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IN THE CIRCUIT COURT, IN AND  
FOR SEMINOLE COUNTY, FLORIDA  
EIGHTEENTH JUDICIAL CIRCUIT

STATE OF FLORIDA

CASE NO: 11-1858-CFA

vs.

SHAWN RICHARDSON,

EXCERPT OF MOTION IN LIMINE  
TESTIMONY OF WILLIAM TOBIN

Defendant,

\_\_\_\_\_ /

BEFORE THE HONORABLE

JOHN D. GALLUZZO

JUDGE OF THE COURT

REPORTED BY:

ERIN E. LEBEN, FPR  
CHARITI L. COLÓN, FPR  
In Courtroom 5A  
Criminal Justice Center  
101 Bush Boulevard  
Sanford, Florida  
August 16, 2013

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I N D E X

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1 WHEREUPON:

2 The following proceedings were had:

3 \* \* \* \* \*

4 THE COURT: All right. Counsel, are you ready to  
5 proceed? Back on the record on the case involving  
6 Shawn Emmanuel Richardson, 11-81858-CFA. Mr. Chang?

7 MR. CHANG: Yes, sir. At this time we call  
8 Mr. Bill Tobin.

9 THE COURT: All right. Sir, if you will come  
10 forward to the podium. Face the Clerk. Raise your  
11 right hand to be sworn.

12 THE CLERK: Do you solemnly swear or affirm that  
13 the testimony you shall give will be the truth, the  
14 whole truth, and nothing but the truth, so help you  
15 God?

16 THE WITNESS: I do.

17 COURT DEPUTY: Thank you. Follow me, please.  
18 Watch your step up.

19 THE COURT: Whenever you're ready, Counsel.

20 MR. CHANG: Thank you, sir.

21 WILLIAM TOBIN,  
22 having been first duly sworn, was examined and testified as  
23 follows:

24

25

## 1 DIRECT EXAMINATION

2 BY MR. CHANG:

3 Q Sir, can you introduce yourself to the Court,  
4 please?

5 A My name is William Tobin, T-O-B-I-N.

6 Q Sir, could you briefly tell us what your  
7 educational background and work experience is, very briefly.8 A I have a Bachelor of Science Degree in metallurgy  
9 from Case Institute of Technology Cleveland, Ohio. I  
10 continued my formal education in graduate school at Ohio  
11 State University, at George Washington University, and the  
12 University of Virginia.13 I acquired practical experience from my  
14 employments as a research metallurgist with the National  
15 Aeronautics and Space Administration with Battelle,  
16 B-A-T-T-E-L-L-E, Memorial Institute in Columbus, Ohio, and  
17 as a plant metallurgist with Chase Copper -- Chase Brass and  
18 Copper and with Monarch Aluminum Company.19 I was a special agent with the Federal Bureau of  
20 Investigation for twenty-seven years, and of those,  
21 twenty-four I was a forensic metallurgist. I've got to  
22 think about it. I have numerous.23 I visited numerous metal manufacturing and  
24 processing plants throughout the United States and -- and  
25 Taiwan. And I've been a guest lecturer for virtually all of

1 the professional metallurgical societies throughout the  
2 United States and also in Canada.

3 I've offered a number of forensic publications,  
4 and I've been -- have -- was asked to participate as an  
5 editorial reviewer for one of the National Academy of  
6 Science's committees. A little more, but that's a good  
7 overview.

8 Q Okay. You mentioned forensic metallurgist. What  
9 specialized qualifications do you have that qualifies you as  
10 a forensic metallurgist slash materials scientist?

11 A Well, I just covered some -- many of the  
12 highlights. But additionally, while I was a forensic  
13 metallurgist, I did conduct toolmark-type examinations,  
14 which is the umbrella -- firearms examinations are -- the  
15 firearms identification examinations is a subset, but  
16 conducted toolmark examinations during my twenty-four years  
17 as a forensic metallurgist.

18 Q Have you ever testified as an expert witness in  
19 any courts?

20 A Yes.

21 Q Okay. Approximately how many times and in what  
22 jurisdictions?

23 A Excluding my two congressional testimonies, I've  
24 had two hundred and forty-seven testimonies in forty-four  
25 jurisdictions, I believe.

1 MR. CHANG: Your Honor, I would -- now that I've  
2 gone through his CV, I'd just simply offer that as  
3 Defense Exhibit B in evidence for Court to review and  
4 consider.

5 THE COURT: All right.

6 (Whereupon, Defense Exhibit B was marked for  
7 identification.)

8 BY MR. CHANG:

9 Q Okay. Mr. Tobin, you were consulted by the  
10 Defense in this case as it relates to Mr. Richardson's case.  
11 Did we provide materials for you to review as a consultant  
12 in this case, sir?

13 A Yes.

14 Q Okay. Can you tell the Court what materials you  
15 received and your review of them to us?

16 A Not without my affidavit, I don't --

17 Q All right. Speaking of the affidavit, sir, you  
18 did prepare an affidavit as it relates to this case?

19 A I did, yes.

20 Q That affidavit sites as part of it the materials  
21 that were provided to review as it relates to this case?

22 A Yes.

23 Q All right. Everything in that affidavit, I  
24 believe, it's a sixty-eight page affidavit formatted and so  
25 on, but everything in that affidavit is true and accurate?

1           A     Yes.

2           Q     Okay. Okay. And you would adopt that affidavit  
3 as part of your testimony today?

4           A     Yes.

5           MR. CHANG: Judge, for the record, I believe we  
6 attached that affidavit as part of our motion in  
7 limine.

8           THE COURT: Right.

9           MR. CHANG: And, you know, it's self explanatory.  
10 But it's -- it goes through. And I -- I just want to  
11 make it a part of the record. Don't need to belabor  
12 it.

13          THE COURT: All right. Thank you.

14          MR. CHANG: And the State, for the record,  
15 obviously was provided a copy of that affidavit.

16 BY MR. CHANG:

17          Q     Mr. Tobin, in consulting with us, you prepared  
18 a -- a PowerPoint presentation --

19          A     Yes.

20          Q     -- regarding the various Daubert criteria as it  
21 relates to the practice of firearms and toolmark  
22 examinations and analysis; is that correct?

23          A     In part, yes.

24          Q     Okay. Would that aid and assist you in explaining  
25 to the Court your various positions on the practice itself?



1           A     It would, yes.

2           MR. CHANG:   Okay.  Judge, for the record if it  
3           could be marked as Defense Exhibit A.  Copies have been  
4           provided by the State.

5           MR. LEUKEL:   Exhibit C.

6           MR. CHANG:   Oh, Exhibit C.  Copies have been  
7           provided by the State.

8           THE COURT:   All right.

9           (Whereupon, Defense Exhibit C was marked for  
10          identification.)

11          MR. CHANG:   And --

12          MS. VALENTINI:  Your Honor, just want to make an  
13          objection for the record that there's no evidence that  
14          Mr. Tobin is an expert in firearm or toolmark  
15          examination.  He may be an expert in metallurgy, but as  
16          far as an expert in firearm and toolmark  
17          identification, there's been nothing to establish that  
18          he's an expert in that particular --

19          THE COURT:   He's an expert in toolmark  
20          identification.  He's already -- he's already testified  
21          to his -- the level that he -- I'm accepting him as an  
22          expert in toolmark identification.

23          MS. VALENTINI:  May I have --

24          THE COURT:   As far as firearms go, that may be a  
25          different story and you've made your objection for the

1 record. Proceed, Mr. Chang.

2 MR. CHANG: Thank you, Your Honor.

3 BY MR. CHANG:

4 Q Mr. Tobin, if we can go through these real quick.  
5 What I want to do is -- is have you address certain issues  
6 in the list of various Daubert factors as it relates to the  
7 practice of firearm and toolmark examination and analysis.

8 So very quickly, some key concepts are listed here  
9 on your first PowerPoint presentation. Let's talk about  
10 general acceptance of firearms and toolmark analysis. Is --  
11 how is firearms and toolmark and individualization received  
12 in the mainstream scientific community? How is that  
13 perceived?

14 A The practice is perceived -- is -- is  
15 characterized as a fallacy. It is found to be generally  
16 objectionable in large part because of the fact that  
17 firearms toolmarks practice is not a science, and there are  
18 numerous reasons for that. But it's characterized in the  
19 scientific community as a fallacy and characterized as  
20 pathological science, which is basically derived from  
21 wishful thinking, and one of my colleagues calls it  
22 delusional, but wishful thinking or misguided  
23 interpretations of various empirical experiments.

24 Q Okay.

25 MS. VALENTINI: Your Honor, again, I understand

1 Your -- Your Honor's position that you've seen him as  
2 an expert as far as toolmarks, but he is now speaking  
3 of firearm, as well, and he's speaking of the  
4 scientific community, and I don't have any idea what  
5 he's talking about.

6 THE COURT: All right. Counsel, approach the  
7 bench, please.

8 (Whereupon, there was a discussion held off the  
9 record.)

10 MR. CHANG: Thank you, Your Honor.

11 BY MR. CHANG:

12 Q Mr. Tobin, can you briefly tell us whether you've  
13 had any involvement within the firearms industry itself?

14 A Yes.

15 Q Okay. What is that experience, sir?

16 A Well, I have visited several firearms  
17 manufacturing operations. I have been a consultant for the  
18 ammunition industry, as well.

19 But again, I don't represent myself as a firearms  
20 identification expert, but rather the -- which is a subset,  
21 by the way, of toolmarks. Toolmarks identification are much  
22 more difficult from a physics and material science  
23 standpoint than firearms identification.

24 I'd be happy to explain that, if necessary. But  
25 the bottom line is I have a strong background in the

1 scientific methodology of such practices, but I don't  
2 represent -- it's a pattern matching associations and I  
3 don't address issues of whether a match is an actual match  
4 or not.

5 Q As it relates to the firearms identification,  
6 that's subset of toolmark identification?

7 A Yes.

8 Q Have you ever consulted with individuals working  
9 in that field?

10 A Yes.

11 Q Okay. In -- in -- in what capacity, sir?

12 A As a forensic metallurgist at the FBI laboratory  
13 would not be uncommon over the years that examiners would  
14 come to me and ask me to explain to me why they were seeing  
15 what they saw under a comparison microscope or why they were  
16 not able to see what they expected to see.

17 So they would recognize that material science and  
18 metallurgy was a critical was -- was the underlying science  
19 involved in the tribological interactions -- you have any  
20 problem with that? T-R-I-B-O-L-O-G-I-C-A-L -- on the  
21 tribological interactions or the tribology involved in  
22 various components and forced contact and relative motion  
23 with each other. So they would come to me during -- from  
24 their examinations when they would run into difficulties or  
25 problems and ask for assistance with regard to those issues.

1 Q Okay. You used the word "tribology." I think you  
2 just explained it, but can you, for the Court, explain what  
3 tribology is.

4 A Yes. Tribology is the science and engineering of  
5 surfaces in contact and in relative motion with each other,  
6 and generally comprises the science of friction,  
7 lubrications, and wear.

8 Q Okay. Talking about in terms of Daubert criteria  
9 being relevant in the scientific community, what would be  
10 the relevant scientific community in the area of firearms of  
11 toolmarks examinations?

12 A Well, it -- of course, it would include  
13 practitioners themselves. But as Professor Imwinkelried and  
14 I wrote in one of our papers, it's a mistake to restrict the  
15 relevant scientific community to only those practitioners  
16 whose incomes derives from the practice. And, in fact, that  
17 position has been supported in some cases, namely U.S. v.  
18 Porter in 1992.

19 So that position in -- in which we agree that the  
20 relevant scientific community should be those who have a  
21 proper scientific or engineering background should include  
22 those, and who have a proper understanding of the forensic  
23 process.

24 Q So --

25 A In other words, to include the mainstream

1 scientific community, as well as the forensic. Sorry.

2 Q All right. Ms. Skoglund utilized a term  
3 "testability." As a scientist working in the field for a  
4 number of years, can you explain what the theory of  
5 testability entails? What does that cover?

6 A Well, that's pretty self explanatory. Can a  
7 theory or premise be tested -- is it testable? And that  
8 relates to the concept of falsifiability.

9 For a proper theory to be acceptable in the  
10 scientific -- in the mainstream scientific community, a  
11 theory must be falsifiable. And what that basically means  
12 is that by repeated testing, can the theory or premise be  
13 shown to be false or falsified?

14 For example, in one -- my latest paper, I  
15 indicated that the theory that all intergalactic aliens are  
16 purple is an interesting proposition, but it's an  
17 unacceptable scientific theory because it cannot be  
18 falsified. So basically in the field of firearms toolmarks,  
19 it is a testable -- the premise underlying -- required  
20 underlying premises are testable, but there has been no  
21 meaningful or comprehensive testing to support the theory.

22 Q Okay. Rate of errors. Again, Ms. Skoglund  
23 testified about rate of error. And she's testified to  
24 essentially a near zero or zero rate of error in the field.  
25 How is that viewed in the scientific community?

1           A     The repeated claims of zero to one percent or zero  
2 to two percent errors are quite misguided when one  
3 researches as we have the underlying proficiency tests and  
4 validation studies -- well, I'd say purported validation  
5 studies. The problem that we have found is -- well, the  
6 bottom line is there has been no comprehensive or meaningful  
7 showing acceptable to the mainstream scientific community of  
8 error rate for the practice.

9                     The numerous validation studies, as you will  
10 hopefully see here, are terribly misguided from a scientist  
11 perspective. They don't measure what they believe that  
12 they -- they don't capture what they believe they measured.

13           Q     Okay. We talked with her briefly about  
14 proficiency tests, and she actually described -- actually  
15 described the proficiency testing she -- that she actually  
16 takes annually.

17           A     Yes.

18           Q     They're given a limited sample, three known and  
19 three unknowns and asked to basically reach a conclusion as  
20 to which -- which of the samples were fired from a known  
21 sample. Talk to about this proficiency test and -- and how  
22 they relate to rates of errors.

23           A     Again, the proficiency tests that we have  
24 reviewed, including those of the Collaborative Testing  
25 Service, or CTS, are virtually worthless in supporting the

1 underlying premise of the AFTE Theory of Identification.  
2 They're flawed on numerous levels, but the -- probably  
3 the -- the most under -- the most basic scientific flaw in  
4 proficiency testing is they present to respondents a -- a  
5 scenario involving deductive inference processes. As  
6 opposed -- they don't mirror real world cases, and I'll  
7 explain that in subsequent slides.

8           Rather, than the inductive logic processes  
9 required in real world cases. So that's the most basic  
10 flaw, but there are many other flaws, as we probably will  
11 see shortly. But the bottom line is there has not been any  
12 comprehensive or meaningful studies of error rates in the --  
13 in the general practice as anticipated by the Blackman  
14 Court.

15           Q     Okay. As it relates to peer review, let's just  
16 talk about peer review with the -- within the toolmark field  
17 itself, that narrow field.

18           A     I'm sorry. Is that a question?

19           Q     Is there a peer review within the firearms and  
20 toolmarks field?

21           A     There is to a very limited extent. And when we --  
22 we rate or evaluate the various -- in the scientific arena,  
23 the various Daubert criteria and compare it, that's the only  
24 area that has been -- that we will acknowledge there is some  
25 limited peer review.



1           But there is some serious problems with that type  
2 of peer review. It's -- the community of firearms and  
3 toolmarks examiners is a very insular community. Up until  
4 the recent paradigm shift, and I'll maybe in the last ten  
5 years, there was very little, if any extra judicial interest  
6 in firearms identification. So practice was never really  
7 exposed to the true scientific community or mainstream  
8 scientific community until fairly recently.

9           The problem with the peer review, though, is a  
10 major one. And that is it's rife with various forms of  
11 bias, observer biases, and conformation biases. But it's a  
12 process that's not similar to refereeing as is conducted in  
13 the true scientific community. And what it is tantamount is  
14 a -- an author will write a paper or do a study, and then  
15 not literally, but walk ten feet to a colleague's desk and  
16 say, Here, would you peer review my paper for me and then  
17 I'll peer review yours next week.

18           My colleagues, who are rather some well known  
19 scholars, have found it virtually impossible to obtain  
20 articles presented in the AFTE Journal, and there are reason  
21 for that. AFTE, you cannot have access to their journals  
22 unless you're a member of AFTE. And then they require that  
23 more than fifty percent or fifty-five percent of your income  
24 must be derived from performing firearms identification  
25 practice. So that's another reason that the publications

1 have not been exposed or reviewed in the true or mainstream  
2 scientific community.

3           So the bottom line is we give them a half credit  
4 for peer reviewing each other's work, but in the mainstream  
5 scientific community that is rife with flaws and objections  
6 for various reasons, bias being one of them.

7           Q     So to -- to paraphrase, the AFTE Journal,  
8 although, might -- might contain research articles or -- or  
9 so on through -- by other people in the field, that journal  
10 is not general available to the public or to the -- to the  
11 general other scientific community outside of AFTE members?

12           A     That's correct. And as Professor Imwinkelried and  
13 I pointed out in our paper, the Oklahoma City University Law  
14 Review, it's a serious mistake when one is considering peer  
15 review processes to not include cross discipline input into  
16 the peer review process. And it's a mistake to restrict  
17 peer review only to those practitioners.

18           The ideal in the -- in the scientific community is  
19 to have your work, as ours frequently is, validated by a  
20 totally different technique or some other scientific  
21 perspectives. So that's in an ideal world. That's what the  
22 peer review should occur to validate a -- a theory or a  
23 premise.

24           Q     What is indexing as it relates to scientific  
25 journals?

1           A     Indexing is a process that is used in academic and  
2 scholarly communities to -- trying to get a measure -- it's  
3 a proxy for the relative importance of a particular Journal.  
4 And it's a service offered by Thomsen Reuters, an that's,  
5 T-H-O-M-S-E -- yes, E-N. Reuters is, R-E-U-T-E-R-S -- in  
6 the web of knowledge, most specifically the institute for  
7 scientific information.

8                     And what they do it is they calculate what's known  
9 as an impact factor. Those of us in the scientific  
10 community have impact factors and journals have factors.  
11 And that's how they measure its contribution to the -- the  
12 mainstream or true scientific community.

13                     It's -- in short, it's basically how many times  
14 your work is cited and is enumerator -- in the  
15 denominator -- for a particular Journal it would be of all  
16 the articles published in that article. And then the  
17 numerator would be how many times your work has been cited.  
18 And that's used primarily in the academic and -- and  
19 scholarly communities and the scientific community.

20           Q     Is the AFTE Journal indexed?

21           A     No.

22           Q     Let's talk about reliability. How -- why is  
23 reliability important in the scientific field, scientific  
24 matter?

25           A     Well, that's obviously a -- a huge consideration,

1 particularly for Daubert. And that -- what that metric  
2 is -- represents is how the outcome of an experiment can be  
3 continually repeated.

4 In other words, the results can be -- I -- I've  
5 got to be careful because we need to separate it from  
6 repeatability and reproducibility. Those are two other  
7 scientific issues. But basically, it's how frequently the  
8 outcome of an experiment can be replicated.

9 Q Is there reliability within the field of firearms  
10 and toolmarks?

11 A There may be. But if it is, it would be a type  
12 III type error, which means you've got the right answer, but  
13 to the wrong reason. The bottom line is that there's been  
14 no showing to date of any practice-wide reliability for the  
15 underlying premises.

16 Q Okay. You've mentioned falsifiability. Can you  
17 explain what falsifiability is.

18 A I think I already have. It just basically means  
19 can you disprove in hypothesis or -- or a premise -- the  
20 standard format in the mainstream scientific community is  
21 that you don't actually establish a null hypothesis as what  
22 you're trying to prove.

23 You actually -- what you're trying to prove is  
24 typically the alternative hypothesis. So you actually go  
25 out of your way to try to falsify or disprove the null

1 hypothesis. And that has not been done in the community.

2 Q Okay. As it relates to the firearms and  
3 toolmarks, one of the things -- the concept we've talked  
4 about is the concept of uniqueness.

5 Okay. How does that relate to the concept of  
6 falsifiability as it relates to Ms. Skoglund's testimony  
7 that each firearm -- more specific in this case, each breech  
8 face coming off the assembly line is unique and individual?  
9 Is that hypothesis falsifiable? Testable?

10 A Okay. You're actually conflating two issues  
11 there. But the problem -- the main problem is the  
12 underlying theory cannot be falsified. Uniqueness, as we  
13 will shortly see, I believe, is a -- an illogical necessity.  
14 When an examiner opines an individualization, it's a logical  
15 necessity that the underlying premise is one of  
16 individualization -- is one of uniqueness.

17 The problem with falsifying the AFTE theory, one  
18 of numerous problems, I should say. But probably the most  
19 basic is that there is no access to ground truth.

20 There are two required premises, one is uniqueness  
21 and one is repeatability. And we -- I believe we'll talk  
22 about that shortly. But there has been no -- there's no  
23 access to ground truth because it is a purely subjective  
24 practice, one hundred percent subjective in opining  
25 individualization.

1           We'll -- I'll discuss that in a little more  
2 detail. The breech face issue is another metallurgic issue  
3 that's more pragmatic than we can discuss that --

4           Q     Okay. What is the NAS?

5           A     Probably -- probably the nation's most respected  
6 voice of the relevant scientific community. That's the  
7 National Academy of Sciences.

8           Q     Okay. You have something entitled the NAS report.  
9 What is that report?

10          A     Well, the two that would be most relevant to the  
11 case at bar would be the 2008 Ballistic Imaging Committee  
12 report, and the 2009 Strengthening Forensic Science in the  
13 United States, the path forward. That would be the 2009  
14 committee report.

15                I'm sorry. Do you want me to explain -- the 2008  
16 committee addressed ballistic imaging, and they made some  
17 poignant -- some rather significant observations with regard  
18 to forensic firearms identification practice and the  
19 opinions deriving therefrom.

20                And then the 2009 committee report rendered or  
21 offered opinions about some of the issues that we're dealing  
22 with today in the forensic firearms identification arena.

23          Q     And are you familiar with each of those reports,  
24 sir?

25          A     I'm sorry?

1 Q Are you familiar with each of those reports?

2 A Yes, correct.

3 Q How so?

4 A Extensive reviews and research of the -- the  
5 issues. And my colleagues with -- with whom I collaborate  
6 frequently were members of various committees.

7 Q Did the NAS reports reach a conclusion as it  
8 relates to the practice of forensic sciences. And more  
9 specifically, as it relates to the practice of firearm and  
10 toolmark examinations and identifications?

11 A There actually were four or five quite -- quite  
12 eye opening opinions. But the bottom line is, and I don't  
13 have them memorized, but the bottom line is there is no  
14 scientific basis whatsoever that has been demonstrated to  
15 support either the process of individualization or the  
16 exaggerated claims of individualization.

17 In other words, it's my opinion that this item was  
18 fired in this particular firearm platform or firearm to the  
19 exclusion of all others. They'd find that that is without  
20 scientific foundation and objectionable scientifically and  
21 legally in one of the committees.

22 Q Mentioned inductive and deductive reasoning.

23 A Yes.

24 Q Can you expound on that just a little bit more.

25 A I'm sorry?

1 Q Inductive and deductive reasoning analysis.

2 A Explain that.

3 Q The logic used within the firearms and toolmark  
4 examination field.

5 A That's a good question. Whenever an examiner --  
6 an experimenter can sample the entire possible sample pool,  
7 one can then use appropriate -- scientifically and  
8 appropriately a process of deductive logic.

9 And as I explained in one of my congressional  
10 testimonies, the example I use, and I'm told they still use  
11 it today is one of -- let's say that one accepts that all  
12 Chevy Novas ever made were blue. And -- and at a crime  
13 scene, let's say a bombing, investigator recovers a  
14 nameplate that says "Chevy Nova." One can properly deduce  
15 or use inductive -- or deductive inferential processes that  
16 that vehicle was blue.

17 However, that's -- in the field of  
18 firearms/toolmarks that is an inappropriate process because  
19 it's not plausible or feasible that all possible samples in  
20 the sample pool can be tested. In that scenario and  
21 inductive inferential process or inductive logic process  
22 must be used.

23 But when that -- when a respondent or an  
24 experimenter is -- or an examiner is testing samples in the  
25 inductive empirical process, there is required in the



1 scientific committee that is inherently a probabilistic  
2 process, which means there must be a concomitant expression  
3 of scientifically supported expression of certainty and --  
4 to a certain level of confidence. So there must be appended  
5 to in opinion some indicia of variability or error rate.

6 Q And then you next talk about that -- as it relates  
7 to inductive science -- unproven -- inductive hypothesis by  
8 simple enumeration. Explain what you mean by that.

9 A Yes. Scientists have known for decades, hundreds  
10 of years that it is impossible to prove an inductive  
11 hypothesis by simple enumeration or alternatively sample  
12 enumeration is the same thing for this case. And what that  
13 means is there is no combination of test samples that can  
14 actually allow a -- the framer of the hypothesis to prove  
15 the hypothesis to be true.

16 And an example of that was a rather graphic  
17 demonstrative in several of my colleagues' papers where they  
18 indicate, let's say, for example, that there are 100,000  
19 guns in Seminole or Orange County, whatever. And that of  
20 those hundred thousand guns, there are one hundred pairs of  
21 guns that are virtually indistinguishable or easily  
22 conflated to an examiner.

23 And let's say now, for example, that a police  
24 department one hundred firearms identification experts, and  
25 each one of those one hundred examiners conducts ten

1 pairwise examples every day for the next ten days of his or  
2 her career. After 3.65 million comparisons there is still a  
3 ninety-three percent chance that none of the hundred pairs  
4 were -- relevant pairs were examined. That is a  
5 demonstrative example of the folly of trying to, quote,  
6 prove an inductive hypothesis by sample enumeration -- or  
7 simple enumeration.

8 That's probably the basic one of fifteen  
9 underlying flaws of all of these purported validation  
10 studies that we'll discuss shortly.

11 Q How does -- what role does statistics play in  
12 terms of these conclusions that are reached under firearms  
13 and toolmarks trade?

14 A It's critical. It's absolutely necessary. And  
15 that's what I was indicating a little bit ago when -- in  
16 one -- an experimenter is pursuing an inductive experiment  
17 request statistics is absolutely -- is required or at least  
18 a probabilistic statement.

19 Firearms examiners routinely reject that they use  
20 statistics in their practice, but they unknowingly do by  
21 making claims of individualization. And maybe the briefest  
22 sentence to show that is probability is -- probability scale  
23 is zero to one.

24 A probability of zero means it's an impossibility,  
25 cannot occur. A probability of one implies a certainty.

1 When an examiner opines an individualization, they are  
2 implying a certainty of one or a dead certainty -- I'm  
3 sorry, a -- a probability of one as a certainty, and that is  
4 unfounded in today's -- in the state as it already exists  
5 today.

6 Q Okay. In this case, Ms. Skoglund has testified  
7 that essentially these cartridge casings were fired from her  
8 sample of one. She is making an individualization. Is that  
9 scientifically supported, given the fact that she cannot  
10 tell the Court the number of, specifically Browning Hi-Power  
11 firearms that might have been manufactured? How does that  
12 relate to the statistics of individualization?

13 A Well, opining that cartridge cases were cycled or  
14 fired through a particular firearm is an expression of a  
15 certainty that is unfounded. In other words, there is no  
16 basis whatsoever. It's -- as I've indicated in my latest  
17 paper, it's pure speculation. There is no foundation for  
18 such a claim. And I would add that the U.S. Department of  
19 Justice has now recently adopted our position in that those  
20 claims are unfounded.

21 Q Okay. I believe we'll -- we'll supplement the  
22 record if we haven't already done so. But we talked about  
23 the characteristics used by firearms and toolmark for  
24 comparisons.

25 A I think we -- Ms. Skoglund has already covered

1 that area. Basically, it's striations and impressions are  
2 the characteristics upon which firearms examiners conduct  
3 their examination.

4 Q Okay. I'm going to touch on this. I was  
5 wondering if you could explain for the Court what the  
6 difference would be between class, subclass, and individual  
7 characteristics?

8 A Well, again, that's already been covered. But I  
9 think the salient point for our purposes here is the  
10 existence of subclass characteristics. We have considered  
11 that to be -- there's another nine hundred pound gorilla in  
12 the room. So I'll say the eight hundred pound gorilla in  
13 the room of firearms identification assertions that an  
14 examiner is in a position to be able to summarily dismiss  
15 characteristics as purportedly individual characteristics  
16 when, in fact, as I indicated -- have indicated in the  
17 public domain that -- my papers that the overwhelming number  
18 of characteristics generally present are, in fact, from the  
19 manufacturing process, that they have been mistaken for  
20 individual characteristics.

21 So -- and I would also point out that researching  
22 the literature in the domain for the field that the practice  
23 did not even acknowledge the existence of subclass  
24 characteristics until something like 1989.

25 So, in other words, examiners for the first sixty

1 or seventy years would screen or filter the samples by class  
2 characteristics. And then once they were satisfied class  
3 characteristics were consistent, they then presumed that all  
4 the characteristics at that point that they saw were  
5 purportedly individual characteristics.

6 It was only until about 1989 that they finally  
7 acknowledged the -- the phenomenon known as subclass  
8 carryover. And we still maintain to this day that this is  
9 the -- an eight hundred pound gorilla in the room for  
10 firearms identification.

11 Q Hypothetically, if you're shown photographs of --  
12 we've talked about breech face impressions, are you able to  
13 distinguish between subclass and individual characteristics?

14 A Highly likely not, but there are certain traits if  
15 they're fairly uniform. And -- and let's say a metallurgist  
16 or production metallurgist would know what process was used  
17 to form that particular component, then that dramatically  
18 increases the basis by which he or she might say that this  
19 is from the end mill process in production.

20 So -- but it -- and it's well known in the -- in  
21 the domain literature for firearms/toolmarks that it is  
22 incumbent upon the examiner to know the specific  
23 manufacturing process it was used for a specific firearm  
24 component, and that examiners are -- are really remiss in  
25 opining an individualization without knowing what that

1 process was.

2 In fact, there are a number of jurisdictions that  
3 do not allow their examiners to opine an individualization  
4 if a firearm is not recovered, and that's the basis for that  
5 restriction. If a weapon hasn't been recovered, then the  
6 examiner is in no position to know what specific process was  
7 used to fabricate that breech face barrel, extractor,  
8 ejector, whatever.

9 So the salient issue on this slide is the  
10 center -- the subclass characteristics that derive from  
11 manufacturing. And those would be imparted to some unknown,  
12 possibly very large production lot.

13 And just as an example, I was working the bombing  
14 of Judge Robert Vance, the package bombs. I was able to  
15 track the shrapnel nails to Taiwan. And six months after  
16 the bomb went off, and who knows how long the shrapnel, the  
17 eight or ten penny nails were on the shelf before purchase  
18 or even in someone's home. But I was able to track down  
19 the -- the -- it's called a header bench in Taiwan. So here  
20 we're dealing with six plus -- who knows how many months  
21 later, there was still a dramatic numbers of subclass  
22 characteristics exhibited by the samples.

23 Q But one aspect, in order to make that  
24 determination between subclass and individual  
25 characteristics, one would have to know the manufacturing

1 process involved in creating that particular part?

2       A     At an absolute minimum. But I would even now  
3 argue that because of the tribology regimes and their  
4 different regimes operated at any one time, this is another  
5 reason these purported ten gun validation studies are  
6 invalid or flawed is as a plant metallurgist, and I also  
7 knew that the lubrication regime may switch from boundary  
8 layer to fluid layer to elastohydrodynamic -- you have any  
9 problem with that word?

10            Okay. So even getting ten straight guns, may not  
11 be indicative of the eleventh gun or the twentieth gun may  
12 or may not show. So these ten guns may well not represent  
13 what they believe them to represent.

14            But the bottom line is on the subclass  
15 characteristics, with modern technology dramatically  
16 improving the materials used, generally would use tungsten  
17 carbide, which is some of the hardest substance known to man  
18 near diamond in hardness. They wear so very little as to be  
19 a very -- our goal as a production metallurgist was insure  
20 production continuity.

21            We don't want disruptions in production, so we  
22 strive to do what we can to increase production lot sizes.  
23 And those could be tens and hundreds of thousands if not  
24 millions of products, not necessarily guns, but whatever the  
25 product may be.

1           Q     So, in other words, at the factory, the machining  
2 tool, the super-hard tungsten carbide is being used to -- to  
3 basically carve out, if you will, thousands, perhaps tens of  
4 thousands of breech faces, one right after the other?

5           A     Yes. And that makes intuitive sense because you  
6 don't want the tooling to break down. You -- you -- so  
7 therefore, hardness is a pretty good indicator. It's not  
8 always dispositive. You want the fabricating tool to be  
9 significantly harder than the workpiece.

10                     So -- and this is where the double-edged sword  
11 with regard to the second premise of repeatability that they  
12 presume in firearms practice, and that is, in other words,  
13 bullets fired today are going to be matchable to barrels ten  
14 years from now or five years from now. That's another of  
15 the double-edged sword on repeatability.

16                     But bottom line is it's -- we all as plant  
17 metallurgist strive to keep the disparity between the  
18 fabricating tool and the workpieces as -- keep them as far  
19 as apart as possible in hardness.

20           Q     Going back to -- to that premise and asking that  
21 question of Ms. Skoglund, the manufacturing tool, tungsten  
22 carbide, super-hard, under her theory is constantly  
23 changing, such that the tool, in this case breech face  
24 manufacturer, is unique each and every single one that's  
25 produced.



1           But then that softer metal product, the breech  
2 face, despite thousands -- tens of thousands, hundreds of  
3 thousands of repeated firings under high pressure ammunition  
4 never changes. That's, in essence, her theory. What would  
5 your position be on that?

6           A       Well, it would be -- I would also echo my  
7 colleague Michael Saks's opinion that that's folklore that's  
8 been passed down through its unfounded. Clearly that it's a  
9 case of having -- trying to have your cake and eat it too  
10 from the repeatability to show that bullets compared at  
11 maybe some significant delta -- subsequent difference in  
12 time represent a firearm as it did during the -- the  
13 commission of the crime. But then to turn around and claim  
14 that the fabrication tool is changing so quickly that --  
15 that every firearm coming off is just irrational from a  
16 metallurgical standpoint.

17           MR. CHANG: Excuse me. May I approach, Your  
18 Honor?

19           THE COURT: Sure.

20           MR. CHANG: May I approach the witness, Judge?

21           THE COURT: You may.

22 BY MR. CHANG:

23           Q       Mr. Tobin, I hand you Defense Exhibit A for  
24 identification, just a representative sample, came from a  
25 slide from Ms. Skoglund's presentation. Using that just as

1 a hypothetical example, there are a number of horizontal  
2 parallel lines depicted in the photograph on the right.  
3 Would you agree, sir?

4 A Yes.

5 Q Okay. Would you characterize those as impressions  
6 imparted to the surface from the, quote, breech face?

7 A Could you ask the question again, please. Would  
8 I --

9 Q Would you characterize those lines as being  
10 representative of impressions from the breech face?

11 A They're consistent. They could be, yes.

12 Q Could be. We don't know what firearm or anything.  
13 I'm just asking you, are you able as a forensic metallurgist  
14 material scientists, would you be able to identify those  
15 lines as being individual or subclass characteristics?

16 A No. Not -- no. I -- and I would say that --  
17 they're -- have a high likelihood of being subclass  
18 characteristics. But an examiner remote from the operation  
19 is in no position to be able to summarily dismiss the  
20 possibility of subclass carryover.

21 Q Why do you say that there's a high likelihood that  
22 those lines would be subclass characteristics created during  
23 the manufacturing process?

24 A Well, typically, use and abuse or incidental marks  
25 from service abuse, and that's not meaning intentional. It

1 just means service -- material deterioration in service  
2 is -- relatively, generally non uniform corrosion is  
3 typically -- let's say it's an autocatalytic --  
4 autocatalytic process, that's a very non uniform process, as  
5 well.

6           So the service in an incidental abuse tends to be  
7 non uniform. The very uniform characteristics carry in  
8 particularly spatial relationships and -- and their  
9 relationship to each other are more often than not subclass  
10 from manufacture.

11           Q     Are you familiar with tools utilized in this  
12 particular field? Comparison microscopes?

13           A     Yes.

14           Q     And have you ever used those before, sir?

15           A     Oh, yes.

16           Q     And, very briefly, in what capacity?

17           A     As a forensic metallurgist. I would use it both  
18 as shown, for example, in the slide or in some situations I  
19 actually attach some interferometry, which is a different --  
20 a more advanced scientific technique. But yes, I would use  
21 it both with and without the interferometry.

22           Q     Okay. Let's talk about the AFTE Theory of  
23 Identification. As a scientists in the scientific  
24 community, you've had an opportunity to review the AFTE  
25 Theory of Identification. Can you read that? Do you have a

1 copy or should I bring one to you?

2 A No, no, no. I suppose --

3 MR. CHANG: Could we have a --

4 THE COURT: I'm showing what you marked as  
5 Defendant's Exhibit C.

6 THE WITNESS: Oh, I'm sorry. I have a copy, Your  
7 Honor. That would be -- well, I know it pretty much --

8 BY MR. CHANG:

9 Q What I'd like to do is kind of go through their  
10 definition of what constitutes sufficient agreement. And we  
11 talked about their -- their standards in terms of whether  
12 this is an objective or subjective definition. Can we --  
13 can you take us through the AFTE Theory of Identification?

14 A Oh, yes. Unfortunately, this is a very busy  
15 slide, but it actually -- what I've done is highlighted --  
16 and the colors aren't coming as they should have been -- but  
17 highlighted these very vague and ambiguous adjectives and  
18 nouns that are virtually meaningless in the true or  
19 mainstream scientific community.

20 This is one of numerous reasons why the AFTE  
21 theory is not a valid scientific protocol. The word "unique  
22 surface," now, the theory, let's look at the first sentence.  
23 It enables opinions of common origin to be made when the  
24 unique surface contours of toolmark -- two toolmarks are in  
25 sufficient agreement.

1           That alone is flawed on several levels. It  
2 contains what are known as fallacies of presumption, which  
3 are basically premises that presume -- I'm sorry. Yes.  
4 Premises that presume what they purport to prove. And this  
5 would be known as a potential petitio principii -- and  
6 that's P-E-T-I-T-I-O, then space, P-R-I-N-C-I-P-I-I. And  
7 that is assuming the initial claim, the fallacy of  
8 presumption by assuming the initial claim.

9           They're presuming to indicate that the surface  
10 contours are unique. That's a presumption. That has never  
11 been established.

12           Then the -- then moving on, what is sufficient  
13 agreement? What is sufficient to you would be insufficient  
14 to me or to anyone else. They typically tend to hide behind  
15 properly trained examiner, but as I point out -- or actually  
16 we point out in our latest paper, what's ironic about hiding  
17 behind the proper training is that proponents have actually  
18 exclude the -- the opinions of mainstream scientists because  
19 they're not trained to -- reportedly trained to recognize  
20 the very phenomenon that has never been proven to exist, and  
21 that's uniqueness. You cannot be trained to recognize  
22 uniqueness when you see it. It just doesn't happen.

23           So moving on here, this -- the entire theory of  
24 identification is rife with very subjective, vague,  
25 ambiguous terms as -- as -- as can be read. But the very

1 bottom, what we're indicating here is the frequently invoked  
2 training and experience. And as we point out, training and  
3 experience is patently unacceptable in the field of science  
4 as a basis for a theory or premise.

5 Q As a scientist working in the forensic  
6 metallurgist field, is sufficient agreement sufficient --  
7 sufficient agreement quantifiable? In other words, can you  
8 put a percentage on it?

9 A That's a meaningless phrase in the scientific  
10 community. And the answer is, No.

11 Q Okay. Agreement is significant. Can you quantify  
12 "significant" in terms of a percentage, a number?

13 A Not outside the statistical arena. There is -- is  
14 are procedures for characterizing significance. It's called  
15 "p-values." But outside the statistical arena, no, not in  
16 the context here.

17 Q Similarly, can you quantify the term "practical  
18 impossibility"?

19 A No.

20 Q And even within the AFTE Theory of Identification,  
21 they do recognize that the interpretation of  
22 individualization is subjective?

23 A That's correct. They do acknowledge that it is  
24 subjective. Although, I would add that it's followed by and  
25 founded in scientific principles. The problem is no one has

1 ever explained what those purported scientific principles  
2 are. It's a good phrase, but it's so far not been shown to  
3 be valid.

4 Q You have -- in other words here, can you  
5 explain -- summarize what the AFTE Theory of Identification  
6 is here -- in other words, here. What are they -- what are  
7 they asked to do? What are they doing?

8 A Well, the overall summary is that they comprised  
9 one combination of fallacies of presumption. There's false  
10 dichotomy involved in it. There is -- there are other  
11 fallacies of presumption.

12 The bottom line is it's a meaningless protocol, if  
13 you will. And there is no science that accepts training and  
14 experience as a -- you know, basis for a -- a protocol. So  
15 this is not an acceptable scientific protocol.

16 Q Okay. Going back here under the theory of  
17 identification, it talks about where it exceeds the best  
18 known match or best known non match. Those comparisons  
19 really have to deal with the examiner's experience and  
20 having seen those matches, correct?

21 A Yes.

22 Q Okay. Go to your next slide. In other words,  
23 you're told to think back to your best matching non match if  
24 he can remember. Would that be a subjective or objective  
25 test?

1           A       That's clearly a subjective test and requires what  
2 we point out to be superhuman recollections of -- of the  
3 most common geometric form and that's lines. And we -- even  
4 in the Brandon Mayfield matter blunder, that was -- a field  
5 of fingerprints. And there were examiners and that that was  
6 a very graphic demonstration of the various biases involved  
7 in practices of pattern matching identifications.

8                       Two or three examiners were matching fingerprints  
9 in the Brandon Mayfield train bombing. I'm sure we --  
10 everybody remembers it. If not, I'll explain it. And then  
11 a fourth examiner whose financial interests were actually  
12 contrary to those of the law enforcement community or the  
13 prosecutor actually even confirmed that it was, in fact, a  
14 match.

15                      Well, it was subsequently found not to be a match.  
16 And if an error like that can occur in fingerprints, you  
17 have basically seven varied geometric patterns. So if a  
18 Brandon Mayfield type error can occur or exist in a field  
19 where you have the variety of seven quite different  
20 geometric patterns, the -- when we're now boiling down to  
21 matching the basically the most elementary geometric  
22 patterns, and that's lines, assuredly the vulnerability for  
23 error is significantly increased.

24           Q       Okay. I understand that. And I want to, you  
25 know, go back to the theory of identification and the



1 requirement that Ms. Skoglund would have had to basically  
2 recollect a prior Browning Hi-Power cartridge impression.  
3 In this case she testified she has no recollection of that.  
4 But hypothetically, she had a recollection of a Browning  
5 Hi-Power.

6           She's trying to convey that to you another  
7 hypothetical firearms and toolmark examiner. If you had  
8 never seen a prior Browning Hi-Power impression, you would  
9 have no frame of reference in order to make a comparison  
10 that she made. Is that a fair assessment of -- of this  
11 theory?

12           A     Well, again, we're conflating two issues here.  
13 But in her world, yes. That would be significant with  
14 regard to firearm components, which I don't -- that is not  
15 my domain or turf or comfort zone. However, we're now  
16 dealing with pattern recognition and we're now focused in a  
17 very subset world. And it almost doesn't matter from a  
18 pattern recognition adequacy what's the source of the  
19 pattern.

20           The fact is we're now focused on the geometric  
21 form of lines. So I can't really answer that. I -- I can  
22 on the firearm components, I would say that's a valid point  
23 on the components. But when we're talking about the lines,  
24 it almost doesn't matter whether it came from a Glock or a  
25 Smith & Wesson or a Sturm Ruger or whatever. We're -- we're

1 now at the level of five to forty X for magnifications where  
2 we're actually looking at the interspatial relationships of  
3 the lines.

4 Q Okay. Talk to me about Courts rejecting or  
5 limiting testimonies. Are you familiar with Courts that  
6 have, in fact, done so?

7 A Oh, yeah.

8 Q Can you explain to this Court why Courts have  
9 limited firearms and toolmarks examiners from offering  
10 opinions as Ms. Skoglund has in this case?

11 A Well, there are various reasons. One is they --  
12 Courts that I recall have agreed that this is not a science.  
13 In fact, and one comment was, You can call it anything but a  
14 science. But generally, in the last trial I just came from  
15 in Atlanta, I actually, as I indicated to the Court, the  
16 most scientifically defensible opinion that can be rendered  
17 based on the state of the art that exists today is that,  
18 quote, in my opinion, and as I indicated to the Court,  
19 that's the first caveat that needs to be an opinion. And  
20 the jury needs to be aware that this is an opinion and it's  
21 not the CSI belief that this is gospel from the mount, if  
22 you will.

23 But in my opinion, this particular firearms cannot  
24 be eliminated as the source of these characteristics or in  
25 the alternative that characteristics exhibited are

1 consistent with having been fired from this particular  
2 firearm. And, in fact -- so that's what the Courts have  
3 chosen to do was not necessarily exclude but to limit. And  
4 several judges, one world famous is Nancy Gertner who  
5 teaches at the same university where I am a guest lecturer,  
6 as well, said that she tried her darnedest to -- but she  
7 knew that she would be reversed because this has been around  
8 for one hundred-plus years. The best she can do is to limit  
9 and not allow the examiner to imply to the jury that this is  
10 a science or that this is dispositive in any way. In other  
11 words, force the jurors to look at the case as whole and all  
12 look at all the evidence and not just to take the firearms  
13 examiner's testimony as dispositive.

14 Q Let's talk about some of the aspects of AFTE  
15 Theory of Identification. Are there articulated protocols  
16 for firearms and toolmark examiners that are affiliated with  
17 AFTE? These are an objective particular protocol?

18 A Well, now, the use of the word "protocol" is  
19 deceiving. It depends on who you ask. If you ask examiners  
20 in the firearms community, they call that a -- they call  
21 their SOPs protocols. But in the scientific community,  
22 there -- exists, there is no scientific protocol that  
23 allowed opinions of individualization. And that's probably  
24 the primary flaw in the practices that there are no  
25 protocol, which would consist of -- allows the two most

1 basic cornerstones of the scientific method, reproducibility  
2 and repeatability.

3           And what is A, parameters of detection to be  
4 defined. No protocol allows for that. And then even if one  
5 decide -- tries to define what the examiner is specifically  
6 looking for, in other words, what parameters of detection  
7 should be looked for, their second problem is that there are  
8 no rules of application of those parameters to define  
9 same -- or to discern same from different. And those are  
10 another reason that the AFTE Theory of Identification or any  
11 of these laboratory protocols don't constitute scientific  
12 protocols is they don't allow for the two most basic  
13 requirements of the scientific method, and that's  
14 reproducibility and repeatability.

15           Repeatability is the ability of the same examiner  
16 to obtain the results consistent with their earlier trials  
17 or -- as far as the outcome of experiment. Reproducibility  
18 is the trait that allows other experimenters to reproduce  
19 the results of another examiner's experiment.

20           Q     Okay. You heard the testimony of Ms. Skoglund  
21 today when I was asking her about the areas that she zoned  
22 in on. Would those, quote, areas be repeatable and  
23 reproducible from one examiner to another?

24           A     Well, I -- the only way I -- can't answer that.  
25 But the only way -- actually, the only way I can answer that

1 is to say that the field even acknowledges that the practice  
2 is subjective. So if you take -- for example, the  
3 characteristics or the indicia in the case at bar out to  
4 California, it's very possible that an examiner out there  
5 would find that it's not a match or not an individualization  
6 for several reasons. Not the least of which is the  
7 typically predominant out there is a process called CMS,  
8 consecutively matching stria, and that's a different  
9 criteria than is used on the East coast general.

10 But the bottom line is that's known in the field  
11 that you will get differences of opinion based on different,  
12 quote training and experience, and even different geographic  
13 regions because of the prevalence of certain weapons and in  
14 some regions more concentrated than others.

15 Q We've -- we've talked a little bit again with Ms.  
16 Skoglund and her overall assessment of the matching parallel  
17 lines and so on. You have a working hypothesis here. Can  
18 you tell the Court about your experiment and what this  
19 entails and the significance of that.

20 A Well, to -- for issues for example of firing pins,  
21 extractors, ejectors, there is a very small surface area  
22 upon which characteristics can be imparted. In some cases,  
23 very tiny, like a firing pin. So the working theory -- the  
24 hypothesis that I was working under is in a finite -- I'm  
25 sorry. In a very small surface area there is only a finite

1 number of, in this case, lines that one can impart on that  
2 very tiny surface. So -- and in many cases involved where  
3 the examiner used three characteristics or four or five to  
4 make a -- to claim a match. So my -- what I wanted to see  
5 was in a very small space what probability or -- of  
6 coincidental or random matches would occur.

7           So I asked my wife who works at Cracker Barrel,  
8 and she's on the retail side of Cracker Barrel. I said, Do  
9 me a favor and grab several hundred UPC symbols from  
10 different products. Make sure that no two products are  
11 represented in the bar code sheet. So she brought those  
12 home, and I randomly selected two different product UPCs.

13           I did ask her, Does Cracker Barrel include any  
14 marketing demographic information in the codes? And she  
15 assured me they do not. For example, when you buy a product  
16 at, let's say, Wal-Mart or Lowe's or something, when you  
17 take the product back, sometimes they can tell you that you  
18 bought it from that store or another store. But Cracker  
19 Barrel does not include that marketing information in their  
20 UPCs.

21           But to be scientifically accurate, what I did when  
22 I put them under a microscope, is I actually inverted one of  
23 the UPCs to moot out any marketing information that may have  
24 been included in case she was wrong. So what we're seeing  
25 on the screen here is a split screen image. And I'm

1 indicating the laser this line that goes straight down.

2 I've mated two UPCs up against each other in the  
3 microscope and decided to see if I could find what the  
4 chances of a random or coincidental matches would be. So in  
5 this case, realizing that in many cases, they only need  
6 three or four marked characteristics or five, I just  
7 randomly selected these and this is what I found, one, two,  
8 three, four arguably, we'll come back to that in a minute,  
9 five, six, arguable, seven arguable, eight, nine, ten,  
10 eleven, twelve, thirteen, fourteen, fifteen, sixteen,  
11 seventeen, and then these others are arguable. I say  
12 arguable because now that raises another issue, and that is  
13 of line quality.

14 At what level does an examiner decide for example  
15 in the characteristics that I'm looking at here, is this a  
16 match or is this a non match? Some examiners would say, No,  
17 this it too different than this, so I won't call it a match.  
18 Others will say, Yeah. It's a -- a match.

19 One of the difficulties, and even acknowledged by  
20 the National Academy of Science is that the variability from  
21 shot to shot is a immense, much more than examiners may  
22 acknowledge from the non scientific perspective, because  
23 charges in the -- in the cartridges are not uniform and  
24 there are various reason -- differences that can cause  
25 including thread material weight or bullet weight as you

1 were asking earlier.

2 But the bottom line is because of those variances,  
3 even items fired from the same firearm will have significant  
4 dissimilarities exhibited. So it's questionable -- here's  
5 another subjective assessment, is this a match or is this  
6 not a match? But the bottom line of all of this is there is  
7 a very likely chance of random matches of lines even in --  
8 as is known in the community -- even with non matches --  
9 known non matches.

10 Q Is there any literature defining either for  
11 firearms toolmark examiners or other scientists, are you  
12 able to discern between an individual or subclass  
13 characteristics?

14 A No. And that's another salient issue is, given  
15 the prevalence of the publications papers in the firearms  
16 field through the years why there hasn't been a single one  
17 that discusses to examiners how they're supposed to be able  
18 to tell the difference between subclass which comes from  
19 manufacturing and purportedly individual characteristics.

20 So that raises the question as I did, I believe  
21 either in my affidavit or in one of my papers, how are  
22 trainees -- train -- those training examiners behind closed  
23 doors, how are they able to communicate that information?  
24 And it's not -- there is no literature indicating to  
25 examiners how they're supposed to tell the difference



1 between subclass carryover from manufacturing and individual  
2 marks.

3 Q Talk to you about some of these subclasses,  
4 individual signs and problems that we have where bullets and  
5 cartridge cases fired from different weapons can and  
6 sometimes do have more matching marks than bullets fired  
7 from the same weapon explain to me that phenomena?

8 A Yes. I found that personally during all my years  
9 in the toolmarks arena. But some of the studies, and I  
10 think the one that comes to mind is Miller and Neal showed  
11 that fifty-two percent -- well, that's the -- I'll cover  
12 both sides. What experimenters find is that there's  
13 commonly or frequently more dissimilar characteristics in  
14 known -- in -- in bullets or cartridge cases being fired  
15 from a known weapon than there are in cases where they were  
16 fired from different weapons or conversely -- and in some  
17 studies, for example, I remember one showed twenty-one to  
18 twenty-six percent concordance in a particular study.

19 In other words, characteristics they found to be  
20 similar. But that implies that there were nearly eighty  
21 percent dissimilar characteristics in fire -- in items known  
22 to have been fired from the same firearm. And conversely,  
23 they find that -- some find -- and I think I have an example  
24 in here -- bullets or cartridge cases fired from different  
25 weapons can have a, quote, appalling number of similarities

1 when they're fired from different firearm platforms. And I  
2 have an example of that in this slide.

3 Q Talk to you about the -- the second portion of  
4 that. Federal databases have grown. No non matches  
5 appeared. Close to the stop of the catalyst and no matches.  
6 What's the source of that statement?

7 THE COURT: Hold -- hold that thought for a  
8 second. We need to switch out court reporters.

9 (Whereupon, direct examination of Mr. Tobin by Mr.  
10 Chang reported by Erin E. Leben resume and were reported by  
11 Chariti L. Colón as follows:)

12 BY MR. CHANG:

13 Q. Why don't you explain that second statement on  
14 that slide where it talked about as federal database have  
15 grown no known matches have appeared closer to the top of  
16 the candidate list for known matches.

17 What's the source of that statement?

18 A. That is the De Kinder study -- and that's  
19 D-E-K-I-N-D-E-R -- called the AB 1717 Study. And what they  
20 found -- and this is very intuitive. What they found is  
21 they would find that bullets or cartridge cases known to  
22 have been fired in a certain firearm, those images when the  
23 databased is inquired would appear generally in the top ten  
24 most likely candidates if there weren't a whole lot of  
25 entries in the database.

1           But what they found as more and more samples were  
2 entered into the database, the actual candidacy listing was  
3 degraded such that known platform -- known firearms didn't  
4 even appear in the top ten or fifteen once many more  
5 hundreds or thousands or whatever began to get entered into  
6 the database. So, in other words, even though superior to  
7 the known platform, the algorithm was finding better matches  
8 than the -- or more matches, more characteristics than the  
9 queried one, than the known firearm.

10           Q.    So, in essence, this is, basically, the NIBIN  
11 database that we talked about with Ms. Skoglund. And, for  
12 example, as it relates to this case, the known cartridge  
13 that was uploaded on the NIBIN database, presumably since it  
14 was fired from that firearm as a test cartridge, should be  
15 number one?

16           A.    Yes.

17           Q.    But as the database grew, that number one, the  
18 known match, keeps on slipping down further and further down  
19 the list?

20           A.    Yes.

21           Q.    So the computer's basically spitting out better  
22 matches than the known actual match?

23           A.    Yes. And there could be a number of scientific  
24 reasons for that, but yes.

25           Q.    And what is this slide and what does it purport to

1 show?

2       A. This is a slide, and I'm indicating with the laser  
3 here, there's the split screen image for a comparison of two  
4 samples. This was a -- two cartridge cases with breechface  
5 marks published. And I have to look that one up. Yes, this  
6 is Rivera published that is presented to ask audiences does  
7 this look like an identification or an inconclusive or an  
8 elimination.

9               And, in fact, what the author indicates is that  
10 these cartridge cases were fired from two completely  
11 different firearms. And look at the overwhelming -- one is  
12 hard-pressed to find any dissimilarities in this  
13 particular -- and this has a substantial number of  
14 similarities in here.

15               And even the National Academy of Sciences has  
16 found in the -- other instances of where the characteristics  
17 are so similar as to be easily confused with each other.  
18 And I think I've referenced one of those in my latest papers  
19 as well.

20       Q. Is this a documented known nonmatch?

21       A. Yes.

22       Q. It's not very clear, but can you explain what the  
23 second half of that slide is?

24       A. It's pretty much the same. These are bullets, two  
25 bullets that here's the split line, split screen image. And

1 this is obvious. This is labeled. Those were fired from  
2 two different firearms, and it's labeled Barrel Five on the  
3 right and Barrel Six on the left. But look at the  
4 concordance -- extensive concordance of striations on both  
5 of those bullets. Those could be very easily characterized  
6 by an examiner as an individualization when, in fact, they  
7 were fired from two different weapons.

8 Q. Again, a documented known nonmatch?

9 A. Correct.

10 Q. Can you briefly tell the Court what the effect of  
11 technology had on the ability to duplicate, replicate parts  
12 such as in this case: Breechfaces?

13 A. Yes. I think I've already covered it, but,  
14 basically, it's that with technology advancing and courts  
15 have even recognized -- oops -- courts have even recognized  
16 that materials and processes have advanced such that larger  
17 and larger production lots are being made through the  
18 decades, and, in fact, that -- in other words, we're  
19 equating that to subclass characteristics. So that's one  
20 consideration.

21 And as I've pointed out earlier, as a plant  
22 metallurgist, we want to try to -- manufacturing occurs, and  
23 especially this day and age of CNC control --  
24 computer-numerically-controlled processing, we're trying to  
25 control the processes such that the precise -- that the

1 exact sequence of events under the same pressures and forces  
2 and, if we can, tribology regimes occurs over and over and  
3 over throughout the process. So that's another facet that  
4 the field is -- or some of the authors have recognized.

5 And these are just various acknowledgments that  
6 the tools that are used in my industry to create firearms  
7 have become even more and more durable through the decades.  
8 And -- so in other words, these are three characteristics  
9 showing the consistency and the larger and larger production  
10 lots that are possible.

11 Q. I'd like to talk very briefly about validation  
12 studies. I know you authored a paper as it relates to these  
13 purported validation studies. Can you very briefly just  
14 touch on that? If we haven't already, we'll supplement the  
15 Court with that paper. Explain that in more detail.

16 A. You have or have not?

17 Q. I believe we have.

18 MR. CHANG: If we have not, we will, Judge.

19 BY MR. CHANG:

20 Q. But if you can just briefly summarize for the  
21 Court what these purported validation studies stand for.  
22 What's your conclusion based on your research?

23 A. Well, the overall conclusion is they're virtually  
24 worthless. You cannot validate -- in a scientific arena,  
25 you cannot validate a subjective practice, you just can't,

1 for some of the reasons that we've already discussed.

2 I've already pointed out there are no parameters  
3 of detection. It's a subjective process. There are no  
4 rules of evaluation. And the ultimate arbiter has to have  
5 access to ground truth which doesn't exist. And there is no  
6 scientifically acceptable probabilistic model allowing an  
7 examiner to say within a reasonable degree of certainty.

8 Q. And this would be the paper that you -- you  
9 authored?

10 A. I'm sorry. I'm sorry. You wanted the papers. So  
11 the first paper that we published actually hasn't come out  
12 yet, but it's been on-line since November. We actually  
13 analyzed these validation studies that the courts  
14 continually get flooded with or presented. And we take two  
15 of the most represented of the field.

16 We've reviewed almost all of the purported  
17 validation studies, if not all of them. And we took two as  
18 an example, and that was, basically, almost limited by the  
19 editors because of size. But -- and then we evaluate the  
20 very numerous flaws in these validation studies to include  
21 what we're looking here. And we don't -- I don't even have  
22 all of them in the slide. But they do not replicate  
23 casework. And, again, the -- most of these studies present  
24 to the respondent a deductive environment versus an  
25 inductive environment.

1           And the example I use in my latest paper is we're  
2 all probably familiar with Octomom. But let's say for the  
3 sake argument that one of eight octuplets is cloned and  
4 let's say that an examiner is presented with all eight  
5 possible sources and asked which of the these eight  
6 octuplets were cloned. We don't doubt or -- and I don't  
7 doubt that there would be a low, if not zero, rate of error  
8 in that environment because that is a deductive inference.  
9 The examiner can examine the entire possible sample pool and  
10 conclude, therefore, number three was cloned. We don't  
11 doubt that there would be a low error -- rate of error in  
12 that scenario. But that's not real world scenario.

13           In the firearms identification practice, it's an  
14 inductive fields where the examiner does not have access to  
15 the entire field. So let's say in my example scenario that  
16 an examiner in the first month is presented with the clone  
17 and maybe Octuplet Number Two and then three or four months  
18 later the examiner is presented with Octuplet Number Five  
19 and so forth. Assuredly, the rate of error would increase  
20 in that type of a setting. And then there are numerous  
21 others. The sample sizes are, basically, equivalent to  
22 grains of sand on the world's beaches.

23           Q.    What are typical sample sizes in these studies  
24 that have been presented?

25           A.    Well, ten when they're doing ten guns studies.



1 But even some -- as we point out, even this one that has  
2 impressive numbers of participants -- I think I saw a number  
3 280 or whatever -- those are virtually meaningless because  
4 of the numerous flaws that exist in these various studies.

5 We find that examiners have unlimited time. The  
6 samples that are presented are in pristine condition. They  
7 don't -- that doesn't necessarily represent casework. In  
8 fact, most, if not many, if not most, are preexamined to  
9 ensure clarity of characteristics. And that's not --  
10 doesn't occur in the real world.

11 So we, basically, indicate in our papers that the  
12 validation studies are -- and we do indicate that they're  
13 virtually irrelevant to any particular case at bar. And  
14 largely of the fifteen reasons or however many we have here,  
15 in large part because they don't -- they don't capture what  
16 they believe they're capturing or measure what they believe  
17 they're measuring. But not the least of which is the  
18 firearms tested are not those involved in a particular case  
19 and there may be different manufacturing processes used in  
20 those purported validation studies.

21 Q. Within the studies that you've reviewed, have you  
22 examined rates of errors in these purported studies?

23 A. Yes.

24 Q. Can you tell us very briefly about that?

25 A. We found in just a general overview that the

1 problem is most of those errors are blown off as one-offs.  
2 But what we're finding are rates of error from two point  
3 three percent to twenty-eight point two percent in these  
4 various studies.

5           And just say pick one in the middle somewhere, it  
6 was not -- it was recently found that the Detroit state  
7 crime lab -- I'm sorry, the Detroit -- the crime lab in the  
8 city of Detroit was exhibiting a -- I forgot -- ten percent  
9 or twenty percent rate of error. In fact, I may have it.  
10 Here it is. Ten percent rate of error. And that surely is  
11 an understatement, undercharacterization because it was  
12 conducted by other firearm examiners. But that was a  
13 minimum rate of error found in their operation.

14           And I think under notable it's interesting that  
15 some of the examples we cite, for example, statistically  
16 demonstrate the effect of the subjective practice. And in  
17 the case of *Trotter v. Missouri* -- I don't know if we still  
18 have it here -- but a police officer was killed and it was  
19 originally believed that he was shot with his own weapon  
20 because his weapon was missing and the slug recovered from  
21 his body was a .38, was the same caliber.

22           An examiner was submitted -- a suspect was  
23 arrested sometime later. And then his weapon was submitted  
24 to the crime lab. And the examiner test-fired that firearm,  
25 compared it to the bullet from the police officer, and

1 opined an individualization in that case and said that that  
2 was the firearm that killed the officer. So that case went  
3 to trial and I -- the defendant was found guilty.

4 At some subsequent time later, the officer's  
5 actual service firearm was recovered, was sent in to the  
6 laboratory, and from a statistical standpoint -- this is a  
7 perfect case of what we call blocking -- the very same  
8 examiner was given that firearm. He conducted a set of  
9 exams and comparisons and at that time decided that he liked  
10 that match better than the one he had already opined earlier  
11 at the earlier trial.

12 And the reason -- so in other words he change his  
13 specific source attribution or his opinion based on a match  
14 he found that he liked even better. In statistics that's  
15 known as blocking a random variable because that eliminates  
16 the possibility of a claim of difference of opinion between  
17 two different examiners. That's the case where the very  
18 same examiner decided that the second firearm was a better  
19 match than the first one.

20 Q. Mr. Tobin, you've had a chance to review the  
21 examiner's reports or bench notes and we've discussed the  
22 overall characterization of this feel, firearms and toolmark  
23 examination. As a scientist, do you have an opinion as to  
24 the overall reliability, reputability, testability of the  
25 field of firearms and toolmark examination and the ability

1 to attribute components to a specific firearm?

2 A. Yes.

3 Q. Long-winded question.

4 What is that opinion, sir?

5 A. It's the overall opinion -- I have a slide  
6 indicating the ratings on the various categories. But the  
7 overall opinion is that it is unfounded, it is not  
8 scientifically -- the practice is not a science, it has --  
9 for numerous reasons, and that opinions of  
10 individualization -- I can concur with my colleagues -- is a  
11 fallacy and is not supported by mainstream or true science.

12 Q. This the slide you're referring to?

13 A. Yes.

14 Q. We kind of got through that briefly with you.

15 A. Yes.

16 Q. Reliable facts or data, you rate that with a zero.  
17 And what's your scale?

18 A. Zero -- well, it's not a continuum. It's zero --  
19 in this case zero, a half, or one.

20 Q. Okay. Reliable facts or data, does -- is there a  
21 database that exists within the field of firearms toolmark  
22 examination?

23 A. No. And, in fact, the statement I would make is  
24 there are no meaningful or comprehensive data that would  
25 support the theory of identification.

1 Q. Reliable principles and methods. We talked about  
2 the AFTE theory of identification. Is that the principle  
3 and method upon which they purport to make these  
4 comparisons?

5 A. Yes.

6 Q. Is that an objective or subjective --

7 A. That's --

8 Q. -- definition?

9 A. It's subjective.

10 Q. Witness application of reliable principles and  
11 methods. You heard Ms. Skoglund testify. Did she reliably  
12 apply the principles and methods as it relates to the facts  
13 and the exhibits in this case?

14 A. Well, by logical necessity, one cannot apply  
15 reliable principles when the principles and methods haven't  
16 been shown to be reliable. So that gets a zero as well.

17 Q. Testability?

18 A. It's a testable practice that has never been  
19 meaningful or comprehensively tested in large part because  
20 there's no access to ground truth.

21 Q. Okay. And you gave existence of established error  
22 rating zero. Why?

23 A. There had been no meaningful or comprehensive  
24 study establishing a domain-wide practice error rate.

25 Q. Acceptance in a relevant scientific community?

1           A.    I actually probably should have given this a half,  
2 but it's virtually unanimously rejected in the mainstream  
3 scientific community of my colleagues and scientists from  
4 whom I've discussed it or read their papers or discussed the  
5 issues.

6           Q.    Okay.  And you gave peer review a point five.  
7 Why?

8           A.    I did.  And that's even being generous, so maybe  
9 that will offset the -- but the bottom line is it's not an  
10 established scientifically valid process of peer review  
11 because of the inherit biases in an insular review process.

12           MR. CHANG:  Okay.  Thank you, sir.

13           Thank you, Your Honor.

14           THE COURT:  All right.  State.

15           MS. VALENTINI:  May I inquire?

16           THE COURT:  Sure.

17                                   CROSS-EXAMINATION

18 BY MS. VALENTINI:

19           Q.    Good afternoon, sir.

20           A.    Good afternoon.

21           Q.    I apologize in advance if I kind of go a little  
22 out of order.  There's a lot of notes here so I apologize in  
23 advance for that.

24           THE COURT:  Will you be using the overhead at all?

25           MS. VALENTINI:  I will not, sir.

1 THE COURT: Will you need that again?

2 MR. CHANG: No, sir.

3 THE COURT: All right. Let's go ahead and turn it  
4 off then.

5 Counsel approach for a minute.

6 (Whereupon, a bench conference was had.)

7 THE COURT: Mr. Richardson needs to use the  
8 restroom, so we're going to take a five-minute break  
9 while we get him out of there for that.

10 MS. VALENTINI: Yes, sir.

11 THE COURT: Mr. Richardson, they're sending  
12 somebody up here right now. Okay?

13 You can take a break while the defendant uses the  
14 facilities here.

15 THE WITNESS: Right now?

16 THE COURT: You can step down.

17 THE WITNESS: Thank you.

18 THE COURT: We'll go ahead and take a break now,  
19 folks. So five or ten minutes by time we get him out  
20 back and in here. So in the meantime while we're doing  
21 that break, let me see the attorneys on the Jimmie Lee  
22 Blake case, please.

23 (Whereupon, the Court considered other matters.

24 After which, the proceedings resumed as follows:)

25 MR. CHANG: Judge, very briefly, Defense is

1 offering Defense Exhibit C which is the hard copy of  
2 the presentation.

3 THE COURT: Okay.

4 And come on back up here and have a seat in the  
5 witness box.

6 And, Ms. Valentini, you know what, considering  
7 your previous objections, any other objections to  
8 admission of this demonstrative evidence?

9 MS. VALENTINI: I believe ours has been admitted  
10 as well.

11 THE COURT: It was.

12 MS. VALENTINI: It was? I thought it was. Grace  
13 is shaking her head no.

14 THE COURT: I accepted it and admitted. Well, I  
15 didn't necessarily look over at Grace and say put a  
16 sticker on it.

17 MS. VALENTINI: She runs the show sometimes.

18 THE COURT: I'm going to go ahead and admit  
19 Defense Exhibit A now as Defense next. Thank you.

20 All right. Ms. Valentini, you may proceed.

21 MS. VALENTINI: Thank you, Your Honor.

22 CROSS-EXAMINATION (CONT'D)

23 BY MS. VALENTINI:

24 Q. Good afternoon, sir.

25 A. Good afternoon.



1 Q. Sir, can you tell me how you are currently  
2 employed?

3 A. I'm a metallurgical -- forensic metallurgy and  
4 material scientist consultant.

5 Q. I'm sorry. That door opening and closing, I have  
6 a hard time hearing.

7 A. So do I.

8 Q. So if you could say it one more time for me.

9 A. I'm a forensic metallurgist material scientist  
10 consultant.

11 Q. So you make your living as a consultant?

12 A. Yes.

13 Q. And you said metallurgist forensic consultant.  
14 You are not a firearms toolmark identification consultant?

15 A. Well, it depends on the issues, yes.

16 Q. So how often do you testify about what you  
17 testified to today?

18 A. That's a good question. I've testified four times  
19 in the last year, and I believe two or three might have been  
20 the scientific methodology or lack thereof of firearms  
21 identification practice, yes.

22 Q. Okay. So how much money did you make testifying  
23 in regard to firearm and toolmark identification?

24 A. I don't break it down by that category.

25 Q. Okay. How much money are you being paid for your

1 work in this particular case in State of Florida versus  
2 Richardson?

3 THE COURT: Ms. Valentini, I don't care if he's  
4 paid a dollar or a million dollars. It doesn't matter.  
5 It's not a civil case. It has no impact on me on  
6 credibility issues. If you want to bring it out in  
7 front of a jury another time, that's fine.

8 THE WITNESS: It was closer to your first guess,  
9 Your Honor.

10 THE COURT: Go ahead and tell her. Go ahead and  
11 tell her. If we're going to sit there, let's go ahead  
12 and tell her. If you know, how much are you being paid  
13 for this?

14 THE WITNESS: Oh, I'm sorry. My nominal fee is  
15 two ninety-five an hour, but I'm working for two  
16 individuals that I think who could sell refrigerators  
17 to Eskimos. So the last calculation was sixty-some  
18 dollars, but it's declining as we sit here.

19 BY MS. VALENTINI:

20 Q. Sir, isn't it true you were paid five thousand  
21 dollars for your work in this case?

22 A. No.

23 Q. Okay.

24 A. Not even.

25 Q. The reason why I ask you that -- the reason I ask

1 you that question is you had made a comment when Counsel was  
2 talking to you on direct with regard to the Association of  
3 Firearm and Toolmark Examiners and how those were people  
4 that had -- fifty percent of their salary had to be in that  
5 area to become members.

6 Is that what you said?

7 A. Yes. One of my colleagues either said fifty or  
8 fifty-five. I don't remember.

9 Q. So you have no independent knowledge of that  
10 yourself?

11 A. No, not independent knowledge.

12 Q. Sir, you used the term right off the get-go, and  
13 it kind of gave me some pause, that you were talking about a  
14 mainstream scientific community.

15 What is your definition of the mainstream  
16 scientific community?

17 A. Those would be true scientists who adhere to the  
18 scientific method and use scientific protocols in their  
19 daily practice.

20 Q. Well, who are they? Who are they as it relates to  
21 firearm and toolmark identification?

22 A. Well, that's part of the issue as firearms and  
23 toolmark identification is not a science. So my colleagues  
24 are professors in various sciences and various law, heads of  
25 departments in statistics who have studied the field of

1 firearms identification.

2 Q. What are their names? Who are they?

3 A. I mentioned them in my affidavit. I don't  
4 memorize them. David Faigman is one, Dr. William C.  
5 Thompson is another, Michael Saks is another, Michael  
6 Reisinger is another, and Professor Pradip Sheth. I don't  
7 memorize my address book.

8 Q. It's a handful of people?

9 A. Yes.

10 Q. So you're describing about ten people that are in  
11 this field that don't believe that firearm and toolmark  
12 identification is a science?

13 A. That's correct. Actually, a better way to  
14 characterize it is to say that I am unaware of any scientist  
15 in a mainstream scientific community or true scientific  
16 community who accepts the practice of individualization.

17 Q. Of these ten people?

18 A. No. I'm making a statement that even though that  
19 I don't remember specifically as I sit here my address book  
20 not a single individual with whom I've collaborated or  
21 coauthored or discussed these issues accepts the practice of  
22 individualization. In fact, some have even written that  
23 it's a fallacy.

24 Q. Sir, isn't it true that the United States Supreme  
25 Court says that firearm and toolmark identification is, in

1 fact, a science and an accepted methodology?

2 A. Well, that's a two-prong statement so -- and I  
3 would refer back to 1923. The DC -- actually, the basis of  
4 the Frye standard was that the court acknowledged that the  
5 courtroom is not a laboratory. So they attempt -- at the  
6 time, they deferred to --

7 That's where the concept of acceptance in the  
8 relevant scientific community arose because they said we are  
9 not equipped to assess science as a scientist would so we're  
10 going to defer to the relevant scientific -- well, actually,  
11 Frye didn't say relevant, didn't say scientific, and didn't  
12 say community, but basically said to the field in which it  
13 belongs.

14 Q. Sir, isn't it true in the *United States vs. Hicks*  
15 case, United States Supreme Court has accepted under the  
16 Daubert standard that firearm and toolmark identification is  
17 well-accepted in the scientific community?

18 A. That may be said, but that doesn't make it so.  
19 They're not scientist. And, in fact, there have been  
20 numerous cases that don't reflect the opinions of scientist.

21 Q. Sir --

22 A. That's a legal opinion.

23 Q. Sorry. I didn't mean to interrupt you.

24 Sir, please name one case in the United States of  
25 America that has excluded in its entirety testimony with

1 regard -- and has not accepted testimony with regard to  
2 firearm and toolmark identification.

3 A. Sure. I'm not aware of any. I think St. Gerard  
4 may have come close, but I'd have to research that. As I  
5 sit here, I'm not aware of any that have totally excluded.

6 Q. So isn't it true that this field has been  
7 well-accepted in the scientific community and has been  
8 accepted by every court in the United States and has never  
9 been excluded?

10 A. No, that's not true.

11 Q. It's never been excluded by any court?

12 A. No, that's a bifurcated -- that's a compound  
13 proposition you're presenting to me. It's never been  
14 excluded in the legal arena, but that's a legal opinion.  
15 It's not accepted in the scientific community. You actually  
16 conflated both of those in the same question.

17 Q. And you are defining your mainstream scientific  
18 community as these ten or so people?

19 A. No. I'm defining my -- the mainstream scientific  
20 community as did *U.S. v. Porter* in 1992.

21 Q. So it's your subjective opinion that this is not  
22 accepted in the scientific community?

23 A. It's my opinion that it is not accepted in the  
24 scientific community. And I'll characterize that by saying  
25 I do not know of any distinguished or otherwise scientist

1 who accepts the process of individualization as it is  
2 practiced today.

3 Q. Is Adina Schwartz one of your colleagues?

4 A. Yes.

5 Q. And isn't it true that she has been forbidden from  
6 testifying in courts because of her testimony in this  
7 theory?

8 THE COURT: Not this court.

9 MS. VALENTINI: Not this court. Not this court.

10 THE COURT: Be careful how we phrase it.

11 MS. VALENTINI: Yeah. I certainly didn't mean to  
12 insinuate that, Your Honor.

13 BY MS. VALENTINI:

14 Q. Isn't that true?

15 A. Well, I would take issue with your strong words  
16 "forbidden." She has been rejected in several forums  
17 because she's not practiced in the forensic arena. And I  
18 think in one case they said she's never fired a firearm.  
19 But she's a Ph.D. in philosophy of science, and her  
20 principles and her position is quite consistent with that of  
21 the -- in the scientific community. But it's correct she  
22 has been rejected on a number of occasions.

23 Q. And speaking of qualifications, sir, you have  
24 never worked in any capacity in the area of firearm or  
25 toolmark identification, have you?

1           A.    Yes, I have.  I've already testified to that.

2           Q.    Okay.  Define the toolmark identification arena  
3 that you have practiced in.

4           A.    That's the umbrella for firearms identification,  
5 but it's basically where two metal are interacting with each  
6 other and imparting a characteristics of the tribological  
7 transfer, which I did probably -- as I've indicated,  
8 probably minimally once a week during my entire career.

9           Q.    You're talking about over at the FBI, correct?

10          A.    Yes.  And subsequently, yes.

11          Q.    Sir, have you ever been qualified as a firearms  
12 examiner?

13          A.    No.

14          Q.    Have you ever been a firearms examiner?

15          A.    How would you define firearms examiner there?

16          Q.    Have you ever used a comparison microscope to  
17 compare shell casings or cartridge casings that have been  
18 fired from one firearm or been fired at all?

19          A.    Yes.

20          Q.    Where?

21          A.    In those cases where I was asked to provide  
22 assistance to firearms examiners, yes.

23          Q.    Well, the assistance that you were asked to  
24 provide, that wasn't as far as analysis.  That had to do  
25 with metal, did it not?



1           A.    I don't know how you separate -- you're going to  
2 have to rephrase the question.

3           Q.    You weren't examining those bullets or shell  
4 casings for any of the marks on them, you were examining for  
5 maybe the metal at best?

6           A.    Oh, no. All of the above.

7           Q.    Well, that's interesting because, sir, haven't you  
8 qualified before that you've never -- you've never done any  
9 kind of firearm or toolmark examination?

10          A.    No, not without qualification, no.

11                    Let me help you get to where I think you're going.  
12 You asked me if I've ever done those exams. Yes. Was I  
13 ever the principal examiner where I issued a report on a  
14 claimed match or nonclaimed match in firearms  
15 identification? The answer is "no."

16                    Does that save you some time there?

17          Q.    Tell me what you did.

18          A.    Well, it depends on the case.

19          Q.    Give me an example. In your once a week time that  
20 you said firearm examiners from the FBI came to you and  
21 asked for your opinion, what were they asking your opinion  
22 on?

23          A.    They were asking me to assess the tribology of the  
24 characteristics that were exhibited, what they could be  
25 from, how they might have been generated, or why they were

1 not behaving in a manner that they thought they should be or  
2 vice versa, why they weren't seeing what they expected to  
3 see on the screen.

4 Q. All related to the metal?

5 A. I don't know how to separate. It's all metal.  
6 The metal substrate and it's metal behavior and material  
7 flow that creates these various indicia for examination.

8 Q. So you're not a qualified bullet lead examiner?

9 A. What do you mean by -- I don't know what you mean  
10 by "qualified." I did not hang a shingle out. I didn't do  
11 bullet lead examinations as the examiners in the -- that  
12 particular unit did, no.

13 Q. You're not a certified firearms examiner?

14 A. That's correct.

15 Q. You've never undergone any firearm training by any  
16 firearm practitioners?

17 A. Well, that's not true.

18 Q. What firearm training have you gone through?

19 A. We had to qualify every three months in my career.  
20 So we had received firearm training every four months for --

21 Q. I'm sorry. I'm not --

22 A. -- sorry -- every three months.

23 Q. -- talking about firearms training. I'm mean  
24 firearms toolmark examination training. I'm sorry.

25 A. Okay. That's a different issue then.

1 Q. I'm sorry.

2 A. That's correct.

3 Q. I'm sorry. I didn't mean -- my notes. Sorry  
4 about that.

5 Have you ever gone through any blind testing  
6 regarding identifying shell casings being linked to a  
7 particular firearm?

8 A. Nope.

9 Q. Have you ever had any kind of proficiency testing  
10 with regard to firearm or toolmark identification?

11 A. No.

12 Q. And you certainly don't hold yourself out to be an  
13 expert at all in firearm identification, do you?

14 A. That's correct.

15 Q. And the consultation that you mentioned with  
16 firearm analysts at the FBI, that was regarding why metal  
17 was behaving a certain way; isn't that true?

18 A. Well, that's what firearms identification  
19 examiners do is examine the reaction -- the results of  
20 stress -- applications of stress during the cycling of a  
21 firearm. So that's what I would do when they asked me to  
22 help them.

23 Q. You've never made any shell casing comparisons  
24 while you were with the FBI or otherwise?

25 A. That's not true either.

1 Q. Okay. Tell me about any shell casing comparisons  
2 that you've made when you were at the FBI.

3 A. Well, it's the same issues that we're talking  
4 about. Would these be -- would these be comparable? For  
5 example, sometimes the -- what's critical is the alloy  
6 particularly, let's say, in the primer cup.

7 And when I was consulting for the ammunition  
8 industry, I would examine hundreds or thousands of  
9 cartridges in tortious cases. So I can't -- you're  
10 putting -- trying to cubbyhole and put blankets, and I'm  
11 trying to be -- cooperate, but I can't agree to all of your  
12 generalizations, so.

13 Q. You didn't do comparisons? That was my question.  
14 If I didn't say that, I apologize. But I'm pretty sure I  
15 said you've never made shell casing comparisons.

16 A. That's not true either because they would actually  
17 show me a test-fire and maybe a question sample. So I can't  
18 say that I've not done that either.

19 Q. What training have you had that has dealt  
20 specifically with the discipline of firearms and toolmark  
21 identification?

22 A. How would you define firearms identification?

23 Q. Sir, did you hear -- Mr. Tobin, you sat through,  
24 you testified about toolmark -- firearm and toolmark  
25 identification yourself.

1           A.    Well, here's the problem I'm having is and I've  
2 indicated it in my affidavit: The most appropriate true  
3 scientific discipline dealing with these firearms issues is  
4 that of metallurgy and material science.

5           And I outline in the affidavit all the way from  
6 extraction of the ore, all the way into service usage that  
7 the science and principles involved in material science and  
8 metallurgy is the most relevant science to deal with all  
9 these issue of interactions with each other.

10           Now, the actual identification part -- you know,  
11 in other words, if I was asked in my opinion is this a  
12 claimed match or is this not a claimed match, I would not  
13 opine or render opinions that this would be a match suitable  
14 to claim that it came from this weapon. I never did that.

15           Q.    So you've never looked at the microscope and  
16 compared different bullets or shell casings to determine  
17 individual class characteristics or subclass characteristics  
18 and have done no testing in that field?

19           A.    I'm going to give you some literary license and  
20 say "no." In large part because I don't agree with the  
21 process of individualization.

22           Q.    So you've never done that?

23           A.    With firearms that's correct.

24           Q.    In speaking -- and again I apologize for jumping  
25 back and forth. I'm just kind of going with some of the

1 answers were they may lead me.

2 Speaking of your affidavit, the affidavit that you  
3 provided that is part of the defense motion in limine to  
4 exclude or limit the State's proposed expert testimony, sir,  
5 other than section C of that, that is the same affidavit  
6 that you use in every case that you may consult with; is  
7 that correct?

8 A. That's too general. I can't agree with that. I  
9 don't try to reinvent the wheel at a consideration to  
10 clients and courts so that I don't keep running costs up. I  
11 try to be very cost effective or focused. So I will take  
12 the general framework because I've created an overview  
13 summary.

14 In fact, my colleague Michael Reisinger wanted to  
15 publish it as a paper. But -- and then I try to -- try  
16 to -- what's the word -- customize it to a particular case.  
17 So I will modify the general framework, but many of the  
18 paragraphs are quite similar if not identical.

19 Q. And you've never examined any of the evidence in  
20 this case?

21 A. Is that a question?

22 Q. Yes, sir.

23 A. No.

24 Q. You've never compared any of the shell casings or  
25 the firearm, never even seen that firearm, have you?

1           A.    No.

2           Q.    And in your affidavit, you mentioned that  
3 individualization and forensic firearm toolmark practice is  
4 rejected by unanimous consensus of my colleagues and  
5 collaborator.  There's no court that has accepted this, is  
6 that true -- isn't that true?  Excuse me.

7           A.    What is "this"?

8           Q.    Isn't it true your -- your statement in your  
9 affidavit says individualization of forensic firearm  
10 toolmark practice is rejected by unanimous consensus of my  
11 colleagues and collaborators most with scientific  
12 backgrounds or specializing in forensic science from whom I  
13 frequently or periodically interact.

14                    That's your opinion?

15           A.    Yes.

16           Q.    And the opinion of these -- your colleagues,  
17 correct?

18           A.    Yes.  Quoted with permission, yes.

19           Q.    Sure.  There's been no court that has accepted  
20 what you and your colleagues have said with regard to  
21 firearm and toolmark identification?

22           A.    Well, no, that's not true either.  Now, what that  
23 was primarily for were the Frye considerations of general  
24 acceptance.  And as one of my friends and colleagues who  
25 was -- wrote the majority opinion in the Fourth Circuit of

1 the *Blackwell v. Wyeth*, Justice Battaglia, pointed out that  
2 under a Frye regime the very existence of controversy is per  
3 se adequate to show that it's not accepted in the relevant  
4 scientific community. So my purpose there was to indicate  
5 that there is significant controversy. Whether I have five  
6 scientific or legal friends or a thousand is almost a moot  
7 issue.

8 Q. What studies or research exercises have you  
9 participated in which involved looking at toolmarks known to  
10 have been produced by the same and different tools?

11 A. Would you -- I need the first part of that  
12 question again.

13 Q. Sure. What studies or research exercises have you  
14 participated in which involved looking at toolmarks known to  
15 have been produced by the same or different tools?

16 A. I'll try to get to where I think you're going and  
17 save you a lot of time. None published, but I've done  
18 massive numbers when I was a plant metallurgist. I've done  
19 it at the FBI laboratory with colleague for various reasons.  
20 But we did not publish any papers on that if that's where  
21 you're going.

22 Q. And you've done no studies on firearms and  
23 toolmark identifications in that same area, have you?

24 A. Well, in the way you're using firearms  
25 identification, no.



1 Q. Have you ever participated in any proficiency test  
2 to test your own proficiency in terms of firearm and  
3 toolmark identification?

4 A. No. I don't hold myself out to be an examiner in  
5 firearms identification.

6 Q. And you've already said you're not a member of the  
7 Association of Firearm and Toolmark Examiners, correct?

8 A. That's correct.

9 Q. Why not?

10 A. My time is so limited I do not have time to  
11 participate in activities or membership in nonscientific  
12 entities. Other than my Marine Corp. association, all my  
13 other affiliations are in scientific endeavor.

14 Q. What are those other affiliations?

15 A. I'd have to look at my CV, but basically the  
16 National Association of Corrosion Engineers, the Society for  
17 Experimental Mechanics, the National Association of --

18 May I review my -- look at my CV?

19 Q. Sure.

20 The only trade association that you're associated  
21 with is the 1st Marine Division; is that correct?

22 A. Yes.

23 THE COURT: Counsel, approach please.

24 THE WITNESS: But the others in answer to your  
25 question: The American Society for Metals, National

1 Association of Corrosion Engineers.

2 (Whereupon, a bench conference was had.)

3 THE COURT: Anyone with a bronze star -- anyone  
4 with a bronze star would be valor, please tread lightly  
5 with what you're saying about his military association.  
6 I'm just asking you to do that, please.

7 MS. VALENTINI: Well, I wasn't --

8 THE COURT: I'm just asking.

9 MS. VALENTINI: That's what he's a member of and I  
10 acknowledged and recognized that.

11 THE COURT: Okay. I understand. Just be careful.

12 MS. VALENTINI: That's why I was careful to say  
13 that one out loud because I know he is.

14 THE COURT: All right. Thank you.

15 (The proceedings resumed in open court.)

16 THE COURT: All right. You may proceed.

17 THE WITNESS: Did you want me to finish answering?

18 BY MS. VALENTINI:

19 Q. Yes, sir.

20 A. To go down the list, the Society for Experimental  
21 Mechanics; National Association of Corrosion Engineers; the  
22 American Society for Testing and Materials; the American  
23 Society for Metals International; The Minerals, Metals &  
24 Materials Society; the National Fire Protection Association;  
25 the International Metallographic Society; and the American

1 Foundry Society; along with the 1st Marine Division  
2 Association.

3 Q. Now, when we were talking when you were on direct  
4 examination and were talking about the Association of  
5 Firearm and Toolmark Examiners, you said that the journal is  
6 not accessible to you. Is that what you said?

7 A. I didn't say it that way, but I'll need to know  
8 where you're going whether to give you a literary license.  
9 I have to jump through -- well, it's not directly acceptable  
10 to me, that's correct.

11 Q. Well, you have to go to the Internet and go to  
12 their website?

13 A. No.

14 Q. Sir, isn't it true that to get a journal -- the  
15 AFTE Journal is available to anyone at their website?

16 A. It may be only very recently. But I have to go  
17 through colleagues, and I've had colleagues -- other  
18 colleagues who tried to even get some of their papers and  
19 they were declined because they weren't members. So if that  
20 is, in fact, true, it would have been within the last months  
21 if not year or so. So the archives are not available.

22 Q. But you've had access to the journals from AFTE,  
23 have you not?

24 A. Yes, I've had access -- indirect access, yes.

25 Q. Well, you've had them and you've reviewed them?

1           A.    Oh, yes.  I'm sorry.

2           Q.    Because earlier you said that there were no  
3 research papers with regard to this area when, in fact,  
4 there are many research papers in this field; is that not  
5 correct?

6           A.    No, you're mischaracterizing.  I've indicated --  
7 I've not addressed the plethora or lack thereof, or the  
8 volume or number of papers within the AFTE Journal.  What  
9 I'm addressing are papers that are in publically available  
10 or readily accessible in the public domain.

11          Q.    Well, anyone can get a journal article from AFTE?  
12 You have to go to the website, and you get it?

13          A.    I don't know that that's true, but it might be.  
14 If it is, it's within the last very relatively short period  
15 of time.

16          Q.    But nevertheless, they exist?

17          A.    I'll have to accept your representation.  That's  
18 not been my experience or that of my colleagues.

19          Q.    So it's your position that there are not journal  
20 articles published by AFTE with regard to firearm and  
21 toolmark identification?

22          A.    No, that's not my position.  Again, you're  
23 mischaracterizing it.  The overwhelming majority have been  
24 published in the AFTE Journal.  Now, there are -- have been  
25 some in the FSI, the Forensic Science International, and

1 some others. But they still don't represent what  
2 experimenters believe they represent for various reasons.

3 Q. Isn't it true that all those research papers are  
4 subject to peer review by at least three different people  
5 from AFTE?

6 A. That may be true, yes.

7 Q. And, sir, isn't it true that the AFTE Journal is,  
8 in fact, indexed?

9 A. No, it is not indexed.

10 Q. On what basis are you -- do you say it is not  
11 indexed?

12 First of all, you're not a member, right?

13 A. That's correct.

14 Q. So what is your grounds for saying it is not  
15 indexed?

16 A. My colleague and coauthor has indicated -- and  
17 that's Doctor -- Professor Clifford Spiegelman, who's a  
18 distinguished professor of statistics at Texas A & M, has  
19 made several inquiries and found that it is not an indexed  
20 journal. And there are reasons why it wouldn't be indexed.

21 Q. Okay. So it's your -- you are relying on what  
22 somebody else has said to say that it's not indexed. You  
23 yourself have not contacted AFTE or have not made any  
24 efforts on your own to verify that it's not indexed?

25 A. That's correct. And I would also have to suspect

1 because I have other scholars or academicians who -- in  
2 fact, just one this week from University of California at  
3 Irvine --

4 Q. Again --

5 A. -- asked me for access to papers because he  
6 couldn't get them.

7 Q. Again, you have not yourself verified that AFTE is  
8 not indexed?

9 A. That's correct.

10 Q. The publications that you have -- do you have any  
11 publications that deal specifically with firearm and  
12 toolmark identification?

13 A. Yes.

14 Q. Which one?

15 A. Toolmark. Actually -- I'm sorry. Well, actually,  
16 both: Firearms and toolmarks identification.

17 Q. Okay. And which publication are you talking  
18 about?

19 A. The very first. When I was in the Bureau, Mr. J.  
20 Edgar Hoover did not condone agents writing papers, so there  
21 was a large span of years. And subsequent directors  
22 wouldn't allow us to publish. But my first paper that  
23 finally was published was one on toolmarks of -- was on  
24 toolmarks. And then my latest two papers are on the  
25 practice of firearms identification addressing both the

1 validation studies and proficiency testing processes and the  
2 practice of firearms identification as a whole.

3 Q. Okay. So you didn't do any of the statistical  
4 analysis in any of those papers, correct?

5 A. I need a second to think about that because my  
6 coauthoring one was a distinguished professor in statistics,  
7 and then the paper -- oh, I'm sorry. Make that four. Well,  
8 in one, we won the 2008 statistics and chemistry. So that  
9 would have been with chemistry -- I mean with statisticians.

10 I do some, but I would not have been the source of  
11 whatever was in the paper. We either cross-check each  
12 other's work or I'll say let's look at the probabilities or  
13 binomial distributions for this and that. But in answer to  
14 your question, I would handle the metallurgy material  
15 science issues generally, but statistics is an overlapping  
16 discipline in my field.

17 Q. Well, you're not a statistician?

18 A. No.

19 Q. And the answer is in those studies or those  
20 papers, you did nothing with regard to this statistics?

21 A. I wouldn't say I did nothing. I mean, that's too  
22 stark a characterization. I wasn't responsible for doing  
23 whatever we published with regard to the statistical  
24 implications.

25 Q. The article -- the most recent articles that you

1 have participated in, those are simply a critical evaluation  
2 of other people's studies in the area of firearms analysis,  
3 are they not?

4 A. Primarily. I don't know exclusively, but  
5 primarily yes.

6 Q. So in other words, you took a bunch of people's  
7 work product and studied, and then you critiqued them the  
8 way they did their study?

9 A. Primarily, yes.

10 Q. Your papers were not peer-reviewed by anyone in  
11 the field of firearms or toolmark identification?

12 A. I can't say that. In fact, I believe one of them  
13 might have been. If I could explain the process of  
14 referring, we don't know who they are. And, in fact, that's  
15 a major component of the -- of the publishing in scientific  
16 journals. The referring process involves complete total  
17 anonymity.

18 And that process basically is the paper is  
19 submitted to the editor, the editor redacts the author's  
20 name, it's submitted to typically three scientists, they  
21 critique the paper, send their critique back to the editor,  
22 and the editor redacts their name, and then the critique is  
23 submitted to the author for editing or acceptance or  
24 rejection. We're not allowed to know who the -- who the  
25 referees were.



1 Q. I want to go back to toolmark identification.

2 A. I'm sorry. If you want me to elaborate on that  
3 latter one where there's a possibility of -- okay.

4 Q. No, thank you.

5 Can you please define what is toolmark  
6 identification?

7 A. Well, as I -- I don't use that term. So I'm out  
8 of my element because I don't use the term. But I would say  
9 evaluation of characteristics to see if there might be an  
10 association between a tool and a workpiece.

11 Q. So you can't identify -- you can't define toolmark  
12 identification because you don't use that term?

13 A. I think that would vary with whether you're using  
14 it or a forensic examiner is using it or I'm using it. But  
15 I don't generally use that term.

16 Q. Can you ID what tool made a particular mark?

17 A. No, that's actually at the heart of our objection.

18 Q. Would you agree --

19 A. Well, I'm sorry, if I could take that back. If I  
20 knew that there were only two or three available and these  
21 are the only possible choices and it's a logical necessity  
22 that it has to one of them, I might in that circumstance.

23 Q. Would you agree that it takes specialized training  
24 and experience to do that?

25 A. To do what?

1 Q. To ID what tool made a particular mark.

2 A. I can't answer that. I don't -- what we're  
3 discussing here with regard to pattern recognition almost  
4 falls within a lay purview. It's common sense. It's -- and  
5 the way it's practiced, I would disagree that there was much  
6 training required to. . .

7 Q. Well, let me ask you this, sir: Would someone  
8 without training and experience be able to express competent  
9 opinion on metallurgy research?

10 A. No.

11 Q. Then how can you express an opinion on firearm and  
12 toolmark identification when you're not trained in that  
13 field?

14 A. You're now conflating issues again. I do not hang  
15 myself out to be a firearms identification. I am not  
16 qualified to address the nomenclature or various part, how  
17 they may or may not function unless it's described to me in  
18 a specific scenario. That's firearms identification.  
19 Whether an item functions as it designates, I don't do that  
20 as a routine exam.

21 But the actual pattern matching of lining bar  
22 codes, for example, that's pretty common sense, that's  
23 logical. And there are going to be disagreements, and  
24 that's part of our issue. There are no objective criteria  
25 by which to claim whether these are, in fact, associated or

1 not. So it's up to the individual person. And that  
2 probably ranges all the way from the lay observer to a  
3 forensic examiner.

4 Q. Sir, but wouldn't you agree that somebody who  
5 doesn't have any training or experience would not be able to  
6 express an opinion over somebody that has training and  
7 experience?

8 A. In a subjective field, no, I wouldn't agree with  
9 it. For example, we could put my UPC symbol up there, I  
10 could ask you does that look like a match?

11 Q. Respectfully, we're not talking about UPC codes,  
12 right?

13 A. Well, we're talking pattern matching recognition.  
14 I've tried to separate that --

15 Q. Well, let me --

16 A. -- compound sentence from firearms identification,  
17 which they have a wider range of duties than simply pattern  
18 matching.

19 Q. Let's -- can we -- let me talk a little bit about  
20 this subjective argument that you're making. It's your  
21 position that the field of firearm and toolmark  
22 identification is completely subjective?

23 Is that your argument?

24 A. No, that's not my argument. Again, you're  
25 conflating the duties involved in a forensic examiner being

1 a firearms identification expert, and that is not what I do.  
2 Now, if you want to focus the questions on pattern matching  
3 that's done in DNA, that's done in fingerprints, that's done  
4 in firearms, then that's a different issue. But. . .

5 Q. Sir, we're -- I'm sorry. We are here with regard  
6 to -- we have a member of AFTE who is a member of the  
7 Florida Department of Law Enforcement who tested three shell  
8 casings and compared those three shell casings to test-fire  
9 shell casings from a firearm, right? So she is a firearm  
10 and toolmark examiner, correct?

11 A. Yes.

12 Q. And that's -- that is what you are here today  
13 saying is a subjective field. But now I'm confused because  
14 I'm thinking you're not thinking it's as subjective as you  
15 thought you said.

16 So are you saying it's a subjective field or are  
17 you saying it's not?

18 A. You're now trying to get me to characterize the  
19 whole field, and I'm only trying to have a focus on the act  
20 of pattern matching and then claiming an individualization.  
21 That is purely subjective. All the other duties associated  
22 with a firearms identification examiner, as they call it, I  
23 don't address those issues, I don't make any -- take any  
24 position or claim that it's subjective, objective. I don't  
25 even address those.

1 Q. So maybe this helps it. Observations are  
2 objective, right? The observations that a firearm and  
3 toolmark examiner make, observations are objective, they can  
4 be measured and they can be repeated, right?

5 A. No, I would not allow that generalization to be  
6 made.

7 Q. Sir, isn't it true that all science has a  
8 subjective component, all science has a subjective  
9 component?

10 A. To some degree maybe from half percent, one  
11 percent. But there is no science that allows one hundred  
12 percent subjectivity. And I would point out, too, that  
13 observational studies -- for example, you might, under your  
14 categorization of observations, maybe an observation that  
15 this is a match, you might have considered in your  
16 characterization of observations being objective. But  
17 that's why I can't go along with your characterization that  
18 all observations are objective. And I would also point out  
19 that observational studies had the least predictive power to  
20 a population.

21 Q. Sir, what I'm asking you --

22 A. Sure.

23 Q. -- would you not agree that all science, all  
24 science has a subjective component? I'm not saying it's a  
25 hundred percent. But all science has a subjective

1 component?

2       A.    Given that we're dealing with a continuum of zero  
3 to a hundred percent, we could be dealing with ten to the  
4 minus ninth subjectivity. I'll agree that probably all  
5 scientific endeavor has some element of subjectivity.

6       Q.    What do you think about a doctor? You go to the  
7 doctor because you have a cold, right? And the doctor makes  
8 a diagnosis based on these objective symptoms, right? Some  
9 of that is his subjective observations of those symptoms,  
10 correct?

11       A.    Sure, yes. But I would even caution you  
12 characterizing the symptoms that are presented as all  
13 objective because some of them can be psychosomatic or  
14 subjective assessments that do not in reality exist.

15               I'm trying to give you some literary license to  
16 help you get to where you want to go.

17       Q.    Well, sir, I appreciate that, but I would just  
18 appreciate it if you would just answer the questions.

19       A.    Well, I can't as you're phrasing them, so.

20       Q.    Well, if you would like me to rephrase, I'll be  
21 happy to rephrase. I'm not trying to confuse you at all.

22               Have you ever looked at a comparison microscope in  
23 attempt to link a toolmark to a tool?

24       A.    I'm sure I have.

25       Q.    Would you agree that toolmarks contain class

1 characteristics, subclass characteristics, and individual  
2 characteristics?

3       A. Well, now we're dealing with two issues there.  
4 There's an esoteric erudite level that's almost moot, but --  
5 and then there's the pragmatic level. So in correlating it  
6 with the premise of uniqueness, there are two issues about  
7 uniqueness.

8               One is does uniqueness exist? And that is an  
9 ethereal argument or erudite or scholarly argument that  
10 turns out to be almost irrelevant to these types of cases.  
11 What is most relevant however is the phenomenon of  
12 discernable uniqueness. Probably at some level above the  
13 subatomic, all scientists probably agree that all items are  
14 unique. I'm sorry. Scientists probably agree that above  
15 the subatomic level items are probably unique.

16               But the seminal question is can a human observer  
17 discern that uniqueness? So I can't answer your question  
18 because at some level, possibly subatomic, but let's just  
19 say we'll restrict it above the atomic level, that at some  
20 level it's probably unique. But the question is can a human  
21 observer detect where those discernible -- where that  
22 uniqueness exists?

23       Q. So this is my question, yes or no, do you agree  
24 that toolmarks contain class characteristics, subclass  
25 characteristics, and individual characteristics: Yes or no?

1           A.    At some level, but I would disagree that an  
2 individual could discern whatever the individual ones are.

3           Q.    So you agree that those three levels of class  
4 characteristics exist?

5           A.    They probably do.

6           Q.    Now, you -- there was some great length discussion  
7 about subclass characteristics.  If subclass characteristics  
8 are such a problem, why is there not a higher error rate in  
9 proficiency tests?

10          A.    Because the proficiency tests don't even come  
11 close to represent what proponents are claiming that they do  
12 represent.

13          Q.    You've never taken a proficiency test, right?

14          A.    No, that's not true.

15          Q.    I'm sorry, sir.  That was one of the first  
16 questions asked.  I thought you said you'd never taken one?

17          A.    The question you just asked is you've never taken  
18 a proficiency test and I answered correctly that that's not  
19 true.

20                    THE COURT:  In what area, Ms. Valentini?

21 BY MS. VALENTINI:

22          Q.    Sir, have you ever taken a proficiency test in  
23 firearm or toolmark identification?

24          A.    No.

25          Q.    Okay.  And, sir, isn't it true that manufacturing



1 methods are limited when it comes to firearms?

2 A. You're getting better there. That's still a broad  
3 statement. For the time being, I'll, again, agree that  
4 generically -- well, let's just say that's true.

5 Q. And, sir, the field of Association of Firearm and  
6 Toolmark Examiners, they address the issues with regard to  
7 subclass problems in their peer journal, and examiners are  
8 aware of those potential problems with regards to subclass  
9 characteristics; are they not?

10 A. Well, that's a compound statement again.

11 Q. It is. I apologize. You're correct.

12 Well, let's start is -- is it not true that AFTE  
13 addresses that issue and they publish articles with regard  
14 to subclass characteristics?

15 A. They've attempted to -- they acknowledge the  
16 existence of it, and they've attempted to educate the  
17 examiners to be cautious about the existence of subclass  
18 characteristics. And, in fact, one of the papers I think by  
19 Rivera starts out that there are -- that it's the specter of  
20 subclass looms large over the domain or something like that.

21 So that is -- well, expresses recognition that the  
22 problem exists. But they don't -- nowhere in the literature  
23 have we found that they address the issues on how an  
24 examiner at the bench significantly remote from the  
25 production process is in a position to assess what is

1 individual and what is subclass.

2 Q. So one of the things that you're extremely  
3 critical of -- and at the very end of your direct testimony  
4 you put up this chart and you got all zeros except for one  
5 little point five. That was all your subjective opinion,  
6 correct? That was not based on any formal research or not  
7 based on anything, but that's your opinion, correct?

8 A. Well, based on my research, yes.

9 Q. Okay. Your research then includes what?

10 A. An exhaustive literature review, collaborations  
11 with colleague, not just the domain literature, but those of  
12 respected scholars in treatises in the National Academy of  
13 Sciences. I mean, it's a very -- I, slash, we have reviewed  
14 I would say very exhaustively the entirety of the available  
15 literature and scientific opinions and forensic opinions.

16 Q. It's your subjective opinion?

17 A. Well, it's my opinion that that slide --

18 Q. Subjective opinion?

19 A. -- represents my opinion.

20 Q. Subjective opinion?

21 A. I don't know how you want to characterize it:  
22 Objective or subjective. But how do you get -- how do you  
23 make an object the subjective out of a zero? If it doesn't  
24 exist, it doesn't exist.

25 Q. But it does exist. Because on there you gave zero

1 about research in the field when -- if you'd like, I can  
2 rattle off a bunch of articles, and you just mentioned one  
3 yourself by Gene Rivera that is published in the AFTE  
4 Journal called *Subclass Characteristics in Smith &*  
5 *Wesson SW 40VE SIGMA Pistols*. That was a published research  
6 article dealing with the area of subclass characteristics;  
7 was it not?

8 A. That is such a long sentence, and you started out  
9 with an unacceptable premise that I cannot accept, so,  
10 unfortunately, I blocked out the remainder of the question.

11 I did not represent there was no research. At any  
12 time did I not indicate that there was no research. What I  
13 qualified it as there was not comprehensive or meaningful  
14 research that allows it to obtain the status of whatever the  
15 particular criteria was. So I at no time ever indicated  
16 there was no research.

17 Q. So articles that appear in the AFTE Journal are  
18 not competent research? I'm just asking. You give no value  
19 to articles that appear in the AFTE Journal?

20 A. That's not true. What we evaluate when we read a  
21 paper is the first element is what is the stated hypothesis  
22 of the experiment if they even state it, and most of the  
23 time they don't even frame a hypothesis.

24 But in those that do, we then look to see if the  
25 sample population is within the target population or are we

1 talking two totally different -- the target population  
2 doesn't match the sample population. Have they treated --  
3 considered what are called interaction effects or what are  
4 known as threshold effects? Does the experiment full  
5 outcome or conclusions, are they properly confined within  
6 the realm of the experiment that was conducted?

7           There are many reasons that we evaluate these  
8 papers. I would not characterize any research as  
9 incompetent if the outcome or conclusions were properly  
10 confined within the refined -- restrained to the boundaries  
11 of the experiment. And if the experiment was probably  
12 conducted, the sample population coincides with the target  
13 population. And they are all consistent with the stated  
14 hypotheses.

15           That said, that would be considered what's known  
16 as internal validity for the experiment. And the definition  
17 of internal validity is basically -- internal validity is --  
18 probably the best way to define it is in the null -- would  
19 be the absence of which an experiment cannot properly be  
20 interpreted.

21           But many of the experiments, if not most of them,  
22 whether or not internal validity exists, there is no  
23 external validity. And external validity is defined as  
24 generalizability. So in this particular experiment, can the  
25 experimenters' conclusion be -- be extrapolated as a

1 universal assumption to the field?

2 And that's where the majority of these have been  
3 perpetuated on courts. It presented as purportedly  
4 validating the practice. But they're irrelevant. They --  
5 they cannot be generalized to a particular case at bar, so.

6 Q. So it's -- and correct me if I'm wrong. It's your  
7 position that this particular article that you actually  
8 cited in your PowerPoint and that we're talking about today  
9 by Gene Rivera the *Subclass Characteristics in Smith &*  
10 *Wesson SW 40VE SIGMA Pistols* is not valid? Irrelevant? I  
11 mean, what's your position regarding this article?

12 A. I don't make any claim about its validity per se  
13 as I sit here. I'd have to review it if you wanted to look  
14 at the various claims in there. What we -- what I'm using  
15 that paper for is to show the existence of the fact that we  
16 have two cartridge cases, if that's the paper you're  
17 thinking that we're talking, that are so virtually so  
18 similar as to be very easily confusable if a red flag or  
19 yellow flag hadn't been raised somewhere along examination  
20 process, that had that red flag not popped up, that could  
21 have presented the scenario that would have ended up as a  
22 type-one error or a false positive.

23 Q. So you don't take any issue with this article and  
24 this research project that was done?

25 A. Well, I'm not saying that either. You asked me

1 what I was using for it. And all I'm saying is all I'm  
2 using that is to show how astonishingly similar, as they --  
3 one of the authors indicates, at the risk of appalling  
4 misidentifications or how startling high correspondence  
5 in -- in fact, I think that's -- no, that's a different --  
6 startling high correspondence.

7 Q. But they're trained firearm and toolmark  
8 examiners. In fact, in this article it says in this  
9 instance a Smith & Wesson pistol produced a distinct share  
10 pattern that could be used to differentiate the test from  
11 the two pistols if they're in that field.

12 A. Is that a question?

13 Q. Well, the point is that they recognize --

14 A. Sure.

15 Q. -- that it could be difficult?

16 A. Sure.

17 Q. To a trained firearm and toolmark examiner, it's  
18 distinguishable?

19 A. Yes, I will agree with that.

20 Q. And there's many more articles that include  
21 validity studies. Are you familiar with the article by  
22 Bunch and Murphy --

23 A. I believe --

24 Q. -- *A Comprehensive Validity Study for the Forensic*  
25 *Examination of Cartridge Cases* in AFTE Journal?

1           A.    I believe that's one of the ones we reviewed in  
2 one of our papers. I'd have to look at my paper.

3           Q.    That was another validity study, and the  
4 false-positive and false-negative rates were zero in that  
5 study.

6           A.    We reviewed almost all of those purported  
7 validation studies, yes.

8           Q.    And you say "purported." Again, so you disagree  
9 with their studies? That's your subjective opinions that  
10 you disagree with this study?

11          A.    You're putting a very broad brush of disagreeing  
12 with the study. We don't disagree with a study if it's  
13 what -- depending on what it's represented to have measured.  
14 That's where we disagree. They can measure what they want,  
15 and if they -- their conclusions are consistent with the  
16 experimental design, if any, we don't take issue with that  
17 paper as far as internal validity. Where we would take  
18 issue is what's the relevance of that paper to the case at  
19 bar today with regard to the particular firearm that was  
20 used?

21          Q.    Well, what's at case at bar is that a firearm and  
22 toolmark examiner from -- follows the protocol of AFTE in  
23 doing her examination. And all of that is based on the  
24 research that is done by AFTE and the proficiency testings  
25 and that protocol. And this article by Bunch and Murphy is

1 another example that that protocol and those procedures, the  
2 false-positive and false-negative rates are zero.

3           That's -- that's, in my opinion, the relevance. I  
4 mean, you asked me a question, I answered. I shouldn't have  
5 done that, but that is kind of where I was at going with  
6 that.

7           A. Well, you have about four or five premises in that  
8 sentence alone so I don't know which one you want me to  
9 address. The problem is if the examiner is not on -- she's  
10 examining a weapon and doesn't know how it was manufactured  
11 or the breechface was manufactured, if you're not  
12 specifically standing at the production and sampled the  
13 production lot, happen to be aware of the characteristics  
14 exhibits from that specific production lot, any studies  
15 about some other gun under some other circumstance on some  
16 other day -- and believe it or not even these  
17 characteristics and part of the firearms depend on whether  
18 we're in a recession or whether we're in a --

19           As surprisingly as remote as that may sound,  
20 economic conditions can significantly alter the  
21 characteristics on a firearm depending on what are called  
22 feeds and speeds. For example, if we're in a high-demand  
23 environment, we now have different sets of characteristics  
24 imparted because production is dramatically different in  
25 that environment than it would be in a recession.



1 Q. Sir, with all due respect, the production of the  
2 item -- the firearm happens, right?

3 A. Sure.

4 Q. And once that production happens, that firearm is  
5 what that firearm is as it comes off the production line,  
6 correct?

7 A. Sure, yes.

8 Q. So whether -- are you expecting a firearm and  
9 toolmark examiner to be standing there and watch every  
10 firearm come off the assembly line to be able to do an  
11 analysis? Is that what you're saying is the proper analysis  
12 that should be done?

13 A. No, of course not.

14 Q. The reason I'm talking about these articles is  
15 because you mentioned that there -- that there's no  
16 research, there's no data, there's nothing to base it on.

17 And when there's -- wouldn't agree, sir, that  
18 there are hundreds of articles where validation studies have  
19 been done, statistical analysis has been done, you know,  
20 another article by Coffman, *Computer Numerical Control*  
21 *Production Tooling and Repeatable Characteristics on Ten*  
22 *Remington Model 870 Production Run Breech Bolts*. It's in  
23 the AFTE Journal.

24 Familiar with that article?

25 A. Would you repeat the question?

1 THE COURT: Slow down. Slow down when you read  
2 it.

3 MS. VALENTINI: Okay.

4 BY MS. VALENTINI:

5 Q. There's an article by B.C. Coffman that was  
6 published in AFTE titled *Computer Numerical Control (CNC)*  
7 *Production Tooling and Repeatable Characteristics on Ten*  
8 *Remington Model 870 Production Run Breech Bolts* published  
9 the winter of 2003.

10 A. I believe we reviewed that, yes.

11 Q. There's another article by A.C. Coody,  
12 *Consecutively Manufactured Ruger P-89 Slides* in the AFTE  
13 Journal.

14 Are you familiar with that article?

15 A. Not as I sit here; but as I indicated, we did an  
16 exhaustive review of up until 2000, I believe, '11.

17 Q. T.G. Fadul, F-A-D-U-L, *An Empirical Study to*  
18 *Evaluate the Repeatability and Uniqueness of*  
19 *Striations/Impressions in Fired Cartridge Casings Fired in*  
20 *Ten Consecutively Manufactured Slides*. That was published  
21 by the National Institute of Justice.

22 Familiar with that one?

23 A. Not as I sit here.

24 Q. And that was two hundred and seventeen examiners  
25 participated from all across the country in that one.

1           Hamby and Thorpe, *The Examination, Evaluation, and*  
2 *Identification of 9mm Cartridge Cases Fired From 617*  
3 *Different GLOCK Model 17 & 10 Semiautomatic Pistols.*

4           Are you familiar with that one?

5           A.    Yes.

6           Q.    D. LaPorte, *An Empirical Validation Study of*  
7 *Breechface Marks on .380 ACP Caliber Cartridge Cases Fired*  
8 *from Ten Consecutively Finished Hi-Point Model C9 Pistols.*

9           Familiar with that one?

10          A.    Who are the authors?

11          Q.    D. LaPorte, L-A-P-O-R-T-E.

12          A.    That sounds vaguely familiar.

13          Q.    W. Matty, article: *Raven .25 Automatic Pistol*  
14 *Breech Face Tool Marks* also published in the AFTE Journal.

15          Familiar with that one?

16          A.    Not as I sit here.

17          THE COURT: Ms. Valentini, I've been sitting here  
18 three hours. I'm going to take a break.

19          MS. VALENTINI: Yes, sir.

20          (Whereupon, the Court considered another matter  
21 and then a recess was had from 3:32 p.m. to 3:40 p.m.)

22          THE COURT: Ms. Valentini, when you're ready.

23          MS. VALENTINI: Thank you, sir.

24 BY MS. VALENTINI:

25          Q.    I'm not going to go through all of those articles.

1 The point is on direct examination you said there has been  
2 no research in this field. And the point is there has been  
3 a lot of research in this field; isn't that true?

4 A. No, it's not true. And you keep mischaracterizing  
5 my statement. I've never said there hasn't been any  
6 research. What I meant -- what I had indicated repeatedly  
7 is there's been no meaningful or comprehensive research.  
8 And I would say that the one recurring flaw in every study  
9 you just cited that I remember and probably those that I  
10 don't is that they present to a respondent a deductive  
11 environment.

12 And we've already -- I've already indicated the  
13 folly of trying to use sample enumeration, and I think in my  
14 latest paper I said regardless of seemingly impressive  
15 numbers of respondent in any particular experiments. That  
16 doesn't negate the -- the flaw is that you're presenting a  
17 deductive environment to respondents. And that is not real  
18 life. So those --

19 Q. So it's -- it's your position that you disagree  
20 with all of those studies? It's not that the research isn't  
21 out there, you just -- it's your opinion that you don't  
22 agree with the research?

23 A. You're using too broad a brush. If you want to  
24 refine that, I'll address it. But I'm not saying I disagree  
25 with the studies. I might accept each and every one of

1 those for whatever each claims that they're doing in that  
2 particular study. I don't doubt that there were, whatever  
3 you said, one or two percent error in a particular study.

4 The problem is -- and even firearms examiners  
5 within the field recognize that those studies are of no  
6 value to anyone other than the people who participated in  
7 the study. And that is, I believe, Biasotti and Murdock  
8 that indicated that in both their papers and internal memos.

9 Q. So, again, this field, the firearm and toolmark  
10 identification, there's been a lot of research?

11 A. Sure.

12 Q. There's been a lot of articles published in this  
13 area?

14 A. Absolutely, yes.

15 Q. I want to talk a little bit about protocol. You  
16 again on your zero chart you say that there's no protocol in  
17 this field. Well, in fact, isn't it true that the American  
18 Society of Crime Lab Directors has, in fact, protocol and  
19 that they have accreditations?

20 A. One recurring problem we are having --

21 Q. I'm just asking you that question first, and then  
22 if you need to explain it further, we can. But isn't it  
23 true that there is protocol that has been established by the  
24 American Society of Crime Lab Directors?

25 A. That may well be true. I'll have to accept your

1 representation.

2 Q. And that labs get accredited in this area; isn't  
3 that true?

4 A. Sure, yes.

5 Q. And in order to get accredited, they have to do  
6 proficiency testing and they're subject to quality control?

7 A. Is that a question?

8 Q. Yes, sir.

9 A. Yes.

10 Q. So there is protocol in this field, yes?

11 A. By your and their definition, it's probably a  
12 protocol. It's not a scientific protocol.

13 Q. You may disagree with the protocol --

14 A. Correct.

15 Q. -- but there's protocol that has been established  
16 in the field?

17 A. We've never disagreed that there are what they  
18 call SOPs or protocols. The problem is what is a scientific  
19 protocol and what is not scientific protocol? So I will  
20 agree with the word "protocol." It's the same thing with  
21 validation. Calling something a validation study does not  
22 make it so.

23 Q. Have you ever familiarized yourself with the  
24 Florida Department of Law Enforcement standards of  
25 procedures with regard to firearm and toolmark

1 identification?

2 A. FDLE was our biggest contributor when I was at the  
3 FBI laboratory so I was fairly familiar with the various  
4 protocols. But recently, I'm not intimately familiar with  
5 it. So I don't know how to answer that.

6 Q. You put an example on direct examination of a bar  
7 code that you got, I guess, from your wife from Cracker  
8 Barrel. Is there a scientific community that deals with bar  
9 codes from Cracker Barrel?

10 A. I'm not aware of any.

11 Q. And are you comparing what firearm and toolmark  
12 examiners do to what you did with regard to the bar code?

13 A. My only use or purpose for the bar code was to  
14 demonstrate the hypothesis that within a small area there  
15 are only a finite number of locations or loci and finite  
16 number of interspatial relationships so there will be likely  
17 a possible coincidental random matches or coincidental  
18 matches. That's all I was demonstrating with that  
19 metaphoric -- that experiment.

20 Q. But, again, these are trained firearm and toolmark  
21 examiners that are trained in how to identify these subclass  
22 characteristics; are they not?

23 A. That's your representation. We don't agree with  
24 that.

25 Q. All right. Another thing that you said on direct

1 examination we were -- counsel was talking to you about  
2 database, and you said that you printed -- you had printed  
3 off something that had been downloaded into the database and  
4 it always came up number -- came up first. Is that what you  
5 said?

6 A. I think you're referring to the AB 1717 De Kinder  
7 Study, yes.

8 Q. Okay. What database did you use?

9 A. What database did I use for what?

10 Q. In that study. You said you -- you said -- and I  
11 could have misunderstood you, but you said you entered this  
12 into a database. Did you not say that?

13 A. No, I don't recall saying that.

14 Q. Okay. Because you, in fact, have never entered  
15 anything into a NIBIN database at all, right?

16 A. No. Not directly, no.

17 Q. Okay. Well, you have never entered anything into  
18 NIBIN?

19 A. Directly, no.

20 Q. Okay. And that's just an investigative tool,  
21 right? They don't use that to compare firearms or  
22 test-fires or anything like that, correct?

23 A. That's correct, yes.

24 Q. You don't have access to NIBIN?

25 A. No. Well, not that I'm aware of.



1 Q. You know I want to ask you a little bit about. . .  
2 let me find it. You have it in your affidavit. Just give  
3 me one second please to locate it.

4 When you're talking about the work in this case  
5 that was done with regard to shell casings, it is not your  
6 position that -- you're not rebutting what Ms. Skoglund --  
7 the analysis that she's done, you're not rebutting the fact  
8 that these shell casings were not fired from that firearm,  
9 are you?

10 A. No.

11 Q. You just disagree with how she has gone about  
12 coming to that conclusion?

13 A. Yes, ma'am.

14 Q. And one of the reasons that you disagree is  
15 because she can't say -- I mean, she testified that she can  
16 say that those shell casings were fired from that firearm,  
17 right? You heard her testify to that?

18 A. The question is did I hear her testify to that?

19 Q. Yes.

20 A. Yes.

21 Q. And you disagree with that -- you don't disagree  
22 with that, correct?

23 A. Well, that's a tricky question there.

24 How do you want me to. . .

25 Q. You're not debating that it's a match?

1           A.    Well, that's a two-prong -- that's a bifurcated  
2 decision path there.  Am I disagreeing with her -- the truth  
3 of the matter asserted, the fact of a claimed match, or am I  
4 disagreeing with her ability to even say that?  That's two  
5 different issues.

6           Q.    Okay.  Well, you're not offering your testimony to  
7 rebut the truth of the matter that she's claiming it's a  
8 match, correct?

9           A.    That's correct.

10          Q.    Okay.  And kind of where I'm going, just to talk a  
11 little bit about it, in your affidavit, page thirty-eight,  
12 you throw out DNA?

13          A.    Uh-huh.

14          Q.    And you're not an expert in DNA, correct?

15          A.    In a legal sense, I probably know more than the  
16 average juror, but I don't hold myself out to be a DNA  
17 expert.

18          Q.    Okay.  Neither am I.

19          A.    Okay.

20          Q.    So we'll try to keep it as lay terms as we can if  
21 that's all right with you?

22          A.    Sure.

23          Q.    When people test DNA and they get the match,  
24 whether it's thirteen loci or sixteen loci or whatever it  
25 is, then they come up with a statistical number, correct?

1           A.    Yes.

2           Q.    And they will say it's one in however many  
3    quatrillion or million or sometimes thousands really.  I  
4    mean, it varies.  But even when it's one in this quatrillion  
5    number, would you expect them to test every single living  
6    and nonliving human being to come up with that statistical  
7    analysis?

8           A.    No.  And that is exactly what I've been saying  
9    here, and that's exactly why they associate a probabilistic  
10   statement with their opinions because it's inductive  
11   inference, not deductive inference.

12          Q.    But it's well-accepted?

13          A.    Yes, it is.  And that is in scientifically and  
14   forensically and legally.

15                MS. VALENTINI:  Judge, if I could just have a  
16   couple of minutes --

17                THE COURT:  Sure.

18                MS. VALENTINI:  -- to kind of see where I'm at and  
19   what I have left?

20                THE COURT:  Sure.

21   BY MS. VALENTINI:

22          Q.    And I just want to confirm, you've never been  
23   qualified as a firearms identification expert in any court,  
24   correct?

25          A.    That's correct.

1 Q. And the -- you mentioned two hundred and  
2 forty-seven times you've testified. How many of those times  
3 have been with regard to this area?

4 THE COURT: What area?

5 MS. VALENTINI: Firearms and toolmark  
6 identification.

7 THE COURT: Thank you.

8 THE WITNESS: I'm going to guess twenty to thirty.  
9 I don't know. That's not a number that stays in my  
10 head.

11 BY MS. VALENTINI:

12 Q. Because of last November, I believe you testified  
13 it was about nine and that was in the field only allowed to  
14 testify about it with relates to science and meter --

15 Say that word for me.

16 A. Metallurgy.

17 Q. -- metallurgy standpoint?

18 A. Okay. I think -- I'm starting to remember. I  
19 think the last time I tallied there were seventeen  
20 testimonies in the field of, quote, ballistics, end quote,  
21 and then its further broken down because there are three  
22 areas of ballistics. So I wasn't too off on my original  
23 guess so I believe maybe fifteen times.

24 Q. But it's never been as an expert firearm or  
25 toolmark identification?

1           A.    No.  I was proffered in each case as a forensic  
2 metallurgist material scientist to address issues of either  
3 the scientific methodology or scientific underpinnings or  
4 lack thereof of a practice or in the field of terminal  
5 ballistics which is very complex and very scientific.

6           Q.    Sir, isn't it true that in your testimony in *State*  
7 *of Maryland vs. Winningham* you conceded that the underlying  
8 theory that toolmarks are left during the machine process  
9 and can be used to match specific items of evidence to a  
10 specific source is generally accepted theory?

11          A.    No, I don't recall that.  It might have been  
12 some -- you'd have to either read it again or give me some  
13 context in there.

14          Q.    Sure.  That you conceded that the underlying  
15 theory that toolmarks are left during the machine process?

16          A.    Sure, yes.

17          Q.    And can be used to match specific items of  
18 evidence to a specific source is the generally accepted  
19 theory?

20          A.    I don't know if I was addressing legal acceptance  
21 or scientific acceptance.  But to save you, maybe, some  
22 time, yes, the toolmarks imparted can be used to -- and it  
23 may be the definition of match might be the other issue --  
24 to associate items with sources, and sources being  
25 production lots possibly or larger.

1 Q. Sir, are you aware that NAS, the National  
2 Organization of Science, recognizes firearm analysis as a  
3 science?

4 A. I'm sorry. What organization?

5 Q. Isn't it true that NAS --

6 A. Oh.

7 Q. -- recognizes firearm analysis as a science?

8 A. That, I don't know. They may accept the forensic  
9 examiners characterizations of forensic science because  
10 that's in common -- I mean, just as ballistics is misapplied  
11 and it's hard to -- it's trying to, like, turn a battleship  
12 around in a bathtub or stop a locomotive. They may accept  
13 the phraseology, but they do take issues as to whether it's,  
14 in fact, a science.

15 Q. And, sir, isn't it true that the American  
16 Association of CrimeLine Directors recognizes firearm  
17 analysis as a science?

18 A. That may or may not be true. But there's some  
19 issues with ASCLD. I think that's what you're referring to  
20 there.

21 Q. And isn't it true that the laboratory  
22 accreditation board also recognizes it as a science?

23 A. Sure. But they -- I believe the overwhelming  
24 majority, if not all of them, are forensic practitioners,  
25 forensic examiners.

1 Q. You can't make any conclusions regarding any of  
2 the evidence in this case, correct?

3 A. That's another broad brush. I would say that's  
4 not true.

5 Q. Well, you haven't examined the evidence?

6 A. Well, that's true.

7 Q. So what conclusions can you make regarding the  
8 evidence if you haven't even examined it?

9 A. My conclusions are that you can't make a  
10 conclusion as to providence without -- without a concomitant  
11 expression of probabilistic certainty to a certain level of  
12 confidence.

13 Q. Isn't it true that defense can take an expert and  
14 use whatever method -- take the evidence to an expert and  
15 they can use whatever method they want and do their own  
16 testing and can also research the subclass characteristics  
17 and markings?

18 A. I'm sorry. Can the defense?

19 Q. Sure.

20 A. Oh, sure.

21 Q. They can take it and they can have another expert  
22 look at it, and they can use whatever methodology they would  
23 like to reach whatever conclusion they would like to reach?

24 THE COURT: Before the answer's out, let me ask  
25 you a question, Ms. Valentini. Is this not the case

1 where you objected to me releasing the firearm for  
2 examination?

3 MS. VALENTINI: We did object to the process of  
4 mailing it via mail to Virginia.

5 THE COURT: If you're going to go into this area  
6 and the defense now asks me to allow for that happen,  
7 it will happen. So it's your --

8 Sir, you've been good through this whole process.  
9 All right? I don't want to have to exclude you. All  
10 right?

11 THE WITNESS: I'm sorry, Your Honor.

12 THE COURT: It's okay. It's all right.

13 I'm not talking to you, I'm trying to talk to the  
14 defendant.

15 THE WITNESS: Oh, okay.

16 MS. VALENTINI: I understand what you're saying,  
17 Your Honor.

18 THE COURT: Okay.

19 MS. VALENTINI: I'll move on.

20 THE COURT: So if you're going go there --

21 MS. VALENTINI: I'll move on. I'll move on.

22 THE COURT: All right.

23 BY MS. VALENTINI:

24 Q. In simplest terms that you're just simply a  
25 critique of the method of firearms and toolmark



1 identification? That's -- that's really what you do?

2 A. What I do or what I did in this case? They're two  
3 different issues. I'll say "yes" to the latter and "very  
4 limited" in the former.

5 Q. Your methodology is not what has been accepted in  
6 the courts worldwide, correct?

7 A. I can't answer that question the way it's phrased.

8 Q. Okay. The courts accept this as a science,  
9 firearms -- the courts accept firearms and toolmark  
10 identification as a generally accepted scientific  
11 methodology; is that not correct?

12 A. Well, if the courts do, it's a legal opinion and  
13 not a scientific opinion.

14 Q. That's how the courts view it?

15 A. I'm sorry?

16 Q. That's how the courts view it?

17 A. I don't agree all courts. If that was the  
18 question, I don't agree. In fact, I believe --

19 Q. There's not a court that hasn't accepted it,  
20 right?

21 A. Well, now you just changed the ground -- the  
22 question. I believe in either *Green* or *Montero* they even  
23 said this is not a science. You can call it anything you  
24 want, you cannot call it a science. So at least one, and I  
25 believe there are others that. . .

1 Q. They have not excluded the evidence; have they  
2 not?

3 A. No, that's true. Well, based on these issues.  
4 They may have excluded the evidence for other reasons.

5 Q. Are you familiar with the AFTE responses to the  
6 NAS report that you were speaking of from 2009?

7 A. Is that by -- from Ron -- Ronald G. Nichols?

8 Q. It's the AFTE response. It's from AFTE.

9 A. Yeah, I think he may have authored one or more of  
10 those. I'm generally familiar. I didn't -- I'd have to --  
11 you'd have to refresh my recollection if you're going to get  
12 specific about it.

13 Q. And, basically, AFTE had already addressed some of  
14 these suggestions that were made in recommendations that  
15 were made by the NAS report. For example, one of AFTE's  
16 recommend -- I'm sorry. One of NAS's recommendations in  
17 that report was for them to establish definitions in the  
18 glossary of terms.

19 Well, AFTE has had a glossary of terms since 1980,  
20 correct? If you know. You may not know that.

21 A. No, I don't know that.

22 MS. VALENTINI: Judge, may I just have one moment?

23 THE COURT: Mr. Tobin, my comments were not  
24 directed towards you. They were directed towards Mr.  
25 Richardson.

1 THE WITNESS: Oh, thank you, Your Honor.

2 THE COURT: Counsel, just a moment, please. For  
3 security purposes and transport issues, do you believe  
4 we're going to be going beyond five?

5 MS. VALENTINI: Judge, if I can just have a  
6 wrap-up question and then I would call Ms. Skoglund as  
7 rebuttal. That may take thirty minutes. I don't know  
8 how long redirect --

9 MR. CHANG: Short redirect for defense.

10 THE COURT: Okay. Well, let's try if we can --  
11 I'm not going to hold you to it, but let's try and get  
12 everybody out of here by five or a minute or two  
13 afterwards if we can. We have fifty-five minutes to  
14 get that done. I don't want to hold the whole  
15 courtroom -- or courthouse full of deputies.

16 MS. VALENTINI: Yes, sir.

17 THE COURT: Okay. Thank you.

18 THE COURT DEPUTY: I'll let them know, sir.

19 THE COURT: Thank you.

20 MS. VALENTINI: One more flip through the notes,  
21 Judge, and then I'll be done.

22 Nothing further, Your Honor.

23 THE COURT: All right. Thank you.

24 Defense.

25

## REDIRECT EXAMINATION

1  
2 BY MR. CHANG:

3 Q. Mr. Tobin, are you aware of federal courts that  
4 have limited the opinions of firearms and toolmark  
5 examiners?

6 A. Yes.

7 Q. Okay. On their ability to individualize?

8 A. Yes.

9 Q. Okay. Is that a recent trend, sir?

10 A. Yes. It's -- we call it a paradigm shift.

11 Q. Okay. Validity studies, I believe Ms. Skoglund  
12 discussed one that she participated in or was involved in  
13 where she specifically mentioned Rugers. Okay? I'm  
14 paraphrasing, but, essentially, what you're saying is the  
15 studies on Rugers can't be generalized to apply to, in this  
16 case, Browning firearms? Would that be accurate, sir?

17 A. Correct.

18 Q. Similarly, studies on Remingtons and Winchesters  
19 and other brands cannot be generalized to apply to the  
20 Browning in this case?

21 A. Correct.

22 And I assume you're meaning the existing studies,  
23 yes?

24 Q. Existing studies, that's correct, sir.

25 A. Yes.

1           Q.    Very briefly, I'm going to talk about DNA.  DNA  
2 has been recognized by the National Academy of Sciences and  
3 the reports as being a -- how would you describe the  
4 practice of DNA as it relates to the forensic sciences?

5           A.    Well, it's somewhat misleading, but we call it the  
6 gold standard.  You still have to be careful how you're  
7 applying that moniker.  But we consider it the gold standard  
8 at least with regard to how an inductive practice where you  
9 cannot feasibly sample the entire possible sample pool  
10 should be handled.

11          Q.    All right.  However, with DNA I'm going to  
12 oversimplify.  I know this Court probably has done some DNA  
13 cases.  But, essentially, with DNA, there are protocols to,  
14 basically, tell another scientist, another DNA technician  
15 how to extract the DNA, correct?

16          A.    Yes.

17          Q.    There are protocols in place to identify the loci  
18 that they're looking for differences, correct?

19          A.    Yes.

20          Q.    They have, in fact, identified those are loci.  
21 Whatever standard you go by with twelve, fourteen, sixteen,  
22 those loci are standardized, have been identified, and are  
23 utilized by virtually any DNA lab worldwide?

24          A.    Correct.  They create the two missing cornerstones  
25 of firearms and toolmark practice.  And that is

1 repeatability and reproducibility.

2 Q. Okay. As it relates to the statistics in DNA,  
3 they've done the requisite sampling of the population; they  
4 can break it down geographically; ethnically in terms of  
5 Asian Americans, African Americans, Caucasian Americans and  
6 basically create statistics in terms of the frequency within  
7 a given population.

8 Is that a fair assessment that I'm  
9 oversimplifying?

10 A. That's correct. And when they present  
11 characteristics saying one in -- I'm going to make up a  
12 number -- three hundred quadrillion, that far exceeds the  
13 human population. But what that implies is now that the  
14 practical impossibility or whatever is going to be the claim  
15 they don't need to find additional loci or rates of the  
16 parameters of detection in order to -- they don't need to  
17 expand that currently because the population doesn't exceed  
18 that one in -- I mean, doesn't exceed whatever I just said,  
19 three hundred quadrillion.

20 Q. In other words, there is, in essence, a  
21 mathematical basis for them to quantify the likelihood of  
22 repeating those DNA loci --

23 A. Absolutely.

24 Q. -- for any given individual?

25 A. That's correct.

1 Q. Such statistical databases have not been  
2 calculated for frequency in this particular field,  
3 specifically, firearm and toolmarks analysis; is that  
4 accurate?

5 A. That we found, that's correct.

6 Q. And is that the -- one of the bases of the  
7 scientific community's objection to this practice in this  
8 area?

9 A. Yes. In most particularly with a -- also with  
10 error -- rate of error.

11 Q. Certainly, sir, the statements or the whole bunch  
12 of studies, literature, publishing, AFTE Journals, or  
13 elsewhere as it relates to this field, fair to say you  
14 reviewed most of those articles and studies?

15 A. Yes.

16 Q. Okay. Based upon your review of these sciences,  
17 sir --

18 A. Oh, I'm sorry. No. I say "you" meaning me and my  
19 colleagues. I can't read thousands of papers. But my  
20 colleagues have read many, I've read most probably, but...

21 Q. Based upon your review of all the available  
22 studies or literature that you have reviewed, can you, as a  
23 scientist, determine what objective criteria there is in  
24 order to make comparisons or elimination as relates to the  
25 field of firearms and toolmark analysis?

1           A. Objectively, they do look for patterns. But from  
2 that point -- do I say forward? Yeah -- forward the  
3 interpretation of those patterns is virtually purely  
4 subjective. So depending on which aspect, yes, they use  
5 some objective criteria to start assessing class  
6 characteristics and then seeking some indicia or  
7 characteristics to compare. But that's where the  
8 objectivity generally stops. The remaining portion of the  
9 practice is subjective.

10           Q. Let me rephrase it in my layperson's terminology.  
11 Using your bar code example or we've discussed lining up of  
12 striating lines, based upon your review of the literature,  
13 is there an objective criteria, number of lines matching up  
14 that exists anywhere in the materials that would tell a  
15 forensic firearm and toolmark analyst whether something is  
16 or is not a match, or is or is not an exclusion, or may or  
17 may not be excluded? Is there an objective standard?

18           A. The general answers is no, particularly on the  
19 East Coast. They've attempted to remedy that on the West  
20 Coast with CMS or consecutively matching striae. Striae, by  
21 the way, is S-T-R-I-A-E. But the is answer, no, there are  
22 no parameters of detection or rules of application. They've  
23 started that in -- on the West Coast. They indicate that  
24 there should be a minimum of three -- two sets of three or a  
25 consecutive six or something. But the answer is generally



1 no.

2 Q. Okay. Sir, we started off this morning with Ms.  
3 Skoglund, and I basically got her to give the Court her  
4 opinion: The three cartridge casings recovered at the scene  
5 in this case were, in fact, fired from the particular  
6 firearm that ultimately was submitted along with those  
7 three.

8 Did you hear her render that opinion, sir?

9 A. Yes.

10 Q. As a scientist, based on your review of all the  
11 literature, do you have an opinion as to her ability to  
12 render that opinion and her ability to individualize those  
13 cartridges to this particular firearm?

14 A. Yes.

15 Q. What would your opinion be?

16 A. The opinion is that there is no scientific  
17 foundation for such a claim and it's considered a fallacy  
18 and an exaggerated claim in the true or mainstream  
19 scientific community.

20 MR. CHANG: Okay. Thank you, sir.

21 Nothing further, Judge.

22 THE COURT: Ms. Valentini, other questions?

23 MS. VALENTINI: Just one.

24

25

## 1 RE-CROSS-EXAMINATION

2 BY MS. VALENTINI:

3 Q. Sir --

4 MS. VALENTINI: May I stay here, Judge?

5 THE COURT: Sure.

6 BY MS. VALENTINI:

7 Q. Sir, you just said that you claim there's no  
8 scientific foundation, but you do not disagree with her  
9 findings, do you?10 A. Well, now there's the broad brush bifurcation  
11 again. I disagree with the statement, but I don't rebut the  
12 possible -- the claim of a possible match, which would be a  
13 type-three error, meaning you got the right answer but for  
14 the wrong reasons. The problem --15 Q. Sir, you do not disagree with her opinion that  
16 those shell casings were fired from that firearm that she  
17 tested?18 A. Well, the reality of it is I have some problems  
19 with what I'm seeing here as a basis for it even what's  
20 provided. I'm not sure there's adequate data provided to  
21 the defense bar, but that said, no, I'm not here to rebut  
22 the claim of a match.

23 MS. VALENTINI: Okay. No further questions.

24 THE COURT: All right. May this witness be  
25 excused?

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MR. CHANG: Yes, sir.

THE COURT: All right. Sir, you may step down.

THE WITNESS: Thank you.

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CERTIFICATE OF REPORTER

STATE OF FLORIDA  
COUNTY OF SEMINOLE

We, ERIN LEBEN, Florida Professional Reporter; and CHARITI L. COLÓN, Florid Professional Reporter, certify that we were authorized to and did stenographically report the foregoing proceedings; and that the transcript is a true and complete record of our stenographic notes.

We further certify that we are not a relative, employee, attorney or counsel of any of the parties, nor are we a relative or employee of any of the parties' attorneys or counsel connected with the action, nor are we financially interested in the action.

Dated this the 25th day of September, 2013.

\_\_\_\_\_  
ERIN LEBEN

\_\_\_\_\_  
CHARITI L. COLÓN, FPR