IN THE CIRCUIT COURT OF THE
17th JUDICIAL CIRCUIT IN AND
FOR BROWARD COUNTY, FLORIDA

STATE OF FLORIDA,	*	CASE NO: 09-16048-CF10A
Plaintiff,	*	JUDGE: Ilona M. Holmes
vs.	*	
BOBBY MELLAD,	*	
Defendant.	*	**MEMORANDUM OF LAW IN SUPPORT OF DEFENDANT'S MOTION FOR A PRE-TRIAL *DAUBERT* HEARING (FIREARMS COMPARISON)**

COMES NOW the defendant, BOBBY MELLAD, by and through the undersigned Attorney and, as Memorandum of Law in support of the Defense Motion in Limine to Limit the Scope of Opinions of Law Enforcement Identification Expert Witness [pre-trial ***Daubert*** hearing on firearms examination and comparison], states as follows:

Part I: Summary and Overview:

1. ***Daubert v. Merrell Dow Pharmaceuticals***, 509 U.S. 579 (1993) became the standard (in federal court) for trial judges to determine whether certain forensic evidence will be admissible at trial and the extent to which the court will permit expert opinion on certain key issues [such as whether the proffered expert will be permitted to draw conclusions state opinions on the ultimate issue of firearms identification]. The State has the burden to prove beyond reasonable doubt that: (1) a crime was committed; and (2) the defendant is the one who committed that crime. The ***Daubert*** Court set forth five factors for trial courts to consider regarding the forensic evidence sought to be admitted, whether in its pre-trial ***Daubert*** hearing or objections raised again during trial. Those factors are:

a. Whether a particular theory or technique can be (and has been) **TESTED?**

b. Whether the theory or technique has been subjected to **PEER-REVIEW and PUBLICATION?**

c. What are the known or potential **ERROR RATES** associated with the particular *scientific* technique?

d. Whether there are standards controlling the technique's operation by proof of the **EXISTENCE** and **MAINTENANCE** of **STANDARDS?**

e. What is the technique's **DEGREE OF ACCEPTANCE** within the relevant *scientific* community?

2. Florida recently moved away from the ***Frye*** standard. [See ***Frye v. United States***, 54 App. D.C. 46, 293 F. 1013 (1923)]. The ***Frye*** evidentiary standard, that found long acceptance in Florida, emerged and developed from the following language in ***Frye***:

> Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts 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.

Should the trial court, following a pretrial ***Daubert*** hearing, make its determination that the evidence will come in at trial, the Defense will still address certain issues with the jury at appropriate intervals during trial. We contest the State expert's qualifications. The conclusions and opinions have not been adequately **tested; they** have not been subjected to **peer-review** or **publication; error rates** cannot or have not been shown; there are no known **standards** that exist and have been adequately maintained; and that the technique has not found **general acceptance** within the

discipline outside the narrow confines of law enforcements' attempt to solve crimes. Of course, the presentation to the jury is addressed to the lack of reliability, credibility and believability. The Defense may present its own experts at trial to convince the jurors that the State expert's opinion is **not reliable**, not worthy of any **credibility**, and that the witness' opinions should be disregarded in the jury's determination of guilt.

3. The question is whether the State's expert opinion is based upon real ***scientific evidence?*** Such is the case where casings and/or projectiles found at the crime scene are attempted to be compared to each other or to a particular firearm, if one was actually collected into evidence [in the case at bar there was no firearm found by law enforcement]. The law enforcement firearms examiner listed as a State witness may well be able to explain and show what ***lands and groves*** are generally, the theory about how they are formed, and how they actually were observed on the projectiles in evidence in this case. They may be able to show markings on the casings indicating the strikes from impact of the mechanisms in the firearm. But they cannot testify that there is no doubt or 100% certainty that these projectiles were fired from the same gun, as they cannot testify to error rates or any empirical studies that urge credence to their theory. It is up to the jury to draw those ultimate conclusions of fact. For the Court to rule otherwise clearly violates the ***Daubert*** standard, notwithstanding that it seems to sound right to the unscientifically trained mind. This is what makes such testimony errant, misleading, unreliable and objectionable.

Part II: The National Academy of Science Report:

On 11/22/2005, the Science, Justice, Commerce, and Related

Agencies Appropriations Act of 2006 was passed by the United States Congress and became federal law. [*See* P.L. No. 109-108, 119 Stat. 2290 (2005).] Pursuant to this Act, Congress authorized the National Academy of Sciences (NAS) to conduct a study on the forensic sciences. In 2006, a committee was established by the NAS to implement the congressional charge.

In 2009, a National Academy of Sciences Committee embarked on a long-overdue quest to study typical forensic analyses with an appropriate level of scientific scrutiny -- and the results were deeply chilling. Aside from DNA analysis, **not a single forensic practice held up to the rigorous NAS inspection**. The NAS Committee condemned common methods of ballistics analysis as being based on tenuous and largely untested science. The report amounted to a searing condemnation of the current practice of forensics and an ominous warning that death row may be filled with innocents. [*Emphasis added.*]

Now turning to the NAS Report we find, that the **Preface** to the NAS Report [at p. *xix*] states:

> Recognizing that significant improvements are needed in forensic science, Congress directed the National Academy of Sciences to undertake the study that led to this report. There are scores of talented and dedicated people in the forensic science community, and the work that they perform is vitally important. They are often strapped in the work, however, for lack of adequate resources, sound policies, and national support. It is clear that change and advancements, both systematic and scientific, are needed in a number of forensic science disciplines—to ensure the reliability of the disciplines, establish enforceable standards, and promote best practices and their consistent application.

The Committee Co-chairs [at p. xx] state: "In considering the testimony and evidence that was presented to the committee, what

surprised us the most was the consistency of the message that we heard:

> The forensic science system, encompassing both research and practice, has serious problems that can only be addressed by a national commitment to overhaul the current structure that supports the forensic science community in this country. This can only be done with effective leadership at the highest levels of both federal and state governments, pursuant to national standards, and with a significant infusion of federal funds."

The **Summary** [at pp. 1-4], begins with the **INTRODUCTION**. There we read in pertinent part:

"On November 22, 2005, the Science, State, Justice, Commerce, and Related Agencies Appropriations Act of 2006 became law [see P.L. No. 109-108 Stat. 2290 (2005)]. Under the terms of the statute, Congress authorized the 'National Academy of Sciences to conduct a study on forensic science as described in the Senate report [see H.R. Rep. No. 109-272, at 121 (2005) (Conf. Rep.)]. The Senate Report to which the Conference Report refers states:

> While a great deal of analysis exists of the requirements in the discipline of DNA, there exists little to no analysis of the remaining needs of the community outside of the area of DNA. Therefore…the Committee directs the Attorney General to provide [funds] to the National Academy of Sciences to create an independent Forensic Science Committee. This Committee shall include members of the forensics community representing operational crime laboratories, medical examiners, and coroners; legal experts; and other scientists as determined appropriate."

"In the fall of 2006, a committee was established by the National Academy of Sciences to implement this congressional charge…The issues covered during the committee's hearings and deliberations included:

(j) forensic science practices—pattern/experience evidence

- o fingerprints (including the interoperability of AFIS
- o **firearms examination**
- o toolmarks
- o bite marks
- o impressions (tires, footwear)
- o bloodstain pattern analysis
- o handwriting
- o hair

analytical evidence

- o DNA
- o coatings (e.g., paint)
- o chemicals (including drugs)
- o materials (including fibers)
- o fluids
- o serology
- o fire and explosive analysis

digital evidence

(k) the use of forensic evidence in criminal…litigation

- o the collection and flow of evidence from crime scenes to courtrooms
- o **the manner in which forensic practitioners testify in court**
- o cases involving the misinterpretation of forensic evidence
- o the adversarial system in criminal…litigation
- o lawyer's use and misuse of forensic evidence
- o judges' handling of forensic evidence."

Challenges Facing the Forensic Science Community [pp. 4-5]:

"Over the last two decades, advances in some forensic science disciplines, especially the use of DNA technology, have demonstrated that some areas of forensic science have great additional potential to help law enforcement identify criminals. Many crimes that may have gone unsolved are now being solved because forensic science is helping to identify the perpetrators.

"Those advances, however, also have revealed that, in some cases, substantive information and testimony based on faulty forensic science analyses may have contributed to wrongful convictions of innocent people. This fact has demonstrated the potential danger of giving undue weight to evidence and testimony derived from imperfect testing and analysis. Moreover, imprecise or exaggerated expert testimony has sometimes contributed to the

admission of erroneous or misleading evidence."

Disparities in the Forensic Science Community [pp. 5-6]:

"There are great disparities among existing forensic science operations in federal, state, and local law enforcement jurisdictions and agencies. This is true with respect to funding, access to analytical instrumentation, the availability of skilled and well-trained personnel, certification, accreditation, and oversight. As a result, it is not easy to generalize about current practices within the forensic science community. It is clear, however, that any approach to overhauling the existing system needs to address and help minimize the community's current fragmentation and inconsistent practices."

Lack of Mandatory Standardization, Certification, and Accreditation [p. 6]:

"The fragmentation problem is compounded because operational principles and procedures for many forensic science disciplines are not standardized or embraced, either between or within jurisdictions. There is no uniformity in the certification of forensic practitioners, or in the accreditation of crime laboratories. Indeed, most jurisdictions do not require forensic practitioners to be certified, and most forensic science disciplines have no mandatory certification programs. Moreover, accreditation of crime laboratories is not required in most jurisdictions. *** These shortcomings obviously pose a continuing and serious threat to the quality and credibility of forensic science practice."

The Broad Range of Forensic Science Disciplines [pp. 7-8]:

"The term *forensic science* encompasses a broad range of forensic disciplines, each with its own set of technology and practices. In other words, there is wide variability across forensic science disciplines with regard to techniques, methodologies, reliability, types and numbers of potential errors, research, general acceptability, and published material. Some of the forensic science disciplines are laboratory based (e.g., nuclear and mitochondrial DNA analysis, toxicology and drug analysis); others are based on expert interpretation of observed patterns (e.g., fingerprints, writing samples, toolmarks, bite marks, and specimens such as hair). *** There are very important differences, however, between forensic laboratory work and crime scene investigations."

Problems Relating to the Interpretation of Forensic Evidence

[pp. 7-8]:

"With the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source. *** For example, not all fingerprint evidence is equally good, because the true value of the evidence is determined by the quality of the latent fingerprint image. These disparities between and within the forensic science disciplines highlight a major problem in the forensic science community: The simple reality is that the interpretation of forensic evidence is not always based on scientific studies to determine its validity. This is a serious problem."

The Need for Research to Establish Limits and Measures of Performance [p. 8]:

"In evaluating the accuracy of a forensic analysis, it is crucial to clarify the type of question the analysis is called on to address. Thus, although some techniques may be too imprecise to permit accurate identification of a specific individual, they may still provide useful and accurate information about questions of classification. For example, microscopic hair analysis may provide reliable evidence on some characteristics of the individual from which the specimen was taken, but it may not be able to reliably match the specimen with a specific individual. *** A body of research is required to establish the limits and measures of performance and to address the impact of sources of variability and potential bias. Such research is sorely needed, but it seems to be lacking in most of the forensic disciplines that rely on subjective assessments of matching characteristics."

The Admission of Forensic Science Evidence in Litigation [p. 9-13]:

"In order for qualified forensic science experts to testify competently about forensic evidence, they must first find the evidence in a usable state and properly preserve it. A latent fingerprint that is badly smudged when found cannot be usefully saved, analyzed, or explained. *** DNA tests performed on a contaminated or otherwise compromised sample cannot be used reliably to identify or eliminate an individual as the perpetrator of a crime. These are important matters involving the proper processing of forensic evidence.

"Two very important questions should underlie the law's admission of and reliance upon forensic evidence in criminal

trials: (1) the extent to which a particular forensic discipline is founded on a reliable scientific methodology that gives it the capacity to accurately analyze evidence and report findings and (2) the extent to which practitioners in a particular forensic discipline rely on human interpretation that could be tainted by error, the threat of bias, or the absence of sound operational procedures and robust performance standards. These questions are significant.

"In 1993, in ***Daubert v. Merrell Dow Pharmaceuticals, Inc.***, 509 U.S. 579 (1993), the Supreme Court ruled that, under Rule 702 of the Federal Rules of Evidence, a 'trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.' The Court indicated that the subject of an expert's testimony should be scientific knowledge, so that 'evidentiary reliability will be based upon scientific validity.' *** In sum, *Daubert's* requirement that an expert's testimony pertain to 'scientific knowledge' established a standard of 'evidentiary reliability.'

"In explaining this evidentiary standard, the *Daubert* Court pointed to several factors that might be considered by a trial judge: (1) whether a theory or technique can be (and has been) tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) the known or potential rate of error of a particular scientific technique; (4) the existence and maintenance of standards controlling the technique's operation; (5) a scientific technique's degree of acceptance within a relevant scientific community.

"*Daubert* and its progeny have engendered confusion and controversy. *** As a result, trial judges exercise great discretion in deciding whether to admit or exclude expert testimony, and their judgments are subject only to a highly deferential 'abuse of discretion' standard of review. *** (T)he vast majority of the *reported* opinions in criminal cases indicate that the trial judges rarely exclude or restrict expert testimony offered by prosecutors.

"Law enforcement officials and the members of society they serve need to be assured that forensic techniques are *reliable*. Therefore, we must limit the risk of having the reliability of certain forensic science methodologies judicially certified before the techniques have been properly studied and their accuracy verified by the forensic science community.

"The judicial system is encumbered by, among other things, judges and lawyers who generally lack the scientific expertise

necessary to comprehend and evaluate forensic evidence in an informed manner, trial judges (sitting alone) who must decide evidentiary issues without the benefit of judicial colleagues and often with little time for extensive research and reflection, and the highly deferential nature of the appellate review afforded trial courts' *Daubert* rulings. *** The current situation, however, is seriously wanting, both because of the limitations of the judicial system and because of the many problems faced by the forensic science community."

FINDINGS AND RECOMMENDATIONS

The Fragmented System: Symptoms and Cures [pp. 14-31]:

"Adding more dollars and people to the enterprise might reduce case backlogs, but it will not address fundamental limitations in the capabilities of forensic science disciplines to discern valid information from crime scene evidence.

"The major federal resources—NIJ and the FBI Laboratory—have provided modest leadership,…(b)ut again, neither entity has recognized, let alone articulated, a need for change or a vision for achieving it. Neither has the full confidence of the larger forensic science community. And because both are part of a prosecutorial department of the government, they could be subject to subtle contextual biases that should not be allowed to undercut the power of forensic science.

"The FBI, for example, is the investigative arm of DOJ and its principal missions are to procduce and use intelligence to protect the Nation from threats and to bring to justice those who violate the law. *** The entity that is established to govern the forensic science community cannot be principally beholden to law enforcement. The potential for conflicts of interest between the needs of law enforcement and the broader needs of forensic science are too great. *** In sum, the committee concluded that advancing *science* in the forensic science enterprise is not likely to be achieved within the confines of DOJ."

Recommendation 1: Calls for Congress to establish an independent federal entity called the National Institute of Forensic Sciences (NIFS) with **standardized terminology and reporting**.

"The terminology used in reporting and testifying about the results of forensic science investigations must be standardized. Many terms are used by forensic scientists in scientific reports and in court testimony that describe findings, conclusions, and

degrees of association between evidentiary material (e.g., hairs, fingerprints, fibers) and particular people or objects. Such terms include, but are not limited to 'match,' 'consistent with,' 'identical,' 'similar in all respects tested,' and 'cannot be excluded as the source of.' The use of such terms can and does have a profound effect on how the trier of fact in a criminal...matter perceives and evaluates scientific evidence.

"As a general matter, laboratory reports generated as the result of a scientific analysis should be complete and thorough. They should contain, at minimum, 'methods and materials,' 'procedures,' 'results,' conclusions,' and, as appropriate, sources and magnitudes of uncertainty in the procedures and conclusions (e.g., levels of confidence). *** Some forensic science laboratory reports...include no mention of methods or any discussion of measurement uncertainties.

"Forensic Reports, and any courtroom testimony stemming from them, must include clear characterizations of the limitations of the analyses, including measures of uncertainty in reported results and associated estimated probabilities where possible."

Recommendation 2: "NIFS should establish standard terminology to be used in reporting on and testifying about the results of forensic science investigations."

Recommendation 3:

"Research is needed to a address issues of accuracy, reliability, and validity in the forensic science disciplines. The NIFS should promote research in the following areas:

(a) Studies establishing the scientific bases demonstrating the validity of forensic methods.
(b) The development and establishment of quantifiable measures of the reliability and accuracy of forensic analyses. *** Studies also should establish the limits of reliability and accuracy that analytic methods can be expected to achieve as the conditions of forensic evidence vary.
(c) The development of quantifiable measures of uncertainty in the courtroom of forensic analyses.

"To answer questions regarding the reliability and accuracy of a forensic analysis, the research needs to distinguish between average performance (achieved across individual practitioners and laboratories) and individual performance (achieved by the specific practitioner and laboratory).

Recommendation 5: "The NIFS should encourage research programs on human observer bias and sources of human error in forensic examinations."

Recommendation 7: "Laboratory accreditation and individual certification of forensic science professionals should be mandatory, and all forensic science professionals should have access to a certification process. *** No person (public or private) should be allowed to practice in a forensic science discipline or testify as a forensic science professional without certification. Certification requirements should include, at a minimum, written examinations, supervised practice, proficiency testing, continuing education, recertification procedures, adherence to a code of ethics, and effective disciplinary procedures. All laboratories and facilities (public or private) should be accredited, and all forensic science professionals should be certified."

Recommendation 8: "Forensic laboratories should establish routine quality assurance and quality control procedures to ensure the accuracy of forensic analyses and the work of forensic practitioners."

Recommendation 9: "The NIFS should establish a national code of ethics for all forensic science disciplines and encourage individual societies to incorporate this national code as part of the professional code of ethics."

"*Insufficient Education and Training:* Ideally, training should move beyond apprentice-like transmittal of practices to education based on scientifically valid principles. *** (A) trainee should acquire rigorous interdisciplinary education and training in the scientific areas that constitute the basis for the particular forensic discipline and instruction on how to document and report the analysis.

"In addition, lawyers and judges often have insufficient training and background in scientific methodology, and they often fail to fully comprehend the approaches employed by different forensic science disciplines and the reliability of forensic science evidence that is offered in trial. Such training is essential, because any checklist for the admissibility of scientific or technical testimony is imperfect. Conformance with items on a checklist can suggest that testimony is reliable, but it does not guarantee it."

C. Chapter 1—Introduction [pp. 35-37]:

"The world of crime is a complex place. Crime takes place in the workplace, schools, homes, places of business, motor vehicles, on the streets, and, increasingly, on the Internet. Crimes are committed at all hours of the day and night and in all regions of the country, in rural, suburban, and urban environments. In many cases, a weapon is used, such as a handgun, knife, or blunt object. Sometimes the perpetrator is under the influence of alcohol or illicit drugs. In other cases, no one is physically hurt, but property is damaged or stolen—for example, when burglary, theft, and motor vehicle theft occur. In recent years, information technology has provided the opportunity for identity theft and other types of cybercrime. A crime scene often is rich in information that reveals the nature of the criminal activity and the identities of those persons involved. Perpetrators and victims may leave behind blood, saliva, skin cells, hair, fingerprints, footprints, tire prints, clothing fibers, digital and photographic images, audio data, handwriting, and the residual effects and debris of arson, gunshots, and unlawful entry. Some crimes transcend borders, such as those involving homeland security, for which forensic evidence can be gathered.

"When evidence is analyzed, typically forensic science 'attempts to uncover the actions or happenings of an event...by way of (1) identification (categorization), (2) individualization, (3) association, and (4) reconstruction. Evidence is also analyzed for the purpose of excluding individuals or sources.

"In smaller jurisdictions, members of the local police or sheriff's department might conduct the analyses of evidence, such as latent print examinations and footwear comparisons."

"In general, a traditional crime laboratory has been defined as constituting 'a single laboratory or system comprised of scientists analyzing evidence in one or more of the following disciplines: controlled substances, trace, biology (including DNA), toxicology, latent prints, questioned documents, firearms/toolmarks, or crime scene.

"Finally, if evidence and laboratory tests are mishandled or improperly analyzed; if the scientific evidence carries a false sense of significance; or if there is bias, incompetence, or a lack of adequate internal controls for the evidence introduced by the forensic scientists and their laboratories, the jury or court can be misled, and this could lead to wrongful conviction or exoneration. If juries lose confidence in the reliability of

forensic testimony, valid evidence might be discounted, and some innocent persons might be convicted or guilty individuals acquitted."

WHAT IS FORENSIC SCIENCE? [pp. 38-39]

"The categorization used by the National Institute of Justice (is) useful:

1. general toxicology
2. **firearms/toolmarks;**
3. questioned documents;
4. trace evidence;
5. controlled substances;
6. biological/serology screening (including DNA analysis);
7. fire debris/arson analysis;
8. impression evidence;
9. blood pattern analysis;
10. crime scene investigation;
11. medicolegal death investigation;
12. digital evidence.

"The forensic science disciplines exhibit wide variability with regard to techniques, methodologies, reliability, level of error, research, general acceptability, and published material (see Chapters 4 through 6). Some of the disciplines are laboratory based (e.g., nuclear and mitochondrial DNA analysis, toxicology, and drug analysis); others are based on expert interpretation of observed patterns (e.g., fingerprints, writing samples, toolmarks, bite marks)."

Questionable or Questioned Science [pp. 42-44]:

"The number of exonerations resulting from the analysis of DNA has grown across the country in recent years, uncovering a disturbing number of wrongful convictions—some for capital crimes—and exposing serious limitations in some of the forensic science approaches commonly used in the United States.

"According to the Innocence Project, there have been 223 postconviction DNA exonerations in the United States since 1989 (as of November 2008).

"The fact is that many forensic tests—such as those used to infer the source of toolmarks or bite marks—have never been exposed to stringent scientific scrutiny. Most of these techniques were

developed in crime laboratories to aid in the investigation of evidence from a particular crime scene, and researching their limitations and foundations was never a top priority. *** However, although the precise error rates of these forensic tests are still unknown, comparison of their results with DNA testing in the same cases has revealed that some of these analyses, as currently performed, produce erroneous results. The conclusions of forensic examiners may or may not be right—depending on the case—but each wrongful conviction based on improperly interpreted evidence is serious, both for the innocent person and also for society, because of the threat that may be posed by a guilty person going free.

"Even fingerprint analysis has been called into question. For nearly a century, fingerprint examiners have been comparing partial latent fingerprints found at crime scenes to inked fingerprints taken directly from suspects. Fingerprint identifications have been viewed as exact means of associating a suspect with a crime scene print and rarely were questioned [see R. Epstein. Fingerprints meet *Daubert*: The myth of fingerprint "science" is revealed. **75 *Southern California Law Review* 605 (2002)**]. Recently, however, the scientific foundation of the fingerprint field has been questioned, and the suggestion has been made that latent fingerprint identifications may not be as reliable as previously assumed [see S.A. Cole, 2002. *Suspect Identities: A History of Fingerprinting and Criminal Identification*. Boston: Harvard University Press; Epstein, op. cit.]. *** (The question is) whether one can determine with adequate reliability that the finger that left an imperfect impression at a crime scene is the same finger that left an impression (with different imperfections) in a file of fingerprints. *** In her ruling, Judge Souder found the traditional method of fingerprint analysis to be 'a subjective, untested, unverifiable identification procedure that purports to be infallible' [see *State of Maryland v. Bryan Rose*, In the Circuit Court for Baltimore County, Case No. K06-545].

"When the evidence and putative source items are compared, a conclusion of individualization implies that the evidence originated from that source, to the exclusion of all other possible sources. The determination of uniqueness requires measurements of object attributes, data collected on the population frequency of variation in these attributes, testing of attribute independence, and calculations of the probability that different objects share a common set of observable attributes. Importantly, the results of research must be made public so that they can be reviewed, checked by others, criticized, and then revised, and this has not been done for some of the forensic science disciplines."

Errors and Fraud [pp. 44-48]

"Although cases of fraud appear to be rare, perhaps of more concern is the lack of good data on the accuracy of the analyses, conducted in forensic science disciplines and the significant potential for bias that is present in some cases. *** In testimony before the committee it was clear that some members of the forensic science community will not concede that there could be less than perfect accuracy either in given laboratories or in specific disciplines, and experts testified to the committee that disagreement remains regarding even what constitutes an error. *** Failure to acknowledge uncertainty in findings is common: Many examiners claim in testimony that others in their field would come to the exact same conclusions about the evidence they have analyzed. Assertions of a '100 percent match' contradict the findings of proficiency tests that find substantial rates of erroneous results in some disciplines (i.e., voice identification, bite mark analysis).

"As an example, in a FBI publication on the correlation of microscopic and mitochondrial DNA hair comparisons, the authors found that even competent hair examiners can make significant errors."

The 'CSI Effect' [p. 48]

"In courtroom scenes, forensic examiners state their findings or a match (between evidence and suspect) with unfailing certainty, often demonstrating the technique used to make the determination. The dramas suggest that convictions are quick and no mistakes are made.

"Jurists and crime laboratory directors anecdotally report that jurors have come to expect the presentation of forensic evidence in every case, and they expect it to be conclusive. A recent study by Schweitzer and Saks found that compared to those who do not watch CSI, CSI viewers were 'more critical of the forensic evidence presented at the trial, finding it less believable. Forensic science viewers expressed more confidence in their verdicts than did non-viewers."

The Admission of Forensic Science Evidence in Litigation [pp. 52-53]:

"As explained in Chapter 3, most forensic science disciplines are inextricably tethered to the legal system; many forensic fields

(e.g., firearms analysis, latent fingerprint identification) are but handmaidens of the legal system, and they have no significant uses beyond law enforcement. *** As already noted, and as further amplified in Chapters 4 and 5, the forensic science system exhibits serious shortcomings in capacity and quality; yet the courts continue to rely on forensic evidence without fully understanding and addressing the limitations of different forensic science disciplines.

"In a number of forensic science disciplines, forensic science professionals have yet to establish either the validity of their approach or the accuracy of their conclusions, and the courts have been utterly ineffective in addressing this problem. For a variety of reasons—including the rules governing the admissibility of forensic evidence, the applicable standards governing appellate review of trial court decisions, the limitations of the adversary process, and the common lack of scientific expertise among judges and lawyers who must try to comprehend and evaluate forensic evidence—the legal system is ill-equipped to correct the problems of the forensic science community. *** this is particularly important in criminal cases in which we seek to protect society from persons who have committed criminal acts and to protect innocent persons from being convicted of crimes that they did not commit."

Toolmark and Firearms Identification [pp. 150-155]:

"Manufacturing tools experience wear and abrasion as they cut, scrape, and otherwise shape metal, giving rise to the theory that any two manufactured products - even those produced consecutively with the same manufacturing tools - will bear microscopically different marks.

"Gun barrels typically are rifled to improve accuracy, meaning that spiral grooves are cut into the barrel's interior. The process of cutting these grooves into the barrel leaves marks and scrapes on the relatively softer metal of the barrel. In turn, these markings are transferred to the softer metal of a bullet as it exits the barrel. The brass exterior of cartridge cases receive analogous toolmarks during the process of gun firing: the firing pin dents the soft primer surface at the base of the cartridge to commence firing, the primer area is forced backward by the buildup

of gas pressure (so that the texture of the gun's breech face is impressed on the cartridge), and extractors and ejectors leave marks as they expel used cartridges and cycle in new ammunition.

"In addition to the analysis of marks on bullets and cartridges, firearms examination also includes the determination of the firing distance, the operability of a weapon, and sometimes the analysis of primer residue to determine whether someone recently handled a weapon."

The National Academies report, *Ballistic Imaging*, while not claiming to be a definitive study on firearms identification, observed that, 'The validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated.' That study recognized the logic involved in trying to compare firearms-related toolmarks by noting that, 'Although they are subject to numerous sources of variability, firearms-related toolmarks are not completely random and volatile; one can find similar marks on bullets and cartridge cases from the same gun,' **but it cautioned that**, 'A significant amount of research would be needed to scientifically determine the degree to which firearms-related toolmarks are unique or even to quantitatively characterize the **probability of uniqueness**."

"A fundamental problem with toolmark and firearms analysis is the lack of a precisely defined process. The AFTE has adopted a theory of identification, but it does not provide a specific protocol…The meaning of 'exceeds the best agreement' and 'consistent with' are not specified, and the examiner is expected to draw on his or her own experience. This AFTE document, which is the best guidance available for the field of toolmark identification, **does not even consider**, let alone address, **questions regarding variability, reliability, repeatability, or the number of correlations needed to achieve a given degree of confidence**."

Part III: Conclusions:

Ballistics and Firearms analysis is not ***forensic science***. Rather, it is more accurate to refer to Ballistics and Firearms analysis as ***forensic evidence***, as the question of whether there is any real and cognizable scientific basis supporting the evidence is the ultimate issue. Accuracy and reliability of the expert's conclusions cannot readily be adversarially tested as it is entirely a subjective opinion of a law enforcement agent whose sole purpose is to help the State solve a crime and convict the defendant, but who has no desire to clear the defendant. This clearly presents ***Cognitive Bias***, which is very important in understanding the lack of scientific basis in ballistics and firearms comparison. If, as in this case, the State's expert opines that the casings (or the projectiles) could have been fired from the same weapon, this opinion is not **reliable** as it contains no parameters of scientific certainty and no basis for any opinion on ***uniqueness***. The expert not able to provide any testimony as to the **margin of error**. This renders their opinions as entirely subjective, not based upon science at all.

The State proffered firearms expert must be restricted by the Court in order to prevent the expert from extending their opinion beyond the reasonable limits permitted by ***Daubert***. Should the expert be permitted to render an ultimate opinion on comparison? [e.g.: "It is a complete match and the casings were fired by the same weapon. I am 100% certain that the projectiles were fired by the same weapon. There is no doubt in my mind. I even had the entire test and results confirmed by my supervisor. In fact, any expert in this field anywhere would draw the same conclusion."] Such over-reaching, non-scientific conclusions are errant and are not sufficiently reliable to be infused into the trial process as

they do not satisfy the requirements of ***Daubert***. Such opinions and conclusions are not based upon any margin of error studies. They are entirely subjective conclusions which, at best, will mislead the jury.

Where the expert cannot give a known and tested **margin of error** because no testing has ever been performed on error rates and the comparison therefore is purely conjecture, it is totally misleading, inaccurate and unreliable. How can it be said that the expert's opinion can teach the jury how to determine for itself the ultimate issue of fact as to whether the opinion is **accurate** or **inaccurate**? Potential jurors must fully understand that this analysis is their **duty** as a juror. They alone have the duty to determine **reliability**, **credibility** and **believability**.

A law enforcement employee (or agent) testifying as a comparison witness is not able to answer these essential questions within the narrow confines of their field. The State hired Ballistics or Firearms expert knows full-well that ***error rates*** and ***scientific method*** is the ultimate crux of whether the evidence is **science** or **non-science (junk science)**, and they also understand just how far they can go in describing the forensic evidence outside of the scientific method.

This law enforcement junk science causes its experts to testify to way-too-far-reaching opinions on their comparison results.

margins of error or error Rate is NOT a definitive requirement it is only one factor court can use to determine Daubert is met — defense can cross Examine state witness on weakness of opinions

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I HEREBY CERTIFY that a copy of the foregoing Memorandum of Law was E-served upon Shari Tate, Assistant State's Attorney at courtdocs@sao17.state.fl.us whose office is located at the Broward County Courthouse, 201 SE 6th Street, Room 655, Ft. Lauderdale, FL 33301, this 20th day of July 2014.

Respectfully submitted,

/S/ Ira W. Still, III

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