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Emerging Issues in Forensic Fingerprint Examination.

John Black

National Clearinghouse for Science, Technology and the Law.

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>> Welcome to our 17th webinar in your BJA series, Emerging Issues in Forensic Fingerprint Examination. My name is Mercy Roberg. I'm the Director of the Office of Professional Education here at Stetson. Before we get started, a few housekeeping tips. The attendees you are all in listen mode right now. If you have any questions during the webinar, please direct it to either, one, in the chat feature or you can send it specifically to myself, Mercy Roberg. We will collect the questions and if time permits at the end, Mr. Black will answer them towards the end of the webinars.

We have also read your questions that you presubmitted that of and hopefully those will be answered throughout the webinar. We look

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forward to this time with you.

Mr. Black, are you ready?

>> Yes, ma'am.

Good afternoon. And welcome to this webinar. It's my privilege to be able to speak with you today about emerging issues in forensic fingerprint examination. I will say that this presentation was prepared primarily for attorneys and I found out yesterday that a number of fingerprint practitioners are also attending. So for the fingerprint folks they may not see all these top pigs as being truly emerging so I just want to make that statement.

So, I'm going to run through just a quick summary of how we're going to proceed with this. We're going to lack at a brief background as the basis for this presentation and then delve into the topics of the examination framework that fingerprint examiners utilize. Also some important issues regarding documentation, both at the scene and in the examination phase. Also how conclusions are traditionally being stated or have been stated and where those conclusions are now moving towards in some areas. And also look at some case studies. And as it says on the slide there, I do hope to provide a number of questions for you to consider throughout the presentation. For the attorneys, you'll find examples of numerous questions that you could utilize in examining a fingerprint witness. So without any further ado, let's look at the background.

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And much of this goes back to 1999, during the initial Daubert challenge to fingerprints in Pennsylvania, Eastern District in the case of United States versus by Ron Mitchell. That challenge was unsuccessful, but it sparked numerous challenges since then, most of which have been unsuccessful as well.

We then had the fairly famous case now of Brandon Mayfield where Mr. Mayfield was erroneously identified through fingerprint evidence. And there have been other, some other high profile cases of erroneous identification as well such as the could you Wednesday case in Boston, Jackson case in Delaware and some others that I could likely provide some additional information for you on later.

And then there have been four reports that have come out. The first (Cut out) recognized the number of challenges to many forensic disciplines was the 2009 National Research Council, National Academy of Sciences Report, in which latent fingerprint examination took a pretty good beating.

Then in 2012 we had a very good report by a group called the NIST Human Factors Working Group. I'll cover that a little later on in the presentation. But that was a group of practitioners who reviewed a number of areas and made some very solid recommendations on how to improve the discipline.

In 2016, we had the PCAST Report which again offers some insider recommendations into a number of forensic disciplines. We'll unpack

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that in just a moment.

Then lastly and most recently we had the 2017 American Association for the Advancement of Science or AAAS Latent Fingerprint Report. So, going back to the NAS report. When it comes to fingerprint evidence, for a number of years the science of fingerprints pretty much claimed infallibility and there were brazen claims that we had a zero error rate. Well the NAS reports that's not plausible and they're exactly right. No other forensic science to my knowledge ever claimed infallibility besides fingerprints.

They also said and rightly so we needed to have more documentation, more complete documentation for transparency purposes in our reports. And the underlying tenants of will utilizing this and persistence which nobody really objects to even in the Mitchell case objected to uniqueness and persistence, but basically just because we embrace uniqueness and persistence that doesn't mean an examiner on any given day can reliably discern whether two impressions were made by the same person.

An ak could anymore known as ACE-V does not guard against bias and simply following the ACE-V does not guarantee you will reach a proper conclusion.

I'm going to come back to the issue and factors in the presentation. When it comes to PCAST, like I said, there was another look at the different forensic disciplines. And they did acknowledge that the fingerprint discipline had made significant progress since NAS. They

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also addressed two major issues, the foundational validity of fingerprints and the validity of the science as applied.

They also raised specific concerns about confirmation bias in those agencies only verify identification decision. In other words, if that shop only verifies identifications as opposed to all other conclusions, then whenever the examiner hands the verifier a case to review, the verifier already knows that it's an identification that's been made so there is some inherent bias there.

And they also, they gave some praise to a study done by the FBI and a company in Virginia called Noblis, affectionately referred to as the black box study. And I would say that, this particular paper by far is the most significant paper published in the last ten to 15 years in the fingerprint discipline. Now, just so you know for those who are not aware of what a black box study is, a black box study is, is a research project or a study that gives the participant, in this case, fingerprint examiners, gives them a problem and then the examiner provides the solution but there is nothing in between to show how they got to that conclusion. The researchers treat the examiners brain basically as a mysterious black box where nothing is available for, to understand why they made a certain decision.

As opposed to white box studies, where the examiners is given a problem, they then are compelled or made to show their work as to how they reached a conclusion. Both types of studies are very informative, but the

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FBI Noblis has proven to be very significant.

And most likely would be the paper that examiners, and attorneys as well should likely be most familiar with, as far as testimony goes. And then in the AAAS report from 2017, this was a large scale review of literature to also conduct a gap analysis for the discipline of fingerprints. We did provide conclusions and recommendations in that report and made suggestions for additional research which the NAS report did not do.

Okay. So that's just a brief background. And I want to move now into the framework that I would say the majority of fingerprint examiners use today. And that framework is referred to as ACE-V. It's a framework for decision making and fingerprint examiners are heavily engaged on decision making on a daily basis.

The A stands for analysis. This is where the examiner assesses the print, looking at the quality of the print, the information that's available, types of distortions that maybe present and I'll go into more detail in the next slide.

In the comparison phase, the examiner, if they have determined the print to be suitable for comparison during the analysis phase, they then test that data or information against a second print, typically a known impression, to see if there is correspondence or noncorrespondence. And as that is happening, they are making a seamless transition to the evaluation phase where they ultimately will come

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up with a conclusion that is supported by the physical evidence and we'll talk about those different types of conclusions momentarily. Then we will look at verification, which is the final step, which is a proactive quality assurance measure to try to ensure that the correct answer is what is reported out to the end user.

So, just to summarize analysis. Again, we are observing information in the impression. Trying to understand why that print presents itself in the way that it does. Trying to understand any type of distortions that may be present. Any issues that would cause some difficulty or would cause us to need to be very cautious.

We're also trying to make sure, and this is very important. We want to make sure that we do our analysis of the latent or question impression prior to viewing the known impressions as a way to help minimize or even mitigate potential bias issues.

Ultimately in analysis we're trying to determine that print's suitability for comparison purposes. And again comparison is used as a side by side examination to determine if the information in analysis is either present or not in the, in the known impression. I'm going to skip ahead to evaluation.

And just to kind of give you the cliff notes version of this. If the examiner concludes there is sufficient agreement of the information or the data between that will assist -- excuse me -- between the question print and the known print, then that results in a source identification

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conclusion. Likewise, if they determine sufficient disagreement, that typically results in a source exclusion. And if definitive support cannot be found for either of those two, then the examiner must issue some type of inconclusive result. And that has recently been expanded from a true inconclusive to also entail conclusions of support for same source and support for different source. And we will look at those momentarily.

And, again, going with verification as the final step. When you're doing verification, it's very similar to peer review in other scientific endeavors. You are really trying to disprove or falsify the examiner of record's conclusion or maybe how they drew that conclusion. You are certainly not trying to confirm or to rubber stamp your colleague's conclusion. That's a recipe for disaster if you approach it that way. By trying to falsify or disprove, you're trying to ensure that the first examiner did utilize proper procedures and principles, and also to make sure that that conclusion is going to withstand scrutiny going forward.

And verification is typically conducted in two large bins, either blind or nonblind. Nonblind means the verifier has access to pretty much all the data the original examiner had to include the conclusion, which of course can raise bias issues. Or blind being that the verifier has no idea what the first examiner decided. They have no access to their images, bench notes, any of that. So those are the two large

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bins for verification.

And I do want to direct you to the link on this slide. And this is a very recent publication that is up ACE standards development organization level within the OSAC. Which is the organization of scientific committees, it's called best practice recommendations for the -- in the friction ridge examination.

One of the things we have done in this document, which is a very significant departure from the older SWGFAST standards. You look at the second bullet point it says at a minimum verification shall apply to source identification, support for same source, and source exclusion decisions.

Now of course right now there is no mandate for this to be followed. It has not yet been approved. But if you're going to practice ACE-V significantly you must verify all the conclusions.

Now the reason we think this is a good move to say at a minimum verification shall also include source exclusions, is because all of the research studies since NAS and pretty much every examiner's case experience that I have interviewed countless times as I've traveled around the country teaching, everything shows the same trend, that exclusion decisions oftentimes, well all the time are more erroneous than, than identification decisions.

What I mean to say let me say this better. Erroneous exclusion far out weigh erroneous exclusion decision the. So if people are in the

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verifying exclusion decisions they are most likely verifying errors to their end users. And that is how you find that document on the OSAC subcommittee website.

I did a study back in 2010, and '11 it got (indiscernible) in 2012, citation is there below for you. Just trying to engage the verification practice. It was largely in US 54 to 55 agencies were two were outside. Those were England and Canada.

We had a wide range of agency size. From the one or two person shop to the 50 or 60 examiner shop. And if you look, you'll see that most every one was verifying identifications at the time. But just over half were verifying exclusion decisions. You can see it continues to drop with other conclusions.

But the 55 percent for exclusions was very alarming, especially now what we know from the research studies since NAS. We hope more people will be verifying exclusion decisions. And as I traveled in the last couple of years it seems like more people are doing that, but still nowhere near like where we would like it to be.

So, some issues with verification to consider. We know that most shops are not verifying all conclusions, which again if you're going to practice ACE-V and you don't V everything, then you may have to explain the reason for that.

We talked about this already, that some folks view verification as a mere formality. And not, don't do it as a very serious attempt to

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disprove or to falsify.

We've already talked about that point. But you need to check, if I were an examiner, I would want to make sure all my conclusions had been verified. If I were an attorney, I would want to find out if they have not been verified, then what's the reason behind that? They should be able to give you a valid reason, or something they to lend support with to indicate why they did not verify certain things. If that explanation is lacking, I think that's certainly an issue. And while we're talking about issues, we're going to move into documentation. And I have to say that since I've had my small company for the last five years or so, most of the issues I have found in case work that I reviewed, both crime scene work and fingerprint work, involves a lack of documentation.

For instance, let's just talk about briefly crime scene and evidence photography. You know, I've seen situations where the crime scene photographs themselves are not even legible. So, make sure your crime scene photographs are legible. Attorneys, I would certainly raise, make issues out of the fact if photographs are not legible.

If any photographs are missing, that's a huge red flag. Okay? You would have to investigate that.

Two of the main goals of crime scene and evidence photography are to make sure items of evidence and their locations are unambiguous. I've reviewed many cases where that's not the case. But that is something

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that you need to ensure with your case. And if they are taking photographs of impression evidence, such as fingerprints or footwear impressions, you know, you need to make sure they've been taken from the proper perspective. And there are easy tools to use that can accomplish that, but a lot of people don't understand what those tools are.

For instance, using an angle finder is a phenomenal way to make sure your tripod and your impression are oriented properly, so to speak, so the camera is in the proper perspective and right angle to take photograph graph. Simply eyeballing it and taking the photographs without an tripod is unacceptable.

Also a lot of people are not photographing the latent prints at the scene or on evidence prior to trying to lift the prints, if indeed the prints are amenable to lifting.

The problem with that is we don't have any type of objective evidence to show where the print was actually in situ, in other words originally at its environment on a piece of scene or an issue in evidence. So that's an issue that needs to be addressed.

As a best practice I would hope examiners out there were crime scene personnel are taking the time to photograph the prints on scene prior to attempting to lift.

And also, and some of the examiners in the crowd will appreciate this. That oftentimes lift cards that are received or that are submitted,

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I should say, are not filled out completely. So, it takes about a minute to complete the documentation on the back of a lift card to include drawing the sketch to show where the print came from. So I would make sure that this lift card information is indeed complete. When it comes to examination documentation, as far as fingerprint examination goes, you need to determine if the documentation in the case file, if it exists in the first place, is it sufficient to support the reported conclusions?

This is mission critical. I realize that, you know, many years ago, documentation was virtually nonexistent. With recent challenges and with recent criticisms like NAS about the need for more transparency and more documentation, examiners should be recording their examination documentation contemporaneously with the examination.

And one of the main goals of the documentation would be that, you know, another examiner who is competent in fingerprint examination should be able to pick up that case record and understand exactly what the person did, the examiner of record, and why they did that. They should be able to have no difficulty following why certain decisions were reached. There should be ample documentation in the form of images, or bench notes or a combination of those things to understand why certain conclusions were drawn.

Another rule of thumb with documentation, the more complex the print is, typically the more documentation it's going to require. And in

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a similar manner, the less complex, you can get away typically with less documentation.

Sometimes agencies opt to try to streamline the documentation process by creating a standardized documentation forms which I think is a great idea, but you need to make sure, examiners and attorneys, that those forms are being used consistently by everybody in the agency. This can be particularly problematic in large lab systems where they may have three or four different physical locations. So it's very important to make sure that the forms are being used properly by everybody, and consistently.

Is there some type of documentation scheme being used, such as the acronym GYRO? And I'll show you what that looks like here briefly. So this is an acronym for the colors, green, yellow, red and orange. The colors green, yellow and red are used to annotate features during the analysis phase. So before we've ever seen the known. And as the examiners assessment of confidence in those features that dictates the marking utilized, green indicates high competence. And then likewise yellow and red respectively are medium and low competence. And those features are annotated during analysis.

And then anything that is marked orange, you'll see in this image, there is a couple of features. One in about the center and one at about 6:00 that are marked orange. What the examiner means by this is that those features were only became apparent to him or her once

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they saw the known impression. So, it's a transparent way to talk about which features were found and when and the competence associated with each. Okay?

I put the citations there for you. Most examiners are familiar with this, but for attorneys, you may want to be looking at the, at the case record to see if there is some type of, or some type of an no indication or documentation of images in the, in that case record. Something I use in case work and on my private cases, I use two tools that come from a document SWGFAST document number 10. And SWGFAST is documentation for standards of examining friction ridge impression and resulting in conclusion.

This is a quality table or for assessing quality based upon looking at all three levels of detail. In the impression. And there is a companion tool that goes with that called the sufficiency graph, where you see the four bins of quality on the Y axis and then the amount of minutia on the X axis.

And you see three well defined bins, A, B and C. This graph was originally represented to triage cases for the identification decision. (Talking in the background).

As far as zone A goes, what this means is latent prints based on quality and quantity fall into zone A. What this is designed to show (Cut out).

When it comes to zone B this is the complex print zone. And in zone

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B, identification decisions are certainly warranted but are going to require more documentation and maybe some type enhanced verification procedure. So in other words, if you normally do nonblind verifications, if you have a B zone print, you may want to go to blind verification; as a way to enhance the verification.

Zone C is a noncomplex print zone. Identification decisions almost always warranted. Probably expect no push back on verification. But I do use these tools in my private case work. I find that a lot of examiners do not use these and some of them are fought even aware of these to this day, even though this has been out for a number of years. So I would encourage examiners to be familiar with these even though the OSAC has replaced the SWG, the SWG FAST until replaced by OSAC remain to be relevant to the community.

So, let's look at some conclusions now. Let's talk about this. This is certainly a topic that is of a lot of interest to practitioners. Especially if they have operated in the traditional three bin system for a long time, as I have.

So, when it comes to reporting conclusions, traditionally, we had three bins that we would use. And those three bins are largely still used today. One bin is the identification bin where the examiner believes the latent print and known print share a common source. Another bin of course is exclusion where the examiner oh pines that the latent and known do not share a common source. Some other versions of this

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might be language like not identified or no identification effected. I would strongly discourage agencies from using those other words, because they have been criticized as being rather ambiguous.

Exclusion would be the term I would certainly suggest everybody use and get away from the other terminology.

And an inconclusive is when support cannot be found for identification or exclusion. And historically the main use of inconclusive dealt with issues with the known fingerprints. They were either not recorded adequately or clearly enough to be useful.

So, as we move towards the five bin system which I'll end up on a few slides from now. Going back to this FBI Noblis black box study. Some of the large data, very large scale study. So almost 170 examiners participated and all told are there were over 17,000 trials that were conducted.

Overall, in the study, there was only a false positive rate which is an erroneous identification rate of 1/10 of one percent, I think it was actually .17. There were only 6 erroneous identification in the entire study.

If you contrast that with the overall false NEGATIVE rate which is the erroneous exclusion rate, you see it's a staggering 7.5%. This study and several other studies show the same trend. Erroneous exclusions again far outweigh erroneous identifications. In studies and in case work.

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That's again why we're advocating that exclusions need to be verified as a matter of course, not just identification decisions.

Also 34% of the participants were made aware by their agencies that they had made erroneous exclusions after they had completed their training program. I offer kudos to those shops that know that because that means they were verifying their ex exclusions even after the person got out of training. You don't have your exclusions verified, you really don't know what your performance is like when it comes to exclusions.

And this last number is very staggering. In that study, 85% of the people made an erroneous exclusion during the study. And these were one to one presentation where there was one latent print provided to the examiner. They would assess the value of this. And if they were going to compare it, they were going to compare it to this one image. There was no openly searching of fingerprint cards or palm print cards. It was strictly, do this match this? And the false exclusion rate was still 7.5%. Very staggering.

In reporting conclusions and testifying to conclusions in the past, I was trained to do this years ago. Is that I would testify that I had identified a fingerprint or a particular shoe, a piece of footwear, to the defendant or to somebody or to a certain shoe, to the exclusion of all others.

Some other folks in the crowd here I'm sure may have testified that

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way, I'm sure those that have been around a little while. The problem is, all others were never, ever considered.

When, historically when we make identification decisions, you know, you basically are believing that no one else in the world could have made it, but that's not the same, that's not the same as actually consciously excluding everybody else. Okay? Exclusions are indeed conscious decisions that a certain person or certain people are not the source of a particular impression. Okay? Very different than assuming no one else is included, because you've identified somebody else.

We also get into a slippery slope when it comes to talking about verification in the courtroom. Certainly, if you are a government examiner and you're on the stand, especially on direct, you should talk about verification. You should talk about its part in the process, why it's being used in your shop, to what extent it's being used, but you know, you don't want to go further than that because if you do start talking about what the verifier found with regards to your work, the defense is likely going to object and they rightly should, because in many courts this type of testimony has been deemed to be viewed as hearsay or maybe as bolstering.

I do have one citation for you New Hampshire versus Connor. There is also a case out of California I can't remember the citation right away, but there are a few cases out there that you can probably find,

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where the testifying to what the verifier found was certainly problematic.

The way of course to avoid that for the prosecution is to, if you need to, call the verifier to testify as well. Typically in my experience, that has not happened, but certainly the verifier should always expect to have to testify.

Regarding the way conclusions had been reported, as recently as 2015, the Defense Forensic Science Center in Atlanta began to modify their reports and testimony to get away from the term identification, because some people feel like that term carries some baggage with it.

So, they opted to go this route, saying the latent and known prints have corresponding detail. The likelihood of observing this amount of correspondence which two impressions are made by different sources is considered extremely low.

That was their starting point. They received a bit of criticism on the extremely low portion because that seemed to be somewhat subjective. And of course they received some criticism initially because they have abandoned term identification.

Two years later they developed a statistical model called FR stat which was developed internally and validated externally where they now brought in statistics and likelihood ratios to provide a more objective assessment of the strength of the evidence and basically high, the higher likelihood ratio the more support is provided for the same source

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conclusion; or opinion.

In the AAAS report in 2017, we kind of went down this path as well, although it's a little different as you can see. One thing we added was that there are no (indiscernible) that would indicate they were made by different fingers that's critical to the State. Then there is no way to determine how many people might have, you know, this crest responding set of features but if you're making that identification decision, you would not expect to see that same ridge feature set by random chance somewhere else.

What I basically use as far as my language to convey my confidence in my conclusion. Without using to the exclusion of all others, without talking about being a hundred percent certain, without stating things as fact, I tie it all back to the evidence itself. If I'm going to make an identification decision, I will say there is sufficient correspondence of quality, quantity and rarity of the features for me to be confident that no other conclusion can be supported by the physical evidence. And I'm able to go through and explain why I can consciously reject exclusion (indiscernible) and no value as exclusion and why I can only show support for identification.

I can use this same conclusion language for an exclusion. There is sufficient noncorrespondence. And then I could consciously show why I can reject identification, inconclusive and no value. And if I'm going to make an inconclusive decision, I could say there is insufficient

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correspondence or noncorrespondence. And I can show why I can reject exclusion and identification and why I can only show support for the inconclusive decision.

What I'm trying to convey when I state this is that I believe my decision is accurate and it will withstand scrutiny no matter who looks at it. And the reason I say this is, we don't have any ground truth in case work. What that means is, we have nothing to check it against, like they do in the research studies. So, when I say accurate, what I'm saying is, I believe I'm making the appropriate decision based upon the evidence. And I send it out for verification. If the verifier comes back and says I can't find any problems with it, I think this is okay. I had the same decision. Well, that should withstand scrutiny.

If the verifier comes back and says, oh, I don't exactly agree and we have a little consultation and it needs to go to other examiners, we begin to look at what do the majority of examiners say, what does the consensus say the answer should be of the to check it against anything like they can in the research studies.

And going to the five bin scale here with the OSAC friction ridge subcommittee.

Source exclusion and source identification on the ex extremes. In the middle the traditionally inconclusive. Then we have support for different sources and support for same source.

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I really, really like this 5-bin system I've adopted in my case work. I've finished up a case right now where I'm using this, or using this language that's in the document. Many but I like the support for different and same sources, because it just transparently shows that you did find some differences or did find some similarities but in both situations you did not find enough differences or enough similarities to render a conclusion of exclusion or identification respectively.

So I really like that, the identification should be present in the record to show support for all these conclusions. I really like the five bin system and think it's a nice edition and we'll see how it all shakes out as far as enforce ability and all that. I don't know how that's all going to work out, but I'm definitely a document at this point because I think it's an improvement over the 3 bin system. A few case studies for you. Christopher Robinson, this is from 2015. This was a defense motion to ex exclude. Because the examiner was going to testify to absolute source attribution and claim a hundred percent certainty.

The defense cited the human factors report which I referred to in the background information. Very good report. Actually you can see I've got it right here. But they said back then that claims of absolute identification are not appropriate. Examiners should not report or testify directly or by implication to a source attribution to the

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exclusion of all others in the world.

In the motion, they cited the DFSC language which we mentioned a moment ago and also they talked about how FBI examiners now testify. And you can see the italicized version there of how they said examiners of the FBI now testify in a post Mayfield environment. Some of that will come from the Department of Justice uniform language for testimony reporting. That you can look up online. Okay?

This one, in North Carolina, North Carolina versus McPhaul.

On appeal, the panel found error in the trial court admitting the expert fingerprint testimony, siting that there was a lack of reliable conclusions.

They did not reverse the conviction though. But the crux of the matter seemed to be the expert when questioned directly by the judge and by either one or both attorneys, that examiner could not state what features were compared or what process was even used. So, it kind of goes back to the older days of testifying ipse dixit. It's so because I say it is so. So that was something that was very alarming that the examiner could not explain what was even done in the case.

Recent decision I believe also out of Illinois, people versus Cline.

This is me quoting directly from Justice Walker's opinion. I agree with the decision to reverse defendant's conviction because the print analysis was not verified by another examiner. The fingerprint itself was insufficient evidence to sustain a conviction beyond a reasonable

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doubt. The only evidence linking the defendant to the crime is a single partial print on a portable item. No evidence that the defendant left his print under such circumstances as they could only have been made at the time of the crime, at the time the crime occurred.

We don't really have a good solid way of, a valid way, a scientific way to age a fingerprint although research is ongoing at this time. But it would be interesting to see how this opinion shakes out.

And similarly, I don't have a case citation for this, because it never went anywhere. But the district attorney on a potential case in Texas says, the only evidence we have connecting the defendant to the car is his print from the inside the driver's door. It does connect him, but we have to show the fingerprint was made at the time the offense was committed. That evidence is lacking. Reviewing Texas case law, they did not think they could get past a directed verdict of not guilty. Therefore they refused to present that evidence.

So, again, I'm not an attorney, so that's their decision to make. It maybe a way that they're triaging their cases based on the other evidence in the case that might be, or say might aware more fruit. But those are some interesting decisions. I'm curious how those are going to shake out.

A few slides left. Some additional questions for you to consider when you're talking with your fingerprint expert, whether defense or prosecution. I'm hoping to wrap this up in about four or five minutes

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so we can have time for some Q and A.

I would recommend first of all that every defense attorney and every practitioner out there, fingerprint practitioner read this paper. In this article, Miss Steele, who is an appellate attorney practices in the New England area. Very good paper. Just numerous resources that are cited for her inform. Basically says there is six ways the defense can challenge fingerprints. I would encourage prosecutors to also read up on this paper as well. Very, very good piece of work. When it comes to witness qualifications. You know, going beyond the, what's your name, who do you work for, how long have you been doing it, et cetera, et cetera, what are your duties. You need to find out if they've been tested for competency. Did they receive some type of certificate of competency from their agency to say that you can do these examinations. And do they maintain their competency by showing their proficiency in regular testing.

You can also check on certification. And also talk, you can also find out to what extent their conclusions are verified. In other words what is their performance like over time with all conclusions?

And find out if they have ever been aware of making an erroneous ID or erroneous exclusion decision.

When it comes to error rate one of the five prongs of the Daubert decision. Ask if they know about the error rate and more importantly, can they cite any error rate studies and kind of give the Cliff Notes version

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of the salient points of those studies.

In those studies, did the researchers find errors when examiners made identification decisions? The answer is yes. In nearly every study that has happened. Okay?

Then ultimately, you may want to ask them, how do you know you made an accurate decision in this particular case based on the evidence you examined? And that is a question that examiners need to be able to answer. And certainly one you would expect examiners to be asked by the attorneys at some point.

Find out if they're aware of the OSAC and SWGFAST standards or examination of and documentation of fingerprint evidence.

Check the case file to see if they do have documentation to support their conclusions.

This next one we haven't talked about yet, but this comes from the PCAST report and also the AAAS report. We talked earlier in the presentation about viewing the question impression before you see the known impression. But this task irrelevant information refers more to other biased examiner. Like if the examiner knows that the, that the listed suspect has some priors. Oh if the examiner of record saw the instant report and found out details about the case. Those things are not necessarily relevant to the actual fingerprint examination. So find out what the examiner was exposed to, maybe unnecessarily before they did their examination.

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Find out if they got a threshold for making identification decisions? And then have them give a basis for it. There is no scientific basis for any type of numerical standard. These are more likely operational thresholds for decision making.

It's been my experience both in this country and abroad when I've taught that a number of agencies have these self-imposed guidelines or thresholds, but when pressed on where they come from or the reason for them, they come up with I don't know as an answer.

So, what I always try to encourage examiners and others who I teach from time to time, you always need to know why you do what you do, and I would encourage everyone who is engaged in the practice of fingerprint examination to understand why you are doing what you are currently doing.

If what you are doing is providing good results and is not causing any problems, there are no issues with that, then you can likely proceed. But there is a better way to do things, one that might increase the accuracy, things like that, you need to be amenable to those possible changes.

So, that wraps up my presentation for now. I certainly want to thank you for your time, for your attendance. And I would be happy to answer any questions. I did review a number of questions that came in ahead of time. There were over 160 questions that came in. And I know I addressed some of them in this presentation. I don't have time to

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address all of them but I would be glad to take a few questions if there are any out there.

>> Well, Mr. Black, this is Mercy, and a few questions did come in. How about we just take them in the order and you can answer them or did he ever and have someone follow up in an email with you if it's a long question that might take a bit more time. Does that sound good?

>> Yes, ma'am.

>> All right. The first one is, would there be anything in particular we should look for when comparing an analyst's final report with their bench notes?

>> Well, you need to make sure that the, that the bench notes support the conclusion that is in the report. Determine how their conclusion was reached. But again, make sure also that any reporting that is done does not over state the results that are depicted in the bench notes. Those are some things I would look for in comparing the bench notes to the reporting. If I'm understanding the question correctly.

>> Perfect. Thank you, Mr. Black.

The next one, did the black box study have any check for potential cognitive bias that you are aware of?

>> I would have to go back and look at that to see. I don't recall there being cognitive bias issues, but I would have to go back and review that paper again to confirm that.

>> The next question, so this is kind of in the middle of your

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presentation, and the question was, what is the statistical evidence for giving the comparison? I believe they were referencing sort of what statistical evidence when you were sort of talking about, I think it was midway through the presentation. Might need more clarification on that one?

>> I think it would be best for someone to email me off line on that one. Yes.

>> Perfect. Okay.

So the next one is the AAAS has criticized this form of conclusions as without scientific support. Do you have a response specific to their criticism? And I believe that one also was sort of referencing the statistical evidence portion there, that maybe something you want to comment on or not.

>> Can you reread, can you repeat that question please.

>> Sure. The AAAS has criticized this form of a conclusion as without scientific support. Do you have a response specific to their criticism?

>> Well, I mean I certainly understand, to some extent I understand the question, but I would like to get more information from, from the person asking that question. So I do believe, and I was the only practitioner on the AAAS panel. But you know, I do believe that the language that we recommended for reporting is reasonable. It wasn't exactly what I thought would be ideal but I think it is reasonable. So, but again, examiners are not required to follow the recommendations

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of AAAS. There is no mandate to do so. So I think that examiners need to look at AAAS, NPcast, NAS and human factors and decide again what are the, what's the best approach to deal with on all these issues.

>> Thank you. Mr. Black, the next question was, support for same source isn't an identification conclusion. But isn't there a danger in the jury believing it is? Because you say there is support for same source.

>> That's a great question. I think the ultimate success of that is how that is explained to the end user to start with. You certainly don't want an overzealous detective to take support for same source as the green light to get an arrest warrant or something like that. So, what I try to do when I explain that is I say, look, I am, I have found correspondence. I have not found any significant noncorrespondence that causes me any alarm, but yes the correspondence I have found is not sufficient for me to owe pine that these impressions were made by a common source, but nevertheless I do find similarity. But at the end of the day I still cannot say it is or is not that important. So if it's explained properly, I see no difficulty. But if it's not explained properly, I certainly agree with the person asking the question, that there could be a danger in that.

>> Thank you. The next question. Can the determination of a match be a question of fact that could be determined by the fact finder rather than an expert? What are your thoughts?

>> Um, well first of all, I mean, that's a good question. I don't

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know if I can, I don't know if I can actually fully answer that question, but I know that for me, I make it very clear that when I give an opinion, when I draw a conclusion that's my opinion, not some type of fact. Now, as far as the fact finder itself, as far as the court recognizing that, I don't know that I could answer that question. But I know that I, and I state my opinions as fact but rather as my opinions. And then the court can give whatever weight they want to, to my opinion.

>> Well, Mr. Black, are you sure you're not an attorney, because that was an excellent question. An excellent answer.

>> It was a great question, pathetic answer, but it was a great question.

>> All right. So the next question, during the comparison, if the examiner notes minutia that do not match with the latent prints at points where the latent was being analyzed what should the examiner do?

>> I'm sorry, you broke up in the first half of your question, can you please repeat that?

>> Sure. During the comparison if the examiner notes minutia that do not match with the latent print at points that were not notices where the latent was being analyzed what should the examiner do?

>> If the examiner actually notices that there is disagreement?

>> I believe so.

>> Well, they have to, they have to weigh the disagreement with any agreement that is found and decide where the greater weight of the

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evidence lies. I don't know if that actually goes to the intent of the question, but any disagreement that is observed needs to be recorded and transcribed in the notes so that there is a record of that. But again, any disagreement that is observed, you have to determine if it is significant enough to warrant an exclusion or if it is more toward a support for different source. Again not sure if I'm answering the question exactly as it's intended. But that's what I'm going to go with for now.

>> Excellent. And maybe that person can follow up with your email for a bit more detailed.

>> Sure.

>> So the next question. Is there an actual error rate for fingerprint examination?

>> For the science as a whole, I would have to say no. If we look at a number of studies that have been done since NAS, we can comment on the error rate for erroneous identification and erroneous exclusions. In some studies like black box, the erroneous identification rarity was a tenth of a percent. And that number goes as high as maybe approaching four percent in some studies. The erroneous exclusion rates are much larger. But I think we would be hard pressed to try to extrapolate an error rate for the science as a whole because we're not looking at inconclusive and no value decisions predominantly in these studies we're looking for identification and

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exclusion decisions.

So, seems to me the courts are typically concerned most often with erroneous identification rates. And not so much with other things.

But that doesn't mean we should not be verifying all conclusions try to understand our performance over time with all those conclusions.

>> Thank you. So, we have about two minutes left and we do have a few more questions. I'm going to continue with them, and if we don't get to all the questions, I will give some instructions on how to follow up with those.

The next question, what is the main case study that examiners point to that backs the idea that no two people have the same print?

>> The main case study?

>> Yes. That was the question.

>> I'm trying, I'm trying to separate case study from research studies in my brain here. So I want to make sure I understand the question. So a particular case that no two people have the same fingerprint. Well, for a lot of years, people have, examiners have opined that they've never seen a duplicate out there. They've never seen a situation where there is two people that had the same print. And that is backed up typically globally on a regular basis with all the manual and automated searches that are done. But you know, going back, going back to the old Wild West case back in 1904 where it talked about, where finger are prints actually kind of became a replacement for another

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identification system. There have been other studies that have been done, but again, uniqueness, if we think about it from a, from practical standpoint from a scientific standpoint, the way that the skin develops in utero, is such a random process with lots of chaos, then based on the research that's been conducted, it's not even reasonable they would have the same ridge arrangement on the skin. And that goes back to peer review literature from the past, close to 100 years, that shows that the way the skin forms (Cut out) is totally random. That's the thing that I actually refer to in my testimony as being the primary reason to, for the proposition or the theory that there are no two people with the same prints out there.

>> Thank you very much. All right. A final question. Myth or fact. Can someone burn off their fingerprints?

>> (Laughter). Maybe, but why would you want to? Why wouldn't you wear gloves or get a job instead? I don't know. We know that there are cases where people have tried to, you know, use acid, like John Dillinger used acid to burn out the core area of his fingerprints. He was still identifiable on the surrounding area. Other people have made attempts to alter their fingerprints, but they're still able to be identified by other means.

If the damage of the attempt is not deep enough, then the original configuration will return, based on the structure of the friction ridge skin. If the damage is significant enough and deep enough, it would

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alter the ridge arrangement but that new ridge arrangement actually will also be persistent over time going forward.

So, if they simply try to burn their fingerprints off, they're making their selves more unique, if that's possible.

>> Great answer. So, we do have two more, do you have two minutes for us to take those last two questions?

>> Sure.

>> Okay. What is the proper impression for a proper ID?

>> What is the proper, what's the proper?

>> Impression for a proper ID.

>> What is the proper impression for a proper ID?

>> That is the question.

>> I don't think I understand the question. I'm having a mental block here.

>> Okay. Well, the follow up to that, is there a manual that you have written?

>> I have not written any, any manuals. I'm trying to figure out if they're asking, is there a proper way to, to arrive at an ID or proper way to report an ID. I'm just trying to understand the question.

>> We'll see if we can follow up with them.

How about one last one?

>> Okay.

>> And if this was your question, someone wants to type it back in,

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and then we can maybe read it again, but the last question. How do you define sufficient agreement and how is the science responded to criticism of the terms perceived ambiguity?

>> How would I define sufficient agreement?

>> Correct.

>> Always I said earlier, when I looked at, when I showed my personal language I used for articulation. I have found sufficient correspondence, so sufficient agreement, so this in my opinion, no other conclusion is supported by the physical evidence. In other words, the agreement is so pronounced, so harmonious that I can consciously reject exclusion, inconclusive, no value as a conclusion. And I can, I can definitely show the reasoning behind my sufficient correspondence and why I can only support the identification and can reject the other ones.

When it comes to perceived ambiguity, that is something that is very important. We do know that in fingerprint examination, especially with the GYRO system, we do use those colors to denote confidence. And if we mark something green we are very confident in that appearance of that feature and its appearance and position. But when we mark something yellow, we now have a little bit less clarity. So there is some ambiguity that may come into play. When we go into red areas we know that the competence is low and we may expect to find issues in those areas. But, again, when it comes to ambiguity in a lot of

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things, first of all, the documentation should be such that the opinion is not ambiguous, that the features are not ambiguous. The photographs that may have been used to prompt the comparison also need to be unambiguous and be very clear. So that's what I would say to the ambiguity part of that question.

>> Well, thank you, Mr. Black, for joining us today. There were a few more questions. And we will ask the attendees if they would like to follow up with you, your email is there on the PowerPoint.

And in addition to that, we will also be sending out a copy of the PowerPoint, the recording in case you missed any of this today when you were logging on or had to step away for any reason. And we will also send out CLE and CE information, so you should look for that in your inbox by tomorrow, Friday.

And once, again, John, thank you for joining us today. We really appreciate it. And we look forward to seeing everyone online in our next webinar, which is coming soon in May and we will send you an email for give you the dates.

>> All right. Thank you very much.

(End of session).