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# A Scientist's Perspective on Forensic Science

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## A SCIENTIST'S PERSPECTIVE ON FORENSIC SCIENCE

*Carl M. Selavka*

Many of you are attorneys or are already in school to become attorneys. So, I would like to remind everybody here, because you don't live in the world that I live in, as a forensic scientist, that the majority of what we are talking about at this conference involves the advocacy process: defense advocacy, prosecutorial advocacy, and civil advocacy. Scientists, on the other hand, live in what we believe is an objective process that uses physical evidence to derive probative information to help resolve crimes. We don't care whether it helps one side of the advocacy or the other.

We do live in America, and we know, politically, how the system is designed, but we are not trying to help anybody in particular. We are just trying to give the correct answer for the questions that we are asked: "How does this item of evidence lead to the conclusion and resolution of this case?" No matter whom we help, we are not supposed to care.

I'm going to deviate from the assigned specifics to talk about a set of fourteen questions that Professor Hoffmann gave us to think about, because he thought you might be interested in hearing about, and that I might be interested in discussing, one or more of these questions.

The first question is: "What is conclusive scientific evidence?" That is what recommendations number six and eight really talk about. In the law, beyond a reasonable doubt is a standard that goes beyond the scientific certainty that we are often able to develop and present. Scientific certainty, in our world, is greater than or equal to a 95% confidence interval. That is the statistic that we often use to determine whether something can or shouldn't be interpreted as being probative and useful.

This goes beyond civil cases, where a preponderance of the evidence is all that is required. So, when we talk about conclusive scientific evidence, even among scientists, we are often making conclusions that are different, with the same data. Is that conclusive? Well, that is a legal decision. Luckily, it is not up to scientists alone. We are not advocates for either side, but we do want to present the best quality evidence that we can. The good thing is, as Dr. Bieber mentioned, we are the bumpy horse that is pulling along the wagon of justice. Well, sorry about the bumpy ride; but the fact that science does continue to advance every year does give us the opportunity to resolve cases that have not been resolved yet, or to reexamine cases that were previously resolved and show that the wrong resolution was the outcome last time, and make it better now.

Second question: "What kinds of scientific evidence might qualify?" There are two general types; individualization evidence—things where we can say this is the source of that item—and then there are class characteristics—where we can say, "Well, it's fiber, but it's a yellow fiber and there are 300 examples of that." The kind of evidence we get is not determined by us; it is determined by how the crime was committed—how the people interacted. In the end, probative evidence is used to tie together victims, suspects, and crime scenes. If it doesn't do one of those, it is not going to be probative for us to examine things.

In the Kobe Bryant case, for example, you have two people who did interact. DNA testing was not going to solve a question in that case. Criminalistics is what would resolve a case like that. Was the shirt that the woman was wearing ripped open, or was it removed normally? Is there any other kind of physical evidence that came from the clothing that would tell us this was a forced interaction, not a purposeful interaction by the two parties?

Third question: "How likely is it that this requirement can be satisfied in a particular case?" Probative information comes down to the case context. Whatever we hear from the detectives or from the people who went to the crime scene—the people who made the determination of evidence availability on a victim's body, either at autopsy or elsewhere, if it's a non-death case—will determine whether something is probative. We, without context, are just providing information. We can't even help the investigation. So we often try to get that kind of information.

Fourth Question: "Do the requirements in recommendations six and eight cause proportionality problems because very aggravated murders might avoid the death penalty?" In my world, science is science, and law is law. I am not a lawyer, so it's not my call; it's yours.

Five: "Should fingerprints be viewed as adequate scientific evidence, and on what terms?" Latent prints, footwear impressions, tire impressions, other places where something is making an imprint on something else and we can make an individualization call after examination, can be highly probative; they can place people at scenes. However, they don't always tell us when. So, is it probative? Yes. It is always probative? No. Is it based on context of the case? Yes. And that's these scientists. They're all over the place. I thought fingerprints were great? Well, they are great. But they may not be helpful in this case. So it does come down to interpretations.

Six: "Should ballistics evidence be viewed as adequate scientific evidence, and on what terms?" This is the same as fingerprints or other impression evidence. One thing that is different about guns and fingerprints is if I find your fingerprints at the crime scene, I can say Fred was there at some point. I don't know if he was there the day somebody died. On the other hand, this weapon is shown to have been the one that shot the bullet that was found in the head of the homicide victim. Who was holding the gun? That isn't information that will be produced from my examination. That will have to be determined from other items of evidence from the crime scene, but at least we can say this gun was used. That it was owned by Fred is one thing. That he shot it, I do not know without examining Fred, the situation, and the circumstances of the crime scene.

Seven: "What does 'strongly corroborates the defendant's guilt' mean?" "Strongly corroborates guilt" recognizes the reality of what is conclusive scientific evidence. It depends on the case, but thankfully science is science, and law is law. So, there is some flexibility in how that interpretation is made in a given case. I think it incorporates appropriate flexibility.

Does the requirement undermine the "beyond a reasonable doubt" standard? Beyond reasonable doubt, in my opinion, is a legal requirement. Science cannot define "reasonable" any better than a given individual can, because there is law and emotion built into it. Science is not law and emotion based. Science is based on objective information derived from physical examinations using scientific methods. So, I guess I'm kind of skirting the question there, too.

Eight: "Can the requirement be imposed in a meaningful way in cases where the defendant waives the issue of a lingering or residual doubt?" I would say this should actually be the standard. Again, this is my opinion only. I think the standard should be

available for lingering and residual doubt in all cases. We should hold the outcomes to the same level of care in our process. It shouldn't depend on whether or not it is a capital case. I think every case should get the best quality examination results and probative value that we can give it. In a perfect world that would already be the case.

Nine: "Is the independent scientific review process that we talked about adequate to ensure accuracy of scientific evidence?" The nice thing is "ensure" starts with an "E." It is not "insure." So I would say ensure? Yes. Insure? No. The legal process that we all live in is not one that insures anything. Does it ensure it? Yes, we do the best we can in every possible case with the resources provided.

Ten: "Can an independent scientific review ever be truly independent?" Well, it involves conflicts of interest for a given case. It's not a scientific disagreement. Finding DNA tells us where the DNA came from. It doesn't tell us why it got there, how it got there, when it got there. That is up to the advocacy process around it on both the defense and the prosecutorial side. So the nice thing is, we give the information. If it's probative, great; if it's not probative, at least you had the information and you knew why it doesn't seem to matter in this particular case.

Eleven: "Should the accreditation of labs or certification of experts be required?" Now you are hitting me right in my home. Accreditation is now the accepted standard for the majority of forensic subdisciplines in the world. Accreditation is about the place where tests are done; whether it is a laboratory, or another building where examinations are performed. We want it accredited. Certification, on the other hand, is about the people. Unfortunately, the importance of having certified examiners is not widely recognized.

I am the past President of the American Board of Criminalistics, which certifies forensic examiners in physical sciences like chemistry, biology, DNA, bombs, arson, and so forth. So I'm a little biased. I think certification should be required of all of us in our field. It is not right now. Neither is accreditation required of all labs in our field—but it should be. Fortunately, the accreditation movement is doing better on the non-police side—the civilian examination side.

In our nation, most of the examinations for forensic purposes of fingerprints and guns are performed by law enforcement officers, who were hired for one thing but became an expert in another, i.e., this kind of forensic examination. Many of them are not from accredited organizations. That is something Massachusetts is working on already. The nation itself is kind of slow on this part. We hope that it will improve with time.

"What will be the effect of mandatory accreditation and certification on defense experts?" Mandatory accreditation would improve defense quality and appropriateness, but raise the overall cost even higher than it already is going to be raised by this model statute. I think it should be done. Will it be anytime soon? We shall see. It will cost a lot.

And the last question that I was asked, "Will the scientific evidence requirement undermine the right to appeal, because appellate courts will be influenced by their awareness of this strong evidence of guilt?" The right to an appeal shouldn't be undermined. On the other hand, I think it will actually improve the integrity of the overall appellate process if we have these kinds of requirements in place.

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