IN THE ARIZONA SUPREME COURT

STATE OF ARIZONA,	)	No. CR 15-0039-PR
	)	
Appellee/Respondent,	)	Arizona Court of Appeals
	)	No. 2 CA-CR 2012-0378
v.	)	
	)	
JOSEPH JAVIER ROMERO,	)	Pima County Superior Court
	)	No. CR-2010-3531-001
Appellant/Petitioner,	)	

BRIEF OF *AMICUS CURIAE* ARIZONA ATTORNEYS FOR CRIMINAL JUSTICE IN SUPPORT OF PETITIONER, JOSEPH JAVIER ROMERO

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INTERESTS OF *AMICUS CURIAE*

AACJ is a statewide not-for-profit membership organization of criminal defense lawyers, law students, and associated professionals dedicated to protecting the rights of the accused in the courts and in the legislature, promoting excellence in the practice of criminal law through education, training and mutual assistance, and fostering public awareness of citizens' rights, the criminal justice system, and the role of the defense lawyer.

AACJ offers this brief in support of Petitioner regarding the preclusion of Romero's expert witness because the issue presented touches the core of AACJ's mission to protect individual rights guaranteed by the federal and state Constitutions and to resist all efforts to curtail such rights. Defense lawyers routinely must challenge the scientific analysis of expert witnesses and have an interest in preserving their clients' right to call witnesses that challenge the legitimacy of those methods.

ARGUMENT

I. This Court should accept review.

a. This issue is relevant to a large number of trials and to a proper criminal defense.

Jurors place special trust in scientific evidence and the manner in which it is presented impacts the weight given that evidence. *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 595 (1993); *see also United States v. Frazier*, 387 F.3d 1244, 1263 (11th Cir. 2004) ("[E]xpert testimony may be assigned talismanic significance in the eyes of lay jurors. . ."); Dawn McQuiston-Surrett & Michael J. Saks, *Communicating Opinion Evidence in the Forensic Identification Sciences: Accuracy and Impact*, 59 HASTINGS L.J. 1159, 1170 (2008) ("McQuiston-Surrett & Saks, *Communicating Opinion Evidence in the Forensic Identification Sciences*") ("[M]ost jurors have an exaggerated view of the nature and capabilities of forensic identification ....").

The ability to counter this testimony can be vital to an accused's defense. Consider Anthony Ray Hinton, who was recently released from death row. Alan Blinder, *Alabama Man Freed After Decades on Death Row*, THE NEW YORK TIMES, April 3, 2015 (available at http://www.nytimes.com/2015/04/04/us/anthony-ray-hinton-alabama-prison-freed-murder.html?_r=0). Hinton was freed after the Supreme Court ordered a new trial because his attorney failed to secure funds for a qualified defense expert to

challenge the state's ballistic and toolmark experts. *Hinton v. Alabama*, ____ U.S. ___, 134 S.Ct. 1081, 1090 (2014) ("[W]e have recognized the threat to fair criminal trials posed by the potential for incompetent or fraudulent prosecution forensics experts .... This threat is minimized when the defense retains a competent expert to counter the testimony of the prosecution's expert witnesses ….").

Sometimes, "the only reasonable and available defense strategy requires consultation with experts or introduction of expert evidence …." *Harrington v. Richter*, 562 U.S. 86, 106 (2011). The Court of Appeals reinforced this proposition in *State v. Denz*, 232 Ariz. 441, ¶ 19 (App. 2013). *Denz* involved an alleged child abuse and death. The defense attorney did not consult with experts and merely hoped to bring out the defense theory of accidental death through cross-examination of the state's experts. The Court of Appeals found this failure to consult or consider calling an opposing expert ineffective representation. *Id.*

b. This issue is likely to recur.

Because criminal defense attorneys must explore, consult, and prepare expert witnesses to challenge the state's evidence, the lower court's decision interpreting Rule 702 will confuse the issue. There are multiple methods of challenging scientific and forensic evidence and not all involve simply re-testing evidence. Many challenges criticize the methods used and the manner in which conclusions are explained to jurors. A defense attorney must be able to consider

all strategies when representing a client; if the best strategy is to call an expert to attack the science, this option must be available to the defense.

Finally, without clarification of *Romero*, the state could successfully move to preclude defense experts and then capitalize on the preclusion by arguing that the defense did not present its own expert or evidence. Indeed, the prosecutor in this case argued in closings that the defense had presented "no evidence from this courtroom, from that witness stand that actually challenges firearm analysis." *Romero*, 236 Ariz. 451, ¶ 68 fn.18 (J. Eckerstrom, concurring).

c. This court must clarify the intent of Rule 702.

In 2012, this Court amended Rule 702 to conform to Federal Rule of Evidence 702, and the two rules are now identical. Ariz.R.Evid. 702, cmt. 2012 amend.; Fed.R.Evid. 702; *State v. Salazar-Mercado*, 234 Ariz. 590, ¶ 7 (2014). This court added the following guidance:

> Cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.
> . . .
> A trial court's ruling finding an expert's testimony reliable does not necessarily mean that contradictory expert testimony is not reliable. The amendment is broad enough to permit testimony that is the product of competing principles or methods in the same field of expertise.

Ariz.R.Evid. 702, cmt. 2012 amend. In essence, the Court of Appeals interpreted the phrase "same field of expertise" as a limitation on what type of expert the defense could call. *Romero*, 236 Ariz. 451, ¶¶ 25-26. Defendants are now limited to calling only the exact same type of expert: a ballistics expert can be challenged only by a ballistics expert, a medical examiner can be challenged only by a medical examiner. This reading misinterprets the advisory note. "The same field of expertise" language does not reduce or eliminate a defendant's well-defined ability to challenge opposing experts. *See* Ariz.R.Evid. 702, cmt. 2012 amendment.

II. The ability to call experts to critique scientific procedure and testimony is vital to a defense.

a. Junk science has led to wrongful convictions.

The Supreme Court noted, in *Hinton*, one study concluded 60% of wrongful convictions involved invalid scientific testimony. *Hinton v. Alabama*, ____ U.S. ___, 134 S.Ct. 1081, 1090 (2014) (citing Brandon Garrett & Peter Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1, 14 (2009) ("Garrett & Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*")).

Some sciences long relied on by courts have fallen under scrutiny and even lost credibility as science developed. One example is microscopic hair analysis, a subjective analysis prone to high error rates. Hair analysis was used in many cases later overturned due to exonerating DNA evidence. Garrett & Neufeld, *Invalid*

Forensic Science Testimony and Wrongful Convictions, 47-48; Margaret Berger, *Expert Testimony in Criminal Proceedings: Questions Daubert Does Not Answer*, 33 SETON HALL L. REV. 1125, 1130 (2003).

b. Opposing expert criticism is vital to test the legitimacy of evidence.

Many wrongful convictions result not from inappropriate testing, but from over-claiming or exaggerating the probative value of evidence. In Garrett and Neufeld's study of 82 wrongful convictions due to invalid scientific testimony, thirteen cases involved the presentation of inaccurate frequency or statistics, five involved a numerical frequency or probability with no empirical support, and nineteen involved a non-numerical statement of probability or frequency with no empirical data. Garrett & Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 19-20.

This mischaracterization of evidence can occur through misapplication of statistical populations, selective use of terminology, or both. The ability to fully explain these issues to the jury is vital in ensuring the jury's fair consideration of the evidence.

i. Statistics

Lay persons are relatively ignorant regarding the application and use of statistics, both in everyday life and particularly in the application of forensic evidence. Michael Saks & Robert Kidd, *Human Information Processing and*

Adjudication: Trial by Heuristics, 15 LAW & SOC'Y REV. 123, 127 (1980-81) ("[I]n many contexts decision makers' intuitive, common-sense judgments depart markedly and lawfully (in the scientific sense) from the actual probabilities."); William C. Thompson, *Are Juries Competent to Evaluate Statistical Evidence?*, 52 LAW & CONTEMP. PROBS. 9, 9 (Autumn 1989) (summarizing early research and identifying common findings of errors in jurors' assessments of statistical evidence) (available at http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=4006&context=lcp).

Given such limitations, forensic science is subject to mischaracterization and biased explanations, particularly in the use of probability and statistics. McQuiston-Surrett & Saks, *Communicating Opinion Evidence in the Forensic Identification Sciences*, 1159 ("With the principal exception of DNA typing, virtually all areas of forensic identification lack empirically and statistically meaningful measures of the probability that questioned crime-scene marks and known suspect exemplars share a common origin.").

The limitations of such sciences have been particularly troubling in its application to forensic analyses such as comparative bullet lead analysis (CBLA), serology, and hair and fiber matching. Simon A. Cole, *Where the Rubber Meets the Road: Thinking About Expert Evidence As Expert Testimony*, 52 VILL. L. REV. 803, 819-20 (2007) ("Cole, *Where the Rubber Meets the Road*") ("Over-claiming

has long been identified as a problem for microscopic hair comparison."). Cole also noted The National Research Council's (NRC) report on CBLA, "revealed rampant over-claiming over the course of the nearly forty-year history of FBI testimony concerning results of that assay …." *Id.* This included, "the completely unfounded claim that two analytically indistinguishable bullets must have come from the same box or from another box that would have been made by the same company on the same day." *Id.* (citing National Research Council: *Forensic Analysis: Weighing Bullet Lead Evidence, Report in Brief* (2004) http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/bullet_lead_final.pdf). Substantial "scholarly attention devoted to CBLA and the NRC report has focused on the very interesting statistical issues raised by CBLA evidence and the FBI's and NRC's alleged failure to deal with them adequately." *Id.* Over-claiming the weight of evidence was the most harmful component of the misuse of evidence, a fact that would be inescapable irrespective of whether CBLA analysis itself was good science. *Id.*

A large proportion of wrongful convictions due to invalid scientific testimony included the misuse of empirical population data, conclusions regarding the probative value of evidence that were unsupported by empirical data, or both. Garrett & Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 9.

ii. Terminology

Even when statistics are calculated and explained properly, they may still be conveyed in a manner either more or less persuasive to a jury. Jonathan Koehler, *The Psychology of Numbers in the Courtroom: How to Make DNA-Match Statistics Seem Impressive or Insufficient*, 74 S. CAL. L. REV. 1275, 1304-05 (2001) ("The studies offered here suggest that the persuasive value of DNA evidence may depend as much on an understanding of the psychology of numbers as it does on the underlying science and the statistical expression of that science.").

A forensic scientist's intended meaning for terminology does not necessarily correspond to a layperson's understanding. Scientists tested undergraduates on their understanding of the weight to be given common forensic terms such as "match," "probable," "consistent," and "reasonable scientific certainty;" learning that the mock jury's interpretation in no way matched the weight assigned to each term by the relevant forensic discipline (forensic odontology). McQuiston-Surrett & Saks, *Communicating Opinion Evidence in the Forensic Identification Sciences*, 1163. The conclusion was "[f]orensic expert witnesses cannot simply adopt a term, define for themselves what they wish it to mean, and expect judges and juries to understand what they mean by it." *Id.*

When the issue is not the result of a test, but the terms used to explain that result, bringing in an expert to perform the identical test would be a waste of

resources and time. Rather, an expert in terminology and exemplar cueing would be more useful in explaining how scientists interpret phrases in language the jury will understand. To preclude such an expert would miss a valuable opportunity to provide jurors with information that would be useful in understanding testimony and determining what weight to give it.

iii. Confirmation Bias

Sir Francis Bacon noted: "man always believes more readily that which he prefers." D. Michael Risinger et. al., *The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion*, 90 CAL. L. REV. 1, 7 (2002). A well-known but often under-discussed problem, especially inherent in subjective testing, is confirmation bias. Recognized as a common weakness of human scientific research, confirmation bias is the tendency to test a hypothesis by looking for instances that confirm it rather than by searching for potentially falsifying instances, even while recognizing that the latter is better scientific method. *Id.* Recognition of such tendencies is prevalent in multiple disciplines, including teaching (blind grading of examinations or papers). *Id.* at 23. "However, to the extent information on current practices is available, in the forensic science disciplines this fundamental principle is usually ignored." *Id.* at 31. Forensic testing that lacks adequate safeguards to diminish confirmation bias is subject to criticism by experts not only in the testing, but in

the fundamentals of experimental design, as acknowledged by the Court of Appeals majority. *Romero*, 236 Ariz. 451, ¶ 24.

If the law actually allowed for only a DNA examiner to counter another DNA examiner's testimony, or a toolmark expert to counter another toolmark expert's testimony, it would unjustifiably exclude other legitimate grounds for criticism. The law would then exclude a statistician from explaining the incorrect application of probability to the evidence, or an expert in exemplar cueing from framing the statistics for a jury. It would also unjustifiably exclude an expert well-versed and highly studied in the pitfalls of confirmation bias, simply because that expert may not be an expert in the criticized forensic science.

III. This case involved a valid criticism of scientific procedures.

a. The scientific procedures surrounding toolmark examination are subject to reasonable concerns.

Congress, noting concerns regarding the shortcomings of forensic science, commissioned the National Academy of Sciences to study and issue a report on the reliability of forensic science. Among the forensic sciences studied, firearms, ballistics, and toolmark examination caused particular concern. The NAS warned, "even with more training and experience using newer techniques, the decision of the toolmark examiner remains a subjective decision based on unarticulated standards and no statistical foundation for estimation of error rates." NAS Report:

Strengthening Forensic Science in the United States: A Path Forward, 153-154 (2009) (available at https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf).

The NAS went on to say, "Because not enough is known about the variabilities among individual tools and guns," the NAS could not "specify how many points of similarity are necessary for a given level of confidence in the result." *Id.* at 154. Because "[s]ufficient studies have not been done to understand the reliability and repeatability of the methods," particularly regarding individual patterns, the NAS stated additional studies were necessary. *Id.*

One year prior, the National Research Council conducted a cross-disciplinary study of firearms toolmark identification and officially found, "[t]he validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated." National Research Council: *Ballistic Imaging: Committee to Assess the Feasibility, Accuracy, and Technical Capability of a National Ballistics Database*, 3-4 (2008) (available at http://www.nap.edu/openbook.php?record_id=12162&page=R1). Further, "a significant amount of research would be needed to scientifically determine the degree to which firearms-related toolmarks are unique or even to quantitatively characterize the probability of uniqueness." *Id.* Notably, the committee was comprised of persons from a variety of experiences and disciplines, many in areas such as public policy, statistics, and information sciences, a clear

indication that such alternative perspectives are valuable to scientific research and analysis on such a subject. *Id.* at 5.

Scholars of other sciences have expressed concerns about the potential for exaggerated claims of probative value in the case of toolmark evidence:

> It is clear that tool mark examiners sometimes testify that the correspondence between a crime scene tool mark and a test tool mark somehow warrants them to testify the object that made the test tool mark is the object that made the crime scene mark. Further, they claim that all other tools in the universe--even the next consecutive tool produced on the assembly line--can be eliminated as potential sources of the crime scene mark. Courts have noted that this is an "extraordinary" claim in its epistemological strength and probative value, and they have noted that it is particularly extraordinary given the paucity of evidence supporting it.

Cole, *Where the Rubber Meets the Road*, 821 (citing *United States v. Green*, 405 F.Supp.2d 104, 107 (D.Mass. 2005)); *see also Ramirez v. State*, 810 So.2d 836 (Fla. 2001).

Thus, while under some circumstances class characteristics may be a proper subject of testimony, the analysis of individual characteristics is controversial in the scientific community. While the Court of Appeals mentioned toolmark analysis has been generally accepted, a pertinent factor under *Daubert*, 509 U.S. at 593, "[t]he *Daubert* Court did not suggest that acceptance by a legal, rather than a scientific community, would suffice." *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1038 (S.D.N.Y. 1995).

The statistical foundation of the estimation of error rates in toolmark analysis is not established and is highly relevant in jury determinations of the weight of the evidence. Furthermore, in the absence of safeguards, issues of confirmation bias may affect the subjective conclusions drawn by the experts.

b. Reasonable concerns about the legitimacy of scientific evidence are proper subjects for an expert witness.

Expert testimony "fits" a case if it is "sufficiently tied to the facts of the case [so] that it will aid the jury in resolving a factual dispute." *State v. Salazar-Mercado*, 234 Ariz. 590, 593 (2014) (citing *Daubert*, 509 U.S. at 591). An attack on the scientific methodology of the ballistic tester's experiments is clearly material to understanding that testimony and resolving the factual dispute of whether Romero fired the murder weapon. Additionally, an attack on the ballistic tester's level of confidence in the match ("a reasonable degree of scientific certainty") would be likewise material. The credibility of scientific evidence is a vital consideration. N.J. Schweitzer & Michael Saks, *Jurors and Scientific Causation: What Don't They Know, and What Can Be Done About It?*, 52 JURIMETRICS J. 433, 436 (2012) ("[J]urors are predisposed to accept scientific expert testimony and give it even more credence when it is admitted into trial, making it critically important that jurors be able to discern the strengths and weakness of scientific evidence.").

The state and the Court of Appeals posited that the defense expert could not testify unless he too was qualified as a forensic toolmark examiner, or an expert in toolmark experimental design specifically. *Romero*, 236 Ariz. 451, ¶¶ 25-26. However, this conclusion unreasonably narrows Rule 702. The amendment to 702 did not "alter the venerable practice of permitting experts 'to educate the factfinder about general principles, without ever attempting to apply these principles to the specific facts of the case.'" *State v. Salazar-Mercado*, 234 Ariz. 590, ¶ 9 (2014) (quoting Fed.R.Evid. 702, Advisory Committee Notes, 2000 amend). Instead, the effect of *Daubert* and amended Rule 702 was to broaden the number of experts that could be called. *United States v. Crisp*, 324 F.3d 261, 268 (4th Cir. 2003) ("The *Daubert* decision … effectively opened the courts to a broader range of opinion evidence than was previously admissible. Although *Daubert* attempted to ensure that courts screen out 'junk science,' it also enabled the courts to entertain new and less conventional forms of expertise.").

A *Daubert* hearing alone is insufficient:

> At least in criminal cases, having found that the underlying discipline is satisfactory and the evidence admissible following the Frye--or now the Daubert--standard, courts do not typically examine conclusions experts reach on the stand regarding whether statistical claims or other inferences drawn from the data are supported by the evidence. There is no screening of the case specific inferences and opinions before the jury hears them. Yet it is precisely while the expert testifies that, as Simon Cole puts it, "the rubber meets the road," and the jury hears claims about the actual evidence in the case.

Garrett & Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 33 (citing Cole, *Where the Rubber Meets the Road*, 819-24). Where there may be errors in an expert's "statistical claims or other inferences drawn from the data," the defense needs the ability to present expert witnesses to explain the errors.

d. The exclusion of the expert due to the notion that questions of the legitimacy of the science are not properly before the jury is contrary to the law.

Further troubling is the lower court's failure to address the trial court ruling that it had dispositively resolved the reliability of the toolmark evidence and thus it could not be an issue for the jury. *Romero*, 236 Ariz. 451, ¶¶65-68. This Court stated the intent of the amendment was **not** to preclude a credibility, qualification, or scientific attack on expert evidence. Ariz.R.Evid. 702, cmt. 2012 amend ("The amendment is not intended to supplant traditional jury determinations of credibility and the weight to be afforded otherwise admissible testimony ….").

Such a contrary holding would, if taken to its logical conclusion, lead to the preclusion of most cross-examination, and even in some cases obviate the need for a trial. As noted in Judge Eckerstrom's special concurrence, "Haber's testimony went to the weight and credibility of the state's expert testimony and … its preclusion improperly insulated the state's expert from critique." *Romero*, 236 Ariz. 451, ¶ 68.

CONCLUSION

This court should accept review and vacate the Court of Appeals' ruling.

RESPECTFULLY SUBMITTED this 13 day of April 2015.

By /s/ Amy Kalman

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