected, many members of that wide community may not even be aware of the particular method being employed by a subset of its scientists.⁴² However, if too narrow a field is chosen, “the judgment of the scientific community becomes, in reality, the opinion of a few experts.”⁴³ The difficulty of this choice was illustrated in *People v. Quintanilla* where, after much debate, the court found that the relevant community for the DNA method upon which the prosecution’s expert sought to base his testimony, polymerase chain reaction, was not limited to forensics, but rather extended to the entire scientific community employing that method.⁴⁴

C. DNA Fingerprinting Evidence and the Extensive Process It Underwent to Rise to the Level of General Acceptance

Many of these problems can be best illustrated by a look into the process that deoxyribonucleic acid (DNA) fingerprinting⁴⁵ evidence underwent to reach the level of general acceptance required by the test. Before 1989, DNA fingerprinting went “essentially unchallenged”⁴⁶ in the United States, despite its introduction in at least eighty murder and rape trials alone.⁴⁷ During that time, one judge referred to the evidence as “the single greatest advance in the ‘search for truth’ . . . since the

⁴⁰ See *id.*

⁴¹ See Andre A. Moenssens, *Admissibility of Scientific Evidence—An Alternative to the Frye Rule*, 25 WM. & MARY L. REV. 545, 548 (1984); see also DAVID L. FAIGMAN, DAVID H. KAYE, MICHAEL J. SAKS & JOSEPH SANDERS, *SCIENCE IN THE LAW: FORENSIC SCIENCE ISSUES* § 11-2.7.4 (2002) (dedicating an entire section to determining what the relevant scientific community for a given piece of DNA evidence might be, with conclusions including: molecular genetics, biotechnology, biology, statistics, population genetics, and forensic science).

⁴² See, e.g., *People v. Williams*, 331 P.2d 251, 253–54 (Cal. App. Dep’t Super. Ct. 1958) (finding that because the “medical profession generally [was] unfamiliar with the use of Nalline” the test could not have satisfied *Frye* if the entirety of the medical profession were the relevant scientific community).

⁴³ Giannelli, *supra* note 38, at 1209–10.

⁴⁴ *People v. Quintanilla*, No. C-23691 (San Mateo County Super. Ct. Aug. 16, 1991). This community is made up of scientists in the fields of human genetics, molecular biology, biochemistry, population genetics, and demographics. *Id.*

⁴⁵ See *People v. Axell*, 1 Cal. Rptr. 2d 411, 415–18 (Cal. Ct. App. 1991) for an explanation of the science underlying DNA and the technique of DNA fingerprinting.

⁴⁶ Leonard J. Deftos, Daubert & Frye: *Compounding the Controversy Over the Forensic Use of DNA Testing*, 15 WHITTIER L. REV. 955 (1994).

⁴⁷ Jerry E. Bishop, *Reliability of DNA ‘Fingerprinting’ Challenged in New York Murder Case*, WALL ST. J., May 22, 1989, at B4.

advent of cross-examination.”⁴⁸ Later that year, however, the evidence faced its “first serious legal challenge” in a New York case, *People v. Castro*,⁴⁹ with several experts testifying for the first time in a pretrial hearing on the reliability of the test’s procedures and interpretation.⁵⁰ A statement was eventually issued by both parties who came to the out-of-court agreement that if the data were subjected to peer review, “it would not be accepted”⁵¹ and the evidence was subsequently excluded.⁵² Three years later, the court in *People v. Barney*⁵³ specifically cited a report by the National Research Council, which recommended that a pro-defendant mathematical formula be used at trial until there was an improvement of technical procedures to improve the forensic value of the method,⁵⁴ as “indicative of a lack of general acceptance for the current statistical methods of interpreting DNA data.”⁵⁵ Though fear, spurred by its potential failure to measure up to the *Kelly-Frye* general acceptance standard, triggered an increase in challenges,⁵⁶ by 1996, the admissibility of DNA fingerprinting evidence had been upheld by twenty-eight state supreme courts.⁵⁷ This shift was due in part to a subsequent finding by a National Academy of Sciences panel that the usual methodology was sound.⁵⁸ Though each new method of analyzing the data brings new *Kelly-Frye* challenges, many of the more commonly used methods have now been determined by the courts to carry general acceptance.⁵⁹

This history demonstrates how the specific scientific community, when considered and consulted in evaluating novel scientific evidence, can dramatically shift the level of acceptance. The early evaluations reflected a community eagerly embracing the technique, but this focus was tilted when the first National Research Council report cast doubt on acceptance by a wider

⁴⁸ *People v. Wesley*, 533 N.Y.S.2d 643, 644 (Albany Cnty. Ct. 1988).

⁴⁹ *People v. Castro*, 545 N.Y.S.2d 985, 986 (N.Y. Sup. Ct. 1989).

⁵⁰ *Id.*; see also Alison Priske Adema, Comment, *DNA Fingerprinting Evidence: The Road to Admissibility in California*, 26 SAN DIEGO L. REV. 377, 388–89 (1989).

⁵¹ Harold M. Schmeck, Jr., *DNA Findings Are Disputed by Scientists*, N.Y. TIMES, May 25, 1989, at B1, B12.

⁵² Deftos, *supra* note 46, at 956.

⁵³ *People v. Barney*, 10 Cal. Rptr. 2d 731, 738–39 (Cal. Ct. App. 1992).

⁵⁴ See generally NAT’L RES. COUNCIL, DNA TECHNOLOGY IN FORENSIC SCIENCE (1992).

⁵⁵ Deftos, *supra* note 46, at 964–65. But see John McCabe, *DNA Fingerprinting: The Failings of Frye*, 16 N. ILL. U. L. REV. 455, 461–62 (1996) (arguing that *Kelly-Frye* was extended to the statistical interpretation of the DNA data in this case based only on a faulty analogy and bare policy considerations).

⁵⁶ See McCabe, *supra* note 55, at 461–62. See generally DAVID H. KAYE, THE DOUBLE HELIX AND THE LAW OF EVIDENCE (2010).

⁵⁷ See McCabe, *supra* note 55, at 455 n.3 (collecting cases).

⁵⁸ See FAIGMAN ET AL., *supra* note 41, at 671; NAT’L RES. COUNCIL, THE EVALUATION OF FORENSIC DNA EVIDENCE 36 (1996).

⁵⁹ See FAIGMAN ET AL., *supra* note 41, at 669–73.

community. In this case, the issue was ultimately resolved within the institution itself, lending further support to the argument that the *Kelly-Frye* test places these decisions in the right hands by allowing scientific communities to apply their own best practices for vetting the validity of novel techniques over time.⁶⁰

III. THE FEDERAL *DAUBERT* STANDARD

A. The Three Key Cases of the “Daubert Trilogy”⁶¹

In 1993, *Daubert v. Merrell Dow Pharmaceuticals, Inc.* brought before the United States Supreme Court the issue of determining the standard for the admissibility of scientific expert evidence in federal court.⁶² The Court first noted the recent increase in criticism of the *Kelly-Frye* test based on difficulties with determining the proper scope and application of the test relative to different types of evidence and different scientific communities. It then held that it need not weigh in on that debate because the test had been superseded by the 1975 adoption of the Federal Rules of Evidence.⁶³

The Court found that the rigid general acceptance test would be at odds with the “liberal thrust” of the Federal Rules’ “general approach of relaxing the traditional barriers to ‘opinion’ testimony.”⁶⁴ The Court then interpreted Rule 702 to require that scientific expert evidence must be “not only relevant, but reliable.”⁶⁵ Ensuring that these requirements were met would require a trial judge to act as a “gatekeeper” in screening an expert’s testimony to determine the reliability of the scientific methodology and reasoning underlying his opinion.⁶⁶ In doing so, the judge must determine whether the evidence is supported by scientifically valid reasoning or methodology.⁶⁷

While this inquiry can implicate a number of factors, the opinion also sets forth “flexible,”⁶⁸ non-exclusive guidelines for trial judges to apply in assessing the validity of a scientific technique: (1) whether it can be, or has been, tested;⁶⁹ (2) whether it has been

⁶⁰ See generally *supra* Part II.B.

⁶¹ Margaret Berger, *The Supreme Court’s Trilogy on the Admissibility of Expert Testimony*, in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (2d ed. 2000).

⁶² *Daubert v. Merrell Dow Pharm. Inc.*, 509 U.S. 579, 585 (1993).

⁶³ *Id.* at 586, 589; see also BRUCE D. SALES & DANIEL W. SHUMAN, EXPERTS IN COURT: RECONCILING LAW, SCIENCE, AND PROFESSIONAL KNOWLEDGE 31 (2005) (finding it curious that the Federal Rules made no mention of *Frye*).

⁶⁴ *Id.* at 588 (quoting *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 169 (1998)).

⁶⁵ FED. R. EVID. 702; *Daubert*, 509 U.S. at 589.

⁶⁶ *Daubert*, 509 U.S. at 589 n.7.

⁶⁷ *Id.* at 591–92.

⁶⁸ *Id.* at 594.

⁶⁹ *Id.* at 593.

subjected to peer review and publication;⁷⁰ (3) the known or potential rate of error and the existence and maintenance of standards controlling the technique's operation;⁷¹ and finally, (4) whether it has attained general acceptance in the relevant scientific community.⁷² Rather than displacing the *Kelly-Frye* test entirely, the Supreme Court chose to list it as one among several factors to be considered in making the determination.⁷³ Because a trial judge is armed with several more substantive factors that may overcome a deficiency revealed at the "bean-counting" stage, this more expansive test can be more liberally applied to admit evidence that a *Kelly-Frye* court would be forced to exclude.

Just four years later, the United State Supreme Court had the occasion to clarify a number of key *Daubert* issues in *General Electric Co. v. Joiner*.⁷⁴ First, the Court held that a trial judge's decision to admit or exclude scientific evidence under the *Daubert* test is to be reviewed under the standard of abuse of discretion, such that it will not be overturned unless it is "manifestly erroneous."⁷⁵ This standard gives great deference to a trial court's admissibility decision. The Court then held that the district court judge had not abused her discretion in excluding scientific expert testimony and reiterated that the focus under *Daubert* is on methodology and techniques employed by the expert, not on the ultimate conclusion he reaches.⁷⁶ However, the Court acknowledged that "conclusions and methodology are not entirely distinct from one another," and as such, a trial judge may properly exclude the evidence where there are significant analytical gaps between an expert's methodology and his proffered opinion.⁷⁷

Most recently, *Kuhmo Tire Co. v. Carmichael* established that *Daubert's* gatekeeping obligation is not limited to scientific

⁷⁰ *Id.* (noting that while publication does not guarantee validity, it remains a relevant consideration in that by subjecting the work to scrutiny of other experts in the field it becomes more probable that problems or inconsistencies would have been discovered and subject to commentary).

⁷¹ *Id.* at 594; see KENNETH R. FOSTER & PETER W. HUBER, JUDGING SCIENCE: SCIENTIFIC KNOWLEDGE AND THE FEDERAL COURTS 69 (1997) ("Errors can affect either the reliability of a measurement . . . or its validity . . .").

⁷² *Daubert*, 509 U.S. at 594.

⁷³ DAVID H. KAYE, DAVID E. BERNSTEIN, & JENNIFER L. MNOOKIN, THE NEW WIGMORE: A TREATISE OF EVIDENCE - EXPERT EVIDENCE 327-29 (2d ed. 2011) ("General acceptance, in other words, is relevant to the admissibility of scientific evidence because it is circumstantial evidence of validity.")

⁷⁴ See generally *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997).

⁷⁵ *Id.* at 142 (quoting *Spring Co. v. Edgar*, 99 U.S. 645, 658 (1879)).

⁷⁶ *Id.* at 146; see also *Daubert*, 509 U.S. at 595 ("The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate.")

⁷⁷ *Joiner*, 522 U.S. at 146.

testimony, but rather, extends to expert testimony of any kind.⁷⁸ The Court based this finding on the language of Federal Rule of Evidence 702 that “[i]f scientific, technical, or other specialized knowledge will assist the trier of fact . . . , a witness qualified as an expert . . . may testify thereto in the form of an opinion,” noting that the statute makes no distinction between the differing categories of knowledge.⁷⁹ In addition, the Court reiterated that the guidelines established in *Daubert* are flexible aids, rather than a “definitive checklist.”⁸⁰ In any given case, the court may, but need not necessarily, give consideration to those factors that are reasonable reliability measures in the context of the issue, the particular area of expertise, and the subject matter of the expert’s testimony.⁸¹ The combination of the guidelines’ flexibility and the limited review under the abuse of discretion standard results in a trial court’s wide latitude in choosing to admit or deny scientific evidence.⁸²

B. Prominent Criticism of the *Daubert* Standard

Just as there was significant opposition to the *Kelly-Frye* formulation, the *Daubert* test has not been immune to criticism of its own. Critics have long expressed doubt about the confidence with which the court in *Daubert* stated that “federal judges possess the capacity to undertake this review,”⁸³ noting that there is little to no basis for believing judges are equipped with the scientific understanding to do so. Furthermore, many scholars argue that even if we were to assume that judges possessed the knowledge to make these decisions, by doing so they would be usurping determinations properly made by the jury.⁸⁴

1. Judges Are Not Scientists

At the time the *Daubert* decision was handed down, its earliest critique was that judges were not and are not scientists by profession and that our evidence standards should not require them to be. Writing for himself and Justice Stevens, Chief Justice Rehnquist delivered *Daubert*’s dissenting opinion cautioning the Court that it had gone too far,⁸⁵ and stated, “I do not doubt that Rule 702 confides

⁷⁸ *Kuhmo Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999). In this product liability action, the expert in question was an engineer. *Id.*

⁷⁹ *Kuhmo Tire*, 526 U.S. at 147; see FED. R. EVID. 702.

⁸⁰ *Kuhmo Tire*, 526 U.S. at 150 (quoting *Daubert*, 509 U.S. at 593).

⁸¹ *Id.* at 141.

⁸² For example, the Eleventh Circuit has applied this standard in affirming “the lower courts’ *Daubert* rulings in over 70% of published cases since the beginning of this decade.” W. RANDALL BASSETT, ET AL., *Evidence*, 67 MERCER L. REV. 907, 915 (2016).

⁸³ *Daubert*, 509 U.S. at 593.

⁸⁴ See *infra*, Part II.B.2.

⁸⁵ *Id.* at 598 (Rehnquist, C.J., concurring in part and dissenting in part).

to the judge some gatekeeping responsibility . . . but I do not think it imposes on them either the obligation or the authority to become amateur scientists.”⁸⁶ Scholars have echoed these same concerns. For example, Professor Rebecca Harris has argued that judges and scientists are “two very different creatures.”⁸⁷ As evidence of this proposition, she distinguishes between the neutrality and authority that are the hallmarks of the judicial role, and the precision and sterility that comprise the “scientific reputation.”⁸⁸ She notes that these two very different worlds are forced to collide when judges, as gatekeepers, must “determine which scientific ‘strangers’ shall be admitted into the halls of justice.”⁸⁹

Similar concerns are also raised by proponents of the *Kelly-Frye* method, who point out that “the requirement of general acceptance in the scientific community assures that *those most qualified to assess the general validity of a scientific method* will have the determinative voice.”⁹⁰ Professor David Faigman argues that judges “have little training in, knowledge of, or inclination to learn science,” but in the twenty-first century, *Daubert* has made it a job requirement that judges become amateur scientists.⁹¹ In fact, an extensive survey of studies found that “judges may be no better than laypeople in identifying flawed or questionable expert methodologies.”⁹² By requiring trial judges, generally untrained in science of any kind, to determine the reliability of the particular scientific issues before them, we are taking that determinative voice out of the hands of the far more qualified scientific community.

In addition, Professors Caudill and LaRue argue that even if judges had an understanding of the scientific methodologies on which they were ruling, this knowledge would not be enough.⁹³ Instead, a number of reversals of *Daubert* decisions on appeal reveal that judges need to know about the social, institutional, and rhetorical aspects of science as well.⁹⁴ In light of the review

⁸⁶ *Id.* at 600–01.

⁸⁷ REBECCA C. HARRIS, *BLACK ROBES, WHITE COATS: THE PUZZLE OF JUDICIAL POLICYMAKING AND SCIENTIFIC EVIDENCE* 1 (2008).

⁸⁸ *Id.*

⁸⁹ *Id.* at 7.

⁹⁰ *United States v. Addison*, 498 F.2d 741, 743–44 (D.C. Cir. 1974) (emphasis added); see also NAT’L RES. COUNCIL, *supra* note 2, at 11 (“Scientists, nevertheless, generally recognize the limits of their methods and have developed best practices for addressing them . . .”).

⁹¹ David L. Faigman, *Judges as “Amateur Scientists,”* 86 B.U. L. REV. 1207, 1207–09 (2006).

⁹² Marta M. Chlistunoff, *Expert Testimony and the Quest for Reliability: The Case for a Methodology Questionnaire*, 94 TEX. L. REV. 1055, 1061 (2016).

⁹³ See David S. Caudill & Lewis H. LaRue, *Why Judges Applying the Daubert Trilogy Need to Know About the Social, Institutional, and Rhetorical – And Not Just the Methodological – Aspects of Science*, 45 B.C. L. REV. 1, 51–52 (2003).

⁹⁴ *Id.* at 1.

of these determinations under the relatively lax abuse of discretion standard, these reversals indicate serious problems underpinning the lower courts' admissions.

Professor Sheila Jasanoff has identified six characteristics of scientific knowledge of which judges need to be aware when making admissibility determinations: (1) social construction; (2) contingency; (3) inscription; (4) deconstruction; (5) experimenters' regress; and (6) boundary work.⁹⁵ The first of these characteristics, social construction, reflects the view that facts presented by scientists are socially constructed "by human agency through the institutions and processes of science" rather than direct reflections of nature.⁹⁶ The contingency characteristic means that scientific claims are dependent upon background features through which they are produced, like the experimental conventions within the relevant scientific community.⁹⁷ Inscription is the process by which science is transformed into written texts.⁹⁸ The fourth characteristic, deconstruction, is the process by which the socially constructed scientific facts become untangled from their personal components during a controversy, particularly during adversarial litigation processes.⁹⁹ Experimenters' regress is a name given to the common pattern of deconstruction whereby claims are only tested so long as scientists remain motivated to challenge one another. Once these motivations cease, a consensus is said to form and such "black boxed" claims find themselves at the core of scientific knowledge.¹⁰⁰ Finally, boundary work is the tendency of a scientific community to resist criticism from outsiders in order to maintain the stability of its findings.¹⁰¹

Though Professor Jasanoff's additional knowledge requirements vary from those presented by Professors Caudill and LaRue, each of these scholarly writings makes clear that some deeper understanding of science on the part of the judiciary is necessary. Only with this added knowledge can a trial judge appreciate the scientific field's goals and limitations while avoiding a conflation of authority for reliability that leads to the idealization of science rather than a decision grounded in scientific reality.¹⁰²

⁹⁵ See Sheila Jasanoff, *What Judges Should Know About the Sociology of Science*, 77 JUDICATURE 77, 77–78 (1993).

⁹⁶ *Id.* at 77; see also FOSTER & HUBER, *supra* note 71, at 195.

⁹⁷ See Jasanoff, *supra* note 95, at 78.

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ *Id.*; see also Sheila Jasanoff, *Watching the Watchers: Lessons from the Science of Science Advice*, THE GUARDIAN (Apr. 8, 2013, 7:30 AM), <https://www.theguardian.com/science/political-science/2013/apr/08/lessons-science-advice> [http://perma.cc/UL6T-X6TV].

¹⁰² See Caudill & LaRue, *supra* note 93, at 5.

Perhaps most tellingly, concerns about judges' limited scientific knowledge have emerged from trial judges themselves. In *State v. Cauthron*, the court admitted that it "lack[ed] the scientific expertise to either assess or explain the methodology" on which it was asked to.¹⁰³ In *Craig v. Boren*, Justice Brennan proclaimed it "unrealistic to expect . . . members of the judiciary . . . to be well versed in the rigors of experimental or statistical technique."¹⁰⁴ In *United States v. Cline*, Senior District Judge Crow admitted "those of a 'scientific' bent certainly can take issue with whether the judges and lawyers have the education or training to engage in 'scientific' testing."¹⁰⁵ In a 2001 survey of 400 state court judges in jurisdictions applying both *Frye* and *Daubert*, about half admitted that they were not adequately prepared to evaluate the range of scientific evidence proffered in their courtrooms.¹⁰⁶ These admissions and results make abundantly clear that trial judges are anything but comfortable with the scientific role the *Daubert* rule has thrust upon them.

Further argument against this trend is found in the discussion records of the National Research Council of the National Academies' Committee on *Daubert* Standards. The Committee noted the striking cultural differences between science and the law, particularly in the system of values for which each discipline strives.¹⁰⁷ On the one hand, science values precision and accuracy, which take time, with research and testing often extending over a period of years and relying on the collaboration of many scientists and technicians to achieve these goals. In stark contrast, the law values "pragmatic justice at a particular point in time so that people can get on with their lives."¹⁰⁸ Moreover, the law attempts to resolve questions in an adversarial setting.¹⁰⁹ These differences may help explain why qualified, academic scientists are often hesitant to testify as expert witnesses,¹¹⁰ and why lawyers and judges should not be required to act as amateur scientists.

¹⁰³ *State v. Cauthron*, 846 P.2d 502, 517 (Wash. 1993).

¹⁰⁴ *Craig v. Boren*, 429 U.S. 190, 204 (1976).

¹⁰⁵ *U.S. v. Cline*, 188 F. Supp. 2d 1287, 1294 (D. Kan. 2002).

¹⁰⁶ Sophia I. Gatowski et al., *Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a Post-Daubert World*, 25 LAW & HUM. BEHAV. 433, 441-442 (2001).

¹⁰⁷ NAT'L RES. COUNCIL, *supra* note 2, at 17; *see also* SALES & SHUMAN, *supra* note 63, at 38; FOSTER & HUBER, *supra* note 71, at 17-19.

¹⁰⁸ Mark S. Frankel, *The Evolving Role of Scientific Experts in the Courts*, 1 J. OF PHIL., SCI. & L. (2001), <https://jpsl.org/archives/evolving-role-scientific-experts-courts/> [http://perma.cc/498S-9XPM].

¹⁰⁹ NAT'L RES. COUNCIL, *supra* note 2, at 17.

¹¹⁰ *Id.* at 18.

2. The Gatekeeping Role May Infringe on the Jury

Even assuming judges are qualified to make these scientific determinations, critics argue that doing so improperly infringes on the province of the jury¹¹¹ to make determinations about the credibility of witnesses.¹¹² The nation's most cited Evidence law scholar,¹¹³ Edward J. Imwinkelreid, asserts that the language in the *Daubert* opinion limiting the trial judge's inquiry to the methodology, rather than the conclusion it generates, acknowledges this concern about taking evidence from the jury.¹¹⁴ He worries that in the modern era of expanded expert testimony, "[t]he fundamental issue is the allocation of factfinding power between the trial judge and jury."¹¹⁵ Under *Daubert*, the trial judge is explicitly asked to evaluate the credibility of the experts on either side of the scientific argument, impermissibly taking this power away from the jury.

One such critic, Krista M. Pikus, vigorously argues that it should be entirely within the role of the jury to decide the reliability of expert testimony because such a determination "primarily entails questions of fact."¹¹⁶ She goes on to assert that taking these questions of fact from the jury upsets the balance of power in a world where increasingly fewer issues are left to juries.¹¹⁷ For these reasons, she supports the guidelines established by the *Daubert* Court, but believes that it is the jury, not the judge, who should be acting as the gatekeeper by applying these factors.¹¹⁸ While this approach eliminates concerns about infringing on the jury, it raises an entirely new set of concerns because, much like trial judges, jurors are not scientists. Therefore, the scientific community is still not being given a powerful voice in decisions it is most qualified to make.

¹¹¹ *See id.* at 9–10 ("Several concerns have been raised about the courts handling of scientific evidence and expertise, in particular . . . [w]hether judges, by excluding too much evidence, are intruding on the constitutional role of the jury to resolve disputed facts.").

¹¹² *See, e.g.,* *Sparf v. United States*, 156 U.S. 51, 89 (1895) (noting that questions of fact belong to the jury, while it is questions of law that a judge is to decide); *see also* *United States v. Brown*, 511 F.2d 920, 924 (2d Cir. 1975) (finding that it is the jury's role to judge the credibility of witnesses).

¹¹³ Brian Leiter, *Most Cited Law Professors by Specialty, 2000-2007*, BRIAN LEITER'S LAW SCHOOL RANKINGS (Dec. 18, 2007), http://www.leiterrankings.com/faculty/2007faculty_impact_areas.shtml#Evidence [<http://perma.cc/PHW3-9GVXI>].

¹¹⁴ *See* Edward J. Imwinkelreid, *Trial Judges – Gatekeepers or Usurpers? Can the Trial Judge Critically Assess the Admissibility of Expert Evidence Without Invading the Jury's Province to Evaluate the Credibility and Weight of the Testimony?*, 84 MARQ. L. REV. 1, 4–5 (2000).

¹¹⁵ *Id.* at 6–7.

¹¹⁶ Krista M. Pikus, Note, *We the People: Juries, Not Judges, Should Be the Gatekeepers of Expert Evidence*, 90 NOTRE DAME L. REV. 453, 455 (2014).

¹¹⁷ *Id.* at 460–61 (discussing the impact of arbitration agreements, settlements, and waiver of jury trials, and how they are further impacted by *Daubert*-style decision-making).

¹¹⁸ *See id.* at 474.

IV. BRIDGING THE GAP: *SARGON ENTERPRISES INC. V. UNIVERSITY OF SOUTHERN CALIFORNIA*

Before examining the proposed changes to the existing standards, it is useful to look into how the *Kelly-Frye* and *Daubert* standards themselves have changed over the years, and how some scholars argue they may no longer be as distinct from each other as originally thought.¹¹⁹ As discussed below, that argument is somewhat overstated.

In 2012, the California Supreme Court decided *Sargon Enterprises Inc. v. University of Southern California*,¹²⁰ a breach of contract suit brought against the university by a dental implant manufacturer. The court upheld a trial judge's exclusion after an eight-day evidentiary hearing of expert evidence regarding lost profits as improperly supported.¹²¹ The rejected testimony rested on a "market share" approach,¹²² under which the expert declared the small company would have become "extraordinarily successful" had the university completed the five-year clinical study for which it had contracted.¹²³ Under this approach, to calculate Sargon's lost profits, the expert relied not on any of the company's previously realized profits, but on the market's "Big Six" leaders' profits.¹²⁴ Notably, the court held that the trial court had not erred in excluding the testimony because the "trial court has the duty to act as a 'gatekeeper' to exclude speculative expert testimony."¹²⁵

David L. Faigman and Edward J. Imwinkelreid, the authors on whose previous article the *Sargon* opinion repeatedly relied,¹²⁶ proclaim this case to be "arguably the most important expert testimony decision that [the California Supreme Court] has rendered in at least two decades."¹²⁷ The pair goes on to argue that while the decision marks California's move closer to the

¹¹⁹ See, e.g., David E. Bernstein, Frye, Frye, *Again: The Past, Present, and Future of the General Acceptance Test*, 41 JURIMETRICS J. 385, 388–89 (2001) (arguing that "case law under *Frye* is slowly converging with *Daubert* jurisprudence").

¹²⁰ *Sargon Enter, Inc. v. Univ. of S. Cal.*, 288 P.3d 1237 (Cal. 2012).

¹²¹ *Id.* at 1239–40.

¹²² The expert testified that he selected this approach because "the methodology had been used in complicated patent cases, antitrust cases, and unfair competition cases." *Id.* at 1241.

¹²³ *Id.* at 1239.

¹²⁴ *Id.* at 1243. The expert certified public accountant, James Skorheim, testified that Sargon's lost profits "ranged from \$220 million to \$1.18 billion" based almost entirely on his opinion that the innovative product would have allowed the company to quickly command a significant market share. *Id.*

¹²⁵ *Id.* at 1239.

¹²⁶ See *Sargon*, 288 P.3d at 1251–52.

¹²⁷ David L. Faigman & Edward J. Imwinkelreid, *Wading Into the Daubert Tide: Sargon Enterprises, Inc. v. University of Southern California*, 64 HASTINGS L.J. 1665, 1665 (2013).

Daubert standard, the extent of that move is not yet clear.¹²⁸ The authors note that the *Sargon* opinion is framed around *Daubert*¹²⁹ and yet also “formally reiterated California’s commitment to *Frye*.”¹³⁰ The authors venture that because the two tests are not mutually exclusive, in fact noting that general acceptance remains one factor to be considered under *Daubert*, “the two tests may exist side by side in California courts.”¹³¹

Finally, Faigman and Imwinkelreid conclude that although the case marks a “major stride” toward *Daubert*’s test, there are still “significant differences” between applications of the two tests, even after this case.¹³² While the court in *Sargon* paid homage to *Daubert*, it did not go as far as expressly adopting the procedures or factors established by the federal test.¹³³ The *Sargon* opinion requires only that a trial judge engage in an inquiry that determines whether, “as a matter of logic,” the expert’s cited studies support a finding that the underlying theory or technique is valid.¹³⁴ This remains a far cry from *Daubert*’s requirement that the judge weigh the testimony offered by both sides, taking into consideration, if the judge wishes, the credibility of the witnesses, and make a reliability determination by a preponderance of the evidence.¹³⁵

All of this makes clear that despite what some commentators believe, California remains just as much a *Kelly-Frye* jurisdiction as it was before the *Sargon* opinion was announced. While the *Sargon* court did employ *Daubert*’s “gatekeeper” language, it did so only in regard to excluding “unduly speculative” evidence, making no mention of an entire inquiry into the evidence’s reliability.¹³⁶ Rather than reflecting a jump toward *Daubert*-style gatekeeping, the opinion merely reflects that such speculative evidence is not the type reasonably relied upon by experts in the relevant scientific community.¹³⁷ If there remained any doubt as to the true alignment of the court’s test, a critical footnote in

¹²⁸ *Id.*

¹²⁹ In addition to the “gatekeeper” language, the opinion cites with approval all three cases that make up the *Daubert* trilogy. *See, e.g., Sargon*, 283 P.3d at 722.

¹³⁰ Faigman & Imwinkelreid, *supra* note 127, at 1669–70.

¹³¹ *Id.* at 1689–90.

¹³² *Id.* at 1670.

¹³³ *Id.* at 1690.

¹³⁴ *Sargon*, 288 P.3d at 1252 (quoting Edward J. Imwinkelreid & David L. Faigman, *Evidence Code Section 802: The Neglected Key to Rationalizing the Law of Expert Testimony*, 42 LOY. L.A. L. REV. 427, 449 (2009)).

¹³⁵ Faigman & Imwinkelreid, *supra* note 127, at 1691.

¹³⁶ *Sargon*, 288 P.3d at 1240. In particular, the court noted “[u]nder Evidence Code section 801, the trial court acts as a gatekeeper to exclude *speculative or irrelevant* expert opinion.” *Id.* at 1251 (emphasis added).

¹³⁷ CAL. EVID. CODE § 801(b).

Sargon concludes “nothing we say in this case affects our holding in *Leahy* regarding new scientific techniques.”¹³⁸ The *Sargon* opinion may don *Daubert*’s terminology in announcing a gatekeeping role for California trial judges, but the test itself has not been given such a cloak and *Kelly-Frye* remains just as much the standard in California as it was before this case.

V. EMERGING METHODS

Given the problems created by each of the tests, it is hardly difficult to argue that it is time for a change. In fact, several scholars have suggested new methods, ranging from acknowledging the acceptance of a recognized minority of the scientific community to the introduction of “expert robots.”

A. Innovative Proposals Advanced by Scholars

Arguing that the general acceptance standard under *Kelly-Frye* excludes too much valid evidence, scholars and courts alike have argued there is no need for universal or even majority acceptance and instead set forth a substantial, rather than general, acceptance standard.¹³⁹ Leading Evidence professor Michael H. Graham explains: “The difference between the ‘general acceptance test’ and the ‘substantial acceptance test’ is that while general acceptance implies acceptance by a majority if not a significant majority of those experts in the particular field, the substantial acceptance clearly permits admissibility when acceptance is by a recognized minority segment.”¹⁴⁰

Similarly, the court in *United States v. Torniero* recognized that unanimity is rare and instead required only that the lower court “make a discretionary determination that the hypotheses relied upon have substantial acceptance in the discipline”¹⁴¹ The court first made this explanation in light of the admissibility of mental health diagnoses which are not covered by the *Kelly-Frye* standard, but the language it employed has also been applied in the context of novel scientific evidence. In *State v. Hennem*, the court echoed *Torniero* in finding that battered woman syndrome had “gained a *substantial enough* scientific acceptance to warrant admissibility.”¹⁴²

¹³⁸ *Sargon*, 288 P.3d at 1252 n.6.

¹³⁹ See, e.g., *United States v. Torniero*, 735 F.2d 725, 731 (2d Cir. 1984); *United States v. Gould*, 735 F.2d 725, 727 n.6 (4th Cir. 1984); Lisa Gonzalez, *The Admissibility of Scientific Evidence: The History and Demise of Frye v. United States*, 48 U. MIAMI L. REV. 371, 382–84 (1993); CHARLES T. MCCORMICK, MCCORMICK ON EVIDENCE § 203, at 873 (John W. Strong ed., 4th ed. 1992).

¹⁴⁰ MICHAEL H. GRAHAM, MODERN STATE AND FEDERAL EVIDENCE: A COMPREHENSIVE REFERENCE TEXT 329 (1989).

¹⁴¹ *Torniero*, 735 F.2d at 731.

¹⁴² *State v. Hennem*, 441 N.W.2d 793, 798–99 (Minn. 1989) (emphasis added).

Courts have avoided explicitly stating that the same evidence would not have met the general acceptance standard. They have instead determined that they need not decide the issue because the evidence can be properly admitted under a substantial acceptance standard. For example, in *United States v. Williams*, the court first noted divided persuasive authority and evidence presented on the issue of general acceptance within the relevant scientific community for stenographic voice identification. It then dodged the general acceptance determination and found that acceptance “by a *substantial section* of the scientific community concerned” was enough to mandate admission of the evidence.¹⁴³ By applying this standard the court was able to admit evidence that may well have been excluded under the general acceptance standard without having to make that explicit determination.

Despite this evolution of the substantial acceptance standard and widespread criticism of *Kelly-Frye* as too conservative, one scholar argues that even this more stringent rule “does not adequately screen novel scientific techniques.”¹⁴⁴ To solve this problem, Professor and Forensic Consultant Andre Moenssens places a strong emphasis on the need to establish a flexible procedure, rather than a static test, to directly replace *Kelly-Frye* in dealing with the admission of novel scientific evidence.¹⁴⁵ The key to this procedure is emphasizing reliability over consensus at three distinct stages of litigation: discovery, pretrial hearing, and decision-making.¹⁴⁶ This can be achieved by: (1) requiring expert reports subject to discovery to contain information regarding the underlying methodology employed and the people involved in employing it, rather than merely conclusions reached;¹⁴⁷ (2) allowing increased deposition of opposing witnesses;¹⁴⁸ (3) increasing systematic use of, and judges’ active participation in, the motion *in limine* to resolve admissibility issues prior to trial;¹⁴⁹ and (4) employing a number of concrete factors to aid judges in admissibility decisions.¹⁵⁰

¹⁴³ U.S. v. Williams, 443 F. Supp. 269, 273 (S.D.N.Y. 1977) (emphasis added).

¹⁴⁴ Moenssens, *supra* note 39, at 547.

¹⁴⁵ *Id.* at 564.

¹⁴⁶ *Id.* at 568.

¹⁴⁷ *Id.* at 568–71.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* at 571–73.

¹⁵⁰ The eleven suggested factors are:

- (1) [T]he potential error rate in using the technique,
- (2) the existence and maintenance of standards governing its use,
- (3) presence of safeguards in the characteristics of the technique,
- (4) analogy to other scientific techniques whose results are admissible,
- (5) the extent to which the technique has been accepted by scientists in the field involved,
- (6) the nature and breadth of the inference adduced,
- (7) the clarity and simplicity with which the technique can be described and its results explained,
- (8) the extent to which the basic data are verifiable by the court and jury,
- (9) the availability of other experts to test

By employing these methods, the options available to judges and overall flexibility of the approach can be increased, allowing the focus to center on underlying reliability.

Finally, in one very recent solution, Professor Pamela Katz incorporates the use of artificial intelligence (“AI”) to help judges in making pretrial *Daubert* admissibility decisions.¹⁵¹ She begins by taking note of the legal community’s tendency to fear emerging technology, particularly where it relates to the substance of the law rather than merely the efficiency of its practice.¹⁵² Then, however, she explains how her solution would provide critical assistance to a judge but leave the ultimate decision in the judge’s hands.¹⁵³ Armed with both legal and scientific databases, the AI machine would probe published scientific literature in the relevant field exploring that discipline’s chosen methodologies and supported reasoning.¹⁵⁴ It would then evaluate the proffered testimony in light of these databases and its programmed rules to decide whether the evidence complies with the *Daubert*, and other, factors before ultimately displaying its results to the judge.¹⁵⁵

While this novel approach to addressing *Daubert*’s shortcomings adds much to the discussion, the introduction of these machines also exaggerates these concerns. The use of these robots implicates an additional layer of inquiry—before allowing the machines to be used, it would be necessary for the court to determine whether the databases and algorithms employed by the machine in question are themselves reliable and scientifically valid. This puts the trial judge back in his or her original position, left to apply the same test, with the same challenges¹⁵⁶ this innovative approach was designed to overcome. Furthermore, prominent concerns about infringing on the fact-finding province of the jury¹⁵⁷ apply with equal, if not greater, force when the

and evaluate the technique, (10) the probative significance of the evidence in the circumstances of the case, and (11) the care with which the technique was employed in the case.

Id. at 573–74 (quoting Mark McCormick, *Scientific Evidence: Defining a New Approach to Admissibility*, 67 IOWA L. REV. 879, 911–12 (1982)).

¹⁵¹ See generally Pamela S. Katz, *Expert Robot: Using Artificial Intelligence to Assist Judges in Admitting Scientific Expert Testimony*, 24 ALB. L.J. SCI. & TECH. 3 (2014) (explaining that AI machines can follow directions, but can also “determine whether the instructions are correct, whether there is a better method to reach the desired results, or if the process had been used successfully before”).

¹⁵² *Id.* at 3.

¹⁵³ *Id.* at 36–37.

¹⁵⁴ *Id.* at 37.

¹⁵⁵ See *id.* at 39.

¹⁵⁶ See generally *supra* Part II.B.

¹⁵⁷ See *supra* Part II.B.2.

infringing entity is no longer a trier of fact in any form, but rather an artificial device and the algorithms it employs.

B. A New Approach Altogether: Expanding the Use of the American Association for the Advancement of Science's Court-Appointed Scientific Experts Program

Ultimately, the proposals discussed above either go too far or do not go far enough—each either does not fully confront the criticism of the current standards or infringes too deeply on the parties' rights. What California needs is a middle ground between these various extremes. This article now proposes such a solution that comes in the form of imposing an additional prong to the *Kelly-Frye* test. This new prong would require trial judges to consult with Court-Appointed Scientific Experts in determining the admissibility of novel expert scientific evidence.

Justice Blackmun himself, in the *Daubert* majority opinion, noted that, in part, the majority's confidence "that federal judges possess the capacity to undertake this review" was derived from their authority to appoint experts under Federal Rule of Evidence 706.¹⁵⁸ The Rule sets forth a number of procedures, including those for appointment, assignment of duties, reporting of findings, and compensation of experts.¹⁵⁹ A judge additionally has the broader, inherent authority to appoint experts "necessary to permit the court to carry out its duties, including authority to appoint a technical advisor to consult with the court during the decision-making process."¹⁶⁰

Over twenty years ago, researchers Joe Cecil and Thomas Willging of the Federal Judicial Center conducted a mail and telephone survey of 425 then-active federal judges to inquire into the frequency of and reasons for appointment of experts under such sources of authority.¹⁶¹ The results of this survey revealed that appointments were made much more frequently than previously suspected based on a low rate of reference to such experts in published opinions.¹⁶² From these results, two primary reasons a judge would invoke an expert emerged: (1) to aid decision-making on the merits of the litigation; and (2) to aid settlement.¹⁶³ Critically, the study revealed almost unanimous

¹⁵⁸ *Daubert*, 509 U.S. at 595.

¹⁵⁹ FED. R. EVID. 706.

¹⁶⁰ Joe S. Cecil & Thomas E. Willging, *Accepting Daubert's Invitation: Defining a Role for Court-Appointed Experts in Assessing Scientific Validity*, 43 EMORY L.J. 995, 998 (1994).

¹⁶¹ *Id.* at 997 n.7.

¹⁶² *Id.* at 1004–05. The eighty-six judges who responded that they had made one or more such appointments in fact made approximately 225 appointments. *Id.*

¹⁶³ *Id.* at 1009–15.

satisfaction on the part of those judges that had previously made appointments, with only two of the sixty-five responding to this question failing to indicate that they were “pleased with the services provided.”¹⁶⁴

As such, it is clear that no one questions the ability and authority of a judge to appoint such an expert if he or she so chooses.¹⁶⁵ Despite the judges’ own satisfaction with the experts, several critics have questioned whether they would be prudent in so doing.¹⁶⁶ This criticism centers around the lack of parameters provided for a judge in the process of appointing,¹⁶⁷ supervising,¹⁶⁸ and paying¹⁶⁹ such experts. In light of these claims, the logical response is to establish such parameters, not to give up an apparently otherwise satisfactory process entirely.

Enter the Court-Appointed Scientific Experts (“CASE”) Project. Under this service, the American Association for the Advancement of Science (“AAAS”), an international non-profit organization,¹⁷⁰ assists both federal and state judges “in identifying highly qualified scientists, engineers, and healthcare professionals to serve as scientific experts.”¹⁷¹ Started as a demonstration project in 2001, as a result of the report of the National Conference of Lawyers & Scientists Task Force on Science & Technology in the Courts,¹⁷² the project serves as a link between the courts and scientific communities.¹⁷³

¹⁶⁴ *Id.* at 1008.

¹⁶⁵ See FED. R. EVID. 706 advisory committee’s note (“The inherent power of a trial judge to appoint an expert of his own choosing is virtually unquestioned.”).

¹⁶⁶ Note, *Improving Judicial Gatekeeping: Technical Advisors and Scientific Evidence*, 110 HARV. L. REV. 941, 942, 946–49 (1997).

¹⁶⁷ See, e.g., JOE S. CECIL & THOMAS E. WILLGING, COURT-APPOINTED EXPERTS: DEFINING THE ROLE OF EXPERTS APPOINTED UNDER FEDERAL RULE OF EVIDENCE 706 23 (1993), [http://www.fjc.gov/public/pdf.nsf/lookup/experts.pdf/\\$file/experts.pdf](http://www.fjc.gov/public/pdf.nsf/lookup/experts.pdf/$file/experts.pdf) [<http://perma.cc/5YGS-LEB8>].

¹⁶⁸ See, e.g., 29 CHARLES A. WRIGHT ET AL., FEDERAL PRACTICE AND PROCEDURE § 6261 (1st ed. 1997).

¹⁶⁹ See Cecil & Willging, *supra* note 160, at 1055–56 (noting that the need for guidance is exacerbated where one of the parties is indignant).

¹⁷⁰ AAAS is the largest multidisciplinary scientific society in the world. Mark S. Frankel, *Considering Advances in Neuroscience Through the Lenses of Law and Human Rights*, 1 J.L. & BIOSCI. 215, 216 (2014), <http://jlb.oxfordjournals.org/content/1/2/215.full> [<http://perma.cc/R2JE-6GE8>].

¹⁷¹ *Court Appointed Scientific Experts (CASE)*, AM. ASS’N FOR THE ADVANCEMENT OF SCI., <http://www.aaas.org/page/court-appointed-scientific-experts-case> [<http://perma.cc/S69F-JTGG>].

¹⁷² AAAS-ABA NAT’L CONFERENCE OF LAWYERS & SCIENTISTS TASK FORCE ON SCIENCE & TECHNOLOGY IN THE COURTS, ENHANCING THE AVAILABILITY OF RELIABLE AND IMPARTIAL SCIENTIFIC AND TECHNICAL EXPERTISE TO THE FEDERAL COURTS: A REPORT TO THE CARNEGIE COMMISSION ON SCIENCE, TECHNOLOGY, AND GOVERNMENT (1991).

¹⁷³ *CASE: History*, AM. ASS’N FOR THE ADVANCEMENT OF SCI., <http://www.aaas.org/page/case-history> [<http://perma.cc/J43G-PUJK>].

As part of the CASE project, AAAS assists judges by: (1) locating and recommending experts in a variety of scientific and technical fields; (2) independently evaluating the qualifications and potential biases of scientists proposed by one or more parties to serve as court experts; (3) advising on the management of litigation involving experts recommended through the project; and (4) assisting judges in refining the scope of the need for the expert and determining what kinds of experts are most appropriate to address those needs.¹⁷⁴ This proposal focuses primarily on AAAS's role in formally and thoroughly vetting the qualifications and neutrality of experts in order to ensure that the recommendations made to the trial judges regarding the admissibility of the evidence are themselves reliable. This independent evaluation is conducted by the Recruitment and Screening Panel, focusing on the purported experts' "scientific merit, reputation, and the ability to communicate highly technical information to non-scientific audiences."¹⁷⁵

The goal of the Task Force was "to create a system that could 'find an expert who would provide the judge independent and reliable advice that would be free from taint,'" and the CASE program seems to be doing just that.¹⁷⁶ Currently, the program has been used by judges in sixteen jurisdictions, including three of the four federal districts in California, as well as the Department of Health and Human Services Departmental Appeals Board.¹⁷⁷ Much like the surveyed federal judges using court-appointed experts generally, many judges using the CASE program have expressed satisfaction with the experience.¹⁷⁸ One such judge from the Central District of California using the service proclaimed, "[t]he judges [in this District] would benefit from a presentation about the fine services that AAAS makes available."¹⁷⁹ This satisfaction is due in part to the ease of

¹⁷⁴ *Court Appointed Scientific Experts (CASE)*, AM. ASS'N FOR THE ADVANCEMENT OF SCI., <http://www.aaas.org/page/court-appointed-scientific-experts-case> [<http://perma.cc/S69F-JTGG>]; *CASE Experience*, AM. ASS'N FOR THE ADVANCEMENT OF SCI., <http://www.aaas.org/page/case-experience> [<http://perma.cc/6U5W-2PKK>].

¹⁷⁵ *CASE: Recruitment and Screening Panel*, AM. ASS'N FOR THE ADVANCEMENT OF SCI., <http://www.aaas.org/page/case-recruitment-and-screening-panel> [<http://perma.cc/DBW3-PMUU>].

¹⁷⁶ Tom Price, *Explaining Science in the Courtroom*, OPTICS & PHONICS NEWS, Nov. 2007, at 16–17, <http://www.osa-opn.org/Content/ViewFile.aspx?id=10904> (quoting Carnegie Institution President Richard Meserve) [<http://perma.cc/DBW3-PMUU>].

¹⁷⁷ *CASE Experience*, AM. ASS'N FOR THE ADVANCEMENT OF SCI., <http://www.aaas.org/page/case-experience> [<http://perma.cc/6U5W-2PKK>].

¹⁷⁸ *Id.*

¹⁷⁹ *Id.* A Nebraska judge extending his thanks to the AAAS director, stated that "[y]our assistance allowed me to offer to the parties a totally objective examination of the case by qualified and competent experts. . . . The CASE project is an incredibly valuable tool to federal judges." *Id.*

administration provided by AAAS through uniform procedures contained in two handbooks—one for the appointing judges and one for the appointed expert. These handbooks set forth the additional information critics and judges alike had previously found lacking in the power to appoint under Federal Rule 706.¹⁸⁰

In terms of the issue at hand, the CASE program can be implemented on a widespread scale to assist judges during the process of making pretrial admissibility determinations. The expert's services would be used by the judge on a consultation-only basis during the hearing. The expert would address concerns including whether the necessary level of consensus has been reached and whether there is a significant minority whose objections merit consideration in weighing that consensus. Restricting the program expert to a consulting role, rather than allowing the experts to testify at trial, ameliorates concerns about the effect on a jury of the status of the expert as "court-appointed."¹⁸¹ Furthermore, by introducing these neutral experts at the pretrial stage of a civil case, the parties may be motivated to settle the litigation, preventing the need for a trial altogether.¹⁸² In this way the proposed solution could not only help ensure that *Kelly-Frye*- or *Daubert*-style rulings are correctly decided, but could also serve the public policies of encouraging settlement and conserving valuable judicial resources.

In addition, this implementation of the program can address several concerns raised by critics regarding the need for increased guidelines and uniformity of use. For example, the American Bar Association has already begun to promulgate such guidelines.¹⁸³ These standards for court-appointed experts allow testimony only in "exceptional cases" and prefer that the testimony play no role in jury trials. If such testimony is allowed in a jury trial, the jury should usually not be told that a testifying expert was appointed by the judge.¹⁸⁴ Such a disclosure, an author of the standards argues, could subvert the adversary system "if a

¹⁸⁰ See generally AM. ASS'N FOR THE ADVANCEMENT OF SCI., COURT APPOINTED SCIENTIFIC EXPERTS: HANDBOOK FOR JUDGES (2002), <http://www.aaas.org/sites/default/files/migrate/uploads/handbookjudges4.pdf> [<http://perma.cc/SXG9-W69V>]; AM. ASS'N FOR THE ADVANCEMENT OF SCI., COURT APPOINTED SCIENTIFIC EXPERTS: A HANDBOOK FOR EXPERTS (2002), <http://www.aaas.org/sites/default/files/migrate/uploads/handbookexperts3.pdf> [<http://perma.cc/M3GU-KZQ5>].

¹⁸¹ See Price, *supra* note 176, at 17.

¹⁸² See *id.* at 176 ("The mere prospect of testimony from an independent expert seems to spur settlement"); Deborah C. Runkle, *Court-Appointed Scientific Experts: Providing Objective Scientific Advice to the Judiciary*, in SCIENTIFIC EVIDENCE REVIEW: CURRENT ISSUES AT THE CROSSROADS OF SCIENCE, TECHNOLOGY AND THE LAW 19, 24 (Cynthia H. Cwik & Helen E. Witt eds., 2006).

¹⁸³ A.B.A., CIVIL TRIAL PRACTICE STANDARDS 8 (2007).

¹⁸⁴ *Id.* at 9.

jury gives more credence to the testimony of an independent expert simply because he was appointed by the judge.”¹⁸⁵ Limiting the use of these experts to pretrial consultation avoids these issues of jury influence.

This approach also avoids a key concern that neutral court-appointed experts take away the parties’ ability to choose their own experts. This issue is not implicated by the use of CASE program experts as consultants to trial judges in making admissibility decisions because each party remains free to select its own experts, not only for the *Kelly-Frye* hearing, but also for testifying at trial. The court-appointed expert simply serves as an aid to the judge in evaluating the reliability of the evidence presented by those adversary-appointed experts before it can be admitted. While some authors have suggested that these experts replace party experts, neither the program itself nor this article advances such an approach. Rather, the CASE program envisions “only the use of court experts as a supplement to party experts.”¹⁸⁶ In this way, the CASE program expert is merely another resource for the trial judge to consult in making his or her reliability determination.

Finally, while this proposal would require a trial judge to confer with and consider the recommendation of the CASE program’s expert, the judge is not to be bound by that decision. The admissibility determination made following the hearing and consultation remains fully in his or her hands. This ensures not only the autonomy of the judge in issuing his or her ruling, but further provides litigants an order appealable in the same manner and to the same extent as it would have been absent the required participation of the CASE program expert.

In short, the use of the CASE program would take *Kelly-Frye* a step closer to becoming a comprehensive procedure based on cooperation between the legal and scientific communities. The appointed scientific experts would additionally serve a similar role to Katz’s “Expert Robot,” without the need to introduce an element of technology both uncomfortable to judges and carrying precisely the “misleading aura of scientific infallibility” from which the tests seek to free the jury. Finally, CASE experts would serve a similar role to experts appointed under Federal Rule 706 without the accompanying concerns related to a lack of guidelines and the need for vetting bias because AAAS has already taken care of both of these aspects long before the expert is ever presented to the judge.

¹⁸⁵ Price, *supra* note 176, at 17.

¹⁸⁶ Runkle, *supra* note 182, at 23.

VI. CONCLUSION

By mandating the use of experts under CASE or a similarly designed state program, California could confront the shortcomings of *Kelly-Frye* head on without running head-long into the problems plaguing *Daubert*. In this context, the CASE program would serve two primary functions: (1) identification of the relevant community to evaluate a novel scientific method; and (2) evaluation and recommendation of one or more qualified, unbiased experts to be appointed by the court to testify to such an evaluation. By working with appointed scientific experts on a pre-trial basis, the trial judge can directly consult the relevant scientific community to determine whether that community generally accepts the validity of a given methodology beyond the simple head-counting required under what would now become the first of two prongs of California's test. In this way, the judge is asked to work with an actual scientist rather than to become an amateur one. Through this procedure, the expert would first offer guidance on whether the proffered technique was, in fact, novel. He or she could then help to both define and provide valuable insight into the relevant community. After these determinations are made, the CASE role would end before trial began, eliminating concerns without imposing any misleading aura on, or infringing on the providence of, the jury.

In a system where a significant majority of civil jury trials involve expert testimony, and where the result of either a *Kelly-Frye* or *Daubert* hearing is very often outcome determinative, the shortcomings of the current alternatives can no longer be ignored. By incorporating the best of each test and modifying problem areas, California courts can act as legal trailblazers once again in the quest to ensure the validity of the expert scientific evidence that plays such an increasingly prominent role in our modern trials.