District Court, Larimer County, State of Colorado Larimer County Justice Center 201 LaPorte Avenue, Suite 100 Fort Collins, Colorado 80521-2761 (970) 494-3500	DATE FILED: December 18, 2023 9:34 AM CASE NUMBER: 2023CR314
PEOPLE OF THE STATE OF COLORADO vs. **Defendant: JORGE ARREOLA**	**COURT USE ONLY** Case No: **2023CR314** Courtroom: **4B**

ORDER REGARDING OBJECTION TO INTRODUCTION OF EXPERT TESTIMONY REGARDING BALLISTICS AND FIREARM IDENTIFCATION OR IN THE ALTERNATIVE MOTION FOR SHRECK HEARING [D-6]

On March 1, 2023, the Defendant, Jorge Arreola, was charged with Criminal Attempt to Commit Murder in the Second Degree (F3), Possession with Intent to Manufacture or Distribute a Controlled Substance (DF3), and No Operators License (TIA). A trial is scheduled to begin on March 18, 2024.

The People have endorsed a ballistics expert, Scott Webb. On October 3, 2023, Mr. Arreola filed a Motion to bar/limit the expert testimony of Mr. Webb or in the alternative to conduct a Shreck Hearing ("Motion"). The People filed a Response on October 4, 2023 ("Response"). Mr. Arreola filed a Reply on October 4, 2023 ("Reply").

The Court granted the motion for a hearing on this matter. A hearing was held on November 30, 2023, and concluded on December 11, 2023. The Court heard the testimony of Julie Knapp, a forensic scientist with the Colorado Bureau of Investigation and J. Christopher McKee, an expert in the field at issue. The Court received several exhibits, primarily journal

articles regarding tool mark analysis related to firearms. After the hearing, the Court received a supplemental argument from Mr. Arreola indicating specifically the relief he was requesting.

The Court, having reviewed the pleadings, exhibits, the Court's file, and considering the testimony presented at the hearing, DENIES the Defendant's Motion, and enters the following order:

I. Legal Authority

C.R.E. 401 states, "'Relevant evidence' means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence." C.R.E. 402 states that "[r]elevant evidence is admissible." Rule 402 is a rule of inclusion and not exclusion.

While C.R.E. 401 and C.R.E. 402 reflect liberal admission of evidence, C.R.E. 702 and C.R.E. 403 temper that broad admissibility by giving courts discretion to exclude expert testimony if it is unreliable, irrelevant, or "its probative value is substantially outweighed by the danger of unfair prejudice." *People v. Martinez*, 74 P.3d 316, at 322–23 (Colo. 2003) (quoting C.R.E. 403).

C.R.E. 702 states that "[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." Generally, in this context the Court must ask whether the testimony

will be helpful to the finder of fact and whether the witness is competent to give an expert opinion on the subject. *Brooks v. People*, 975 P.2d 1105, 1109 (Colo. 1999).

For many years the Colorado Supreme Court followed the *Frye* test or a "general acceptance" standard for expert opinion reliability. *Frye v. United States*, 293 F. 1013 (D.C.Cir.1923). But this "general acceptance standard cannot apply unless the expertise being considered is based on, or derivative of, hard science." *Brooks*, 975 P.2d at 1111. "When proposed expert testimony involving experience-based specialized knowledge" is offered, "the trial court should first consider the standards for admissibility contained in C.R.E 702," which means deciding whether the testimony would be useful to the jury and whether the witness is qualified. *Id*. at 1114. If it is determined that such expert testimony may be admissible under C.R.E. 702 "the court must then apply its discretionary authority under C.R.E. 403" to consider whether the probative value of such expert testimony is substantially outweighed by the danger of unfair prejudice, confusion, and other factors. *Id*. In *People v. Shreck*, 22 P.3d 68 (Colo. 2001), the Court laid out a four-part test to determine the admissibility of an expert opinion pursuant to C.R.E. 702. In part, the Colorado Supreme Court's decision in *Shreck* was in reaction to the Federal Courts reconsideration of the *Frye* standard in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993) and *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137 (1999).

First, the Court must find that the opinion and the knowledge on which the testimony is based is reasonably reliable. *Shreck*, 22 P.3d at 78. In doing so, the Court must consider the reliability and relevance of the proffered testimony, particularly the reliability of the underlying scientific principles. *Id*. Regarding a specific finding of reliability of expert testimony, a trial

court should apply a liberal standard that only requires proof that the underlying scientific principles are reasonably reliable. *Id*. at 77. Certainty is not required, as certainty goes only to the weight the finder of fact should give the testimony. *Kleing v. State Farm Mut. Auto. Ins. Co.*, 948 P.2d 43 (Colo. App. 1997) (referencing *Vento v. Colorado National Bank-Pueblo*, 907 P.2d 642 (Colo. App. 1995)).

Second, the Court must determine whether the expert is qualified to give the opinion. *Shreck*, 22 P.3d at 78. Pursuant to C.R.E. 702, an expert may be qualified based upon "knowledge, skill, experience, training, or education."

Third, the Court must find whether the testimony will assist the jury. *Id*. This question asks whether the subject is one that is beyond the understanding and experience of the average juror and can enlighten them as to issues before them. *Huntoon v. TCI Cablevision of Colorado, Inc.*, 969 P.2d 681, 689 (Colo. 1998). "Expert testimony is admissible when it is useful to the jury." *Id*. at 79. Usefulness to the jury depends on whether the proffered expert testimony is "relevant to the particular case: whether it 'fits.' Fit demands more than simple relevance; it requires that there be a logical relation between the proffered testimony and the factual issues involved in the litigation." *People v. Tucker*, 232 P.3d 194, 203 (Colo. App. 2009) (citing *Martinez*, 74 P.3d at 323).

Lastly, the Court must exercise its discretion in determining whether the probative value of the evidence is not outweighed by the danger of unfair prejudice or the other trial concerns listed in C.R.E. 403. C.R.E. 403 states, "[a]lthough relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless

presentation of cumulative evidence." The Court is to give the evidence its maximum probative value and its minimal prejudicial effect. *People v. Quintana*, 882 P.2d 1366, 1374 (Colo. 1994).

The Court in *Shreck* further stated that a trial court should consider the totality of the circumstances in each case in making its findings and determination. *Shreck*, 22 P.3d at 78.

However, not all expert testimony is scientific testimony. In addition to scientific testimony, C.R.E. 702 allows testimony which is based on technical or other specialized knowledge. It provides: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." C.R.E. 702. "There is no requirement that a witness hold a specific degree, training, certificate, accreditation, or membership in a professional organization, in order to testify on a particular issue." *Huntoon*, 969 P.2d at 690; *see also City of Aurora v. Colorado State Engineer*, 105 P.3d 595, 625 (Colo. 2004).

It is proper for a court to admit non-scientific expert testimony while the testimony may not meet some of the familiar *Shreck* standards applicable to scientific opinions. Courts which have addressed the distinction between scientific and other expert testimony have noted under the earlier *Daubert* standard that: While *Daubert* focuses on scientific evidence, *Daubert* also applies to knowledge based on technical or specialized knowledge. *See Kumho Tire Co.*, 526 U.S. at 141-2.

The distinction between scientific and non-scientific expert testimony was recognized in Colorado in *People v. Brooks*. 950 P.2d at 652-3, *aff'd*, 975 P.2d 1105 (Colo. 1999). Referring to both

the *Frye* and *Daubert* tests, *Brooks* noted that neither test applies to non-scientific expert opinions. *Id*. at 653.

Both tests have been applied only to "scientific" evidence. Typically, this refers to testimony regarding "novel scientific devices and processes involving the manipulation of physical evidence including lie detectors, experimental system of blood typing, voiceprints, ID of human bite marks, and microscopic analysis of GSR." *People v. Hampton*, 746 P.2d 947, 950-951 (Colo. 1987), *abrogated by Shreck*, 22 P.3d 68.

In *Core-Mark Midcontinent, Inc. v. Sonitrol Corp.*, the trial court excluded testimony of defendant's expert fire protection engineer finding that his opinion was "unsupported 'by a scientific and/or technical analysis…" 300 P.3d 963, 972 (Colo. App. 2012). The reviewing court found that the trial court abused its discretion because the expert's testimony would have been helpful to the jury, and the expert's knowledge was based upon "applicable fire and building codes and fire safety recommendations." *Id*. at 975. The lack of scientific analysis in the opinion was irrelevant to a determination of admissibility under C.R.E. 702.

"In the case of an expert witness possessing experience-based specialized knowledge that is not dependent on a scientific explanation, a trial court must find that the testimony would be useful to the trier of fact and that the witness is qualified to render the expert opinion on the subject." *Schuessler v. Wolter*, 310 P.3d 151 (Colo. App. 2012). Further, the court must determine that the testimony is both relevant under C.R.E. 402 and not unfairly prejudicial under C.R.E. 403. *Id*.

II. Application of Legal Authority

In the current case, Mr. Arreola is accused of shooting the alleged victim while driving down the road. The People intend to present evidence through their expert, Mr. Webb, that the gun found in the possession of Mr. Arreola fired the bullet that hit the alleged victim.

The Defendant has objected to this testimony, arguing that the testing employed by Mr. Webb specifically involving ballistics, firearm, and toolmark identification generally are too unreliable to pass muster pursuant to *Shreck.* At the hearing, Mr. Arreola provided several articles, studies, and case law in support of that proposition.

A. Relevance

First, the Court finds that the evidence the People wish to present is relevant pursuant to C.R.E. 401. The testimony that the bullet found in the alleged victim's car was likely fired from the gun in Mr. Arreola's possession is clearly relevant.

B. Reliability of Scientific Principles

Next, the Court finds that the opinion and knowledge on which Mr. Webb's testimony is based is reasonably reliable. However, the Court is not currently finding Mr. Webb is qualified to opine on this issue pursuant to C.R.E. 702. The People will still need to lay the appropriate foundation for such testimony at trial.

Mr. Arreola argues that "[p]rior to 2009, firearm and toolmark identification testimony was generally considered reliable and therefore admissible." Motion, 2 (citing *People v. Genrich*, 471 P.3d 1102, 1106-07 (Colo. App. 2019)). He further argues that the sentiment changed in 2009 due to a report published by the National Academy of Sciences, Nat'l Research Council of the

Nat'l Acads., *Strengthening Forensic Science in the United States: A Path Forward* (2009) (hereinafter "NAS Report"). *Id*. He argues that the NAS Report "largely discredited toolmark and firearms identification as a reliable science." *Id*. [D-7 Att. A].

The Court disagrees with Mr. Arreola's interpretation of the report. While the Court notes that the report calls into the question the reliability of firearms identification procedures, it was hardly discredited by the report. The report seems to call into question the training of specific individuals, noting that many examiners perform multiple types of testing. NAS Report, 136. The Report then explains the process for toolmark and firearms identification. *Id*. at 150-155. This section of the report stands for the proposition that firearms analysis lacks a "precisely defined process." *Id.* at 155. The report states, "the process for toolmark and firearms comparisons lack the specificity of the protocols for, say, 13 STR DNA analysis. This is not to say that toolmark analysis needs to be as objective as DNA analysis in order to provide value." *Id*. The Court agrees with this assessment. The Court finds that a standardized process for firearms identification would benefit science, but the lack of that standardized process is insufficient for the Court to find that the science is not reasonably reliable.

Agent Julie Knapp testified as an expert in firearm and toolmark analysis and interpretation pursuant to C.R.E. 702. The Court notes that Counsel for the Defendant objected after voir dire on the issue of the witness' qualifications. The witness testified that she was certified by the Association of Firearm and Tool Mark Examiners in Firearms Evidence Examination and Identification as well as Gunshot Residue Evidence Examination and Identification. However, the Association has a third certification in toolmarks generally.

Toolmarks related to things like hammers, wire cutters, etc. The testimony was clear that the toolmark identification related to firearms is contained within the certifications held by the witness. The Court finds that the general toolmark certification is not relevant to the issues presented here.

Agent Knapp testified that the NAS Report was created primarily by judges and lawyers. The creation of the report excluded the input and expertise of practitioners and subject matter experts. The report was not reviewed by any practitioners in the field prior to publication. Interestingly, the NAS report makes several suggestions to improve the validity of toolmark/firearms identification which were already adopted by the CBI analysists in this field at the time the report was published.

Professor McKee also testified to the NAS Report. He testified that it was not just lawyers and judges who were on the Committee, but also scientists. The Court has reviewed the Committee make-up and determines that it is primarily made up of judges, lawyers, and academics. There are seemingly a few individuals who may be considered scientists, but there are clearly no practitioners of toolmark/firearm analysis. Professor McKee further testified to the issues related to the subjective nature of the field detailed in the NAS Report. The Court agrees that objectivity is generally better than subjectivity when one is trying to develop certainty, but the subjective component of the field is insufficient to find it unreliable.

Mr. Arreola further argues a report published by President's Council of Advisors on Science and Technology, President's Council of Advisors on Sci. & Tech., Forensic Science in Criminal Courts: Ensuring Science Validity of Feature-Comparison Methods (2016) (hereinafter

"PCAST Report"), shows there is a lack of validity and reliability in the field of firearms identification. Motion, 3 [D-7 Att. B]. This report again casts doubt on firearms analysis by showing the lack of processes and studies showing error rates. PCAST Report, 11-12. While the Report states that "earlier studies were inappropriately designed," the report does not explain how.

The Court further notes the Report calls into question both latent fingerprint analysis even though it finds it to be a "foundationally valid subjective methodology." *Id*. at 9. Further the report calls into question DNA interpretation. *Id*. at 8. The Report takes issue largely with any analysis that requires any subjective component. *Id*. at 8-38. The Court questions the logic of this argument. While subjective aspects of scientific observation could increase error rates, no scientific testing is wholly objective. There is always some level of interpretation that must take place. The subjective aspects of firearms identification raised in the report are of insufficient concern to find the scientific testing unreliable.

Agent Knapp testified that the PCAST Report committee contained no subject matter experts, nor was the Report peer reviewed by anyone in the field. Interestingly, the PCAST Report calls into question several toolmark/firearms studies because they were not peer reviewed by any practitioners in the field. If the Court were to discredit a study due to lack of peer review, the Court would have to completely discredit the PCAST Report for the same reason. Agent Knapp further called into question the use of the term "metrology" in the report as the study of measurements was not part of the PCAST Report. Agent Knapp concluded that

they must have confused metrology with metallurgy. She further stated that the Report was rejected by the Department of Justice, the Attorney General, as well as President Obama himself.

Mr. Arreola also attached to his motion an article published in Scientific American, David L. Faigman, Nicholas Scurich, Thomas D. Albright, *The Field of Firearms Forensics is Flawed*, Scientific American (May 25, 2022).[1] [D-7 Att. C]. This article cites the NAS Report for much of its foundational support. Because the Court finds the NAS Report to be insufficient to require exclusion, the Scientific American article's reliance on said Report is circular. This article again takes great issue with the concept that any decision can be made based upon subjective experience. *Id*. at 2. The Court again finds such objection to be insufficient to find the expert opinion unreliable.

This article argues that firearm examination studies have used the "inconclusive" result as a "correct" result and thus not an error. *Id.* at 3-4. The authors argue that "inconclusive" cannot be an answer in a study related to firearms identification in many of the prior studies. They state that "researchers studying firearms identification in laboratory settings create bullets and cartridge cases to use in their studies. Hence, they know whether comparisons came from the same gun or a different gun." *Id*. at 3. Therefore, "there are only two answers in these research studies; 'I don't know' or 'inconclusive' is not one of them. *Id*. The Court takes issue with these assumptions by the authors. In many tests there is an unknown sample, similar to field work. In that context, "inconclusive" is a perfectly acceptable finding.

[1] The Court notes that this is an op ed with a disclaimer from Scientific American that "the views expressed by the author or authors are not necessarily those of Scientific American.

Mr. McKee testified to this issue. The Court is unconvinced that based upon the ground truth that a casing came from a known gun, thus "inconclusive is an error." To the contrary, an error would be a match to a firearm that did not create the toolmark. In this context, "inconclusive" in this Court's view is a satisfactory answer and not an error.

The authors, taking issue with the "inconclusive" findings being counted as accurate findings, states, "[e]xisting studies, however, count inconclusive responses as correct (i.e. 'not errors') without any explanation or justification. These inconclusive responses have a huge impact on reported error rates." *Id.* The author then, without explanation or justification, lumps the inconclusive results into the category of "errors" thus drastically increasing the error rates. The author does this without keeping the "inconclusive" in their own category as he argues the researchers should have done in the same paragraph. *Id*. The Court finds this op-ed to be unpersuasive in its logic.

Agent Knapp further testified to several studies pointing to the validity of toolmark/firearms analysis. She testified to one study, Keith L. Monson, Erich D. Smith, Eugene M. Peters, Accuracy of Comparison Decisions by Forensic Firearms Examiners, J. Forensic Sci. 15 (2022) (hereinafter "AMES II Study") that, with more robust controls, produced a false positive error rate of less than one percent. Further, the AMES II Study was designed to force the examiners to make a false positive finding. Even considering that attempt, the false positive rate was less than one percent.

Professor McKee also testified to the AMES II Study. He stated that the error rate that was reported was in fact too low. He put the error rate at approximately thirty percent. He stated that the individuals who conducted the study simply ignored this error rate in their final report.

Agent Knapp spoke to a study conducted by Arizona State University, Max Guyll, Stephanie Madon, Yueran Yang, Kayla A. Burd, Gary Wells, *Validity of Forensic Cartridge-Case Comparisons*, PNAS 120 (2023) (hereinafter "Arizona State University Study"). She stated that this study was made up of sociologists and not practitioners. In the Court's view, this study could suffer from some of the same flaws suffered by the studies cited by Mr. Arreola. However, this study came to the opposite conclusion finding a false positive error rate of less than one percent. It should be noted that both the AMES II study and the Arizona State University Study are post-PCAST studies.

Next, she testified regarding the Firearm and Toolmark Research Summary by the Association of Firearm and Tool Mark Examiners. This is a summary of 105 studies regarding various aspects of firearms identification. Each of these articles lends credibility to the concept that toolmark/firearms analysis is valid and reasonably reliable. The People also admitted the 2018 S&W Cartridge Case Study, Mark A. Keisler et al., *Isolated Pirs Research Study*, AFTE Journal 50 (Winter 2018), the 2022 Study on 10 Consecutively Reamed an Button-Rifled Thompson/Center Arms G2 Contender Barrels, Brandon A. Best & Elizabeth A. Gardner, *An Assessment of the Foundational Validity of Firearms Identification Using Ten Consecutively Button-Rifled Barrels*, AFTE Journal 54 (Spring 2022), the 2018 Study on 10 Consecutively Rifled 9mm Ruger Pistol Barrels, James E. Hamby et al., *A Worldwide Study of Bullets Fired from 10*

Consecutively Rifled 9MM RUGER Pistol Barrels–Analysis of Examiner Error Rate, J. Forensic Sci. Technical Note (2018), and the 2020 Study on Beretta Barrels, Jaimie A Smith, *Beretta Barrel Fired Bullet Validation Study*, J. Forensic Sci. (2021). All these studies lend immense credibility to a finding that the toolmark/firearms identification science is reasonably reliable. Further, many of these studies show reliability even in situations where gun parts which leave marks were manufactured consecutively on the same machinery.

C. Usefulness to the Jury

The Court additionally finds that Mr. Webb's testimony will be useful to the jury. Mr. Arreola is charged with Criminal Attempt to Commit Murder in the Second Degree. Testimony that the bullet found in the alleged victim's car was likely fired from the gun in Mr. Arreola's possession bears a clear logical relationship to the factual issues involved in this case.

D. Probative and Prejudicial Value

Lastly, the Court finds that the probative value of Mr. Webb's testimony is not substantially outweighed by the danger of unfair prejudice, confusion of the issues, or other trial concerns listed in C.R.E. 403.

III. Conclusion and Order

The Court finds that the People have shown that the evidence to be presented related to toolmark/firearms identification is sufficiently scientifically reliable pursuant to *Shreck.* The Defendant has raised issues related to the reliability of the evidence and will be allowed to cross examine on all issues related to the expert's testimony. The Court further declines to limit the

testimony of the expert as requested by the Defendant. The issues raised are best handled on cross examination and not limitation or exclusion.

The Defendant's Motion is Denied.

SO ORDERED: December 18, 2023

BY THE COURT:

Daniel McDonald
District Court Judge