

SUPERIOR COURT OF THE DISTRICT OF COLUMBIA
CRIMINAL DIVISION
Felony Branch

UNITED STATES OF AMERICA, :
 :
 v. : 2003 FEL 6856
 : Judge Neal E. Kravitz
 TROY WORSLEY, : Status: June 2, 2008
 :
 Defendant. :

GOVERNMENT'S OPPOSITION TO DEFENDANT'S MOTION TO EXCLUDE
EXPERT TESTIMONY CONCERNING FIREARMS "MATCH" EVIDENCE

INTRODUCTION

On April 10, 2008, counsel for defendant, Troy Worsley, filed a motion to exclude firearms identification testimony. Specifically, defendant argues, through counsel, that the firearms evidence should be precluded because (1) "the state of the firearms identification discipline is not sufficiently developed to permit an expert to declare a 'match' between bullets and cartridge casings and a particular firearm;" (2) "there is no generally accepted methodology for determining the statistical likelihood of a coincidental 'match,'" and (3) "the unfair prejudice from such testimony would substantially outweigh its probative value and would likely [] mislead and confuse the jury." Defendant's Motion at 2-3. Moreover, defendant has requested a hearing on this motion. Id.

Defendant's arguments fail under the principles governing the admissibility of scientific evidence in this jurisdiction

under Frye v. United States, 54 App. D.C. 46, 293 F. 1013 (1923). The field of firearms and toolmark identification is not a new science and, in any event, the traditional method of pattern matching utilized by the firearms examiner in this case enjoys general acceptance the relevant scientific community. Defendant's effort to label firearms and toolmark identification as an undeveloped scientific discipline ignores nearly a century of forensic history, and his efforts to create a scientific controversy ignores a vast body of case law, here and throughout the country, cataloguing the near-universal acceptance of pattern matching throughout the relevant scientific community.

Moreover, defendant's effort to extend DNA-type statistical frequencies to firearms and toolmark identifications is misplaced. The relevant scientific community of firearms and toolmark examiners does not use statistics to express the certainty of an identification. In fact, any attempt to require statistical calculations in connection with firearms identifications would be impractical because the requisite data is nonexistent and unobtainable. Firearms examiners are capable of communicating conclusions without overstating the certainty of an identification by opining that a particular toolmark was made by a particular tool (firearm) "to a reasonable degree of scientific certainty."

Furthermore, defendant's assertion that the admission of

the ballistics evidence would substantially outweigh its probative value runs afoul of a long and well established history of jurisprudence in which this court, the D.C. Court of Appeals, and other courts throughout the country have found this evidence to be highly probative and properly admissible. These points are clearly established by the materials attached hereto, as well as the legal and scientific authorities cited herein. Thus, defendant's motion should be denied without a hearing.

BACKGROUND

The defendant, Troy Worsley, is charged in a seventeen-count indictment with First-Degree Murder While Armed (Premeditated) (Benjamin Somerville); First-Degree Theft (Benjamin Somerville); Unauthorized Use of a Vehicle (Benjamin Somerville); Carrying a Pistol without a License (Outside Home or Place of Business); Assault with a Dangerous Weapon (Delonta Jones); First-Degree Murder While Armed (Premeditated) with Aggravating Circumstances (Nathan Lewis); Armed Robbery (Nathan Lewis); First-Degree Murder While Armed-Felony Murder with Aggravating Circumstances (Nathan Lewis); Carjacking While Armed (Nathan Lewis); First-Degree Theft (Nathan Lewis); Unauthorized Use of a Vehicle (Nathan Lewis); Carrying a Pistol Without a License (Outside Home or Place of Business); and, five Counts of Possession of a Firearm During the Commission of a Crime of Violence or Dangerous Offense, for events which

occurred on or about between September 26, 2001 and October 2, 2001, in Washington, D.C. The government expects the evidence to show the following:

a. Shooting in Maryland

On September 26, 2001, defendant attempted to shoot Christopher Johnson at Johnson's home in Maryland. Witnesses described the weapon used as having a red-beam laser sight. Four of the five shell casings recovered from Johnson's residence were fired from a 9mm handgun. Defendant later plead guilty to first- degree assault and use of a handgun in the commission of a felony and admitted firing five shots through his cousin's bedroom door. b. Murder of Benjamin Somerville

On September 30, 2001, defendant and Benjamin Somerville arranged to meet at the apartment of Yolande Smith, defendant's girlfriend, located at 1420 Eastern Avenue, Northeast, Washington, D.C. Defendant shot and killed Somerville during this meeting. Three bullets were subsequently recovered from Somerville's body.

A search of Smith's apartment revealed three cartridge casings and the presence of bloodstains on the walls.

c. Assault of Delonta Jones

On October 1, 2001 (the day following Somerville's murder), at 1420 Eastern Avenue, Delonta Jones was assaulted by the defendant, who had a gun in his hand. Jones then saw defendant

leave the area in Somerville's car.

On October 2, 2001, Somerville's car was found crashed and abandoned on I-295 South in Washington, D.C., near the home of Nathan Lewis. From Somerville's stolen vehicle, the police recovered one baseball hat, an empty box of ammunition, a Styrofoam cartridge holder capable of holding fifty rounds of ammunition, and three rounds of 9mm ammunition. Later testing of the hat revealed the presence of defendant's DNA.

d. Murder of Nathan Lewis

On October 2, 2001, defendant shot and killed Nathan Lewis, in front of Lewis's home on Hayes Street, Northeast, for the purpose of taking his car. After discovering Somerville's stolen car, the police discovered the body of Nathan Lewis. The police recovered three shell casings from the middle of the street. At approximately 6:00 a.m. that same day, Lewis's Cadillac was found abandoned at 2201 Brightside Road, Landover, Maryland. The police recovered one skullcap and 40 rounds of 9mm ammunition from Lewis's car.

e. Use and Recovery of the Murder Weapon

On October 2, 2001, witnesses saw defendant with a handgun in the Kentlands Section of Maryland. Later that day defendant was arrested in Capitol Heights, Maryland, during an attempted carjacking. Incident to defendant's arrest, Capitol Heights Police recovered a 9mm handgun with a red-beam laser sight.

Defendant later pled guilty to two counts of armed robbery in connection with the Capitol Heights incident.

FIREARMS EVIDENCE

On March 21, 2006, Jonathan Pope, a Firearms and Toolmark Examiner with the Metropolitan Police Department (MPD), issued a report summarizing his conclusions regarding his examination of the firearms evidence in this case. He reported that the 9mm Ruger Luger semi-automatic pistol recovered in connection with defendant's Capitol Heights arrest was in normal operating condition, but missing a magazine. After determining that most of the firearms evidence was suitable for comparison, Pope test-fired the pistol.

Using a comparison microscope (at 20X magnification), Pope first compared a test-fired shell casing with the shell casings recovered from the various crime scenes. After observing consecutive patterns of striations whose individual characteristics corresponded on the "breechface marks" of the respective shell casings, Pope concluded that the four shell casings recovered at the September 26th Maryland shooting, the four shell casings recovered from the September 30th Somerville murder, and the three shell casings from the October 2nd Lewis murder were all fired from the 9mm Ruger recovered during defendant's arrest in Capitol Heights, Maryland.

Pope also compared a test-fired bullet to the three bullets

removed from Lewis at Lewis's autopsy. After observing consecutive patterns of striations whose individual characteristics corresponded on the "land impression" of the respective bullets, Pope concluded that the three bullets recovered from Lewis's body were also fired from the same 9mm Ruger. Pope also reported that the forty rounds of ammunition recovered from Lewis's stolen Cadillac consisted of 9mm cartridges, Remington-Peters brand (the same brand recovered from the Lewis murder).

FIREARMS AND TOOLMARK IDENTIFICATION

Firearm identification has been a forensic discipline since the 1930s. See Declaration of Stephen G. Bunch ("Bunch Decl.") at ¶ 9 (see TAB A).¹ Firearms identification is a subset of the broader forensic discipline known as toolmark identification. Id. Toolmark examiners are trained to examine the marks left by tools on any variety of surfaces in an attempt to "match" a toolmark to a particular tool that made the mark. Id. Firearms are simply a subset of tools that impart marks on bullets and

¹ Since 2002, FBI Firearms Examiner Steve Bunch has served as a Supervisory Physical Scientist (Unit Chief) at the Federal Bureau of Investigation (FBI) in Quantico, Virginia. His principal duties as Unit Chief involve managing the Firearms and Toolmarks Unit. Bunch has been employed with the FBI since 1996, and has served as a qualified Physical Scientist since 1999. From 1999 to 2002, Bunch's principal duties involved examining firearms and toolmarks related evidence, reporting results to contributing agencies, and sometimes testifying to findings in court. He has been an active member of the Association of Firearm and Tool Mark Examiners (AFTE) since 2001. Bunch also serves as a member of the Scientific Working Group for Firearms-Toolmarks identification (SWGUN). A listing of his peer-reviewed publications are listed on his resume, which is appended to the attached sworn statement.

cartridge cases. Id.²

Firearm and toolmark identification is based upon two propositions:

Proposition #1:

Toolmarks imparted to objects by different tools will rarely if ever display agreement sufficient to lead a qualified examiner to conclude the objects were marked by the same tool. That is, a qualified examiner will rarely if ever commit a false positive error (misidentification).

Proposition #2:

Most manufacturing processes involve the transfer of rapidly changing or random marks onto work pieces such as barrel bores, breech faces, firing pins, screwdriver blades, and the working surfaces of other common tools. This is caused principally by the phenomena of tool wear and chip formation or by electrical/chemical erosion. Microscopic marks on tools may then continue to change from further wear, corrosion, or abuse. Id.

Examiners are trained to identify three types of markings, known also as "characteristics," which are imparted onto bullets and cartridge cases: (1) class characteristics; (2) subclass characteristics; and (3) individual characteristics. Id. ¶ 14.

Class characteristics are predetermined during the manufacturing process, such as brand name, caliber, etc. Id. ¶ 15.³

² A firearm imparts different types of marks on the various components of a cartridge. With respect to bullets, cuts within a gun barrel ("grooves") and raised surfaces ("lands") create corresponding depressed "lands impressions" and raised "groove impressions" as bullets travel through a barrel. Bunch Decl. ¶ 12. The twist imparted on a bullet can be either left or right, depending on the direction of the lands and grooves. Id.

With respect to shell casings, contact between the cartridge and the breech create "breech face marks" and the impact of the firing pin on the primer creates a **"firing pin impression" on the primer itself.** Id. at ¶ 13.

³ For a fired bullet, class characteristics include the number of land and groove impressions, the direction of twist of the land and groove impressions, and the width of the land and groove impressions. Bunch Decl. ¶ 15. For a fired cartridge case, class

Individual characteristics, on the other hand, consist of microscopic, random imperfections in the barrel or firing mechanism created by the manufacturing process, wear, corrosion, or abuse. These unintended characteristics are initially caused by changes in the tool as it makes each barrel on the production line. Id. ¶ 16.⁴

Subclass characteristics straddle the line between class and individual characteristics. Id. ¶ 17. These characteristics can exist within a particular production run in the manufacturing process and occasionally arise from (1) imperfections in a machine tool that persist during the production of multiple firearm components; (2) extreme hardness differences between the machine tool and the workpieces; or (3) particular manufacturing processes such as casting or molding. Id. Qualified examiners are trained to distinguish subclass characteristics from individual characteristics, because identifications may not be made from subclass characteristics.

characteristics are typically limited to the firing pin impression on the primer, which can appear in various shapes, including circular, rectangular, hemispherical, and elliptical.

4 Individual characteristics typically fall into two categories: (1) striated marks made by movement of the bullet **within a gun's barrel** (typically appearing as scratches), and (2) impressed marks that are pressed into a surface. Bunch Decl. ¶ 16. A spent bullet usually has striated marks, created as it moves through the barrel of the gun. Id. A spent cartridge case, on the other hand, can have both impressed and striated marks. Id. Before firing, the process of feeding the cartridge into the chamber can create striated marks. Id. Once the firearm is fired, impressed marks are created on the cartridge case by the gun's firing pin and breech. Id. With semi-automatic weapons, additional marks can be made as the case is expelled from the gun. Id. In general, a tool will change over time from wear and thus leave different marks on bullets and casings. Id. ¶ 35. As microscopic similarities diminish, the likelihood of an inconclusive result increases, but the likelihood of a false positive remains unchanged. Id.

Id. ¶ 18.⁵

Since the inception of firearms and toolmark identification as a forensic discipline, firearms examiners have been using a method known as "pattern matching" to determine whether sufficient similarity exists between toolmarks to warrant a conclusion that two bullets or two cartridge cases came from the same firearm. Id. ¶ 19-20. In 1992, the Association of Firearms and Toolmark Examiners (AFTE) memorialized the theory of identification in an attempt to explain the basis of opinions of common origin in toolmark comparisons:

1. The theory of identification as it pertains to the comparison of toolmarks enables opinions of common origin to be made when the unique surface contours of two toolmarks are in "sufficient agreement."

2. This "sufficient agreement" is related to the significant duplication of random toolmarks as evidenced by a pattern or combination of patterns of surface contours. Significance is determined by the comparative examination of two or more sets of surface contour patterns comprised of individual peaks, ridges and furrows. Specifically, the relative height or depth, width, curvature and spatial relationship of the individual peaks, ridges and furrows within one set of surface contours are defined and compared to the corresponding features in the second set of surface contours. Agreement is significant when it exceeds the best agreement demonstrated between toolmarks known to have been produced by different tools and is consistent with agreement demonstrated by toolmarks known to have been produced by the same tool. The statement that "sufficient agreement" exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility.

3. Currently the interpretation of

⁵As part of his training and experience, Firearms Examiner Pope toured various firearm manufacturing facilities and reviewed several articles published in the journal of the Association of Firearm and Toolmark Examiners (AFTE). Pope Decl. ¶ 13 (see TAB B).

individualized/identification is subjective in nature, founded on scientific principles and based on the examiner's training and experience. Id. The AFTE theory of firearms identification adopted and articulated traditional principles of pattern matching that have been broadly accepted within the forensic firearms community for decades. Bunch Decl. ¶ 38. Today, traditional pattern matching is practiced by firearms and toolmark examiners in forensic laboratories throughout the world. Id. In fact, according to a survey conducted by the Scientific Working Group for Firearms and Toolmarks (SWGUN) of firearms and toolmark laboratories throughout the United States, 98% of laboratories answering the survey (176 laboratories total) utilize traditional pattern matching. See SWGGUN Survey Summary.⁶

Firearms and toolmark identification involves some degree of subjectivity when an examiner looks for a high degree of correspondence in patterns. Stephen Bunch, Unit Chief for the FBI Firearms and Toolmark Unit, describes the subjective nature of this field as follows:

⁶ Firearms Examiner Pope and the other firearms examiners at the MPD Firearms Section use the traditional pattern matching method. Pope Decl. ¶ 8. Some of the laboratories throughout the United States use pattern matching in conjunction with "consecutively matching striae" (CMS) criteria. See SWGGUN Survey. CMS and pattern matching are not mutually exclusive. In practice, rather, CMS is merely an extension of pattern matching. See Bunch Decl. ¶ 34. See also Richard Grzybowski, et. al., Firearms/Toolmark Identification: Passing the Reliability Test Under Federal and State Evidentiary Standards at 24 ("Examiners who use the CMS tabulation approach to the interpretation of striated pattern agreement in their casework are simply recording/tabulating the quantitative element of what constitutes pattern agreement in striated toolmark identification that has traditionally been kept in the mind's eye of the examiner.").

Doubtless the methodology is similar to matching dental records to a particular person. It is also analogous to the manner in which we recognize people in everyday life. When we see a friend or relative in public we are able to make an identification based upon patterns of features that match our memories. Familiarity with a particular subject is what enables us to make an identification of a face with a high level of confidence. This explains why parents of identical twins can typically distinguish between their children with practical certainty. Similarly, a medical researcher may know each mouse by name. The practiced eye of the firearms examiner is trained to recognize corresponding marks on bullets and cartridge casings. It should be noted that all sciences involve some elements of subjectivity, whether it's taking readings from an analog instrument; or interpreting epidemiological data, for example; or interpreting the meaning of a fossil or bone; or a physician diagnosing a fever.

Id. ¶ 37.

Pattern matching is accomplished by inspecting bullets or cartridge casings under a comparison microscope, with typical magnifications of 10X-50X. Bunch Decl. ¶ 23; Pope Decl. ¶ 8. This instrument has been used in the field of firearms and toolmark identification since the 1930s. Bunch Decl. ¶ 23.⁷ There are generally four conclusions that examiners reach when conducting an examination: (1) identification, (2) inconclusive, (3) elimination, and (4) unsuitable for comparison. Id. ¶ 24.

Examiners undergo standardized technical training designed to develop cognitive skills to recognize patterns of individual characteristics necessary to make an identification. Id. ¶ 25.

⁷All firearms examiners at the MPD Firearms Section, including Firearms Examiner Pope, conduct their examinations under a comparison microscope. Pope Decl. ¶ 8.

However, there is no way to be absolutely (100%) certain of any identification without comparing a particular set of marks to marks created by every firearm produced since the invention of the modern day firearm (an impossible endeavor). Id. ¶ 26. Because an examiner cannot rule out with absolute certainty the highly unlikely event that two different firearms produce indistinguishable individual characteristics, an examiner, if asked, can properly qualify an identification by stating that it is made with “practical certainty”⁸ or “to a reasonable degree of scientific certainty.” Id. Either qualification communicates the examiner’s high level of certainty without overstating the significance of the match. Id.

The field of forensic firearm and toolmark identification continues to undergo testing in the form of (1) presumptive validity checks;⁹ (2) validation studies;¹⁰ and (3) proficiency

⁸ Practical certainty means that the determination of identity correlates to features whose frequency (or likelihood) of reoccurrence by another tool is so remote that it can be considered **practically** impossible. Bunch Decl. ¶ 26.

⁹ Presumptive validity checks are performed by examiners who investigate a new manufacturing technique to check for indications of “subclass” marking. On the **infrequent** occasions when this phenomena occurs, the results are published or publicized and examiners are thereby informed to be careful about these circumstances. Bunch Decl. ¶ 27.

¹⁰ Validation studies are the most comprehensive way to test and validate firearms and toolmark identification as a forensic science. Bunch Decl. ¶ 28. In these tests it is known with absolute certainty where each of the test components came from. Id. Using the same methods and identification criteria as those in actual casework, qualified examiners have consistently reached correct conclusions with error rates of zero. Id. The only **published** tests that contained any mis-identification involved marks produced by tools other than firearms. Id. Even where researchers have studied bullets and casings fired from consecutively manufactured firearms – where the possibility of a false-positive conclusion is at its highest – **trained examiners have been able to readily distinguish marks produced by the various firearms.** Id. ¶ 29. The SWGGUN has tracked the most recent

testing.¹¹ Moreover, the accuracy of individual casework is enhanced through standard operating procedures which typically require all identifications to be documented and then subjected to peer review. Bunch Decl. ¶ 32. In the instant case, Firearm Examiner Pope's conclusions are set forth in his final report (including the attached worksheets and photographs), dated March 21, 2006, and his conclusions were verified by fellow Firearms Examiner Rosolyn Brown. Pope Decl. ¶ 14-18. After the report was finalized, Firearms Examiner Pope met with defendant's counsel to discuss his conclusions. Id. ¶ 19. In addition, the firearms evidence was independently examined by a defense

studies as follows:

STUDY	ERROR RATE
Brundage (1998)	0%
Bunch & Murphy (2003)	0%
De France (2003)	0%
Thompson & Wyant (2003)	0.78%
Smith (2005)	0%
Orench (2005)	0%

Id. ¶ 28. Copies of the above-referenced studies are attached hereto (see TAB G). Efforts by researchers to conduct "worst case scenario" tests by testing a firearm examiner's ability to distinguish between articles fired from consecutively manufactured firearms is nothing new in the field of firearms and toolmark identification. See Teale, Popular Science Monthly, February 1932 (author reports on studies by Calvin Goddard in which the examiner was able to identify fired casings and bullets to consecutively manufactured firearms).

¹¹ Proficiency tests are quality assurance devices designed to test an examiner's competence, or the competence of a laboratory system. Bunch Decl. ¶ 30. Although proficiency tests tend to have higher error rates than validity tests (primarily because anyone who pays the fee may participate in these tests, including attorneys and examiner-trainees), id., Firearms Examiner Pope has successfully completed each bi-annual proficiency test (administered to the MPD Firearms Section since 1999) without any errors. Pope Decl. ¶ 17.

expert. Id. ¶ 20.

ARGUMENT

A. The Law in the District of Columbia

In evaluating the admissibility of expert testimony in this jurisdiction the court must inquire (1) whether the subject matter is "so distinctively related to some science, profession, business or occupation as to be beyond the ken of the average layman;" and (2) whether the witness has "sufficient skill, knowledge, or experience in that field or calling as to make it appear that his opinion or inference will probably aid the trier in his search for truth;" Dyas v. United States, 376 A.2d 827, 832 (D.C.), cert. denied, 434 U.S. 973 (1977). However, expert testimony is inadmissible if (3) "the state of the pertinent art or scientific knowledge does not permit a reasonable opinion to be asserted even by an expert." 376 A.2d at 832. Defendant's challenge to the admissibility of the proposed expert ballistics testimony is limited to the third Dyas factor.

District of Columbia courts evaluate the admissibility of novel scientific evidence by the standard first announced in Frye v. United States, 54 App. D.C. 46, 47, 293 F. 1013, 1014 (1923): where expert testimony is not based on a "well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which

it belongs." Id. at 47, 293 F. 1014. See Bahura v. S.E.W. Investors, 754 A.2d 928, 943 n.15 (D.C. 2000) (affirming that Frye test remains in effect in the District of Columbia). "Under Frye, the proponent of a new technology must demonstrate by a preponderance of the evidence that this technology has been generally accepted in the scientific community." United States v. Porter, 618 A.2d 629, 633 (D.C. 1992) ("Porter II") (emphasis added). "The issue is consensus versus controversy over a particular technique, not its validity." Id. at 634 (quoting Jones v. United States, 548 A.2d 35, 42 (D.C. 1988)). "[T]he focus is primarily on counting scientists' votes rather than on verifying the soundness of a scientific conclusion." Jones, 548 A.2d at 42. However, unanimity among scientists is not required. Porter II, 618 A.2d at 634.

The Frye test does not require a showing that a scientific method is infallible. After acknowledging that the methods of DNA analysis at issue in Porter theoretically might produce a false result, the D.C. Court of Appeals nonetheless held that the possibility of a false match was sufficiently low that it did not affect the scientific acceptance of the results. Porter II, 618 A.2d at 636 (citing People v. Axell, 235 Cal. App. 3d 836, 860, 1 Cal. Rptr. 2d 411, 426 (1991)). Nor does Frye condition admissibility on a pre-trial showing that generally accepted techniques have been appropriately applied by the

agency performing the firearms examination. "The Frye analysis . . . begins and ends with 'the acceptance of particular scientific methodology' and not the acceptance of a particular result or conclusion derived from that methodology." United States v. Jenkins, 887 A.2d 1013, 1022 (D.C. 2005) (citing Porter II, 618 A.2d at 634, in turn citing Ibn-Tamas v. United States, 407 A.2d 626, 638 (D.C. 1979)). "Any failure by the scientists to adhere to the appropriate procedure is, of course, a proper subject of inquiry, but does not raise an issue which implicates Frye." Porter II 618 A.2d at 636.¹² "Once the scientific method is shown to be generally accepted, it is presumptively reliable, although the opponent may challenge the weight of the evidence." United States v. Bridgett, 120 Daily

¹²Like the District of Columbia, many states apply the Frye general-acceptance standard to the theory and technique of a novel scientific method, but treat the question of whether a generally accepted technique was properly performed as one of weight, not admissibility. See, e.g., State v. Cauthron, 846 P.2d 502, 507 (Wash. 1993) (conditioning admissibility on absence of error is "inappropriate in jurisdictions utilizing the Frye standard of admissibility [because the] core concern of Frye is only whether the evidence being offered is based on established scientific methodology").

Other states add requirements to Frye's "general acceptance" standard before admitting novel scientific evidence. This variation is known as "Frye-Plus." See Taylor v. State, 889 P.2d 319, 325 n.13 (Okla. 1995) (comparing jurisdictions, like Oklahoma, that adhere to a "pure" Frye test with those that apply a "Frye-Plus" test). See also, e.g., People v. Kelly, 549 P.2d 1240 (Cal. App. Ct. 1976) (adopting three-part admissibility standard: Part I incorporates Frye general acceptance test; Part II looks at qualifications of the expert witness; Part III requires proof that the scientific test was performed according to a generally accepted methodology); State v. Nose, 649 N.W.2d 815, 819 (Minn. 2002) (state's Frye-Mack test "asks first whether experts in the field widely share the view that the results of scientific testing are scientifically reliable, and second whether the laboratory conducting the tests in the individual case complied with appropriate standards and controls"); People v. Castro, 545 N.Y.S.2d 985 (Sup. Ct. 1989) (applying three-part test that adds requirement that techniques be properly performed).

Wash. Law Rptr. 155, at 1702 (D.C. Super. Ct. Aug. 11, 1992)(citing Williams v. District of Columbia, 558 A.2d 344, 346 (D.C. 1989)).

This Court has broad discretion as to the kinds of evidence it may consider in a Frye inquiry. The D.C. Court of Appeals has held that "the appellate court, like the trial court, may, and often should, pay attention not only to expert evidence of record but also to judicial opinions in other jurisdictions that have considered the question, as well as to relevant legal and scientific commentaries in which the technique or test has been scrutinized." Jones, 548 A.2d at 41 (emphasis added) (upholding trial court's admission of EMIT drug-test results based on judicial notice of evidentiary record compiled in different case, and other court opinions that relied on expert testimony and review of scientific literature); see also Roberts v. United States, 916 A.2d 922, 929 (D.C. 2007).

In determining the admissibility of scientific evidence under Frye v. United States, 54 U.S. App. D.C. 46, 293 F.1023 (1923), this Court may take judicial notice of extra-record materials, including expert testimony from other proceedings. See District of Columbia ex rel. J.A.B. v. W.R., Jr., 1991 WL 214204, *7-*8 (D.C. Super. Ct. 1991) ("[E]xpert testimony in other cases, subject to cross-examination, can be probative of the general acceptance of a scientific technique. . . . This

Court can also take judicial notice of such expert testimony.”) (citing Jones v. United States, 548 A.2d 35, 36 (D.C. 1988)); see also United States v. Bridgett, 120 Daily Wash. Law Rptr. 155, at 1697 (D.C. Super. Ct. Aug. 11, 1992) (taking judicial notice of expert testimony from proceedings in United States v. Porter, 1991 WL 319015 (D.C. Super. Ct. Sept. 20, 1991) (“Porter I”). The testimony does not have to come from a court in this jurisdiction to be helpful to the admissibility determination. See Porter I, 1991 WL 319015, *28 n.47 (acknowledging usefulness of expert testimony from admissibility hearing in Ohio federal district court); accord Porter II, 618 A.2d at 631 n.4.

Where the scientific literature and opinions and records from other cases clearly demonstrate the general acceptance of a scientific method, a court may dispense with live testimony. See, e.g., Porter II, 618 A.2d at 635; Bridgett, 120 Daily Wash. Law Rptr. 155, at 1697. In fact, the Court of Appeals rejected a challenge to the reliability of a scientific procedure used to test sobriety (the Horizontal Gaze Nystagmus Test (“HGN”)) simply by taking judicial notice that “the great weight of scientific literature supports [the] reliability [of the HGN] and [that] the majority of jurisdictions around the country have declared HGN testing to be reliable.” Karamychev v. District of Columbia, 772 A.2d 806, 812 (D.C. 2001) (quoting Schultz v. State, 664 A.2d 60, 74 (Md. Ct. Spec. App. 1995)).

B. Pattern Matching Is Not A "New Scientific Methodology"

Before a proponent of scientific evidence is put to the rigors of Frye, the court must first inquire whether the proposed expert testimony involves "a new scientific methodology." Jenkins, 887 A.2d at 1022. As the Frye Court held over three-quarters of a century ago:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

Frye, 293 F. At 1014. The traditional method of pattern matching was already in use when Frye was decided and has since become the cornerstone of firearms and toolmark identification.¹³

As discussed supra, Firearms Examiner Jonathan Pope examined the ballistics evidence under a comparison microscope

¹³ Ironically, firearms and toolmark identification evidence first made its way into local case law in a decision issued by Associate Justice Van Orsdel (the same judge who authored Frye) one day after the Court of Appeals of the District of Columbia issued its decision in Frye. Laney v. United States, 54 App. D.C. 56, 60, 294 F. 412, 416 (D.C. 1923) ("[T]he testimony given by the expert witnesses, tending to establish that the bullet, extracted from the head of the deceased, was shot from the pistol found in the defendant's possession, was competent, and the examination in this particular was conducted without prejudicial error . . ."). Since that time, expert testimony of firearms and toolmark identifications have been routinely admitted into evidence in this jurisdiction. United States v. Andrews, 922 A.2d 449, 454 (D.C. 2007); Ingram v. United States, 885 A.2d 257, 267 n.27 (D.C. 2005); Williams v. United States, 881 A.2d 557, 566 (D.C. 2005); Peyton v. United States, 709 A.2d 65, 66 n.7 (D.C. 1998); Long v. United States, 687 A.2d 1331, 1334 (D.C. 1996); Friendak v. United States, 408 A.2d 364 (D.C. 1979); Frezzell v. United States, 380 A.2d 1382 (D.C. 1977); Goodall v. United States, 180 F.2d 397, 86 U.S.App.D.C. 148 (D.C. Cir. 1950); Medley v. United States, 155 F.2d 857, 81 U.S.App.D.C. 85 (D.C.), cert. denied, 328 U.S. 873, reh. denied, 329 U.S. 822 (1946).

and reached his conclusions based upon the traditional methodology of pattern matching. Pope Decl. ¶ 8. This instrument and methodology has been in use since the 1930s. See Bunch Decl. ¶¶ 19 & 23. As early as 1937, the Supreme Court of Missouri discussed the method of pattern matching under a comparison microscope:

The basis of his opinion was that a sufficient number of microscopic ridges and grooves at different places around the circumference of the evidence bullet, though not all, corresponded with the ridges and grooves on the test bullets to warrant the conclusion that all had passed through the same gun. The comparison was made in this way. The questioned bullet and a test bullet were put under what is called a comparison microscope, which is composed of two microscopes with a common eye piece, so arranged that the questioned bullet can be put under one microscope and the comparison bullet under the other; the single eye piece seeing the upper half of one bullet and the lower half of the other in juxtaposition, practically as if they were one bullet. By rotating the two bullets, it can be determined whether the ridges and grooves thereon are in alignment and match in height, depth, width, and direction, somewhat like matching the grains in a piece of wood that had been sawed in two.

State v. Shawley, 67 S.W.2d 74, 80 (Mo. 1933) (emphasis added).¹⁴

14 That same decade, traditional methods of firearms and toolmark identification had already been recognized as an established field of forensic science:

Firearms identification or the science of forensic ballistics is a well-recognized subject of expert testimony. The federal government has established at Washington, D. C., a department for firearms identification. Northwestern University, at Evanston, Ill., has made an exhaustive study of the subject in its scientific crime detection bureau, whose director is Prof. Calvin H. Goddard, one of the leading ballistic experts of the world and quite frequently a major witness in homicide cases in different states, being recognized as an authority on the matter.

State v. Dallao, 175 So. 4, 16 (La.), cert. denied, 302 U.S. 635, reh. denied, 302 U.S. 777

Traditional methods of pattern matching continue to be the dominant methodology of firearms and toolmark identification to this day. See attached SWGGUN Survey Summary (see TAB E).

Defendant suggests that the "fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks" were recently called into question by the March 8, 2008, prepublication issuance of a report by the National Research Council (NRC) titled "Ballistic Imaging." Defendant's Motion at 8. However, as noted in the attached affidavit of Dr. John E. Rolph, Chairman of the NRC's Report on Ballistic Imaging, the report was "neither a verdict on the uniqueness of firearm-related toolmarks generally nor an assessment of the validity of firearms identification as a discipline." See Affidavit of Dr. John E. Rolph at ¶ 6 (see TAB C). Hence, the Report on Ballistic Imaging does not alter the Frye analysis.

Recently, the defense in United States v. Ronald English et. al., 2007-CF1-01618, filed a similar motion to exclude firearms evidence. On March 20, 2008, the Honorable Geoffrey M. Alprin denied defendants' request without a Frye hearing. See 3/20/08 EH 44.¹⁵ Although the government had no opportunity to

(1937). In the decades that followed, firearms and ballistics evidence admitted through qualified experts gained universal acceptance by federal and local courts throughout the country. See 26 A.L.R. 2d. 892 (listing, by federal circuit and state, cases admitting various forms of firearms and toolmark evidence).

¹⁵"3/20/08 EH 44" references the March 20, 2008, transcript of the hearing to decide defendant's motion to exclude firearms evidence in English at page 44. A copy of the hearing transcript is attached.

address the NRC Report on Ballistic Imaging in English (due to the timing of defendant's motion), Judge Alprin nevertheless addressed the report, and found that it did not form a basis to hold a Frye hearing on the generally accepted practice of firearms and toolmark identification. Id. at 40-44.¹⁶ Because there is nothing new or novel about the scientific methodology employed by the MPD Firearms Examiner in this case, this court should deny defendant's motion without a hearing.¹⁷

C. The Traditional Method of Pattern Matching Enjoys General Acceptance in the Relevant Scientific Community

"The history of firearms identification and court acceptance of firearms and toolmark evidence in the United States goes back over 100 years and has been the subject of numerous publications The AFTE Theory of Identification, developed and adopted by the relevant scientific

¹⁶Recently a federal district court judge in the Southern District of New York reached the same conclusion in an effort by the defense to challenge the admissibility of firearms evidence under Daubert v. Merrell Dow, 509 U.S. 579 (1993). See United States v. Khalid Barnes, Decision and Order, S9 04 CR. 186 (SCR) (April 2, 2008) at p. 9 (copy attached TAB J). The district court specifically noted that the NRC Report on Ballistic Imaging "does not identify any new evidence undermining the core premise upon which ballistics analysis is based, nor does it purport to." Id. at 7. In Khalid Barnes, like here, defendant relied heavily upon an affidavit by Professor Adina Schwartz. The district court noted that Ms. Schwartz "is not trained or experienced as a firearms examiner and her contentions do not persuade this Court to find that the reliability of firearms identification evidence in general or in this case in particular warrant preclusion or, moreover, a hearing." Id. at 8; see also State v. Brewer, 2005 WL 1023238, * 1 (Conn. Super. 2005) (testimony of state's expert with regard to firearms and ballistics so well established that it does not require analysis under the state's Daubert-type rule).

¹⁷In 1997, a defendant requested a Frye hearing on the admissibility of ballistics evidence in United States v. Corey A. Moore, Crim. No. F-10928-94. It is the government's understanding that the Honorable Susan Holmes Winfield denied defendant's motion without a hearing. Although the government does not have a copy of the court's ruling, the government's pleading and an affidavit by a defense expert were published in the AFTE Journal, Vol. 30 No. 1 (Winter 1998).

community, has provided the toolmark identification community with a theory defining and describing the approach that examiners have traditionally taken when identifying/individualizing toolmarks." Richard Grzybowski et al., *Firearm/Toolmark Identification: Passing the Reliability Test Under Federal and State Evidentiary Standards*, 35 *AFTE Journal* 209, 219-20 (2003);¹⁸ see also Bunch Decl. ¶ 38 ("The AFTE theory of firearms identification merely adopted and articulated traditional principles of pattern matching that have enjoyed broad acceptance within the forensic firearms community for decades."). In Commonwealth v. Meaks, 2006 WL 2819423 *38 (Mass. Super. Sept. 28, 2006), the court discussed the scope of the "relevant scientific community" and its general acceptance of the traditional pattern matching method:

The evidence in these cases suggests that the firearms examination community . . . has a voluntary professional group, the Association of Firearms and Toolmark Examiners, or AFTE. [Peter] Striupaitis [a Firearms Examiner with the Northern Illinois Crime Laboratory and the former President of AFTE] testified that the firearms examiners community numbers approximately 1,100 individuals, 900 of whom are AFTE members. He further testified that the AFTE Theory of Identification requiring "sufficient agreement" among striations before an identification is found is generally accepted among the community of firearms and toolmark examiners. He knows of no examiner who disagrees with the AFTE Theory of Identification and the underlying principles of the field, although he acknowledged that firearms examiners engage in debates

¹⁸At the time this article was published, Richard Grzybowski was serving as the Chief of the Identification Section at the Bureau of Alcohol, Tobacco, Firearms and Explosives Forensic Laboratory. 35 *AFTE Journal* 209 n. b.

on a variety of issues concerning the field of firearms examinations. He based these assertions on the positions he has held in AFTE since 1981, including vice president and president, and on the conferences he has attended and the *AFTE Journal* articles he has read.

Because traditional methods of pattern matching have enjoyed general acceptance within the relevant scientific community for a significant period of time, few courts have deemed it necessary to conduct a bull blown inquiry into the issue. However, on the few occasions when courts have reexamined this issue, they have universally reaffirmed the general acceptance within the relevant scientific community of the traditional pattern matching methodology.

In upholding a trial court's admission of expert firearms and toolmark identification testimony under the Frye standard, the Superior Court of Pennsylvania discussed the long history of pattern matching and its general acceptance within the relevant scientific community:

The comparison microscope examination method has been in use since the 1930's and is an accepted methodology by the Association of Firearms and Toolmark Examiners. Laboratories which use this method of analysis include those at the FBI, the Bureau of Alcohol, Tobacco and Firearms, the Washington, D.C. Metropolitan Police Department . . . and basically every crime laboratory in the United states that is doing firearms identification work []. In direct response to questioning by the trial court regarding the reliability of the comparison microscope technique, Corporal Wall [a firearms and toolmark examiner with the Pennsylvania State Police] stated that it is tested every day "in crime laboratories throughout the United States and throughout the world and it is

accepted science and has been accepted for years and years."

As the technique has been in use since the 1930's, it is neither new nor original, but rather is of the sort that is offered all the time. The trial court determined that the methodology employed by Corporal Wall was generally accepted by the scientific community consisting of firearms experts and by a number of significant governmental bodies within and without the Commonwealth of Pennsylvania. Because this conclusion is fully supported by the record, we find no abuse of discretion in the trial court's decision to permit admission of the evidence regarding comparison of the two shell casings with the shotgun owned by Appellant.

Commonwealth v. Whitacre, 878 A.2d 96, 101 (Pa. Super. Ct. 2005)

(quotations marks and citations to the record omitted).

Federal courts facing challenges that such as that raised by defendant in this case, have reached similar conclusions when addressing the issue of general acceptance within the scientific community under the rubric of Daubert:

The AFTE theory of firearms identification based on traditional pattern matching appears to have broad acceptance in the forensic community. There has been no critique sufficient to undermine the traditional examination method as it is performed by competent, trained examiners. The few critiques - such as the impossibility of calculating a true error rate and the fact that there can be no statistical, objective verification of an examiner's conclusions - do not represent the instability in the field that defendants make them out to be. It is clear that the community of firearm and toolmark examiners accepts the current identification methodology as reliable. Even examiners who promote CMS use do not contest the validity of traditional pattern matching.

United States v. Diaz, 2007 WL 485967 *11 (N.D. Cal. Feb. 12,

2007) (internal quotation marks and citations omitted); United

States v. Monteiro, 407 F. Supp. 2d 351, 372 (D. Mass. 2006) (“[T]he community of toolmark examiners seems virtually united in their acceptance of the current technique.”); see also United States v. Bowers, 534 F.2d 186, 193 (9th Cir. 1976) (“The record was sufficient to permit the trial court to conclude that ‘tool mark identification’ rests upon a scientific basis and is a reliable and generally accepted procedure.”).¹⁹ Thus, regardless of the applicable admissibility standard, courts have consistently concluded that the traditional method of pattern matching enjoys general acceptance within the relevant scientific community.²⁰ Tellingly, defendant cites no case, and

¹⁹The Supreme Court discussed the admissibility of firearms evidence, in dictum, by comparing polygraph experts who “can supply the jury only with another opinion” to “expert witnesses who testify about factual matters outside the juror’s knowledge, such as the analysis of fingerprints, ballistics, or DNA found at a crime scene” United States v. Scheffer, 523 U.S. 303, 312-13 (1998).

²⁰Defendant cites to one instance in which a court in Florida excluded knife-mark evidence. Defendant’s Motion at 13 n.7 (citing Ramirez v. State, 810 So. 2d 836, 853 (Fla. 2001)). This case, however, does nothing to advance defendant’s cause. The Florida court ruled that the proposed knife-mark testimony was inadmissible because it “depart[ed] from traditional knife marks identification theory in significant ways” 810 So. 2d at 845. Moreover, the court made clear that its opinion was not disturbing the long history of case law supporting the admissibility of traditional toolmark identification: “The theory underlying tool mark evidence . . . is generally accepted in the scientific community and has long been upheld by courts.” Id.

we are aware of none, that has found to the contrary.²¹

D. Defendant's Claims are without Merit

In the face of nearly a century of case law favoring the admissibility of firearms and toolmark identification testimony, defendant now asserts that this court should apparently become the only court to exclude this type of testimony based upon a lack of general acceptance within the relevant scientific community. Defendant's Motion at 7-14. Rather than acquire an arsenal of highly qualified firearms examiners, or uncover a single case in support of this argument, defendant attempts to mount such a herculean challenge without support from a member of the relevant scientific community. The opinions expressed

²¹Defendant cites to federal district court decisions in Monteiro, 407 F. Supp. at 371, Diaz, 2007 WL 485967, and United States v. Green, 405 F. Supp. 2d 104 (D. Mass. 2005), to the support the claim that federal courts are beginning to acknowledge that the subjective nature of firearms identification is a "serious problem" that must be considered in the admissibility analysis. Defendant's Motion at 13 n.7. Monteiro and Diaz, however, expressly found that the principles of traditional pattern matching are generally accepted within the relevant scientific community. Monteiro, 407 F. Supp. 2d 351, 372 (D. Mass. 2006) ("[T]he community of toolmark examiners seems virtually united in their acceptance of the current technique."); Diaz, 2007 WL 485967 *11 ("The AFTE theory of firearms identification based on traditional pattern matching appears to have broad acceptance in the forensic community."). Although the court in Green did not specifically address the issue of general acceptance, the court noted: "There is apparently widespread acceptance in the courts of ballistics testing and toolmark analysis." 405 F. Supp. 2d at 122. Moreover, to the extent the court found there to be criticism within the "scholarly literature," the court cited to an article on "bitemarks" and two legal articles (including an article written by Adina Schwartz) rather than scientific peer-reviewed publications. Id. n.33. None of these courts excluded firearms evidence of the type that the government seeks to introduce in this case. As discussed infra, to the extent Diaz and Monteiro required the experts to express their respective identifications "to a reasonable degree of scientific certainty," see Diaz, 2007 WL 485967 *14, Monteiro, 407 F. Supp. 2d at 372, the decisions are consistent with the government's position. In Green, the court imposed a similar limitation by ruling that the firearms expert would be permitted to testify about his observations, but would not be permitted to testify that a match had been made to the "exclusion of all other guns." 405 F. Supp. 2d at 124.

the persons providing sworn statements by the defense do not undo the long-standing general consensus within the relevant scientific community. More importantly, the materials relied upon by these purported experts, such as the NRC Report on Ballistic Imaging and other sundry articles, do not support their contentions.

1. Fundamental Assumptions Underlying Firearms and Toolmark Identification

Defendant asserts that the fundamental assumptions underlying firearms and toolmark identification do not enjoy general acceptance among the relevant scientific community. Defendant's motion at 7. Defendant's claim is without merit.

Defendant's argument is almost entirely based upon a few select excerpts from the voluminous NRC Report on Ballistic Imaging. Id. at 8. As indicated by the attached sworn affidavit of Dr. John E. Rolph, Chair of the Report on Ballistic Imaging, defendant's reliance upon the NRC Report is misplaced. The purpose of the report was to assess the feasibility of creating a ballistics data base. See Rolph Affidavit ¶ 3. As Dr. Rolph points out, the admissibility of ballistics evidence in legal proceedings "was explicitly ruled out of the Committee's charge." Rolph Affidavit ¶ 5. Dr. Rolph further clarifies, "[t]he statement in the Report that the 'validity of the fundamental assumptions of uniqueness and reproducibility of firearm-related toolmarks has not been fully demonstrated'

(Report at 3-22) was not made in the context of assessing the admissibility of firearms-related evidence.” Id. ¶ 6. Importantly, the Report explicitly stated that it was not passing judgement on the field of firearms and toolmark identification:

[T]his study is neither a verdict on the uniqueness of firearm-related toolmarks generally nor an assessment of the validity of firearm’s identification as a discipline. Our charge is to focus on ‘the uniqueness of ballistic images’ - that is, on the uniqueness and reproducibility of the markings (toolmarks) left on cartridge cases and bullets as they are recorded or measured by various technologies.

Rolph Affidavit ¶ 6 (quoting NRC Report on Ballistic Imaging at 1-5 (emphasis in original Report)). Thus, the NRC report did not evaluate, much less undermine, the fundamental assumptions of firearms and toolmark identification.²²

Next, defendant contends that a study conducted by Al Biasotti reveals similarities in markings created by different firearms. Defendant’s Motion at 8-9. We note initially that this argument goes to the validity of the underlying science which, although relevant under Daubert,²³ has no place in a Frye inquiry: “The Frye analysis . . . begins and ends with the acceptance of particular scientific methodology.” Jenkins, 887

²² We note, at the time the NRC Committee was being formed, “it was decided not to include an active firearms examiner” on the NRC Committee. See Report on Ballistic Imaging, Preface at ix. Instead, the NRC Committee used a single retired firearms examiner as a consultant. Id. Thus, it is unclear whether the NRC Committee was qualified to comprehensively evaluate the field of firearms and toolmark identification or weigh in on the general acceptance of pattern matching within the relevant scientific community.

²³Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993)

A.2d at 1022 (internal quotation marks omitted). In any event, as explained in the attached statement of Stephen Bunch, defendant misinterprets Biasotti's study. See Bunch Decl. ¶ 36 (Biasotti was merely making the point that there is no value in "counting the percentage of matching lines (straie) in a bullet comparison, which is a fact understood by firearms examiners for about as long as firearms identification has been practiced;" rather, "it is consecutiveness that matters").²⁴ Importantly, defendant cites to no article or study that casts doubt on the general acceptance of the traditional pattern matching method within the scientific community.²⁵

Lastly, defendant relies upon an affidavit by Adina

²⁴Defendant also points out that a number of known non-match test-fires from different firearms appear "near the top of the [same gun] candidate lists." Defendant's Motion at 8-9. However, this phenomena is "completely predictable" in large imaging databases such as the National Integrated Ballistic Information Network (NIBIN). Bunch Decl. ¶ 39. Importantly, matches in NIBIN are merely a starting point for further examination. Id. Any positive identifications are made under a comparison microscope. Id. Moreover, there is no evidence that an increase in similar images in databases has lead to misidentifications under a comparison microscope. Id.

²⁵One of the most comprehensive reviews of the relevant scientific literature in the field of firearms and toolmark identification was conducted in two stages by ATF Firearms Examiner Ronald G. Nichols. In the first article, Nichols reviewed a total of thirty-four scientific articles. See Nichols, R.G., Firearms and Toolmark Identification Criteria: A Review of the Literature, Journal of Forensic Sciences, 1997: 42(d): 446-74 (hereafter "Nichols Part I"). In the second article, Nichols reviewed a total of twenty-two scientific articles. See Nichols, R.G., Firearms and Toolmark Identification criteria: A Review of the Literature, Part II, Journal of Forensic Sciences, 2003 Mar: 48(2): 318-27 (hereafter "Nichols Part II"). All three Nichols articles are attached hereto (see TAB H). Recently, during a Daubert hearing in United States v. Diaz, No. CR-05-0167 (N.D. Cal.), Nichols testified that after his comprehensive review of the scientific literature in the field of firearms and toolmark identification, he was not aware of a single peer-reviewed article which stands for the proposition that firearms and toolmark identification is not a reliable forensic discipline. See Transcript of Testimony of Ronald G. Nichols in U.S. v. Diaz, No. CR-05-0167 at 26.

Schwartz to establish that her review of the scientific literature reveals that "principles and methodology of firearms identifications are not generally accepted within the firearms identification community or among a broader group of scientists." Defendant's Motion at 9-10. However, Ms. Schwartz is a law professor and defense attorney by profession, and, as such, is not qualified to comment on the state of the scientific agreement in the relevant scientific community:

Schwartz has never been trained as a firearms examiner or conducted a firearms examination, but she has gone to a ballistics lab and looked at cartridge cases under a comparison microscope on two occasions. She has never conducted a test concerning the changes in toolmarks over time, nor has she ever written or taken a proficiency test in the field of firearms investigations. She has never attended an armorer's school, watched the manufacture of a firearm, spoken with firearm manufacturers, or fired a gun.

Meaks, 2006 WL 2819423 *29; see also Khalid Barnes, Decision and Order at 9 (Ms. Schwartz "is not trained or experienced as a firearms examiner and her contentions do not persuade this Court to find that the reliability of firearms identification evidence in general or in this case in particular warrant preclusion or, moreover, a hearing"). Moreover, her assertion that a rift within the relevant scientific community can be gleaned from a review of the scientific literature is belied by the sworn testimony of ATF Examiner Ronald Nichols in Diaz. See Transcript of Testimony of Ronald G. Nichols in U.S. v. Diaz,

No. CR-05-0167 at 26 (see TAB F).²⁶ Having heard sworn testimony by both Ms. Schwartz and ATF Firearms Examiner Nichols, the district court in Diaz had no trouble finding consensus within the relevant scientific community. Diaz, Slip Op. 2007 WL 485967 * 11 ("The AFTE theory of firearms identification based on traditional pattern matching appears to have broad acceptance in the forensic community.").²⁷

2. The Subjective Nature of Firearms Identification

Under the guise of arguing a lack of agreement within the relevant scientific community, defendant argues that the methodology of pattern matching "is entirely subjective and has never been proven to produce reliable results." Defendant's Motion at 10. Once again, appellant's "Frye" challenge is a thinly veiled effort to attack the underlying science, the very thing that Frye precludes: "Tersely put, this court's inquiry is focused on counting scientists' votes, rather than [on] verifying the soundness of a scientific conclusion." Jenkins, 887 A.2d at 1022 (citations omitted). Based upon these same Frye

²⁶See also Nichols Part I & Part II; Ronald G. Nichols, Defending the Scientific Foundations of the Firearms and Tool Mark Identification Discipline: Responding to Recent Challenges, *Journal of Forensic Science*; May 2007, Vol. 52, No. 3.

²⁷To the extent the NRC Report on Ballistic Imaging, or the Affidavit of Ms. Schwartz, are being cited in an effort to demonstrate that firearms and toolmark identification could be made better by reducing or eliminating the possibility of a false match, defendant misses the point. Presumably, most, if not all, forensic disciplines are constantly evolving in terms of accuracy, technical capabilities, and quality control. However, Frye requires consensus not perfection. In Porter II, the D.C. Court of Appeals recognized the theoretical possibility of a false DNA match or the more likely possibility of a procedural error on the part of a scientist. 618 at 636. These concerns, however, did not "raise an issue which implicates Frye." Id.

principles, the Superior Court of Pennsylvania affirmed the denial of a similar challenge to the admissibility of firearms and toolmark identification: "What is required is that the methodology employed be generally accepted by the relevant scientific community, even if it is heavily dependent upon the subjective judgement of the expert." Whitacre, 878 A.2d at 102 (affirming admissibility of ballistics evidence under Frye).²⁸

Stephen Bunch readily acknowledges that firearms and toolmark identification involves subjectivity when an examiner looks for a high degree of correspondence in patterns, but points out that all sciences involve some elements of subjectivity. Bunch Decl. ¶ 37; see also Roberts, 916 A.2d ("[a]s with any scientific process, interpretation of electropherogram or other test results always involves an

²⁸Defendant contends that "[statisticians]" dispute the reliability of a subjective methodology without any verifiable "error rate." Defendant's Motion at 12. In actuality, defendant relies on an affidavit from a single statistician. Defendant makes no effort to explain how this statistician is part of the "relevant scientific" community or how his lone position could create controversy therein. After all, unanimity among scientists is not required. Porter II, 618 A.2d at 634. We note, in the context of DNA evidence (where statisticians do play a significant role in the "relevant scientific community"), challenges to the admissibility of DNA "matches" without accompanying "error rates" have been rejected by the D.C. Court of Appeals. See Roberts, 916 A.2d at 931 ("the best protection an innocent suspect has from a false match is an independent test, and that opportunity should be made available if at all possible") (quoting from DNA NRC II at 24). Moreover, in Daubert jurisdictions, where "error rate" is an appropriate topic of inquiry, courts have rejected similar challenges to ballistics evidence. See State v. Williams, 974 So. 2d 157, 163 (La. Ct. App. 2008) (rejecting defendant's argument that firearms identification should not be admissible without accompanying error rate); Monteiro, 407 F. Supp. 2d at 368 (government established that known error rate is not unacceptably high). In any event, validation studies have demonstrated that the error rate amongst qualified examiners is exceedingly low. Bunch Decl. ¶ 28. Moreover, MPD Firearms Examiner Pope has been taking bi-annual proficiency tests since 1999 with an error rate of zero. Pope Decl. ¶ 17.

element of subjectivity"). This element of subjectivity has been discussed by courts in evaluating the admissibility of firearms and toolmark identification evidence:

There is no question ... that conclusions of identity in firearms ... are possible." Biasotti & Murdock [] 36:10, at 413. "[T]he interpretation of the ... identification is *subjective* in nature, *founded on scientific principles* and based on the examiner's training and experience. " AFTE Theory [] at 86 (emphases added); see Biasotti & Murdock [] § 36:9, at 413 ("[T]he interpretation that forms the basis for these conclusions is subjective."). The "scientific principles" have been continually tested empirically and [have] stood the test of time, resulting in the general principle (Theory) adopted by [AFTE] in 1992." Biasotti & Murdock [] at 411. "The studies leading up to this theory have been peer reviewed, published, and thus have been available for replication by the relevant scientific community of forensic scientists. Id.

Meaks, 2006 WL 2819423 *17. However, the presence of subjectivity in pattern matching has not caused courts to exclude the admissibility of firearms and toolmark identification evidence. Meaks, 2006 WL 2819423 * 50; see also Diaz, 2007 WL 485967 *1 ("While there is some subjectivity involved, it is the subjective judgment of trained professionals with a keen practiced eye for discerning the extent of matching patterns."); People v. Gear, 2007 WL 2259026 *5 (Cal. Ct. App., Aug. 8, 2007) (rejecting defendant's argument that firearms and toolmark identification should be excluded because it is "highly subjective"); State v. Anderson, 624 S.E.2d 393, 398 (N.C. Ct. App. 2006) ("subjective nature of Agent Powell's [ballistics]

examination go to the weight of Agent Powell's testimony and not its admissibility"); People v. Duncan, 2004 WL 797790 *5 (Cal. Ct. App., April 15, 2004) (rejecting defendant's assertion that ballistics evidence should have been excluded by trial court because it is, inter alia, "subjective science"); cf., United States v. Plaza, 188 F. Supp. 2d 549, 570 (E.D. Pa. 2002) (in admitting particular methodology of fingerprint comparisons, court noted: "[T]here are many situations in which an expert's manifestly subjective opinion (an opinion based . . . on 'one's personal knowledge, ability and experience') is regarded as admissible evidence in an American courtroom . . .").²⁹

²⁹Defendant characterizes the practice of Consecutive Matching Striae (CMS) as a different "method" of firearm and toolmark identification, and argues that CMS is an indication that the traditional practice of pattern matching alone is "inherently probabilistic in nature." Defendant's Motion at 12 n. 5. Once again, defendant is straying from the principles of Frye. The only question for this court to resolve is whether the traditional method of pattern matching enjoys general acceptance within the scientific community, Jenkins, 887 A.2d at 1022, which it does. Moreover, defendant's interpretation of CMS is misguided. CMS is merely "an extension of pattern matching," and, as such, does not disturb the general acceptance of the more traditional method of firearm and toolmark identification. Bunch Decl. ¶ 33-34. In Diaz, the court rejected similar efforts to create a controversy over CMS:

[ATF Firearms Examiner Ronald] Nichols, himself a CMS proponent, disagreed with [Adina] Schwartz's assessment that the field was "in turmoil" due to the development of CMS. Nichols explained that all firearms examiners start their process by looking for patterns that match between the two items under the comparison microscope. CMS merely quantified and described the pattern the examiner was observing. Thus, the field was not "divided" because CMS and traditional pattern matching were not mutually exclusive. Nichols was adamant that CMS was not a separate theory of identification. Rather, it was only a method to describe the striated patterns on which firearms examiners had been basing conclusions for decades.

Diaz, 2007 WL 485967 *12 (emphasis in original). Hence, defendant's effort (through Ms. Schwartz) to characterize the development of CMS as a sign of disagreement within the relevant scientific community has no merit.

Finally, defendant, also asserts that this evidence should be excluded based on the alleged lack of "meaningful studies" demonstrating an ability on the part of firearms examiners to distinguish between individual and subclass characteristics. Defendant's Motion at 12. Aside from the fact that defendant is once again attempting to divert this court away from the issue of general acceptance (toward the underlying validity of firearms and toolmark examination as a science), his contention is wrong. See Bunch Decl. ¶ 31 (subclass marks in practice are by no means a serious problem for firearms and toolmarks examiners because (1) examiners are always alert to new manufacturing techniques that could possibly produce subclass marks, and publish any positive findings to the community at large in order that practicing examiners can take special care in cautionary situations; (2) examiners are trained to remain alert to potential subclass issues, even when research may be silent on particular circumstances; and (3) by all accounts, subclass marks appear to be rare in actual casework, as they are in validity and proficiency tests); see also Diaz, 2007 WL 485967 *2 ("[G. Andrew Smith, a firearms and toolmark examiner at the San Francisco Police Department Crime Lab] testified that a trained, qualified examiner takes care not to confuse subclass characteristics with individual characteristics, because an identification should not be made based on subclass

characteristics,” and “[ATF Firearms examiner Ronald] Nichols also explained that trained examiners can account for subclass characteristics”); Monteiro, 407 F. Supp. 2d at 371 (court concluded that “the trained eye will be able to distinguish among the class, subclass, and individual characteristics produced by the firearms”).³⁰

3. Absence of Statistical Probabilities in Firearms and Toolmark Identification

Defendant points out that there is no methodology for determining the statistical likelihood of a coincidental “match” in the context of firearms and toolmark identification.³¹ Based upon this unremarkable fact, defendant asserts that a firearm and toolmark examiner “who states that a bullet or cartridge casing was fired from a particular gun, to the exclusion of all other guns in the world, claims 100% accuracy, with a 0% chance of a coincidental match.” Defendant’s Motion at 13. Defendant’s assumption, that all firearms and toolmark examiners state their conclusions with 100% certainty, is simply wrong.

³⁰Defendant also attempts to attack the scientific validity of firearms identification with an affidavit from William Tobin, a former FBI Metallurgist, who appears to have no firearms-related casework experience or specialized training in the field of firearms and toolmark identification. Bunch Decl. ¶ 40. Even assuming that Mr. Tobin, as a retired Metallurgist, is a part of the “relevant scientific community,” his broad sweeping assertions about the field of firearms and toolmark identification are unsupported by any specific evidence or research studies. Id. Frye requires general acceptance not unanimity.

³¹Appellant makes no effort to clarify what is meant by a “coincidental match.” For purposes of argument, we assume that defendant is referring to “the probability that two firearms related tool marks are identical or that cartridges were not fired from the same firearm or that some other unknown firearm might have left similar distinguishing tool marks on a particular piece of crime scene evidence.” See Affidavit of Dr. Frederick R Bieber ¶ 15 see TAB D).

According to Steve Bunch, firearm examiners cannot state an identification with "absolute (100%) certainty," and, if asked, must qualify an identification by stating that a match is made with (1) "practical certainty";³² or (2) to "a reasonable degree of scientific certainty." Bunch Decl. ¶ 26. Either qualification communicates an examiner's high degree of confidence in an identification without overstating the significance of a match. Id.; see also Diaz, 2007 WL 485967 *1 (the examiners who testify in this case may only testify that a match has been made to a "reasonable degree of certainty in the ballistics field"); Monteiro, 407 F. Supp. 2d at 372 ("a qualified examiner who has documented and had a second qualified examiner verify her results may testify based on those results that a cartridge case matches a particular firearm to a reasonable degree of ballistic certainty"); State v. Riley, 568 N.W.2d 518, 527 (Minn. 1997) ("it was proper for [the firearms expert] to state his opinion that to a 'reasonable degree of scientific certainty,' the Smith & Wesson handgun was the source of the collected shell casings"). Consistent with the general practice of firearm examiners in general, MPD Firearms Examiner Pope, when asked, reveals that an identification is made "to a reasonable degree of scientific certainty." See Pope Decl. ¶ 12.³³

³²Practical certainty means as follows: "the determination of identity correlates to features whose frequency (or likelihood) of reoccurrence by another tool is so remote that it can be considered practically impossible." Bunch Decl. ¶ 26.

³³The government recognizes that examiners have, on occasion, stated

Once again, defendant places a great deal of reliance upon the NRC Report. Specifically, defendant cites language in the report that firearms examiners often "cast their assessments in bold absolutes, commonly asserting that a match can be made 'to the exclusion of all other firearms in the world.'" Defendant's Motion at 14 (quoting NRC Report on Ballistic Imaging at 3:23). Once again, however, defendant's reliance on the report is misplaced. According to John Rolph, "The Committee's cautionary statement [about examiners who make bold identification statements] is not a commentary on the admissibility of firearm-related toolmark evidence." Rolph Affidavit ¶ 10. Instead, statements of "matches" should be supported by (1) "the work that was done in the laboratory;" (2) "the notes and documentation made by examiners;" and (3) "proficiency testing." In the instant case, each of these requirements were met. See Pope Decl. In addition, Firearms Examiner Pope's conclusions were subjected to peer review within his laboratory and the evidence was subsequently examined by an defense expert. Id.³⁴

identifications with 100% certainty. See e.g. United States v. Natson, 469 F. Supp. 2d 1253, 1261 (M.D. Ga. 2007) (firearms expert stated his opinion with 100% certainty). However, this is neither the generally accepted practice within the firearms community, see Bunch Decl. ¶ 26, nor the practice of the firearms examiner in this particular case. See Pope Decl. ¶ 12.

³⁴Any limitations on the certainty of the conclusions reached in the Firearms Report can be brought to the attention of the jury through cross-examination. Porter II 618 A.2d at 636 ("Any failure by the scientists to adhere to the appropriate procedure is, of course, a proper subject of inquiry, but does not raise an issue which implicates Frye."). More importantly, to the extent the defense disagrees with any of the conclusions reached by Firearms Examiner Pope, they are free to call the defense firearms expert. See Roberts, 916 A.2d at 931 ("the best protection an innocent suspect has from a false match is an

Furthermore, there is no support for defendant's efforts to extend the rules governing the admissibility of DNA evidence, see Porter, 618 A.2d at 640, to the context of firearms and toolmarks identification. As discussed in the attached Affidavit of Dr. Frederick R. Bieber, methods of calculating estimates of forensic DNA profile frequencies "do not readily apply to firearms related toolmark comparisons [] because these are two very different phenomena, one biological/genetic and one non-biological/physical." Bieber Affidavit ¶ 17. More specifically, DNA profiles involve genetic traits, researched through populations studies, which enable scientists to estimate the probability that genetically shared markers will occur in a given population of individuals. Id. However, "analogous calculations are not available to estimate the probability that two firearms related tool marks are identical or that cartridges were not fired from the same firearm or that some other unknown firearm might have left similar distinguishing tool marks on a particular piece of crime scene evidence." Id. ¶ 15. Dr. Bieber points out that such a calculation would "require adequate knowledge of the universe of firearms in existence at the time of a particular crime," which "does not appear feasible" under the "current state of technology." Id.³⁵

independent test, and that opportunity should be made available if at all possible") (quoting from DNA NRC II at 24).

³⁵Dr. Bieber was one of two expert witnesses called by the government in Jenkins to explain the application of statistical probabilities in the context of cold-hit DNA cases.

Defendant cites no case, and we are aware of none, that has required a firearm examiner to give statistical calculations in connection with firearms and toolmark identifications. Considering the role that firearms and toolmark identifications have played in the American judicial system over the past century, the absence of a single case in support of defendant's position is telling. In sum, there is no basis in science or law to impose such a requirement.³⁶

CONCLUSION

WHEREFORE, defendant's motion to exclude expert testimony regarding firearms match evidence should be DENIED.

Respectfully submitted,

JEFFREY A. TAYLOR,
United States Attorney.

ROY W. McLEESE III,
MICHAEL T. AMBROSINO,
Assistant United States Attorneys

ROBERT J. FEITEL,
SHARAD KHANDELWAL,
Assistant United States Attorneys
555 Fourth Street, N.W.
Washington, D.C. 20001

Jenkins, 887 A.2d at 1017.

³⁶Defendant also claims that unfair prejudice from Firearms Examiner Pope's testimony will substantially outweigh its probative value. Defendant's Motion at 15. Rather than articulate any new arguments, however, defendant merely repeats his complaint that there is no empirical data to support an identification purportedly made with absolute certainty. This argument fails for the reasons discussed supra.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing Government's Opposition to Defendant's Motions to Exclude Expert Testimony Regarding Firearms Match Evidence, was served by hand upon counsel for the defendant, Matthew Mazur, PDS, 633 Indiana Avenue, N.W., Washington, DC 20004, on this 30th day of May, 2008.

ROBERT J. FEITEL
Assistant United States Attorney