

IN THE CIRCUIT COURT OF GREENE COUNTY, MISSOURI
DIVISION V

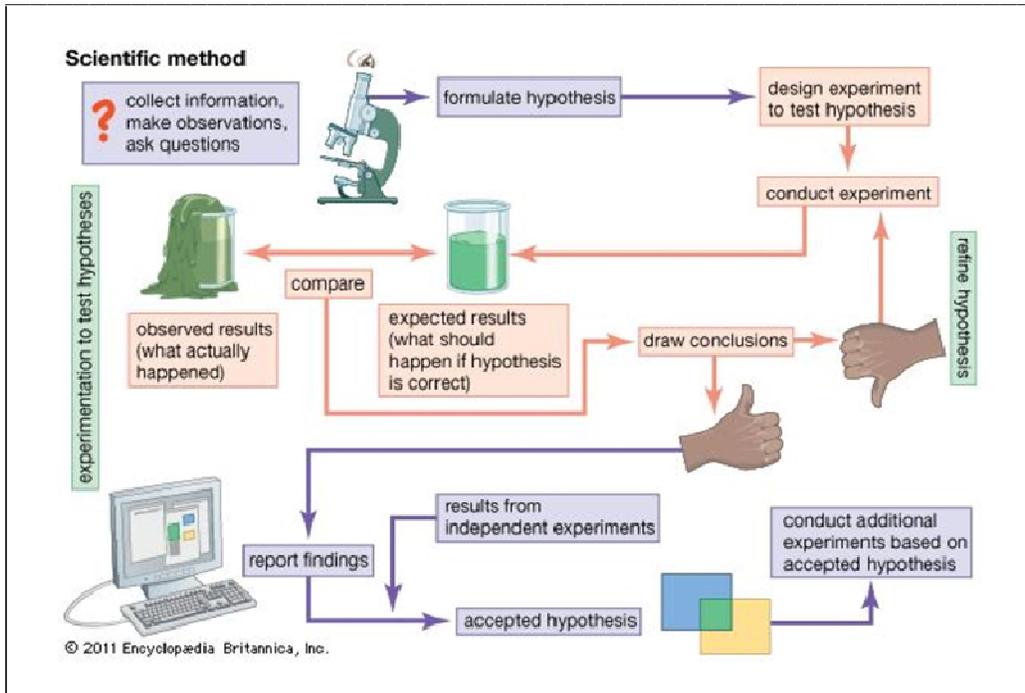
STATE OF MISSOURI,)
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 Plaintiff,)
)
 v.) Case No.
)
 SG)
)
 Defendant.)

JUDGMENT

Science: Scientific Method

Science is the basis upon which a hypothesis is formulated about an unknown area. It is what a scientist works to prove or disprove about the subject.

The diagram below explains the process of the scientific method:



This process allows a scientist to analyze the results to approve or reject a hypothesis. The issue with ballistics testing or acceptance in court is; has this method ever been subjected to the scientific method? Has any of its methods been subjected to peer review by anyone outside of law enforcement? Also, the process has been reviewed by whom? Has the process been shown to be accepted in the particular field in which it belongs? Who decides whom is in the “particular field”?

Defense’s Position

With purported confidence levels of a zero percent failure rate, one would think that the technician had at her disposal 3D imaging software that allowed her to measure with the laser precision the spatial relationships of the various striations found on each bullet; and that a computer program employed complex algorithms to mathematically compute whether a match existed. But one would be wrong.

One would think that there would be a standard by which a technician had to find X number of striations that lined up before declaring a match. But one would be wrong.

One would think that the technician would be required to find that a certain percentage of the overall striations lined up before declaring a match. But one would be wrong.

One would think that the technician would be required to examine the entire surface area of the two bullets before declaring a match. But one would be wrong.

One would think that there would be a certain level of objectivity in declaring a match to a known standard. Again, one would be wrong.

What we learned in the Frye/Daubert hearing was that this “discipline” is entirely subjective, with no uniform standards by which a match could be declared.

The only community that continues to declare the practice scientifically valid is AFTE – the Association of Firearms and Toolmark Examiners. Apart from its obvious self-interest, the evidence

was clear that AFTE is made up primarily of current and past law enforcement personnel. So to ignore the independent views of the relevant scientific community would be to empower the proverbial fox to guard the hen house.

As established during the hearing, a criminalist will examine the two bullets through a comparison microscope and try to determine if there is sufficient agreement between their striations. But sufficient agreement is a purely subjective determination on the part of the technician looking through the microscope. Per AFTE: “Agreement is significant when it exceeds the best agreement demonstrated between toolmarks known to have been produced by different tools’ As acknowledged by Dr. Hamby, this standard requires the examiner to think back to the best matching striations from bullets she knows came from different guns. If the two bullets she is viewing now exceeds that best matching non-match, then it is practically impossible for the match to be coincidental.

This is an absurd standard. As Dr. Hamby acknowledged, the best matching non-match is not a uniform concept. Rather, it is based on what the individual examiner recalls from his or her recollection. Thus, as Dr. Hamby explained, if there were 2,000 examiners in the U.S., you could conceivably have 2,000 different standards for what constitutes sufficient agreement to declare a match. How then can this highly individualized non-uniform criteria be considered scientifically valid? As established below, it is not.

The NAS Report is a sweeping critique of many of the forensic methods that police and prosecutors rely on -- including firearms identification. On this point, the committee found:

Often in criminal prosecutions and civil litigation, forensic evidence is offered to support conclusions about “individualization” (sometimes referred to as “matching” a specimen to a particular individual or other source) or about classification of the source of the specimen into one of several categories. ***With the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.***

Id. at p. 7 (emphasis added).

The NAS report details the fallacies of what has been an assumption of the ability to discern uniqueness. “But 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.” Id. at pp. 153-54.

It is the lack of a precisely defined process that is the fundamental problem with firearm and toolmarks analysis. Id. at p. 155. “Because not enough is known about the variabilities among individual tools and guns, we are not able to specify how many points of similarity are necessary for a given level of confidence in the result.” Id. at p. 154.

Indeed, “[w]ithout appropriate estimates of accuracy, an examiner’s statement that two samples are similar, or even indistinguishable, is scientifically meaningless: it has no probative value, and considerable potential for prejudicial impact.” Id. at p. 46 (emphasis in original).

It remains a rather obvious notion that if forensic method lacks foundational validity, then a criminalist should not be heard in court to opine that “this bullet came from that gun” and it is practically impossible that she is wrong.

PCAST agreed. “Over the past 15 years, the field has undertaken a number of studies that have sought to estimate the accuracy of examiners’ conclusions. While the results demonstrate that examiners can under some circumstances identify the source of fired ammunition, many of the studies were not appropriate for assessing scientific validity and estimating the reliability because they employed artificial designs that differ in important ways from the problems faced in casework.” See PCAST, p. 106.

Even more concerning was the fact that “there is internal evidence among the studies themselves indicating that many previous studies *underestimated the false positive rate by at least 100-fold.*”

As it stands today, independent scientists have uniformly concluded that firearm and

toolmark analysis has not been scientifically validated. Only current and former law enforcement personnel – who have proverbial skin in the game – believe otherwise.

State's Position

“For criminal cases, Missouri follows the standard for admissibility of results of scientific procedures enunciated in *Frye*. *State v. Davis*, 814 S.W.2d 593, 600 (Mo. banc. 1991).

Accordingly, results of scientific procedures ‘may be admitted only if the procedure is ‘sufficiently established to have gained general acceptance in the particular field in which it belongs.’” *Id.*

(quoting *Frye*, 293 F. at 1014). *Dorsey v. State*, 448 S.W.3d 276 (Mo. en banc 2014) (note – all of the Missouri Supreme Court justices concurred in this opinion)

“Missouri courts follow the Frye standard in determining the admissibility of scientific evidence in criminal cases. Under that standard, scientific evidence may be admitted only if the procedure is ‘sufficiently established to have gained general acceptance in the particular field in which it belongs.’ *Id.* (quoting *Frye* at 1014).” *State v. Keightley* 147 S.W.3d 179, 187 (Mo. App. S.D. 2004)

“Missouri courts, in criminal cases, still follow the test articulated in *Frye v. United States*, 293 F.1013 (D.C. Cir 1923), for the admission of scientific evidence. *See Butler v. State*, 108 S.W.3d 18, 26 (Mo. App. W.D. 2003). To admit the testimony of a expert witness or the results of scientific procedures in a criminal case ‘the testimony must be based on scientific principles that are generally accepted in the relevant scientific community.’ *Id.* (quoting *Callahan v. Cardinal Glennon Hosp.*, 863 S.W.2d 852, 860 (Mo. banc 1993)). *See also State v. Davis*, 814 S.W.2d 593, 600 (Mo. banc 1991), *cert. denied*, 502 U.S. 1047, 112 S.Ct. 911, 116 L.Ed 2d 812 (1992). Whether a procedure has gained acceptance in the relevant field and is admissible scientific evidence is established in a *Frye* hearing, that is a hearing held outside of the presence of the jury.” *State v. Daniels* 179 S.W.3d 273, 281 (Mo. App. W.D. 2005)

The defense motion does not cite any Missouri law to support its position. The defense motion does not cite a case from ANY jurisdiction in which firearms and tool mark identification have been ruled inadmissible based upon a lack of general acceptance of the science.

The defense suggestions dismiss the evidence that Mr. Nixon, Mr. Tobin, and Dr. Hamby, all testified that firearms and tool mark identification is **currently** being used by crime labs in all fifty states, by federal agencies, by the military, and by foreign governments including the United Kingdom where Mr. Nixon learned firearms and tool mark identifications.

The issues raised by the Defendant are not novel. Courts across the United States are being confronted with admissibility issues regarding firearm and toolmark identification. The NAS report was issued in August of 2009. The PCAST report was issued in September of 2016. The reports are consistent in their critiques of firearm and toolmark identification. Even with these critical reports, both state and federal courts whether using a *Frye or Daubert* standard are admitting ballistic identification evidence.

Issues for This Court

An issue to be reviewed is, in 2016, the Missouri Legislature passed a *Daubert* like statute in civil cases, to subject scientific testimony to a heightened standard, (later vetoed by the Governor). This statute is an attempt to prevent “junk” science from being allegedly used by the plaintiffs. If the legislature is concerned about junk science in civil cases, it surely is only a matter of time before the legislature passes legislation to apply the standard to criminal cases where a defendant’s freedom is at stake and a decision of a jury may rely on junk science.

In reviewing the procedure of administering a polygraph, there is a testing of heart rate, breathing and subjective opinion of the person who administers the test. This procedure has been denied for decades as admissible evidence in our courts, yet it is widely used by employers, United States government, State government and law enforcement. The process is not that different from ballistic testing.

The problem with ballistic evidence is that it is all subjective. There have been no large scientific studies to determine an error rate. The peer community is almost exclusively law enforcement. It is not scientific.

Toolmark identification is a very valuable investigative tool. However, that is where it should stay, in the area of law enforcement, not in the courts, just as the polygraph.

However, the standard we are to apply in Missouri is, “Whether opinion evidence...is admissible depends on whether the facts and circumstances shown by the evidence are such that a person of special skill by reason of training or experience in the field.” *State v. Moore* 690 S.W.2d 453 (Mo. App. 1985). The State produced evidence of the training required to be able to examine and decide if bullets matched each other.

Based on this standard and that Missouri Courts have for decades allowed ballistics experts to testify, this Court very reluctantly will allow the State’s lab person to testify, but only to the point this gun could not be eliminated as the source of the bullet.

So Ordered.

12/16/2016

DATED



CALVIN R. HOLDEN
CIRCUIT JUDGE, DIVISION V