



NATIONAL COMMISSION ON FORENSIC SCIENCE

NIST
National Institute of
Standards and Technology
U.S. Department of Commerce

Testimony Using the Term “Reasonable Scientific Certainty”

Subcommittee

Reporting and Testimony

Commission Action

On August 11, 2015, the Commission voted to adopt this recommendation with a more than two-thirds majority (97% affirmative) vote.

Type of Work Product

Views Document

Statement of the Issue

Forensics experts are often required to testify in court that the opinions or facts stated are offered “to a reasonable scientific certainty” or to a “reasonable degree of [discipline] certainty.” Outside of the courts, this phrasing is not routinely used in scientific disciplines. Moreover, the terminology, in its varying forms, is not defined in standard medical or scientific reference materials. With respect to its use in the courts, this phrase is almost always interjected as a matter of custom, but in some jurisdictions, results from an appellate court ruling or trial judges’ or lawyers’ belief seem to indicate that it is a necessary precondition for admissibility. In the courtroom setting, the phrase risks misleading or confusing the factfinder.

It is the view of the National Commission on Forensic Science (NCFS) that the scientific community should not promote the use of this terminology. Additionally, the legal community should recognize that medical professionals and other scientists do not routinely use “to a reasonable scientific certainty” when expressing conclusions outside of the courts, because there is no foundational scientific basis for its use.

Therefore, legal professionals should not require that forensic discipline testimony be admitted conditioned upon the expert witness testifying that a conclusion is held to a “reasonable scientific certainty,” a “reasonable degree of scientific certainty,” or a “reasonable degree of [discipline] certainty,” as such terms have no scientific meaning and may mislead jurors or judges when deciding whether guilt has been proved beyond a reasonable doubt. The Commission recognizes the right of each court to determine admissibility standards, but expresses this view as part of its mandate to “develop proposed guidance concerning the intersection of forensic science and the courtroom.”

Putting the Issue in Context

The NAS Report Strengthening Forensic Science—A Path Forward, explained that the existing legal regime—including the rules governing the admissibility of forensic evidence, the applicable standards governing appellate review of trial court decisions, the limitations of the

adversary process, and judges and lawyers who often lack the scientific expertise necessary to comprehend and evaluate forensic evidence—is inadequate to the task of curing the documented ills of the forensic science disciplines. This matters a great deal, because “forensic science is but the handmaiden of the legal system.”¹

Although not addressing the specific issue of using terms such as “reasonable degree of scientific certainty,” the Report concludes its discussion of “Forensic Science Evidence in Litigation” with the following observation: “the adversarial process relating to the admission and exclusion of scientific evidence is not suited to the task of finding ‘scientific truth.’”²

The Historic Background to Use of the “Reasonable Degree of Certainty” Terminology

The requirement of an expert testifying that a conclusion is held to a “degree of certainty” emerged in the context of medical testimony, when witnesses in civil cases were asked about the potential future consequences of an injury or illness. In predicting future events, courts wanted to avoid speculation. As a result, they required that the testifying doctor make a prediction with some degree of certitude.

As best as can be ascertained, the “reasonable degree of certainty” formulation was first applied to scientific evidence in 1935, when a witness was “asked whether he could determine with reasonable scientific certainty the cause of the capsizing of the boat.”³ This was not the mandate of the court but a stylistic approach adopted by a lawyer. Not until 1969 was the terminology linked to the admissibility determination:

If the witness, based upon his background skill, possesses extraordinary training to aid laymen in determining facts and if he bases his answer upon what he believes to be reasonable scientific or engineering certainty, generally the evidence should be admitted, subject, of course, to the cross-examination of the adversary.⁴

This statement was made without legal or scientific analysis as to what the term meant or why its use was being mandated.

Use of the term became custom and practice, but in fact only one state—Ohio—had an apparent mandate requiring use of this term as a precondition to admissibility, and that state’s highest court has repeatedly confirmed that use of this terminology is not required.⁵ The modern view recognizes that the term is not required. The most current review of state court case law, undertaken by the Hawaii Supreme Court in 2014, confirmed this and concluded, for its state, that “trial courts should not require a ‘reasonable degree of scientific certainty’ before admitting expert opinions but may exclude expert testimony based on speculation or possibility.”⁶

The same is true in federal courts—neither the *Daubert* trilogy of cases [*Daubert*, *Joyner*, or *Kumho Tire*] nor Federal Rules of Evidence 702-705 require such language. See, e.g., *United States v. Mornan*, 413 F.3d 372, 381 (3d Cir. 2005) (“this Court has been unable to find any authority to support the position that questions regarding the expert’s ‘degree of scientific

¹ NAS Report, 85 (citation omitted).

² *Id.*, 110.

³ *Herbst v. Levy*, 279 Ill. App. 353, 358 (Ill. App. Ct. 1935).

⁴ *Twin City Plaza, Inc. v. Central Surety & Ins. Corp.*, 409 F.2d 1195, 1203 (8th Cir. 1969).

⁵ *State v. Thompson*, 23 N.E.3d 1096, 1129 (Ohio 2014); *State v. Lang*, 954 N.E.2d 596, 617 (Ohio 2011).

⁶ *State v. DeLeon*, 319 P.3d 382, 403 (Haw. 2014).

certainty’ categorically renders expert testimony inadmissible”). As well, both the *Daubert* and *Frye* tests, when properly implemented, serve to screen out speculative testimony and thus further demonstrate the lack of need for the “reasonable degree of certainty” language.

Emerging Criticism of the Terminology

Both academic and policy writing have addressed the lack of a requirement for, and the problems arising from use of, the term “reasonable degree of [] certainty.” The authoritative evidence treatise, *The New Wigmore: A Treatise on Evidence*, explains in its 2015 supplement that there is no requirement that such terminology be used and that the standard for admissibility only requires that the expert’s opinion be a reasonable one, deduced from the evidence.⁷ As another scholar concluded,

The term “reasonable medical certainty” has no scientific meaning. Its legal meaning is at best ambiguous, at worst misleading. It is not required by the Federal Rules of Evidence, nor any other evidence code. More importantly, the term (“scientific certainty”) is problematic for a different reason—misleading the jury, and should be excluded under Federal Rule 403 for that reason alone.⁸

Criticism has also emerged in judicial decisions. In more than one instance in recent years, a court has precluded all mention of “reasonable degree of certainty” in a forensic evidence case. “The Court therefore concluded that to allow Detective Valenti, or any other ballistics examiner, to testify that he had matched a bullet or casing to a particular gun ‘to a reasonable degree of ballistic certainty’ would seriously mislead the jury as to the nature of the expertise involved.”⁹ In *Glynn*, the expert was limited to testifying “in terms of ‘more likely than not,’ but nothing more.”

The concern over this terminology has been recognized in the forensics community as well. The 2012 report *Latent Print Examination and Human Factors: Improving the Practice Through a Systems Approach. The Report of the Expert Working Group on Human Factors in Latent Print Analysis* emphasized:

Outside the courtroom, however, scientists do not communicate their findings in this fashion. An astronomer who reports the discovery of an exoplanet does not characterize the finding as satisfying some “reasonable degree of scientific certainty.” A chemist who deduces the identity of a compound from its nuclear magnetic resonance spectrum has no table of degrees of scientific certainty with which to label the deduction. Scientists might refer to personal degrees of confidence in a finding or to the degree of controversy surrounding it, but there is no generally accepted or working definition of a “reasonable degree of certainty” in scientific discourse.¹⁰

The Problems Arising from This Terminology

⁷ Kaye, Bernstein and Mnookin, *New Wigmore: A Treatise on Evidence*, §1.5.2(c), 2d Edition, 2011 New York: Aspen Pub. Co., 2015 *Cumulative Supplement* (in press).

⁸ Paul Gianelli, Scientific Evidence “Reasonable Scientific Certainty”: A Phrase in Search of a Meaning, *Crim. Just.*, Spring 2010, at 40, 41.

⁹ *United States v. Glynn*, 578 F. Supp. 2d 567, 574 (S.D.N.Y. 2008).

¹⁰ *Latent Print Examination*, 119.

The phrase “reasonable degree of scientific certainty,” which combines two words of concern—“scientific” and “certainty”—has no scientific meaning. One scholar summed it up this way:

The reasonable-degree-of-scientific-certainty language almost certainly was drafted by the lawyers. Scientists have no use for this phrase (outside the courtroom). Indeed, “a reasonable degree of scientific certainty” is not a defined concept in scientific disciplines or even in law. . . . It is legal mumbo jumbo derived from archaic cases in which lawyers discovered that if a medical doctor did not utter the incantation “to a reasonable degree of medical certainty,” his testimony might be excluded because doctors were not supposed to talk about mere probabilities. Modern cases usually recognize that suitably explained information about less-than-certain possibilities can be helpful in various circumstances, but experts want to (or are induced to) incant not only “medical certainty” but also “clinical certainty,” “psychological certainty,” “psychiatric certainty,” “engineering certainty,” “architectural certainty,” “ballistic certainty,” “professional certainty,” and even “forensic certainty” and “legal certainty.”¹¹

Multiple problems abound with this phrase, whether “scientific certainty” or “[discipline] certainty.” These include the following:

- There is no common definition across science or within disciplines as to what threshold establishes certainty. Therefore, whether couched as “scientific certainty” or “[discipline] certainty,” the term is idiosyncratic to the witness.
 - A juxtapose to the term “beyond a reasonable doubt” is appropriate here. Although not precisely quantifiable, it can be measured by comparison (it is greater than both the “preponderance” standard of 50.1% and the much higher “clear and convincing” standard) *and* has a definition as being convinced beyond having a doubt of the size that would cause a reasonable person to pause or refrain from acting in a matter of high importance.
- Use of the term “scientific” implies that the discipline is indeed a science, which in some instances may be putting the cart before the horse. As the Supreme Judicial Court of Massachusetts explained, “The phrase ‘reasonable degree of scientific certainty’ should also be avoided because it suggests that forensic ballistics is a science, where it is clearly as much an art as a science.”¹²
- Coupled with the term “reasonable,” a juror might equate it with certainty at the level of beyond a “reasonable” doubt.
- The term invites confusion when presented with probabilistic evidence. How is a lay person, without either scientific or legal training, to understand an expert’s “reasonable scientific certainty” that evidence is “probably” linked to a particular source?

The ambiguity of the term is illustrated in *Burke v. Town of Walpole*, 405 F.3d 66 (1st Cir. 2005), a bite mark identification case. The First Circuit had to interpret the term as used in an arrest warrant:

[W]e must assume that the magistrate who issued the arrest warrant assigned no more than the commonly accepted meaning among lawyers and judges to the term “reasonable

¹¹ David H. Kaye, *The Double Helix and the Law of Evidence* 82 (2010)

¹² *Commonwealth v. Pytou Heang*, 458 Mass. 827, 849 (Mass. 2011).

degree of scientific certainty”—“a standard requiring a showing that the injury was *more likely than not* caused by a particular stimulus, based on the general consensus of recognized [scientific] thought.” *Black’s Law Dictionary* 1294 (8th ed. 2004) (defining “reasonable medical probability,” or “reasonable medical certainty,” as used in tort actions). That standard, of course, is fully consistent with the probable cause standard.¹³

The case involved a magistrate, not a jury, and it seems doubtful that a jury would understand that the term “reasonable scientific certainty” meant only “more probable than not”—i.e., 51%. It is more likely that the jury would understand the term to mean 95% certain or perhaps “beyond a reasonable doubt.”

Toward a Meaningful Alternative (or Alternatives)

The Commission recognizes that recommending the abandonment of a long-used phrase is only a first step. An expert’s certainty in a conclusion may be an appropriate concern in a particular case, and that certainty is actually a statement of confidence distinct from the likelihood of the conclusion itself. For example, an expert may be very certain that “X” is the most likely cause of condition “Y.” As well, depending on the nature of the case, a court may determine that for the testimony about the existence of a fact to be sufficiently helpful, the witness must indicate that, in the expert’s judgment, the fact is at least more probable than not (or meets some other threshold level of certainty). Nonetheless, the terminology at issue—reasonable degree of scientific certainty—in no way serves such a function.

Work will be needed to identify the full range of appropriate language for expressing an expert’s opinion. That work, particularly for forensic science, may best be undertaken through the OSAC structure or this Commission. As a first step, however, the term “reasonable degree of scientific [or discipline] certainty” has no place in the judicial process.

¹³ *Id.* at 91.