STATE OF ILLINOIS)
) SS.
COUNTY OF COOK)

IN THE CIRCUIT COURT OF COOK COUNTY
COUNTY DEPARTMENT, CRIMINAL DIVISION

PEOPLE OF THE STATE OF ILLINOIS	)	
	)	
vs.	)	15 CR 14066 01
	)	
RICKEY WINFIELD	)	
	)	
Defendant.	)	

REVISED ORDER AND MEMORANDUM RULING[1]

I. BACKGROUND AND PRELIMINARY COMMENTS[2]

A. Background

This matter comes before this Court on the matter of this post-hearing ruling on the admissibility of certain firearms identification evidence (namely, the multiple fired bullets and cartridge casings from the scene of the shooting in this case, the testimony from a firearms examiner, Brian Parr, in order to link those bullets and cartridge casings to a 45-caliber Hi-Point semiautomatic pistol (also recovered from the scene), and the 9mm-caliber Ruger semiautomatic pistol) after this Court allowed a discretionary *Frye* hearing and extensive post-hearing brief submissions and arguments by both sides in this instant matter.

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[1] This Revised Order and Memorandum Ruling edits in written form the oral ruling this Court made in this matter in open court on January 11, 2023.

[2] This Court adopts the whole of "Defendant's Post-*Frye*/Rule 403-Hearing Brief Against the Admissibility of Firearms Examination Evidence" (hereafter "Defense's Brief" found at Addendum II of this ruling) and the whole of the references/citations included therein except as otherwise clarified or rejected herein. In the body of this ruling, this Court has left in place the footnotes from those relevant portions of the Defense's Brief quoted herein for the purpose of judicial economy. Please look at the substance of those footnotes to further clarify this Court's ruling (see Addendum I of this ruling). The same holds true to any other footnotes left in place in this ruling that may pertain to other source documents upon which this ruling depends. Reference to "People's Final Pre-Hearing Brief" (hereafter "State's Brief" found at Addendum III of this ruling) is solely for the purpose of putting the Defense's Brief and this Court's ruling in their proper context.

This Court granted a *Frye* hearing in the instant matter within the sound discretion trial courts are allowed to exercise in determining whether or not to grant such hearings. It is important to note this order and memorandum ruling is confined to this instant matter only and does not rule on the admissibility of ballistics evidence as a whole.

B. Preliminary Comments

This Court starts by first complimenting the attorneys who have represented both sides with respect to the level of scholarship they have exhibited by the memoranda, briefs, and collections of evidence and testimony of the witnesses in support of their various authority and citations referenced in the *Frye* hearing.

Both sides provided invaluable information on the important matters relevant to this Court's decision-making role in these matters. Both sides have provided an abundance of issue-related materials to assist this Court in performing its constitutional duty in this case. The interest the State has with respect to public safety and to the goals and tasks they have as the prosecutors as well as their roles as upholders of constitutional due process rights are addressed in this ruling. Likewise, the Defense's obligations to their individual client and the due process rights their client possesses are also addressed in this ruling.

The summary of the procedural history in this case is simple: this Court has chosen to be more than a well-worn judicial rubber stamp that would simply and summarily deny a *Frye* hearing on the issue of the admissibility of firearms examination evidence without weighing the rapidly changing evidence-based questions and challenges surrounding this branch of forensic evidence.

In summary—at the request of the Defense in connection with the murder indictment and subsequent proceedings over the course of a number of weeks in March and April of 2022—a series of lengthy and complex pretrial evidentiary hearings involving testing from a number of

national experts on all areas concerning the vastly changing viability of the branch of forensics evidence known commonly as firearms identification evidence were held in this matter. This subfamily of evidence comes to us from a larger family of forensics evidence known as tool-mark forensic evidence. Similar to the subcategory of firearms identification evidence, tool-mark evidence itself has not favored well after the bright light of evidence-based forensic methods and means has been activated. The hearings were supplemented with rolling submissions from both the State and the Defense with affidavits, forensic articles, scientific study results, *etc.*

The relevant submissions of the parties which are referenced in the footnotes listed herein are attached as Addendum I to this ruling. Addendum II is a copy of the "Defendant's Post-*Frye*/Rule 403-Hearing Brief Against the Admissibility of Firearms Examination Evidence." Addendum III is a copy of the "People's Final Pre-Hearing Brief." All three addenda are incorporated herein as part of the ruling of this Court.

This order and memorandum ruling is the result of a *Frye* hearing granted by this Court at the request of the defendant, Rickey Winfield, and his attorneys from the Law Office of the Cook County Public Defender. The hearing was granted over the objection to the *Frye* hearing by the Cook County State's Attorney's Office. Nonetheless, the granting of the *Frye* hearing rested in the sound discretion of this Court. This Court is still confident in the discretion used in granting the instant *Frye* hearing.

II. **ISSUES**

The issues in this matter are simple in their articulation. It is the layers of separation and analysis required to render a just and fair result that a bit of measured and healthy, intellectual complexity emerges.

A. Issue One

Based upon what now appears to be an overabundance of evidence-based criticism of firearms identification evidence, does it still fit under the flag of general acceptance flown by the flag of *Frye*.

B. Issue Two

Did the State meet its burden of proof/standard of proof required in the *Frye* hearing conducted in this matter.

C. Issue Three

Even if firearms identification evidence survives its voyage under the *Frye* flag, will it then be able to successfully navigate around the evidentiary iceberg that sank the 1912 ill-fated *RMS Titanic* which Illinois Rules of Evidence (hereafter "IRE") 403 now threatens.

D. Issue Four

As a result of the instant *Frye* hearing, which proposed items of firearms identification evidence, if any, will be barred from admission during the pending trial of defendant, Rickey Winfield.

III. BURDEN AND STANDARD OF PROOF

The burden of proof on the scientific evidence in this case is to be met by the proponent of such evidence. In the instant matter, the State seeks the admission of firearms identification evidence so it must meet the applicable standard of proof from such evidence before its admissibility can be allowed. The State suggests the standard of proof it must reach to allow such *Frye* based evidence into the purview of finder of fact consideration is by a preponderance of proof standard. To this end, the State cites to the 1994 First District decision in *Watson*. *See People v. Watson*, 257 Ill. App. 3d 915, 925 (1994).

The State argues in its "People's Final Pre-Hearing Brief" (filed September 14, 2022) (hereafter "People's Brief") as follows:

> While *Watson* appears to be the only Illinois case to specifically address the burden of proof under *Frye* and admittedly does not engage in a lengthy analysis, the preponderance burden of proof is consistent with the burden imposed relative to other questions of evidentiary admissibility. *See People v. Peterson*, 2017 IL 120331 ¶37 (state's burden of proof at forfeiture by wrongdoing hearing is preponderance of the evidence); *People v. Rudd*, 2020 IL App (1st) 182037 (where evidence is relevant based on a condition of fact, the conditional fact must be proved by a preponderance of the evidence to allow admission under Ill. R. Evid. 104); *See also Bourjaily v. United States*, 483 U.S. 171, 175 (1987) (questions of fact that must be decided by a court in order to determine the admissibility of evidence under the Federal Rules of Evidence must be established by a preponderance of the evidence) and *Daubert v. Merrell Dow Pharms. Inc.*, 509 U.S. 579, FN 10 (1993) (preponderance of evidence standard applies to *Daubert* test); *C.f. People v. Braggs*, 209 Ill. 2d 492 (2004) (where a defendant challenges the admissibility of his confession, the state must prove the confession was voluntary by a preponderance of the evidence).

See p. 8 of People's Brief.

On the other hand, the Defense responds with its argument, essentially, NOT SO QUICK! The State and the Defense agree that the State must bear the burden of proof before such evidence is admitted but differ on the weight of the standard of proof in such a matter.

In the "Defendant's Post-*Frye*/Rule 403-Hearing Brief Against the Admissibility of Firearms Examination Evidence," (filed September 14, 2022) (hereafter "Defense's Brief") it responds in relevant part:

> Illinois appellate decisions also make eminently clear that, as the proponent of firearms examination evidence, the State bears the weighty burden of demonstrating the existence of such consensus.[56] But those same cases have left open the question of what quantum of proof the State must satisfy, be it preponderance of, or clear and convincing evidence. In fact, the only court to so much as mention the issue specifically noted that the *standard* of proof was "not discussed in the cases applying the *Frye* standard in this state," and merely surmised that said standard "*appears* to be a preponderance of the evidence," because "neither party dispute[d]" the issue.[57] Given that the selection of the standard of proof had so little bearing as to provoke not even argument by the parties, that *Watson* decision's reference to preponderance clearly qualifies as *obiter dicta* and does not bind this Court.[58] But, the question of whether to apply the preponderance standard or the higher burden of clear and convincing evidence turns out to be a troublesome one which has vexed and divided state courts.[59] Due Process, however, provides at least some direction in terms of setting a quantum of proof, mandating that courts weigh "the private and public interests affected, as well as a societal judgment about how the risk of error should be allocated between the

parties."[60] On the private side of the coin, the unique persuasive sway scientific evidence exacts on juries warrants additional caution, and thus a higher standard of proof, to prevent dubious experts from provoking wrongful convictions.[61] And the public interests and risk of error at stake do much the same. Unlike most pretrial rulings in criminal cases, which impact only the litigants in any individual matter, a decision under *Frye* "transcends that particular inquiry, for, in attempting to establish such general acceptance for purposes of the case at hand, the proponent will also be asking the court to establish the law of the jurisdiction for future cases."[62] That more wide-ranging impact has already prompted Illinois to adopt a far more searching *de novo* standard of review on appeal,[63] and should similarly lead this Court to require the heightened, clear-and-convincing evidence standard at the trial level.

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[56] *See People v. McKown* II, 236 Ill.2d at 294; *Bernardoni v. Indus. Comm'n* (Huntsman Chem. Co.), 362 Ill. App. 3d 582, 595 (3d Dist. 2005).
[57] *People v. Watson*, 257 Ill. App. 3d 915, 925 (1st Dist. 1994).
[58] *See People v. Lacy*, 2011 IL App (5th) 100347, ¶ 18.
[59] *Compare New Jersey v. Foley*, 851 A.2d 123, 127 (Super. Ct. 2003) (clear and convincing); *Kelly v. Texas*, 824 S.W.2d 568, 573 (Tex. Crim. App. 1992) (clear and convincing); with *Alford v. Maryland*, 180 A.3d 244, 252 (Ct. App. 2018) (preponderance); *Magaletti v. Florida*, 847 So. 2d 523, 526 (Fla. Dist. Ct. App. 2003) (preponderance).
[60] *In re D.T.*, 212 Ill. 2d 347, 361 (2004).
[61] *See Kelly v. Texas*, 824 S.W.2d 568, 573 (Tex. Crim. App. 1992) (applying a clear and convincing evidence standard given the "uncertainties inherent" to evaluating scientific evidence, and "the difficulty laypersons have in evaluating the reliability of novel scientific testimony"); *Ramirez v. Florida*, 810 So. 2d 836, 853 (Fla. 2001) ("Any doubt as to admissibility under *Frye* should be resolved in a manner that minimizes the chance of a wrongful conviction"); *compare In re Det. New*, 2014 IL 116306, at ¶26 (highlighting the "natural inclination of the jury to equate science with truth and, therefore, accord undue significance to any evidence labeled scientific").
[62] *Simons*, 213 Ill. 2d at 531.
[63] *See Id.*; *McKown II*, 236 Ill. 2d at 294-95.

See pp. 11-12 of Defense's Brief.

In this Court's view, it will adopt the more conservative view of standard of proof in these matters as argued by the State in the instant matter, absent further authority from a higher Illinois court of appeals or Illinois Supreme Court statute. Accordingly, standard of proof rests with the State and the standard of preponderance of the evidence, rather than the clear-and-convincing standard, is applied in the instant matter at this point under Illinois law. This Court is compelled to follow the preponderance standard although the public policy reasons suggested by the Defense should move higher courts to look at clarifying these matters in the future.

IV. DISCUSSION

One of the primary issues raised by the Defense in opposition to the admissibility of firearms identification evidence in the instant matter centers around the Defense's position that such is bottomed to unreasonable and unpredictable "purely subjective human judgments" to evaluate "individual characteristics of such evidence." The first task is this area of inquiry is to identify the breadth of the relevant scientific community that must logically be considered before facing the issue of defining the concept of "general acceptance" under *Frye* in the instant matter.

The State suggests a rather simplest approach to this issue by stating the following in its brief:

> The methodology employed by firearms examiners to identify or eliminate a particular fired component to another fired component, or a test shot from a known firearm is generally accepted by the relevant scientific community. The relevant scientific community to opine on generally acceptance includes forensic scientists practicing within the field of firearms identification and individuals with a scientific background and training sufficient to allow them to comprehend the methodology underlying firearm identification and to form a judgment about it. *People v. Luna*, 2013 IL App (1st) 072253 ¶ 76.
>
> The record establishes that firearms identification is generally accepted in the relevant scientific community. The discipline is practiced in over 200 accredited laboratories in the United States including the FBI Laboratory, the ATF Laboratory, and the United States Army Criminal Investigation Laboratory (Tr. 3/1/22 p. 48). Additionally, the discipline is practiced in countries throughout the world including England, The Netherlands, Israel, Greece, China, Canada, and Latin America (Tr. 3/1/22 p. 48). The ubiquity of the practice of firearms identification demonstrates that the methodology underlying this discipline is accepted not only by practitioners of firearms identification but also by the larger forensic science community including laboratory directors and organizations that offer laboratory accreditation, among others. Furthermore, over the last decade a series of black box false positive error rate studies in the field of firearms identification designed and conducted by classically trained scientists holding terminal degrees in relevant scientific fields demonstrates the reliability and concordant general acceptance of the discipline. These studies designed, conducted, and reported by scientists also establish that the acceptance of the methodology underlying firearms identification extends to the larger relevant scientific community and is not limited to practitioners of the discipline.

See pp. 1-2 of State's Brief.

> **4. Scientific reports, studies, or other writings in support of admissibility**
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> The People submit that the following validation studies which were entered into evidence by the People at the *Frye* hearing, which satisfied the PCAST study design requirements establish

that the field of firearms identification has a very low false positive error rate and demonstrate that the opinions of forensic scientists and lab directors around the world and researchers conducting these studies that the methodology employed by the field is generally accepted is well-founded:

> · People's Exhibit 2: "A Study of False-Positive and False-Negative Error Rates in Cartridge Case Comparisons," David P. Baldwin, Stanley J. Bajic, Max Morris, and Daniel Zamzow (April 7, 2014)
>
> · People's Exhibit 3: "Isolated Pairs Research Study,"Mark A. Keisler, Stacey Hartman, Angela Kilmon, Melissa Oberg, and Mitzi Templeton, AFTE Journal Vol. 50, No. 1 Winter 2018
>
> · People's Exhibit 4: "Report: Validation Study of the Accuracy, Repeatability, and Reporducibility of Firearm Comparisons," Stanley J. Bajic, L. Scott Chumbley, Max Morris, and Daniel Zamzow, (October 7, 2020)

Additionally, the statement of the FBI Laboratory in response to the Declaration Regarding Firearm and Toolmark Error Rates submitted by Vanderplas et. al. in this case referenced above provides a comprehensive discussion of the error rate studies of the firearm/toolmark discipline which spans more than two decades and demonstrates low false positive error rates of approximately 1% or less. Similarly, a recent law review article in the Baylor University Law Review by Colonel (Ret.) James Agar, "The Admissibility of Firearms and Toolmarks Expert Testimony in the Shadow of PCAST," 74 Baylor Law Review 93 Winter 2022, discusses error rate 10 studies in the field of firearm and toolmark identification making the case for the continued admission of such evidence.

See pp. 9-10 of State's Brief.

On the other hand, the Defense goes on to indicate the following, which includes the Defense's well taken criticisms of the State's sole witness Todd Weller, when they argue:

> SELF-CERTIFICATION'S INADEQUACY & THE STATE'S FAILURE TO MEET ITS BURDEN
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> Normally, applying these standards would require careful and nuanced assessments of the scope of the relevant scientific community, as well as meticulous vote counting within its bounds. After all, the mere act of drawing the borders of the relevant scientific community often, in and of itself, dictates the result of any litigation under *Frye*.[70] And, even if it does not, courts almost necessarily will struggle to determine "general acceptance" within said community given that no numerical guideposts exist against which to juxtapose / gauge the sufficiency of particular levels of agreement about the legitimacy of a methodology.[71] But this case requires no such troublesome inquiries: whatever dissent the *Frye* standard might tolerate,[72] however much it might forgive a lack of "unanimity" surrounding firearms examination,[73] it does not allow the State to meet its burden merely by demonstrating the acceptance of that method amongst its practitioners alone.

[70] *See e.g.*, Paul C. Giannelli; Edward J. Imwinkelried, "*The Frye General Acceptance Standard*," in SCIENTIFIC EVIDENCE, at §1.08 (2021) (calling selection of the relevant scientific community a "troublesome" task, but also emphasizing its importance because "selection of the appropriate field will often affect whether a novel technique satisfies the general acceptance test"); Adina Schwartz, "*A 'Dogma of Empiricism Revisited*," 10 Harv. J. Law & Tec 149, fn.176 (1997) (referring to the "***dispositiveness** of definitions of the relevant scientific community*") (emphasis added); Jennifer L. McGarrity, "*Facilitated Communication- Just Another Admissibility of Evidence Issue for Courts?*," 20 Dayton L. Rev. 935, 946 (1995) ("A court's decision regarding the relevant scientific community may unduly influence whether the proponent will be able to establish general acceptance"); *United States v. Williams*, 583 F.2d 1194, 1198 (2d Cir. 1978) ("Selection of the 'relevant scientific community,' appears to influence the result").

[71] *See Donaldson*, 199 Ill. 2d at 77-78 (emphasizing "consensus versus controversy" but also explaining that "the mere existence of a dispute does not preclude a finding that the procedure is generally accepted," nor must the court observe some "statistically significant" number of supporters for a method) (internal quotations & citations omitted).

[72] *See Luna*, 2013 IL App (1st) 072253, at ¶80.

[73] *Simons*, 213 Ill. 2d at 530.

Not only does such a conclusion follow necessarily from the original *Frye* decision itself (which concluded that despite the support of polygraph operators and technicians, i.e. its practitioners, the test had "not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting" it).[74] But Illinois appellate courts have also emphasized as much when they have "counseled against too narrowly defining the relevant scientific community to those who share the views of the testifying expert."[75] And other *Frye* jurisdictions have spoken all the more forcefully to the same effect, warning that to allow findings of general acceptance based only on the word of a method's practitioners—to permit "those who have developed and whose reputation and livelihood depends on use of the new technique [to] alone certify, in effect self-certify, the validity of the technique" —would undercut the "scrutiny of the marketplace of general scientific opinion" central to *Frye*.[76] In other words, while firearms examiners may constitute ***part*** of the relevant scientific community, the general acceptance standard requires more than their self-interested thumbs up:[77] it "requires the testimony of ***impartial*** experts or scientists" who have been convinced by practitioners to also believe in a method's legitimacy.[78] In fact, the First District in *Luna* showed such concern for, and attention to, this central pillar of the *Frye* standard that, when vetting the general acceptance of fingerprint analysis, it went out of its way to catalog the multitude of "academicians and practicing scientists representing a variety of scholarly as well as technical and scientific disciplines" who had testified in prior hearings regarding the reliability of the discipline.[79] The evidence presented by the State in this case, however, shows no such widespread support. Instead, the only sworn statement / testimony secured by the State on the question of firearms examination's general acceptance came from a practitioner, Todd Weller.[80] And its minimal efforts to demonstrate acceptance beyond firearms examiners themselves[81] either amounted to nothing more than speculation or failed as a matter of law to satisfy its burden.

[74] 293 F. 1013, 1014 (D.C. Cir. 1923).

[75] *Luna*, 2013 IL App (1st) 072253, at ¶75; *see also Bernardoni*, 362 Ill. App. 3d at 595 ("A court must not define the relevant field of experts so narrowly that the expert's opinion inevitably will be considered generally accepted. If the community is defined to include only those experts who subscribe to the same beliefs as the testifying expert, the opinion always will be admissible. The community of experts must include a sufficiently broad sample of experts so that the possibility of disagreement exists.").

[76] *Michigan v. Young*, 391 N.W.2d 270, n.24 (1986) ("To allow general scientific acceptance to be established on the testimony alone of witnesses whose livelihood is intimately connected with a new technique would eliminate the safeguard of scientific community approval implicit in the general scientific acceptance test. Scientific community approval is absent where those who have developed and whose reputation and livelihood depends on use of the new technique alone certify, in effect self-certify, the validity of the technique"); *see also Ramirez v. State*, 810 So.2d 836, 844 n.13 (Fla. 2001) (warning against reliance on experts who have a "personal stake" in the acceptance of a methodology or show "institutional bias"); *New York v. Wesley*, 633 N.E.2d 451, 464 (Ct. App.1994) (J. Kaye concurring) ("A Frye court should be particularly cautious when—as here—the supporting research is conducted by someone with a professional or commercial interest in the technique") (internal quotations & citations omitted"); *New York v. Williams*, 147 N.E.3d 1131, 1142 (Ct. App. 2020) (admission must be "supported by those with no professional interest in its acceptance. Frye demands an objective, unbiased review"); *Almeciga v. Ctr. for Investigative Reporting, Inc.*, 185 F. Supp. 3d 401, 420 (S.D.N.Y. 2016) (noting that "review by a competitive, unbiased community of practitioners and academics ... would be expected in the case of a scientific field") (internal citations & quotations omitted).

[77] *See Watson*, 257 Ill. App. 3d at 925-26 (refusing to limit the relevant scientific community to forensic scientists alone), *citing United States v. Porter*, 618 A.2d 629, 634 (D.C. 1992) ("It simply is not creditable to argue ... that general acceptance may be premised simply on the opinion of forensic scientists").

[78] *Ramirez*, 810 So.2d at 851 (emphasis added); *see also People v. Davis*, 75 Cal. App. 5th 694, 719 (2022) (requiring courts "receive the testimony of *disinterested and qualified* experts on the issue of the scientific technique's general acceptance in the relevant scientific community") (emphasis original, internal citations & quotations omitted); *Arizona ex rel. Collins v. Superior Court*, 644 P.2d 1266, 1285 (1982) ("Acceptance must be by those experts who are relatively disinterested and impartial and whose livelihood, therefore, is not intimately connected with approval of the technique"); *Young*, 391 N.W.2d at 273-74 ("the party offering novel scientific evidence has the burden of demonstrating general scientific acceptance for reliability among impartial and disinterested experts before the evidence may be admitted"); *California v. Leahy*, 882 P.2d 321, 330 (1994) (*Frye* "contemplates an undefined period of testing and study by a community of experts before a new scientific technique may be deemed generally accepted, thus delaying the admissibility of evidence derived from the technique").

[79] 2013 IL App (1st) 072253, ¶¶ 77-78 (also highlighting that, in past hearings, even experts for the Defense had not opined that "that fingerprint evidence is unreliable or should not be allowed in court").

[80] The State's second witness, Caryn Tucker, was also a firearms examiner, but this brief does not linger on her during its discussion of *Frye* because the State called her only to

discuss quality assurance and not to opine on the general acceptance / reliability of her field. *See Testimony of Caryn Tucker*, WINFIELD FRYE HEARING TR., at 49 (The State asked Ms. Tucker only "as a training coordinator and a professional firearms/toolmark examiner, do you have an opinion as to whether or not the procedures and protocols that we have talked about here today are generally accepted within the field of firearm identification?").

[81] *See* **STATE EX.12**: Todd J. Weller, "*Declaration in Illinois v. Winfield, 15CR14066-01*," at 5-6 & 12-14 (Dec. 10, 2021); *Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 87-90.

As an initial matter, to avoid the implications of reliance solely on firearms examiners, the State attempted to suggest (for the first-time during closing arguments) that, even standing alone, Mr. Weller's opinion about the validity of firearms examination counts for something more than the practitioner viewpoint: "insofar ... as there's this criticism or this idea that we can't just rely upon firearms examiners, you're talking about a gentleman who has a broad scientific background, who is not limited as a firearms examiner by trade only."[82] But even putting aside the myriad ways the record belies that claim—among other shortcomings: the State sought to qualify Mr. Weller solely as an expert in "[f]irearm and tool mark identification and firearm and tool mark error rate studies," (with this Court agreeing only to the former); his only education in and experience with traditional, laboratory sciences came at the undergraduate level;[83] his coursework in the relevant fields of metallurgy, materials engineering, metrology, computer science, research design, and statistics amounted to a single undergraduate course in the final of those disciplines; and (given the topic of his thesis) even his masters program in forensic science clearly focused on firearms examination[84]—the State's argument mistakes the central premise of the cases counseling against methodological self-certification. The concern raised by their references to impartiality is not one of knowledge / experience but one of bias / allegiance, and their requirement of proof of acceptance beyond practitioners aims to guard against witnesses "so personally invested in establishing the technique's acceptance that [they] might not be objective about disagreements within the relevant scientific community."[85]

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[82] *Closing Arguments*, WINFIELD FRYE HEARING TR., at 22-23.

[83] To the extent Mr. Weller's time as a DNA analyst in a law-enforcement crime lab would seem to contradict this statement, it bears mentioning that he does not hold himself or other members of the firearms examination field to the standards for examination and testimony commonplace in the realm of DNA analysis. *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 106-09 & 118-120.

[84] *See id.* at 33-40 & 44-46.

[85] *Davis*, 75 Cal. App. 5th at 719 (internal citations & quotations omitted).

As at least one court has already concluded, Mr. Weller falls flat under such a litmus test.[86] Before even considering the substance of his testimony, the record here establishes that Mr. Weller presently relies primarily on firearms examination consulting work to support himself; has toured the country to defend his field in admissibility hearings; has worked in, and

testified almost exclusively for, law enforcement over the last 16 years; has published articles exclusively related to the field of firearms examination; and has submitted those articles to / taken part in the editorial process for only forensic as opposed to more general science journals.[87] But diving into Mr. Weller's various claims and admissions reveals an even more pernicious thumb on the scale. Time and time again (in this hearing and the many others at which he has testified) Mr. Weller has shown no ability whatsoever to fulsomely educate judges or to provide objective testimony (testimony capable of admitting weakness in addition to highlighting strengths). Among other displays of partiality:

· Mr. Weller evidences no desire to engage with, or to understand the concerns of his field's critics. Shockingly, he (1) did not even bother to read all the declarations/affidavits of the Defense's experts;[88] (2) admitted to a glaring lack of familiarity with the make-up, purpose, and work products of an organization as important as the National Commission on Forensic Science[89] (a standard-setting agency formed under the ambit of the Department of Justice in collaboration with the National Institute of Standards and Technology to reform and improve the reliability of forensic science);[90] and only "skimmed" a publication critical of firearms examination by a group of statisticians from the Center for Statistics and Applications in Forensic Evidence ("CSAFE"), even though he acknowledges that (as developers of emerging 3D comparison algorithms for his field) those authors unquestionably constitute part of the relevant scientific community.[91]

· Mr. Weller has mischaracterized the range of false positive findings for the field of firearms examination, even in sworn testimony. In this hearing (when confronted with multiple examples) Mr. Weller acknowledged the existence of studies on the accuracy of firearms examiners showing false positive rates (even by his own calculation methods) well-beyond the threshold of 5% set by PCAST;[92] in fact, there have been three such studies showing false positive rates of 39.6%, 9.48%, and 10.8%.[93] But he also made a rather disturbing admission: not only did he fail to discuss these studies during sworn testimony at prior admissibility hearings,[94] he had actually claimed (falsely) that no study had ever demonstrated a false positive rate above 1.6%.[95] Whether Mr. Weller knowingly misled these courts, or simply lacked a knowledge base adequate for the task of providing accurate testimony makes precious little difference. Regardless of the reason for his false claims, his repeated mischaracterizations on an issue as central to the validity of firearms examination as the field's misidentification rate show that he cannot be trusted to give this Court sound, objective, or thorough information on questions of scientific legitimacy and general acceptance.[96]

· Mr. Weller similarly failed to objectively inform PCAST about the full range of error rate findings relevant to their review of firearms examination. In 2015, as vice chair of the Organization of Scientific Area Committees ("OSAC") Firearm / Toolmark Subcommittee, Mr. Weller (along with several other firearms examiners in that organization) responded to a call from PCAST to provide references regarding the field's foundational research; essentially an information gathering exercise in advance of the publication of that organization's 2016 report on forensic science.[97]

The response spans 26 pages, cites to over 50 references, and includes all manner of research (conference presentations, error rate studies, papers by European and American based authors, etc...).[98] Yet, despite its length, that response does not reference the two studies discussed in the preceding paragraph which had been published before its release.[99] Mr. Weller claims that he (and presumably his firearms examiner peers on the OSAC Subcommittee at the time) simply were "not aware" of those studies when they issued the response, after all, not "a single person ... ever pip[ed] up to say why don't we tender [them] to PCAST."[100] But it bears considering that, given the availability of those studies to firearms examiners through the AFTE Journal and yearly conference,[101] any accidental failure to provide them would essentially have required a one-of-a-kind epidemic of simultaneous (and highly convenient) memory lapse on the part of over a dozen practitioners. The Defense leaves it to this Court to decide whether the occurrence of such seemingly-contagious amnesia—with regards to studies as notable as two showing the highest false positive rates (9.48% and 39.6%) ever recorded in the field no less—is deserving of belief.[102]

· When he designed his own studies on examiner accuracy (albeit focused on the use of virtual comparison microscopy as opposed to traditional light comparison microscopes),[103] Mr. Weller made sure to use samples so easy / simplistic as to essentially guarantee low rates of misidentification. As regards the first, he stunningly admitted that he would expect lay people (without training or experience in firearms examination) to be able to complete the test without committing any misidentifications (and, in fact, when a group of lawyers from the Bronx Defenders tried their hand at samples from the study, they passed it with flying colors).[104] And as to the second, Mr. Weller in essence conceded that, despite the paper's claim to have included samples "spanning a range of expected comparative complexity,"[105] it ultimately did not utilize cartridge cases with "features that are similar that could provoke a misidentification."[106] That Mr. Weller designed and published these studies knowing full well the inadequacy of such simplistic testing of different-source samples without any coincidental similarity,[107] itself speaks volumes (and indicates a desire to manufacture favorable error rates for his field over and above a commitment to actually evaluating accuracy). But worse still (and as he admitted in this hearing), he has shown little honesty about their limitations when testifying under oath. In admissibility hearings undertaken by defense attorneys unwilling or unable to confront him regarding the weaknesses of the Duez study, for example, Mr. Weller testified significantly about that research without giving judges so much as a hint that the study might have been too simplistic to warrant much of any weight; in fact he did the opposite, claiming that it actually demonstrated the field's validity pursuant to the criteria set forth by PCAST.[108] And his excuse for such misleading testimony—"I can only answer what I'm asked"—rings supremely hollow given that he displayed such a penchant for editorializing in this hearing as to warrant a rebuke from this Court, along with a warning that your Honor was "not going to let [him] write [his] next book in response to a question."[109]

[86] *See Ross*, 129 N.Y.S.3d at 633 & 639 (calling Weller "an impassioned advocate for AFTE toolmark identification theory" and further explaining: "*Frye* demands an unbiased, objective review by those with no professional interest in its acceptance. The professional standing and livelihood of forensic scientists depends on the validity of AFTE theory. Certainly this came across in the testimony of Mr. Weller, a professional consultant and frequent expert witness for the prosecution. The targeted use of AFTE theory by law enforcement investigators, under pressure and with potential for confirmation bias, limits the degree of intellectual rigor and detachment that counts as neutral scientific expertise").

[87] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 40-43; *compare Davis*, 75 Cal. App. 5th at 719 ("Factors such as being a leading proponent of the scientific technique, having a long association with its development and/or promotion, or having a vested career interest in its acceptance in the scientific community are among those that show a lack of impartiality by the expert") (internal quotations & citations omitted).

[88] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 85-86 ("Q. Are you familiar with -- have you had occasion to review the declarations and/or affidavits submitted by the defense in this case? A. I have reviewed some of them but not all of them").

[89] *See Id.* at 115-116 ("A. I'm aware of the commission. I'm not really aware, nor did I pay much attention to the overall makeup of the national commission...Again, you are getting outside my expertise. I don't know who their author was, who was the founder. I can't speak to what their work product -- what it was aimed for. Q. You are familiar with the fact that they released a views document on the use of the term reasonable scientific certainty, right? A. That rings a bell. Q. They have rejected the use of that terminology? A. I don't know if it was reasonable scientific certainty or just scientific certainty, something along those lines"); *see also* NCFS, "*Views on Use of the Term 'Reasonable Scientific Certainty'*," (2016), *available at* https://www.justice.gov/archives/ncfs/work-products-adopted-commission.

[90] *See* NCFS, "*Reflecting Back-Looking Towards the Future*," (2017), *available at* https://www.justice.gov/archives/ncfs.

[91] *Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 153-55; *see also* **DEF. EX.11**: Heike Hofmann *et al.*, "*Treatment of inconclusives in the AFTE range of conclusions*," 19 Law, Prob., & Risk 317, 342-43 (2020) (the paper discussed with Weller, which concludes that "It seems clear from our assessment of the currently available studies that there is significant work to be done before we can confidently state an error rate associated with different components of firearms and toolmark analysis").

[92] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 64 & 217-19 (not just acknowledging, but relying on the PCAST threshold of 5% to argue validity); **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 151-52 ("Methods with a high FPR are scientifically unreliable for making important judgments in court about the source of a sample. To be considered reliable, the FPR should certainly be less than 5 percent and it may be appropriate that it be considerably lower, depending on the intended application").

[93] *See id.* at 219-241; **DEF. EX.16**: Julie Knapp & Angela Garvin, "*Consecutively Manufactured .25 Auto F.I.E. Barrels- A Validation Study*," Presentation at AFTE 43rd Annual Training Seminar (2012) (false positive rate with inconclusive responses removed of 39.6%); Alan Dorfman & Richard Valiant, "*Inconclusives, errors, and error rates in*

forensic firearms analysis: Three statistical perspectives," 5 For. Sci. Int'l: Synergy 100273, at 2 (2022) (providing the data on inconclusive responses necessary to calculate the Knapp study false positive rate); **DEF. EX.15**: Petra Pauw-Vugts et al., "*FAID: Proficiency Test & Workshop*," 45 AFTE J 115, 124-25 (2013) (false positive rate with inconclusive responses removed of 9.48%); **DEF. EX.14**: Erwin J.A.T. Mattijssen et al., "*Validity & reliability of forensic firearm examiners*," 307 For. Sci. Int'l 110112, at 7, Table 2 (2020) (false positive rate with inconclusive responses removed of 10.8%). These figures use PCAST's method for calculating false positive rates of dropping inconclusive responses, in other words FPR = FPs / FPs + Eliminations. *See* **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 51-52, 109, & 111. The Defense uses this metric, because it would naturally correspond with PCAST's own 5% threshold, and because Mr. Weller does not oppose that approach. *See e.g.*, Transcript of Proceedings, United States v. Harris, Case Number 19-cr-358, at 85 (Oct. 15, 2020).

[94] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 242-43 ("these papers were around, they were published before several of the admissibility hearings regarding firearms examination that you have testified at, right? A. Yes. Q. Not once in any of those admissibility hearings have you mentioned, have you brought up either of those two studies? A. Yes…I did not bring those – those studies are not discussed").

[95] *See Id.* at 219 ("Q. You have on multiple occasions said that the range of false positive rates in studies conducted in firearms examination ranges from 0 to 1.6 percent? A. Yes."); Transcript of Proceedings, *United States v. Harris*, Case Number 19-cr-358, at 84-85 ("Q: In your opinion, what is the range of false positive error rates you've seen over the past couple of decades in research? A: The error rates range from 0 percent up to 1.6 percent. Q: the government cites the various validation studies showing false positive rates within that range, 0 to 1.6 percent. In your experience, are you aware of a single study using traditional microscopic examination of physical evidence or 3D imaging that would refute that the error rate of the discipline falls within this range? A: I'm not aware of any studies that would be outside of that range."); Transcript of Proceedings, *New York v. Ross*, Ind.# 267-2018, at 778 (Jan. 21, 2020) ("so the worst overall error rates is 1.6 percent and the smallest measured one is zero percent").

[96] In fact, even in this hearing, Mr. Weller provided inaccurate testimony regarding the final of the above-cited studies. Specifically, he tried to explain away its double-digit, false-positive rate by arguing that the study itself, and the examiners involved, used a different, likelihood-ratio conclusion scale. *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 220-21 & 245. That claim, however, misstates the characteristics of the examiners involved, and the design of the study. Of the participating examiners 75% (58 of 77) used a categorical conclusion scale (identification, inconclusive, elimination) in casework, not a likelihood-ratio approach. *See* **DEF. EX.14**: Mattijssen et al., "*Validity & reliability of forensic firearm examiners*," 307 For. Sci. at 4. And although the study did ask participants to "to assign a degree of support for their source judgment on a six-step verbal scale," they did so only after providing an opinion as to source, and were further asked to state whether they "would feel confident to report their judgment about the source in casework or would provide an 'inconclusive' conclusion." *Id.* at 5. There is no reason to believe that those examiners using the same, categorical conclusion scale at issue in this hearing ignored that final question and would not have reported their false positives as identifications in casework. Thus, their false positive rate is fully applicable to our sense of the accuracy of examiners, like those at the ISP, using such a scale.

[97] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 243-45.
[98] *See* OSAC Firearm/Toolmark Subcommittee, "*Response to the President's Council of Advisors on Science and Technology (PCAST),*" (Dec. 23, 2015), *available at* https://www.nist.gov/organization-scientific-area-committees-forensic-science/firearms-toolmarks-subcommittee.
[99] *See Id.*; *Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 244.
[100] *Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 244-45.
[101] *See Id.* at 229-30, 236-37, & 244-45.
[102] To that end, this Court should know that forgetting the FAID study was not Mr. Weller's only instance of memory lapse, or perhaps selective attention. For example, although he informed this Court that the term "unique" inappropriately suggests unscientific exclusion of all other guns in the world, he suspiciously could not recall that the AFTE Theory of Identification (his field's main source of guidance for identification conclusions, and spanning less than a page) uses that terminology. *See id.* at 49 & 111-12. And while he showed an impressive ability to recall aspects contained even in the appendixes of the PCAST report, he could not remember whether that same reference criticized the AFTE Theory of Identification's use of the phrase "practical impossibility," even though PCAST discusses the issue five times and across various sections. *See id.* at 64-65 & 114; **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 19, 29, 60, 137, 145, & 151).
[103] *See* **DEF. EX.12**: Pierre Duez et al., "*Development and Validation of a Virtual Examination Tool for Firearm Forensics*," 63 J. For. Sci. 1069 (2018); **DEF. EX.13**: Chad Chapnick et al., "*Results of the 3D Virtual Comparison Microscopy Error Rate (VCMER) Study for firearm forensics*," J. For. Sci. 1-14 (2020).
[104] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 211 ("Q. Would it surprise you given the way these samples look if lay people without training and experience in firearms examination could complete the Duez study without committing a false positive? A. No."); **DEF. EX.12**: Duez et al., "*Development and Validation of a Virtual Examination Tool for Firearm Forensics*," 63 J. For. Sci. at 1083 ("it is difficult to infer the reason a false identification was made" because "The shears are quite different"); **DEF. EX.40**: Emily J. Prokesch, "*Declaration in Illinois v. Winfield, 15CR14066-01*," (Dec. 13, 2021) (documenting that six attorneys took a version of the test using images and none committed a false positive).
[105] **DEF. EX.13**: Chapnick *et al., "Results of the 3D Virtual Comparison Microscopy Error Rate (VCMER) Study*," J. For. Sci. at 12.
[106] *Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 216.
[107] *Id.* at 194 ("Q. When you are testing specificity, it is important to also make sure that you are including different source comparisons that bear some level of coincidental similarity, right? A. Yes. Q. It is important, in other words, to try and test close nonmatches? A. Yes.").
[108] *Id.* at 204-05 ("Q. With regards to the Duez study, you have testified about this study in a court before, right? A. Yes. Q. When you have done that, you have never alerted judges that this is an easy study, that its results should be taken with a grain of salt, right? A. I can only answer what I'm asked as we have demonstrated here today"); Transcript of Proceedings, *United States v. Harris*, Case Number 19-cr-358, at 66-74 (Weller testimony regarding Def. Ex.12, the Duez study, including claims regarding its relevance to PCAST's criteria).
[109] *Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 185-86.

Even if the State could establish the general acceptance of firearms examination through a solitary expert (a dubious proposition at best),[110] Todd Weller is clearly not that witness. His professional association with, and dependence on, firearms examination renders his objectivity suspect from the get-go. And as the preceding examples clearly demonstrate, his lack of impartiality transcends the theoretical; it simply should not require a Defense attorney carting multiple banker's boxes worth of exhibits to court for a purported expert to offer fulsome and accurate testimony. This Court should therefore find him not credible and should determine whether the State has met its burden under *Frye* based solely on whether it produced evidence of general acceptance beyond Mr. Weller's self-serving claims; ultimately it did not.

To that end, the State's attempts to show that non-firearms-examiners also consider the method legitimate, none of them persuasive, came in four flavors. Specifically, the State focused on (1) the practice of firearms examination in accredited laboratories around the world;[111] (2) the policy statements of law-enforcement agencies;[112] (3) a handful of papers by non-practitioners;[113] and (4) Mr. Weller's wholly-speculative opinion that laboratory quality assurance managers and directors, along with academic researchers developing 3D comparison algorithms and coauthoring error-rate studies, approve of the field's present methodologies.[114] Of those efforts, the first two scarcely require discussion. Illinois law makes clear that a method's use in crime labs cannot "justify admission of evidence in the face of a bona fide scientific dispute,"[115] and similarly gives essentially no weight to the opinions of law enforcement agencies.[116] As to the latter, however, it does bear mentioning that things are even worse than the State's reliance on law-enforcement opinions would make them seem: both references are unsigned / anonymous (thereby making it impossible for this Court to assess whether their authors even have a seat within the relevant scientific community), but appear, to the extent one can glean authorship, to have been drafted by prosecutors, not scientists.[117]

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[110] *See e.g., California v. Kelly*, 549 P.2d 1240, 1248 (Sup. Ct. 1976) ("we think it questionable whether the testimony of a single witness alone is ever sufficient to represent, or attest to, the views of an entire scientific community regarding the reliability of a new technique. Ideally, resolution of the general acceptance issue would require consideration of the views of a typical cross-section of the scientific community, including representatives, if there are such, of those who oppose or question the new technique").

[111] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 47-48; **STATE EX.12**: Weller, "*Declaration in Illinois v. Winfield*," at 5-6.

[112] *See "FBI Laboratory Response to the Declaration Regarding Firearms and Toolmark Error Rates Filed in Illinois v. Winfield*," (May 3, 2022); "*United States Department of Justice Statement on the PCAST Report: Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*," (Jan 13, 2021), *available at* www.justice.gov/opa/pr/justice-department-publishes-statement-2016-presidents-council-advisors-science-and.

[113] *See e.g.*, **STATE EX.13**: Alex Biedermann & Kyriakos N. Kotsoglou, "*Forensic science and the principle of excluded middle: 'Inconclusive' decisions and the structure of error rate studies*," For. Sci. Int'l: Synergy 100147 (2021).
[114] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 87-90.
[115] *People v. Harbold*, 124 Ill. App. 3d 363, 379 (1st Dist. 1984).
[116] *See McKown II*, 236 Ill.2d at 300 ("Law enforcement, however, is not a scientific field. Therefore, general acceptance within law enforcement circles cannot be the basis for finding scientific evidence admissible under Frye").
[117] For example, the DOJ's statement appears to have been written by Ted Hunt, a career prosecutor. *See* Jessica A. Mortan & Samara M. Spence, "*Request for Correction Under the Information Quality Act*," UNION OF CONCERNED SCIENTISTS, at 13-16 (June 24, 2021) ("portions of the Statement are verbatim or nearly identical to large portions of the law review article published by the career prosecutor who replaced DOJ's scientific advisory committee. The Statement's failure to acknowledge authorship prevents the public from understanding whether and to what extent it is engaged in a scientific—or legal—debate," also documenting the statements "verifiably false" claims regarding the position of the American Association for the Advancement of Science); Christina Swarns, "*Letter to Acting Attorney General Monty Wilkinson & Acting Deputy Attorney General John Carlin*," Innocence Project (Feb. 4, 2021) (describing the statemen as "[l]argely based on a previous publication by Senior Advisor on Forensic Science Ted Hunt"); Katie Kronick, "*Forensic Science and the Judicial Conformity Problem*," 51 Seton Hall L. Rev. 589, 628 (2021) (documenting nearly identical comments by Mr. Hunt at a 2017 symposium for judges on forensic science).

The State fares no better when trying to establish general acceptance by noting that several of the exhibits it introduced throughout this hearing were authored (at least in part) by academic scientists and/or mathematicians. If those individuals actually made statements indicating a belief in the validity and general acceptance of current firearms examination methods, the State might make up some ground carrying its burden (although this Court would still be left to wonder why, with such disinterested parties available, the State chose to call a firearms examiner as its only live witness subject to cross examination). But none do. Two such papers (error rate studies conducted by largely the same group of academics from the AMES Laboratory) contain no statements whatsoever regarding the authors' views on the general acceptance or validity of firearms examination.[118] The third, although taking issue in metaphysical terms with the position of several Defense experts in this case (discussed more fully later in this brief, but for purposes of this section: potentially counting inconclusive responses as errors, or otherwise acknowledging that their use may artificially deflate false positive rates), similarly makes no claim that the results of firearms examination validation studies (or any other basis) support viewing the field as legitimate; in fact the paper does not even include the word firearm.[119] And the final reference (an affidavit filed in a D.C. case in response to the opinions expressed by CSAFE statisticians in this matter) actually supports the Defense's ultimate argument that the validity of firearms examination, as performed by human examiners, remains mired in controversy: the authors of that statement not only caveat that they "express no opinion on whether the field of forensic feature-comparison, as applied to firearms examination, meets or should be considered to meet any specific legal requirement(s) or test(s) regarding, for example, for admissibility," they actually

admit that they cannot provide a satisfactory answer as to whether "feature-comparison in forensic firearms examination [is] a valid method," because of ongoing "debates" and "disagreements" about how to assess examiner accuracy.[120] At bottom, the State's reliance on these publications to demonstrate general acceptance beyond firearms examiners relies on a false equivalency between that standard and mere discussion amongst scientists.[121] Without more—specifically without evidence that the authors of these publications actually endorse firearms examination methods—the existence of academics debating the scientific nuances associated with calculating error rates cannot satisfy *Frye*. In fact, quite the opposite, "[w]here controversy rages, a court may conclude that no consensus has been reached."[122] The debates highlighted by the State's exhibits, in that sense, not only fail to carry its burden, they underscore the Defense's claim that the legitimacy of firearms examination remains unsettled.

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[118] *See* **STATE EX.2**: David P. Baldwin et al., "*A Study of False-Positive and False-Negative Error Rates in Cartridge Case Comparisons,"* Technical Report # IS-5207 (2014); **STATE EX.4**: Stanley J. Bajic et al., "*Validation Study of the Accuracy, Repeatability, and Reproducibility of Firearm Comparisons*," Technical Report # ISTR-5220 (2020).

[119] *See* **STATE EX.13**: Alex Biedermann & Kyriakos N. Kotsoglou, "*Forensic science and the principle of excluded middle: 'Inconclusive' decisions and the structure of error rate studies*," For. Sci. Int'l: Synergy 100147 (2021). In fact, that paper includes at least six statements explicitly noting agreement with the position of the Defense's experts, and goes on to reject the notion that examiners can and should validly report opinions using an identificationinconclusive-elimination scheme. *See id.* at 2-5 (for example the authors state that, "it is difficult to disagree with Dror & Scurich that current practices for processing "inconclusives" are unsatisfactory, and prone to adversely affect standard operating procedures for computing error rates"). Where they depart company from the Defense experts, they do so on philosophical and theoretical grounds so opaque that even other scholars find them incomprehensible. *See e.g., id.* at 5 ("Dror & Scurich's view conflates the ontological level of analysis ... with the epistemic level of analysis"); *Testimony of David Faigman*, WINFIELD FRYE HEARING TR., at 69-70 (Apr. 21, 2022) ("So it is a little bit difficult to understand why they wrote it ... I don't know what metaphysical world they are living in, but in the metaphysical world I live in, the question presented is the question of the accuracy of the diagnostic test"); *Testimony of Dr. Nicholas Scurich*, WINFIELD FRYE HEARING TR., at 73 (Apr. 14, 2022) ("So, much like the rest of this paper, I'm frankly confused by what they're trying to argue").

[120] *See* Alex Biedermann, Bruce Budowle, Christophe Champod, *"Forensic feature-comparison as applied to firearms examination: evidential value of findings and expert performance characteristics: Reply to the affidavit by Vanderplas et al. (2022) submitted in US v Kaevon Sutton* (2018 CF1 009709)," at 6 & 6-18 (Apr. 28, 2022).

[121] *See e.g., Collins*, 49 Misc.3d at 612 ("this court cannot accept the thesis that publication and discussions equate to general acceptance").

[122] *Wesley*, 633 N.E.2d at 464.

That leaves just the State's arguments regarding laboratory directors and researchers developing 3D comparison algorithms. Initially, Mr. Weller's beliefs about the views of these groups (the only source of information presented by the State in that vein) amounted to nothing more than speculation (for example, regarding the latter he said only that, if such researchers harbored doubts about the validity of firearms examination as performed by human examiners, he would "***find it hard to believe*** they would continue to be professionally involved in that pursuit of research").[123] But worse still, they also contradict the record in this case: the only laboratory directors, or developers of 3D algorithms, whose sworn statements came into evidence in this case testified (or produced affidavits) for the Defense. This brief will further elaborate on their views of firearms examination in later sections, but for now it should suffice to note that those experts (contrary to the State's assertions during closing arguments)[124] did not mince words when positioning themselves in opposition to the general acceptance of firearms examination. Dr. Salyards (whose storied career in forensics, including high level roles in accrediting agencies and a tenure as the chief scientist for the United States Army's crime lab, the State did not dare attack)[125] called firearms examination an "immature" method, opined that the available studies from the field do not show that its methods are "well-settled and ... established," and clarified that the deficiencies in firearms research he identified go "beyond mere imperfection" and "have to be investigated."[126] And the four statisticians / 3D algorithm developers from CSAFE (Drs. Alicia Carriquiry, Heiki Hofmann, Khori Khan, and Susan Vanderplas) were no less forceful: "Fundamentally, we do not know what the error rate is for these types of comparisons. This is a failure of the scientific study of toolmarks, rather than the examiners themselves, but until this is corrected with multiple studies ... we cannot support the use of this evidence in criminal proceedings."[127]

Moreover, these experts went beyond just voicing their dissent from the validity of firearms examination, they also made clear why and how their involvement in and around that field should not, and does not, signal support for its present methods. Dr. Salyards explained at length why he (and presumably other quality managers or directors) could oversee laboratories using firearms examination without necessarily ascribing to a view in the field's validity, including that he hoped to (and ultimately did) promote the precise chain of research studies relied on by Mr. Weller and the State in this case.[128] And regarding 3D algorithm developers, it makes perfect sense (as these experts have personally clarified) that working to create new methods to supplant the old implies no endorsement of the subjective, human comparison model they hope to replace.[129] But more than that, a review of the approaches taken, and the caution exercised, by these researchers (CSAFE statisticians and beyond) actually reveals that current studies on the performance of human examiners—covering only, as later sections of this brief will demonstrate, a precious few variables in terms of sample/gun type—could not possibly satisfy their high standards.[130] Ultimately, the words of the women of CSAFE put it best: "Our intent in approaching the discipline ... is constructive: until the extent of the cancer is identified, treatment cannot begin."[131] As every medical doctor alive would tell this Court, treating a disease never equals endorsing it.

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[123] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 88-89 (emphasis added).

[124] *See Closing Arguments*, WINFIELD FRYE HEARING TR., at 18-20.
[125] *See Id.* at 18 ("I certainly don't quibble with any of his credentials, you know, the principal scientist at the U.S. Army Crime Lab. He's done a lot of great things in his career."); *see also* **DEF. EX.34**: Michael J. "Jeff" Salyards, *Curriculum Vitae* (2021); *Testimony of Dr. Jeffery Salyards*, WINFIELD FRYE HEARING TR., at 5-21 (voir dire).
[126] *Testimony of Dr. Jeffery Salyards*, WINFIELD FRYE HEARING TR., at 33, 36, 69-70, & 134.
[127] **DEF. EX.41**: Susan Vanderplas, Khori Khan, Heike Hofmann, & Alicia Carriquiry, "*Declaration in Illinois v. Winfield, 15CR14066-01: Firearms & Toolmark Error Rates*," at 9 (Jan. 3, 2022); Susan Vanderplas, Khori Khan, Heike Hofmann, & Alicia Carriquiry, "*Reply to Response by FBI Laboratory filed in Illinois v. Winfield and Affidavit by Biederman et al. (2022) filed in US v. Kaevon Sutton (2018 CF1 009709),*" at 28 (Jul. 1, 2022) (opining that the research in firearms examination "falls well short of that required for 'broad scientific support' due to fundamental issues with internal and external validity in the validation studies which exist to date"); **DEF. EX.11**: Hofmann *et al.*, "*Treatment of inconclusives in the AFTE range of conclusions*," 19 Law, Prob., & Risk at 342-43 ("It seems clear from our assessment of the currently available studies that there is significant work to be done before we can confidently state an error rate associated with different components of firearms and toolmark analysis").
[128] *See Testimony of Dr. Jeffery Salyards*, WINFIELD FRYE HEARING TR., at 52-53.
[129] *See* **DEF. EX.11**: Hofmann *et al.*, "*Treatment of inconclusives in the AFTE range of conclusions*," 19 Law, Prob., & Risk at 344 ("An effective approach to eliminate the biases associated with the current approach to firearm and tool examination is to rely on automatic, objective algorithms... Even though the use of algorithms is not far in the future, we should also work to resolve the biases associated with the current practice of firearm and toolmark identification"). If the State thinks otherwise, it could only be by conflating a belief (1) in the reality that, generally speaking, guns leave behind discriminating marks on the bullets and cartridge cases they fire, with (2) one in the capacity of human examiners using nothing more than subjective eyeballing and judgment to appropriately compare and derive meaning from these marks. Even the State's own exhibits recognize this fundamental distinction. *See* Biedermann, Budowle, Champod, "*Forensic feature-comparison as applied to firearms examination*," at 16-18. As that reference would imply, the CSAFE statisticians, and other 3D researchers in the field, clearly depend on the truth of that first belief, without making the leap of faith necessary to put faith in the method (human comparison) presently relied on to vet the significance of firearms markings. *See e.g.*, Vanderplas, Khan, Hofmann, & Carriquiry, "*Reply to Response by FBI Laboratory and Affidavit by Biederman et al. (2022),*" at 3, 28, & 33.
[130] *See* **DEF. EX.41**: Vanderplas, Khan, Hofmann, & Carriquiry, "*Declaration in Illinois v. Winfield,*" at 6 ("We cannot generalize error rates from small consecutively manufactured firearm studies to the entire population of firearms examinations, and as a result, we do not know how to assess the error rate of the discipline as a whole on the basis of these studies. Researchers are well aware of these limitations and typically characterize their findings in a much more limited fashion than some professional expert witnesses."), *citing* Fabiano Riva *et al.*, "*Objective Evaluation of Subclass Characteristics on Breech Face Marks*," 62 J. For. Sci. 417, 422 (2017) ("even if the results obtained in this study illustrate the impact of subclass characteristics for a given make and model of firearm, they cannot be easily transposed to all firearms at this stage. We remain conscious of the

limitation of the sample used here. It is known that the quality and the quantity of these features will vary as a function of the type of firearms and the manufacturing process"); *see also* John Song *et al.*, "*Estimating error rates for firearm evidence identifications in forensic science*," 284 For. Sci. Int'l 15, 19 (2018) (noting that, given its sample of just ten consecutively-manufactured breechfaces: "The current test is intended mainly to demonstrate the error rate procedure rather than to show application to a real result from case work"); Eric Hare *et al.*, "*Automatic Matching of Bullet Land Impressions*," Annals Applied Stat. at 25 (2017) ("To understand whether an automated approach along the lines of the one we propose can accurately identify sets of bullets with undistinguishable markings, it will be necessary to assemble a much larger database that includes a wide range of ammunition types, degrees of dam-age, gun makes, etc. We are unaware of the existence of any such database. In addition to serving as a realistic testbed for the performance of the auto-mated matching algorithm, such a database would also permit testing the underlying, as of yet untested, assumptions of uniqueness and reproducibility of the markings left by a gun on bullets").

[131] *See e.g.*, Vanderplas, Khan, Hofmann, & Carriquiry, "*Reply to Response by FBI Laboratory and Affidavit by Biederman et al.* (2022)," at 3.

All told, the State made essentially no effort to impeach, or otherwise call into question, the five ***Defense*** experts it fully acknowledges deserve a place within even its own construction of the relevant scientific community. Nor (despite bearing the burden of proof) did it provide any reason for this Court to think that the views expressed by Dr. Salyards and the CSAFE statisticians would not be shared by, and are not representative of, the larger communities of laboratory directors and academic firearms researchers they inhabit. Coupled with its failure to present a single solitary sentence from any non-practitioner—through live testimony, sworn affidavits, publications, or any other source—endorsing the current methodology underlying firearms examination, this reality compels only one conclusion: the State failed utterly to meet its burden of proof under *Frye*. Reliance on the opinions of a single, incredible witness from within the challenged field of firearms examination simply cannot carry the day.

See pp. 13-26 of Defense's Brief.

While the above outlines the State's failure to establish the "general acceptability" of firearms identification evidence to meet the requirements of *Frye* to satisfy its burden of proof, the Defense took the Court on an even deeper dive against the admissibility of such evidence. In this portion of the Defense attack, it moved to persuade this Court that other experts should be accepted to review and opine on the problems with firearms identification evidence.

Such experts can be characterized under the broad label as human factors experts. These human factors experts offered in the *Frye* hearing covered how statistics, study decisions, research, testing

methods, and human interpretation factors all play critical roles before general acceptability may be assumed. This was a broad and complex area of evidence which demonstrates the whole of firearms identification evidence is in fact no longer widely accepted except by a minimally educated law enforcement, self-interested employee who simply peers through a microscope while trusting his own biased eyes to make a judgment call without any measure of a set of evidence-based objective criteria.

To this end, the unrebutted testimony of Defense witness David Faigman explains in detail the danger of inconclusive responses in firearms examination, *see* pp. 45-46 of Defense's Brief. Indeed, to summarize this hearing declaration in the instant matter, he concluded the testimony in this so-called area of forensics is just about as reliable as the flipping of a coin, *see* p. 46 of Defense's Brief and Defense Exhibit 41. This invaluable defense expert goes on to explain the implications these processes may have not only in a given case but more importantly the global problems caused by such business as usual methods. These gross problems with inconclusive results impact the establishment of a real error rate for such examination processes, *see* p. 46 of Defense Brief and footnotes 224, 225, and 226 in further explanation. These practices mask true error rates and are sometimes referred to as "artificially and falsely" masking, confusing, or, at worst, "deflat[ing] estimates of error," *see* p. 47 of Defense's Brief and footnotes 228, 229.

Another source of error in firearms examination evidence is found in the area of inconclusive samples being interpreted differently by examiners for a variety of reasons. The problem is the individual experiences rarely identified known samples in exams, procedures, and testing protocols that produce reasonable and scientifically sound results that can be accepted as trustworthy, *see* pp. 48-52 of Defense's Brief.

Yet another problem with this brand of "evidence" is it falls flatly on its face when the basic requirements of any area of scientific or forensic examination is used. Simply stated, the concepts of repeatability and reproducibility are not just nice to have requirements. These two requirements are basic and simply mandatory. In the areas of firearms identification forensics, the Defense expert Nicholas Scurich by his testimony and affidavit points out these requirements are nothing less than "a prerequisite for having a valid assessment technique," *see* pp. 52-53 of Defense's Brief and footnotes 251-253 cited herein.

Next the Defense separately takes the Court into an even more terror-filled room of the State's haunted house of firearms identification evidence. In that basement room of horrors, the Defense kicks open the room the Court will now call the High False Positive Hideout. In this room, we see the false positive evidence under this category of problems as high as almost 40%, *see* pp. 54-57 of Defense's Brief and footnotes cited therein.

Another area which the Defense raised is a problem with so-called "forensic evidence" caused by those problems inherent with what is called subclass characteristics analysis. This problem causes confusion in the identification procedures where the manufacturing of firearms is not as individually distinguishable as they were once believed to be.

Additionally, there is another viable criticism of this area of firearms identification that does not take into account that those characteristics of some firearms which actually mimic the appearance of other weapons. See pp. 57-59 of Defense's Brief. These many and diverse problems with firearms identification have not been evidence has not been adequately addressed by the analysis of firearms identification examination or the State in the instant *Frye* hearing, and mitigate against any argument of general acceptability.

The last Defense attack specifically launched against firearms identification evidence centers around the dangers against reliability of result based upon the existence of cognitive bias. In a field where subjective examination is often the beginning, middle, and end of what is at best an extremely shaky, subjective process, the Defense dove wide and deep while the State stayed in the swamp with nothing to counter.

In its brief, the Defense points out:

> G) The Field's Susceptibility to Cognitive Bias
>
> The inadequacies of firearms examination, however, extend beyond just gaps in our understanding of, and faith in, the field's accuracy. The discipline has also failed to garner support in the relevant scientific community because of its susceptibility to, and neglect of safeguards against, cognitive biases. For over a century, psychologists have recognized that "people do not process information in a purely objective way. Instead our judgements and our perceptions tend to be colored by our idiosyncratic beliefs, desires, motivations, experiences or by the contextual situation in which the information is presented."[297] As such, "people often interpret the same information in different ways" even though "in matters of fact, at least one of these differing interpretations must be incorrect."[298] Such biases can impact any and all subjective, human judgments,[299] but (as research shows)[300] they pose an especial problem in the realm of subjective feature-comparison methods like firearms examination "where stimulus ambiguity, context-driven expectations, and motivations conspire to create fertile conditions for psychological contamination and bias to operate."[301] Worse still, good intentions and awareness do not suffice to combat these pernicious flaws in perception; "they cannot be willed away."[302] Instead, psychologists uniformly agree that only appropriate methodological safeguards and procedures can minimize the potential inaccuracies injected into forensic decision making by cognitive biases.[303] While other scientific disciplines have taken substantial steps to do so,[304] Dr. Kukucka identified two ways in which (by contrast) firearms examination's very methods invite / fail to protect against well-recognized sources of bias: the discipline's procedures (1) call for side-by-side comparisons of items without prior evaluation and documentation of "each sample in isolation,"[305] and (2) do not require truly blind / independent verification of all conclusions[306] (Dr. Kukucka also raised concerns regarding exposure to task-irrelevant information, which this brief will tackle in the next section). Until the field remedies these deficits it will remain outside the scientific norm, and the community of psychologists / scholars with expertise in cognitive bias will not accept it as mature and reliable.[307]

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[297] *Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 113; *see also* **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 131 ("Cognitive bias refers to ways in which human perceptions and judgments can be shaped by factors other than those relevant to the decision at hand. It includes 'contextual bias,' where individuals

are influenced by irrelevant background information; 'confirmation bias,' where individuals interpret information, or look for new evidence, in a way that conforms to their pre-existing beliefs or assumptions; and 'avoidance of cognitive dissonance,' where individuals are reluctant to accept new information that is inconsistent with their tentative conclusion"); **DEF. EX.8**: NAS, "*Strengthening Forensic Science*," at 117-118 ("Human judgment is subject to many different types of bias, because we unconsciously pick up cues from our environment and factor them in an unstated way into our mental analyses. Those mental analyses might also be affected by unwarranted assumptions and a degree of overconfidence that we do not even recognize in ourselves").

[298] **DEF. EX.18**: Jeff Kukucka, "*Affidavit in Illinois v. Winfield, 15CR14066-01*," at 3; *Testimony Dr. Jeffery Kukucka,* WINFIELD FRYE HEARING TR., at 124-25 ("Q. Can these biases actually influence or impact ultimate conclusions in forensic decision making? A. Definitely. There is no shortage of research evidence to that effect.").

[299] *See* **DEF. EX.25**: National Commission on Forensic Science, "*Ensuring that Forensic Analysis is Based on Task-Relevant Information,"* at 4 (2015) ("Contextual bias is not a problem that is unique to forensic science. It is a universal phenomenon that affects decision making by people from all walks of life and in all professional settings"); *Testimony Dr. Jeffery Kukucka,* WINFIELD FRYE HEARING TR., at 186 ("Q. Doctors. I mean literally no limit to what this could - - If human judgement is involved, cognitive bias plays a role? A. You took the words right of out my mouth. Yep.")

[300] *See e.g.*, **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 31 (summarizing findings); NCFS, "*Ensuring that Forensic Analysis is Based on Task-Relevant Information*," at 4 (same); **DEF. EX.18**: Jeff Kukucka, "*Affidavit in Illinois v. Winfield, 15CR14066-01*," at 4 (same).

[301] **DEF. EX.19**: Saul M. Kassin et al., "*The forensic confirmation bias: Problems, perspectives, and proposed solutions*," 2 J. App. Research Memory & Cognition 42, 48 (2013); *see also Testimony Dr. Jeffery Kukucka,* WINFIELD FRYE HEARING TR., at 131 ("Q. So why is cognitive bias particularly problematic then within pattern matching fields? A. Precisely because they tend to be highly subjective. They certainly vary in their subjectivity, but generally speaking the more subjective the judgement, the higher the risk of cognitive bias effecting that"); **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 5 ("Subjective methods require particularly careful scrutiny because their heavy reliance on human judgment means they are especially vulnerable to human error, inconsistency across examiners, and cognitive bias. In the forensic feature-comparison disciplines, cognitive bias includes the phenomena that, in certain settings, humans may tend naturally to focus on similarities between samples and discount differences and may also be influenced by extraneous information and external pressures about a case").

[302] **DEF. EX.8**: NAS, "*Strengthening Forensic Science*," at 117-118; *see also Testimony Dr. Jeffery Kukucka,* WINFIELD FRYE HEARING TR., at 116, & 159-60 ("Q. You told us this is unconscious. Can cognitive bias be willed or wished away? A. Unfortunately no"); NCFS, "*Ensuring that Forensic Analysis is Based on Task-Relevant Information*," at 5 ("contextual bias is by no means limited to cases of misconduct or bad intent. Rather, exposure to task-irrelevant information can bias the work of FSSPs who perform their job with utmost honesty and professional commitment. Moreover, the nonconscious nature of contextual bias also means that people cannot detect whether they are being influenced by it. It follows that task-irrelevant information can bias the work of FSSPs even when they earnestly and honestly believe they are operating with utmost objectivity").

[303] *See e.g., Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 117-18 & 159-60 ("Q. Similarly, can a technical discipline like firearms examination naturally be immune from cognitive bias? A. No. Q. So is it acceptable then, Dr. Kukucka, in your opinion to ignore the impact of cognitive bias in any technical or scientific methodology? A. No, it would not be acceptable to ignore" & "Q. Do you agree then, Doctor, that forensic science practitioners and the lab in which they work must guard against the influence of bias in order to provide reliable and correct testimony? A. Absolutely" & "Q. And again...When Ms. Tucker this morning testified about the ethics portion of the Command directives where she mentioned the analysts are to keep an open mind and remain objective, similarly, Doctor, is that sufficient without actual, practical, required procedure to mitigate against bias? A. I think that's admirable, but not at all sufficient. To address this problem it requires concrete intervention"); **DEF. EX.8**: NAS, "Strengthening Forensic Science," at 8 & 191 (forensic "disciplines need to develop rigorous protocols to guide these subjective interpretations ... The development of such research programs can benefit significantly ... from the large body of research on the evaluation of observer performance in diagnostic medicine and from the findings of cognitive psychology on the potential for bias and error in human observers" & further emphasizing need to "develop standard operating procedures ... to minimize, to the greatest extent reasonably possible, potential bias"); **DEF. EX.19**: Saul M. Kassin et al., "*The forensic confirmation bias: Problems, perspectives, and proposed solutions*," 2 J. App. Research Memory & Cognition at 48-50 (recommending reforms to combat bias in forensics).

[304] *See e.g.*, **DEF. EX.8**: NAS, "*Strengthening Forensic Science*," at 122 ("Science takes great pains to avoid biases by using strict protocols to minimize their effects. The 1996 National Academies DNA report, for example, notes, '[l]aboratory procedures should be designed with safeguards to detect bias and to identify cases of true ambiguity. Potential ambiguities should be documented'"); **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 31 ("The biomedical science community, for example, goes to great lengths to minimize cognitive bias by employing strict protocols, such as double-blinding in clinical trials").

[305] **DEF. EX.18**: Jeff Kukucka, "*Affidavit in Illinois v. Winfield, 15CR14066-01*," at 5; *Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 132.

[306] **DEF. EX.18**: Jeff Kukucka, "*Affidavit in Illinois v. Winfield, 15CR14066-01*," at 6-9; *Testimony Dr. Jeffery Kukucka,* WINFIELD FRYE HEARING TR., at 132.

[307] *See id.* at 169 & 171 ("Q. Doctor, must a mature and reliable methodology guard against cognitive bias? A. Yes. I mean you can say that about any science. Any science is only as strong as its methodology" & "Q. Doctor, do you have an opinion then as to whether firearms examination ... whether they have adequately mitigated against the influence of cognitive bias? A. In my opinion they have not").

Even an analyst isolated from all outside information about a case cannot escape the influence of cognitive biases: the samples themselves can provoke a form of "tunnel vision" or "circular reasoning" if not fully analyzed in isolation from one another.[308] More specifically, "when one jumps immediately into a side-by-side comparison, there is a tendency to seek out similarities and thereby overlook differences between the two samples, and in so doing, ignore or disregard or explain away information that they would otherwise deem relevant to their decision."[309] The famous misidentification of Brandon Mayfield in the fingerprint realm provides a troubling example of this problem,[310] and research across other forensic fields

further underscores the danger.[311] Luckily psychologists, forensic scientists, and other researchers have coalesced around a fairly straightforward solution known as Linear Sequential Unmasking; essentially "rather than jumping directly into a side-by-side comparison of these two items of evidence, it's actually preferable to analyze each item of evidence and document the analysis of each item of evidence independently before looking at them side by side."[312] Yet, while other forensic disciplines (including at the Illinois State Police) have incorporated this approach into their methods,[313] firearms examination has done no such thing. Examiners, by policy and practice, jump straight to side-by-side comparisons without a full analysis or documentation of each cartridge case or bullet in isolation.[314] Accordingly, the field not only enjoys no general acceptance among psychologists and other experts in cognitive bias, but falls outside the norm of even other forensic endeavors. In such a state, firearms examination (even putting aside all the other arguments in this brief regarding research and accuracy issues) cannot satisfy *Frye*.

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[308] *Id.* at 133-35; *see also* **DEF. EX.20**: Dan E. Krane *et al., "Letter to the Editor-Sequential Unmasking: A Means of Minimizing Observer Effects in Forensic DNA Interpretation,"* 53 J. For. Sci. 1006 (2008) ("forensic analysts are commonly aware of submitted reference profiles when interpreting DNA test results, creating the opportunity for a confirmatory bias"); **DEF. EX.19**: Saul M. Kassin et al., "*The forensic confirmation bias: Problems, perspectives, and proposed solutions,*" 2 J. App. Research Memory & Cognition at 49 (noting "the potential influence of the target [sample] on how information is processed and the weight assigned to it"); **DEF. EX.18**: Jeff Kukucka, "*Affidavit in Illinois v. Winfield,* 15CR14066-01," at 5 ("forensic examiners may evaluate the same item of evidence differently depending on whether they analyze it in isolation or alongside another item of evidence. This is a particular concern in pattern-matching disciplines, where examiners compare two samples ... one of known origin and one of unknown origin—and opine as to whether they share a common source ... To be exact, the mere presence of a comparison sample can lead examiners to selectively attend to points of correspondence between the two samples and thereby fail to notice other important information").

[309] *Testimony Dr. Jeffery Kukucka,* WINFIELD FRYE HEARING TR., at 133*; see also* **DEF. EX.21**: Itiel E. Dror *et al., "Letter to the Editor- Context Management Toolbox: A Linear Sequential Unmasking (LSU) Approach for Minimizing Cognitive Bias in Forensic Decision Making,"* 60 J. For. Sci. 1111 (2015) ("it is possible that an analyst's interpretation of the trace evidence might inadvertently be influenced by knowing the characteristics of the reference samples—a form of bias arising from circular reasoning").

[310] *See Testimony Dr. Jeffery Kukucka,* WINFIELD FRYE HEARING TR., at 133-34 ("Q. During the investigation of this misidentification, did sort of the powers that be determine that the act of merely looking at the crime scene evidence next to the reference samples played a role in that misidentification? A. Yes. And in fact, in their subsequent review of the case, the Office of the Inspector General specifically cited confirmation bias as a contributing factor"); **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts,*" at 90 ("Reviewers believe the misidentification resulted in part from ... going from the known print to the latent image in a way that led to overreliance on apparent similarities and inadequate attention to differences" & "A notable example of the problem of bias from the exemplar resulting in circular reasoning occurred in the Madrid misidentification, in which

the initial examiner reinterpreted five of the original seven analysis points to be more consistent with the (incorrect) exemplar").

[311] *See e.g., Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 132-135 ("What studies have repeatedly shown is that by doing the individual item analysis before the side-by-side comparison, examiners actually undertake a more thorough, more comprehensive analysis"); **DEF. EX.18**: Jeff Kukucka, "*Affidavit in Illinois v. Winfield, 15CR14066-01*," at 5 ("To illustrate, Dror and colleagues16 found that presenting fingerprints individually rather than in pairs led experts to produce a more thorough analysis. In their study, 20 fingerprint experts were asked to count the number of minutiae ... in ten latent prints—half of which were shown in isolation and half of which were shown alongside a comparison print. On average, examiners counted 26% more minutiae in the same latent print when it was presented alone, suggesting that the mere presence of a comparison print led examiners to overlook features of the latent print that they would have otherwise deemed important. From this, the authors concluded that examiners should first 'examine the latent mark in isolation, prior to being exposed to any potential comparison print" so as to produce a "more objective analysis'"); William C. Thompson, "Painting the target around the matching profile: the Texas sharpshooter fallacy in forensic DNA interpretation," 8 L., Prob., & Risk 257, 261-62 (2009) (documenting shifts in opinion by analysts about whether peaks should be termed alleles or artefacts based on whether presented as advancing or damaging the potential of including a defendant in a mixture); Bradford T. Ulery et al., "*Changes in latent fingerprint examiners' markup between analysis and comparison*," 247 Forensic Sci. Int'l 54, 59 (2015) (explaining that the only misidentification is their study resulted from an examiner making significant changes to their mark up after exposure to a suspect print); **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 102 ("Work by FBI scientists has shown that examiners typically alter the features that they initially mark in a latent print based on comparison with an apparently matching exemplar. Such circular reasoning introduces a serious risk of ... bias").

[312] *Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 132 & 135-39; *see also* **DEF. EX.20**: Dan E. Krane *et al., "Letter to the Editor- Sequential Unmasking: A Means of Minimizing Observer Effects in Forensic DNA Interpretation,"* 53 J. For. Sci. 1006 (2008) (recommending the same); **DEF. EX.19**: Saul M. Kassin *et al.*, "*The forensic confirmation bias: Problems, perspectives, and proposed solutions*," 2 J. App. Research Memory & Cognition at 49 (same); **DEF.EX.21**: Itiel E. Dror et al., "*Letter to the Editor-Context Management Toolbox: A Linear Sequential Unmasking (LSU) Approach for Minimizing Cognitive Bias in Forensic Decision Making*," 60 J. For. Sci. 1111 (2015) (same); **DEF. EX.22**: Itiel E. Dror & Jeff Kukucka, "*Linear Sequential Unmasking–Expanded (LSU-E): A general approach for improving decision making as well as minimizing noise and bias*," 3 For. Sci. Int'l: Synergy 100161 (2021) (same); **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 32 & 149.

[313] *See e.g.*, Glenn Langenburg & Christophe Champond, "*The GYRO System—A Recommended Approach to More Transparent Documentation*," 61 Journal of Forensic Identification 377 (2011) (providing documentation system for linear method in fingerprint field); Illinois State Police, "*Forensic Biology/DNA Procedures Manual: Interpretation PowerPlex® Fusion*," Division of Forensic Services, Forensic Sciences Command, at 9 (Oct. 30, 2019) ("the genotypes for the unknown evidentiary profiles must be determined before a comparison to a reference standard").

[314] *See Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 166 ("Q. And the portion of the procedure that I just handed to you and that we have talked about throughout, is there anything in the first stage of analysis, the side-by-side, is there anything in the procedure that directs ISP analysts to guard against the effects of circular reasoning? A. No, there is not. The procedure implies that they should proceed immediately into a side-by-side comparison."); **DEF. EX.29**: Illinois State Police, "*Firearms & Toolmarks Procedures Manual- Microscopic Comparison*," Division of Forensic Services, Forensic Sciences Command (Apr. 26, 2011) (procedure in place at time of examination makes no mention of analyzing or documenting each bullet or cartridge case in isolation); *Testimony of Caryn Tucker*, WINFIELD FRYE HEARING TR., at 74 ("Q. And you don't document any individual characteristics until there's a side-by-side analysis? A. That is correct").

But the problem does not end there; the final step of firearms examination (a verification, or reanalysis, by a second examiner) also falls prey to cognitive bias. As Dr. Kukucka pointed out, the opinion of that second examiner does not so much as qualify as independent, much less provide its intended effect as a quality assurance safeguard, when the verifier knows, or can guess at, the opinion originally reached by their peer.[315] Instead, "if the verifying examiner is aware of the original examiner's conclusion, they naturally become prejudiced to agree with that conclusion rather than conducting their own independent evaluation of that evidence," and if laboratories "do not verify all judgements, they only selectively verify certain types of judgement," this "can create an expectation on behalf of the verifying examiner that can create a bias."[316] Recent research backs up Dr. Kukucka's concerns; specifically, a group from the Netherlands "analyzed 568 real-world firearms verification decisions—and sure enough, they found that verifiers were far less likely to disagree with their colleague's opinion if they were aware of it (12.5%) than if they were unaware of it (42.3%)."[317] Thus, a host of researchers have recommended the adoption of blind verification of all conclusions reached by firearms examinations;[318] in fact, some laboratories have begun to adopt that practice, and the OSAC subcommittee for firearms and toolmarks has recommended the same course (albeit only in draft form).[319] On theme, however, the method practiced at the ISP lags behind the times and the recommendations of subject-matter experts: not only does the laboratory verify primarily identification conclusions, but it further allows the verifier full access to knowledge of the first examiner's conclusions (in fact the primary analyst will actually set up the microscope for their verifier focusing their attention on the specific marks relied upon to reach the initial conclusion).[320] As such, that method falls outside the scope of what is generally accepted, not just by cognitive psychologists, but even by other firearms examiners, again underscoring the need for exclusion under *Frye*.

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[315] *See Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 157-58 ("Q. So let me ask you this, Doctor: Is it possible for an examiner to credibly acclaim that conclusions were quote, independently verified, if they were not blind? A. In my opinion, no, because again, we have sufficient evidence that the verifying examiner's judgement is actually contingent on the original examiner's judgement").

[316] *Id.* at 151.

[317] **DEF. EX.18**: Jeff Kukucka, "*Affidavit in Illinois v. Winfield, 15CR14066-01*," at 6; see **DEF. EX.27**: Erwin J.A.T. Mattijssen *et al.*, *"Cognitive biases in the peer review of bullet*

and cartridge case comparison casework: A field study," 60 Sci. & Justice 337 (2020); *Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 153-57 (further explaining study and noting that "I would certainly welcome more research on firearms judgement specifically, but I think at this point there's more than enough research to justify the adoption of blind verification").

[318] *See e.g., Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 152 ("The second examiner, the verifying examiner should not be aware of the original examiner's conclusion so that they can carry out their own independent evaluation of the evidence. And secondly, laboratories should verify all conclusions, not only certain types"); **DEF. EX.19**: Saul M. Kassin et al., "*The forensic confirmation bias: Problems, perspectives, and proposed solutions*," 2 J. App. Research Memory & Cognition at 49 ("The verification of forensic decisions should be a more controlled process in which blind and double-blind procedures are used whenever possible. Such procedures would require that the verifier is not informed of the initial conclusion; if possible, that the verifier does not know who the examiner was; and that the examiner does not select the verifier"); **DEF. EX.9**: PCAST, "*Forensic Science in the Criminal Courts*," at 96 (recommending blind verification and noting that "for a verification program to be truly blind and thereby avoid cognitive bias, examiners cannot only verify individualizations").

[319] *See Testimony of Todd Weller*, WINFIELD FRYE HEARING TR., at 104 ("Q. Other laboratories use what is called blind verification. The second examiner is not told, is not given indications of the first examiner's conclusion? A. I believe that is true*"); Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 152-54 (Q. Have reputable labs, let's say for example the FBI, adopted blind verification procedures? A. Yes. The FBI fingerprint lab now uses blind verification as a standard procedure); **DEF. EX.26**: Organization of Scientific Area Committees, "*OSAC Proposed Standard: Standard for Verification of Source Conclusions in Toolmark Examinations*," at 7 (2020) ("All (100%) of the primary examiner's source conclusions shall be subjected to the verification process" & "The verifier shall not be informed of the primary examiner's source opinion(s) nor be exposed to task-irrelevant information prior to reaching their own opinion(s)").

[320] *See Testimony of Caryn Tucker*, WINFIELD FRYE HEARING TR., at 26, 79, & 81; **DEF. EX.28**: Illinois State Police, "*Firearms & Toolmarks Procedures Manual- Appendix II: Minimum Standards & Controls*," Division of Forensic Services, Forensic Sciences Command (Aug. 1, 2013) (requiring verification only of identifications and, in an "exceptional situation," eliminations reached based on individual characteristics); *Testimony Dr. Jeffery Kukucka*, WINFIELD FRYE HEARING TR., at 165-68.

See ps. 60-65 of Defense's Brief.

V. ANALYSIS OF ILLINOIS RULES OF EVIDENCE 401, 402, AND 403

IRE 401 defines relevant evidence as 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. IRE 402 states relevant evidence is generally admissible and irrelevant evidence is inadmissible. This Court gets to determine what irrelevant evidence is

inadmissible. Under IRE 403, relevant evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, misleading the jury, or by consideration of undue delay, waste of time, or needless presentation of evidence.

Let's discuss but a few of the IRE 403 (or even 401/402) triggering problems that would be caused if the subject evidence were admitted.

Firstly, it is an even heavier pull for the State to drag the proffered evidence through, or even, under the requirements mandated by IRE 402. This Court notes that there is a more basic problem the State may face getting past the requirements of IRE 402. Seeking to introduce such evidence is for the "nothing proposition" that certain bullets or cartridges cannot be excluded as coming from certain firearms the State wishes to have admitted. Let's assume for argument purposes, that the best the State hopes to obtain from its "expert witness" in this matter would be nothing more than the following opinion:

> "These bullets and cartridges cannot be eliminated from not being fired by these weapons" (or words to that effect).

See generally, p. 65 of Defense's "Motion to Exclude Firearms Examination Opinion Testimony."

Then such an opinion is perhaps a 402 or even a 401 problem without ever getting to the level of conducting an IRE 403 analysis. If that is the best the States believes its expert can offer, then such testimony would be essentially a "nothing or zero" contribution that a reasonable application of one-two punch by the light-weight's IRE 401 and 402 could achieve a technical knockout without even bringing into the ring the heavy-weight IRE 403.

Assuming on the other hand that the State survives the IRE 401/402 test the heavy weight IRE 403 must clearly knockout such potential evidence from being admitted.

This Court opines that every prong of IRE 403 is offended/violated if the Court allowed in what is at best a scientific dice throw of nothing more than a mere hunch evidence over defense objection in the instant matter. The short checklist is as follows:

The probative value of the evidence in the instant matter is a big zero based upon the discussion above. For example, if admitted in spite of this view/finding by the Court, it would imply or suggest the value of such evidence is far beyond what it actually should be viewed as representing. Such evidence would also improperly imply a logical closeness between some immediate fact and the ultimate case issues when nothing could be further from accurate. Therefore, such evidence should be barred based upon the possibility of such misplaced strength inferences that may be drawn simply based upon such admission.

Separately, it must be excluded based upon the "substantially outweighed" aspect of IRE 403 under even the most basic analysis that would essentially follow the admission of junk science evidence that violate the due process rights of the defendant while at the same time leading to burden shifting that would undoubtedly flow from the same.

When looking at the "danger of unfair prejudice" prong, the hurdles created by the evidence at issue here appear to be fairly obvious to this Court as a matter of law. The combination of scary weapons, spent bullets, and death pictures without even a minimal connection, would create an unfairly prejudicial effect that could lead to yet another wrongful conviction.

The possibility of "confusion of the issues" in the instant matter is not merely a possibility, it's a promise without the use of IRE 403. The offered evidence is clearly inflammatory by its inferences and could trigger and encourage irrational and emotional results far beyond simply being incorrect inferences. Similarly, the "misleading the jury" prong comes into play because such evidence will be given far too much weight by a jury.

The safeguard of the proper activation of IRE 403 will save the trier of fact from an undue delay since the presentation and cross-examination of such evidence would be at least a three to four-week process due to the highly questionable and not currently generally accepted nature of such junk science. It has taken the parties about six hours a day for a complete week before this basic judge to hear such evidence in his courtroom as a pretrial *Frye* hearing.

This same testimony in front of a jury will easily be at least three to four times longer. It has taken this Court about four months post-hearing to sort through about a thousand articles, studies, witness transcripts, and submissions as well as more six hour days to fashion the instant ruling. This would be a living torture for citizens simply called in response to a jury summons. Therefore, this situation clearly cries out for IRE 403 relief.

VI. FINDINGS OF FACT AND CONCLUSIONS OF LAW

A. The State's sole live witness, Mr. Todd Weller, on the general acceptability of firearms identification evidence, was remarkably not credible in any areas of his testimony.

   i. Mr. Weller demonstrated no desire to engage with, or to understand the concerns of this field's critics. See p. 17 of Defense's Brief.

   ii. In his testimony before this Court, Mr. Weller mischaracterized the range of false positive findings for the field of firearms examination, even in his sworn testimony before this Court.

   iii. Mr. Weller failed to objectively inform PCAST about the full range of error rate findings relevant to their 2015 review of firearms examinations.

   iv. Mr. Weller lacked objectivity in virtually every area of his testimony before this Court. See ps. 17-19 of Defense's Brief.

B. This Court found the testimony, declarations, and corresponding defense exhibits of the following Defense experts credible and helpful in establishing firearms identification evidence is no longer widely accepted within the meaning of *Frye*, including but not limited to:

   i. Dr. Jeffrey Salyards

   ii. Dr. Nicholas Scurich

   iii. Dean David Faigman

   iv. Dr. Thomas D. Albright

   v. Caryn Tucker, and

   vi. Dr. Jeffrey Kukucka

C. The studies the State submitted for consideration on the issue of "general acceptability" under *Frye* did not speak to the issue of general acceptability of firearms identification evidence.

D. The Defense criticisms of firearms identification evidence were helpful, highly persuasive, and credible in this Court's finding that firearms identification evidence is nothing more than a mere hunch as that term has come to be known as under Illinois jurisprudence.

E. The Defense arguments against the "general acceptability" of such evidence under *Frye* are well taken evidence-based and credible in all of the following areas:

   i. The so called forensic areas known on firearms identification evidence is a misnomer. There are no objective standards for testing that support any theory of general acceptability by the State in the instant matter.

F. There are no objective forensic based reasons that firearms identification evidence belongs in any category of forensic science for the purpose of the instant litigation and trial.

G. The areas of firearms identification evidence have been at the root of a disproportionate number of wrongful convictions which speak as a cry against any notion of general acceptability based upon a *Frye* analysis. If such evidence is admitted in the instant matter, the process of penciling in Defendant Winfield's name should be made.

H. The Illinois State Police firearms laboratory has imbedded standard operating procedures that invite cognitive bias in the initial analysis processes.

   i. One way this occurs is by way of its use of a side-by-side comparison of the evidence.

   ii. This intentionally faulted and inherently bias-tainted method is employed by the Illinois State Police during its verification processes.

   iii. The aforementioned initial and verification processes are in large part or even exclusively non-blind and selective. The employment of such techniques are not widely accepted within the mandates inherent under *Frye*.

I. As such, this Court finds such ISP processes are not widely accepted and are out of step with many evidence-based analyses which this Court finds as yet another factor which adversely effects its not being a generally accepted method of forensics method and means under when examined under any trained *Frye* eye review.

J. The State must meet its burden of proof in a *Frye* hearing.

i. The State failed to meet its burden of proof required under *Frye* on the proposition that firearms identification evidence is generally accepted.

ii. The State has failed to meet in its critical burden by even the minimal standard of proof measured by the preponderance standard.

K. Even if the State were to be found to meet its burden of proof of general acceptability under *Frye*, any consideration of such evidence would be barred from admissibility under IRE 403.

i. Said evidence borders on not even meeting the relevance standard required under IRE 401 and 402.

L. If the firearms identification evidence is admitted in the instant case, there will necessarily be a constitutionally prohibited shifting of the burden of proof which should not be carried on the back of the Defendant.

M. Wherefore all of the above reasons and findings, the evidence/testimony that the State seeks to have admitted in the instant matter, will be excluded (See p. 1 of Defense's "Motion to Exclude Firearms Examination Opinion Testimony"):

i. Multiple fired bullets and cartridge casings from the scene of said shooting.

ii. Testimony from a firearms examiner, Brian Parr, in order to link those bullets and cartridge casings to a 45-caliber Hi-Point semiautomatic pistol (also recovered from the scene).

iii. 9mm-caliber Ruger semiautomatic pistol.

VII. CONCLUSION

Below is just a sampling of the wrongful convictions that have resulted from the flawed misinterpretation of general acceptance in the area of firearms identification evidence and the failure to reasonably interpret constitutional obligations under *Frye* and IRE 403:

> Charles F. Stielow: A jury in New York convicted Mr. Stielow of murder and imposed a death sentence in 1915 based largely on the testimony of a firearms examiner who purported to have matched bullets taken from two victims to Mr. Stielow's revolver. Despite reanalysis by three separate examiners disputing those initial findings, Mr. Stielow's conviction survived review on direct appeal, as well as two postconviction challenges. He escaped wrongful execution only after yet another review, this time by a special prosecutor (1) conclusively revealed that "the bullets extracted from the bodies could not have been fired from Stielow's revolver," and (2) obtained a confession from the true murderer. Mr. Stielow was finally freed and declared innocent by New York's governor in 1918, following a full three years of wrongful incarceration. See Craig Cooley & Gabriel Oberfield, "Symposium: Daubert, Innocence, and the Future of Forensic Science: Increasing Forensic Evidence's Reliability and Minimizing Wrongful Convictions: Applying Daubert Isn't the Only Problem," 43 Tulsa L. Rev. 285, 337-38 (2007).
>
> Fred Hampton: Following the controversial death of Mr. Hampton, the Chairman of the Black Panther Party of Illinois, at the hands of officers assigned to the Cook County State's Attorney's Office, the United States Attorney General appointed a team of prosecutors to reinvestigate the shooting death and present their findings to a specially-convened, inquisitorial grand jury. That reinvestigation involved, in part, reanalysis by the FBI of the firearms examination conclusions made originally by Chicago Police Department firearms examiners. That reanalysis revealed several misidentifications had been committed by the original firearms examiners, including one associating two cartridge cases with a firearm possessed by one of the Black Panthers; in reality the shells were fired by one of the law enforcement officers raiding the apartment where Mr. Hampton was murdered. See U.S. District Court for the Northern District of Illinois, Eastern Division, "Report of the 1970 Grand Jury," (Jul. 28, 1970), available at https://peopleslawoffice.com/wp-content/uploads/2012/02/Hampton.-1970-FGJ-Report.pdf.
>
> Darrell Siggers: In 1984, a jury convicted Mr. Siggers of first degree based in part on the testimony of a firearms examiner from the Detroit Police Department claiming that bullets taken from the victim's body matched (were fired from the same gun as) bullets found in the defendant's apartment. His conviction survived direct appellate review and multiple postconviction challenges until 2015, when an independent firearms examiner reviewed the initial firearms comparison and disagreed with the original conclusion. A Michigan court then entered an agreed order vacating Mr. Siggers's conviction, and the prosecution declined to retry him. All told, however, Mr. Siggers spent 34 years unjustly behind bars. See Brandon Garrett, "Siggers' Firearms Exoneration," Duke Law Forensic Forum (Oct. 23, 2018); Siggers v. Alex, No. 19-CV-12521, 2021 U.S. Dist. LEXIS 182956 (E.D. Mich. Sep. 24, 2021).

Anthony Ray Hinton: Prosecutors relied exclusively on firearms examination testimony to convict Mr. Hinton of two 1985 murders in Birmingham, Alabama: examiners from the Alabama Department of Forensic Services "matched" six bullets from those murders (and an additional killing) to a revolver owned by the defendant's mother. Mr. Hinton spent nearly 30 years on death row before being exonerated, largely due to reanalysis by three independent firearms examiners contradicting the original forensic evidence. See Hinton v. Alabama, 571 U.S. 263 (2014); Daniella Silva, "Anthony Ray Hinton, Alabama Man Who Spent 30 Years on Death Row, Has Case Dismissed," NBC News (Apr. 2, 2015).

Rickey Ross: In 1989, Mr. Ross, a Los Angeles County Sheriff's Deputy, was wrongfully arrested for, and charged with the murder of, several sex workers after two Los Angeles Police Department officers erroneously concluded that his gun fired the bullets recovered at the scene of each murder. Prosecutors dismissed the charges against Mr. Ross only after three independent firearms examiners excluded his gun as the source of the relevant bullets. See Craig Cooley & Gabriel Oberfield, "Symposium: Daubert, Innocence, and the Future of Forensic Science: Increasing Forensic Evidence's Reliability and Minimizing Wrongful Convictions: Applying Daubert Isn't the Only Problem," 43 Tulsa L. Rev. 285, 338-39 (2007).

Nanon McKewn Williams: Mr. Williams was convicted of a series of murders from 1992 based in part on the opinion of a Houston Police Department firearms examiner who testified that Williams's pistol (and not that of the State's cooperating witness) fired a bullet recovered from a surviving victim of the shooting. Although Williams has never been acquitted, during postconviction proceedings the government's firearms examiner recanted his earlier testimony, admitting he had identified the wrong firearm as the source of the bullet. See Williams v. Thaler, 684 F.3d 597 (5th Cir. 2012).

Desmond Ricks: Mr. Ricks was convicted of Murder in 1992 based largely on testimony by firearms examiners of the Detroit Police Department who matched bullets taken from the victim's body to a gun recovered from the defendant's home. The bullets taken from the victim were severely damaged and deformed, but when the Defense hired its own firearms examination expert, he was mysteriously sent pristine bullets and told that they were, in fact, the evidence bullets taken from the victim. Only decades later did Mr. Ricks and his attorneys discover the subterfuge. And during postconviction proceedings, multiple independent firearms examiners agreed that the original identification made by the Detroit Police Department was not only incorrect, it was impossible: the evidence bullets had different class characteristics that the handgun recovered from Mr. Ricks's home. All told, Mr. Ricks spent 25 years wrongfully incarcerated before his conviction was reversed; the State declined to retry him, and the murder charges against him were dismissed with prejudice. See Ricks v. Pauch, No. 17-12784, 2020 U.S. Dist. LEXIS 50109 (E.D. Mich. Mar. 23, 2020).

Patrick Pursley: A jury convicted Mr. Pursley of first-degree murder based largely on testimony from a firearms examiner of the Illinois State Police who "matched" bullets and cartridge cases recovered from the crime scene to a later-recovered Taurus, 9mm handgun belonging to the defendant. After multiple failed appeals and postconviction challenges, Mr. Pursley finally found an avenue for relief in the form of 725 ILCS 5/116-3, which allowed him to request that the cartridge cases and bullets be run through a database for such evidence, called IBIS. That system did not return a match, or correlate, the crime-scene bullets and cartridge cases to those test-fired from Mr. Pursley's Taurus. And two independent firearms examiners hired by the defense contradicted the conclusions of ISP- eliminating the Taurus as the source of both the crime scene bullets and the crime scene cartridges. The Second

District ordered a retrial at which the Illinois State Police (while admitting to error in having identified the bullets as having been fired from the Taurus) stood by its conclusions regarding the crime scene cartridge cases. Mr. Pursely was acquitted and has since received a certificate of actual innocence. He spent 23 years wrongfully incarcerated. See People v. Pursley, 2018 IL App (2d) 170227-U; Ivan Moreno, "Rockford man who spent 23 years in prison acquitted after ballistics retest proves innocence," CHICAGO TRIBUNE (Jan. 16, 2019); Ken DeCoster, "Patrick Pursley officially declared innocent of 1993 murder in Rockford," Rockford Register Star (Feb. 26, 2021).

Curtis Flowers: The state of Mississippi tried Mr. Flowers for the 1996 murder of four people a full six times before the United States Supreme Court intervened and reversed the final conviction obtained against the defendant because the prosecutor had discriminated on the basis of race when exercising peremptory challenges during jury selection. Each of his trials involved testimony from firearms examiners (both from the Mississippi Forensics Laboratory as well as a court-appointed, retired Michigan State Trooper) purporting to match, with absolute certainty, bullets from the crime scene to bullets from a gun stolen from Mr. Flowers's uncle. After close to 23 years behind bars, Mr. Flowers was finally freed following the Supreme Court's ruling. Prosecutors declined to pursue a seventh trial, and Mr. Flowers was paid $500,000 by the state of Mississippi, the maximum amount under state law for wrongful imprisonment. See Flowers v. Mississippi, 139 S. Ct. 2228, 2234 (2019); Rogelio V. Solis, "Curtis Flowers Sues The DA Who Put Him On Trial 6 Times," NPR (Sept. 3, 2021); Jiaxin Zhu et al., "The Reliability of Forensic Evidence: The Case of Curtis Flowers," Cornell Univ. L. School Social Sci. & L., available at https://courses2.cit.cornell.edu/sociallaw/FlowersCase/forensicevidence.html.

Detroit Police Department Forensic Services Laboratory Firearms Unit: In 2008, at the request of the Detroit Police Department Chief and the Wayne County Prosecutor's Office, a team from the Michigan State Police Forensic Science Division conducted an audit of the DPD's firearms unit, including a random reanalysis of 250 real-world cases and an additional 33 cases which were known to have been prosecuted. The results of the audit were striking (enough to shutter the unit): in ten percent (29) of the 283 cases reanalyzed, firearms examiners from the DPD's firearms unit had committed serious errors (defined as false identifications or false exclusions). The majority of those errors (24) fell into the category of misidentifications. See Michigan State Police Forensic Science Division, "Audit of the Detroit Police Department Forensic Services Laboratory Firearms Unit," (2008).

Leslie Merritt: Four shootings occurred along the I-10 freeway in Phoenix, Arizona in 2015. During its investigation of those shootings, the Arizona Department of Public Safety Crime Laboratory matched four bullets from the scenes to a handgun recently pawned by Mr. Merritt. He was arrested, and incarcerated for seven months, until reanalysis by an independent firearms examiner revealed the original conclusions as misidentifications; "the four evidence bullets could not be excluded or identified as having been fired from" Mr. Merritt's handgun. See Merritt v. Arizona, 425 F. Supp. 3d 1201 (D. Ariz. 2019)

D.C. Department of Forensic Services: A casework review triggered by a failed proficiency test by a firearms examiner in 2016 launched an odyssey of multiple audits that would ultimately cost the laboratory its accreditation in 2021. The audits revealed that six separate firearms examiners had committed misidentifications of cartridge cases relevant to an ongoing murder prosecution. Following the loss of accreditation the laboratory fired all of its

firearms examination personnel, and D.C. is now set to review every case completed by their unit over the last decade. See Spencer S. Hsu & Keith OL. Alexander, "Forensic errors trigger reviews of D.C. crime lab ballistics unit, prosecutors say," Washington Post (March 24, 2017); Jack Moore, "Sweeping report urges DC to review every case handled by firearms, fingerprint units at troubled crime lab," WTOP News (Dec. 14, 2021); Jack Moore, "Officials now expect DC crime lab to remain sidelined until next spring," WTOP News (Mar 31, 2022).

Southwestern Institute of Forensic Science: In 2016, the Texas Forensic Science Commission had an identification by a firearms examiner with the Southwestern Institute of Forensic Science (as well as her supervisor) reanalyzed pursuant to a complaint by a local attorney. Based on that reanalysis the Commission concluded that the original identification was erroneous; to address the error the laboratory actually decided to move away from a fully-subjective pattern matching approach, and to adopt "Consecutive Matching Striae" criteria. See Texas Forensic Science Commission, "Final Report for Complaint Filed By Attorney Frank Blazek Regarding Firearm/Toolmark Analysis Performed At the Southwestern institute of Forensic Science," (April 2016), available at https://www.txcourts.gov/media/1440859/14-08-final-report-blazekcomplaint-for-joshua-ragston-swifs-firearm-toolmark-analysis-20160419.pdf.

Victor Meinhardt: In 2017, Mr. Meinhardt, a firearms examiner with the Baltimore Police Department, was removed from casework duties because he was fund to have committed a misidentification. See Justin Fenton, "'Serious questions' raised by reports on problems inside Baltimore Police crime lab, councilman says," Baltimore Sun (Aug. 16, 2021).

See pp. A-II-1-A-II-4 of Defense's Brief.

In conclusion, the above sampling of wrongful convictions should serve as a wake-up call to courts operating as rubber stamps in blindly finding general acceptance of firearms identifications evidence. Wherefore the reasons stated above, the junk evidence in question fails under the general acceptability standard of *Frye* or, in the alternative, IRE 403 delivers the final knockout blow.

IT IS SO ORDERED.

ENTERED
Judge William H Hooks #1985
FEB - 8 2023
IRIS [illegible]
CLERK OF THE CIRCUIT COURT
OF COOK COUNTY, IL

ENTERED: _____
Honorable William H. Hooks
Circuit Court of Cook County
Criminal Division

DATED: _____