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Forensic Science Needs a Lot Less Finger-Pointing and a Lot More Solutions

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Editors' Note: The following speech was delivered June 4, 2010, by Joseph P. Bono, president of the American Academy of Forensic Sciences, at an ABA Conference at the Fordham University Law School in New York.¹

A FEW YEARS AGO I addressed an interesting issue in a workshop at the American Academy of Forensic Sciences meeting in Washington, DC: Who have been the most influential people in the enhancements in forensic sciences over the past few years? The response flowed off my tongue as if I knew the question was coming. Actually, my response was based on impulse rather than thought: Peter Neufeld and Barry Scheck. Ten years from now, if I am still around, and that might be questionable after what I am about to say this afternoon, my answer will probably be: Barry Scheck and Peter Neufeld. I will reverse the order because Barry is sitting in the audience. Barry and Peter and my other friends in the defense bar including fellow Academy board member, Betty Layne DesPortes, and my friend Steve Benjamin, have forced us to take a long hard look at what we are doing in forensic science and they are forcing us to do it better.

No matter what the endeavor, professionals at any level improve when challenged. We scientists think of ourselves as purveyors of the truth. We do not argue philosophy; we argue data. We do not appeal to emotions of the heart; we appeal to the processes in the head. However, we have a corresponding responsibility to address issues many of us are not equipped to address.

I am reluctant to say that too many of my colleagues take the “forensic” out of forensic science. Most of us have not been trained in the “forensic” part of forensic science. We are incapable of justifying our conclusions or methods if we must go beyond explaining charts, tables and photographs of images. We are incapable of sorting through conflicting viewpoints and formulating sound responses during cross-examinations or discussions similar to the forum we are conducting right now. We are reluctant to formulate cogent arguments because many of us are not trained to do so. My response to this: “Get over it,” and learn to communicate in the social science arenas, including the courtroom.

In the same vein I respectfully request that my colleagues on both sides of the bar educate themselves more on the basics of forensic science to be better prepared to question those who testify as expert witnesses.

Many have commented on my response to an article that appeared in a recent issue of *Newsweek*.²

The first requirement for a learned treatise or an authoritative text is that the author be learned or an authority. I have no evidence of that here, but there is that implication in the wording. This author talked about convictions in the 1980s and 1990s based on “faulty forensic science.” Based on my response to the *Newsweek* article cited above, a close friend advised me, “Take the high road, Joe. Be among those



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who call for rigor while avoiding quibbling over how much wrong was done when less powerful techniques were claimed to have more power than could be validated.”

He advised me that I would be wise to back down. Here is what he wrote, “All I’m saying is that when IP [the Innocence Project] insist faulty forensic testimony is responsible, it’s not helpful to scream NOT TRUE. Methinks thou doth protest too much, as the Bard would say.”

My response back included the following, “There is only one thing worse than protesting too much and that is protesting not at all. Methinks that too many have not protested enough.”

That same issue of *Newsweek* included an article by former United States Senator Alan Simpson of Wyoming.³ In fact this article was on the page facing Sharon Begley’s piece. Matt, you will appreciate what Senator Simpson said, “You’re entitled to be called a fool, idiot, bonehead, slob, screwball. But an attack unanswered is an attack believed.”

Many in forensic science have not been allowed to answer attacks directed against forensic science. I want to make the point that what I am saying here this afternoon would not have been possible three years ago when I worked for the federal government. Here is the reason: Whenever a government employee speaks in public, the speech must be cleared and usually watered down to ensure that it does not offend anyone. And when the speech finally has been cleared for delivery, the message is usually lost. Afterwards someone will call a supervisor or write a letter of indignation to an elected official about what had been said. Guess who is going to prevail in a conflicting opinion discussion between a government employee and the constituent of a congressman?

I admire the work of the Innocence Project in evaluating claims where exoneration may be considered, and then, through the use of DNA, “exonerate” those where exculpatory evidence exists. What I do not agree with is the viewpoint and proclamation that faulty forensic science is accountable for many of those convictions.

Conclusions in science are based on the technology and protocols of the time. A re-evaluation of some forensic science testimony from the past disclosed that so-called forensic scientists had not properly examined the physical evidence they were responsible for analyzing. In most other cases from the 1970s and 1980s, physical evidence had been properly evaluated and conclusions were rendered with strong caveats. Most of these cases included, but were not limited to: hair/fiber/soil/glass examinations, and blood-typing using ABO absorption inhibition techniques.

There were no attempts to deceive, and results were

reported based on protocols in existence at the time. Comparing blood types and the morphology of physical evidence were the accepted protocols. However, these conclusions should always have included caveats to ensure that there was no attempt to individualize those types of evidence to one person. I repeat, those accepted protocols of the day were never intended to associate any of this trace evidence or blood to any particular individual. It should not have happened then; it certainly should not happen today. If that association argument was made, the advocacy system in our courts required the other side in the courtroom to challenge the veracity of such claims.

Some may take offense with what I am about to say, but here goes: It is easier to abrogate responsibility in such a case than to admit culpability in not providing a proper defense, or to admit embellishment of forensic science testimony in a closing argument. Even more interesting is the

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fact that the forensic science testimony in many of these cases appeared much less significant in the outcome of the case than eye witness testimony or ineffective counsel. And yet charges of “faulty forensic science” remain the purported counterpoise on which the conviction is allegedly attributed.

To continue pointing at examples from 15-25 years ago and attributing the alleged norms then as the state of forensic science in 2010 is disingenuous at best. Forensic science is only one of many factors that contribute to the outcome of a trial. Forensic science does not convict or acquit; that is the responsibility for judges and juries.

Challenging the admissibility of forensic science testimony in court is the responsibility and the obligation of the defense and prosecution in all criminal cases. However, justification for doing so does not originate in the NAS report.⁴ Rather, it lies in the rules of evidence and appellate court decisions in the federal and state court systems. And

these rules were in place long before February 18, 2009. The number of times these confrontations happen in Daubert/Kuhmo/Frye pre-trial hearings is quite small; and the number of times this happens during trial is even more negligible.

Nothing has prevented these challenges in the past; and nothing prevents them now. I encourage jurists on both sides to call to task anyone who believes that invalid forensic sciences are being used in a courtroom. I was the first to say "STOP" when actual faulty forensic science in the laboratory was brought to my attention. I am not about to change my approach to challenging those who claim, "I'm right because I've been doing this for 30 years." Being from Missouri, I've always said, "Show me the data or images and explain what they mean."

To be clear, in an adversarial system, I will be the first to challenge the conclusions of the forensic scientist by evaluating the collection methods, examination methods, and data or images; however, those challenges are different from arguing that the testimony should not be admitted because the methods are unvalidated. In the use of "pattern evidence," there are no standardized quantitative thresholds for a conclusion, and there should be. For example, how much of the friction ridge pattern is required for an association of a fingerprint to an individual? Or is this even possible when minimal detail is discernable?

Let's examine for a moment what I refer to as one of the Mother of all Forensic Science mistakes. Let's call it what it is: a Gigantic Mess-Up (I used another descriptor in the last draft of this speech; however, my wife made me remove it before I left for the airport yesterday)—the Brandon Mayfield fingerprint debacle. There is little doubt in anyone's mind that the examiners in this case, and I believe there were a total of four, one whom actually worked for the defense, agreed that the latent print image that was faxed and originated from the bag seized from the train in Madrid, belonged to Brandon Mayfield.

The methodology was typical of what friction ridge pattern examiners do: examine friction ridge patterns images, usually from fingers. These prints are transferred to evidence from a person at a crime scene. The examiners then compare these patterns with those from a 10-print card associated with a known individual. If the patterns are indistinguishable, they associate the latent with the individual.

That methodology was used here. However in this case, the conclusion was dead wrong. The print from the bag did not originate from Mr. Mayfield. As was later discovered in an examination conducted by the Spanish National Police using an INTERPOL-AFIS system, the latent belonged to

an Algerian later identified as having participated in the bombing in Madrid. What is interesting is that the same comparison method using friction ridge patterns was employed by Spanish examiners. What changed? The quality of the print. The bag containing the latent was examined, not a faxed copy of the latent, and different examiners conducted the evaluation. The methodology of examining the friction ridge patterns was essentially the same.

This is an example of the use of a method, examining friction ridge patterns, and proving the method to be valid when used properly, and invalid when used improperly. In both instances the examiners were trained and experienced. In a trial, where I believe the adversarial system would have worked, that so-called individualization in Mayfield could

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have easily been debunked on cross-examination. In every case where a true forensic science error is made, there is always a smoking gun. Think about how many offenders have been identified based on friction ridge pattern identifications that used the current methodology properly. Does anyone remember how James Earl Ray was identified for the assassination of Dr. Martin Luther King in 1968? Truth can be irritating: You cannot be in favor of reality when it works for you and against it when you are losing an argument.

This leads me to discuss what I believe are the six most questionable words used to formulate the justification for a conclusion by any forensic analyst: **Based On My Training And Experience...**

Does anyone know how many years of training and experience the examiners in the Mayfield case possessed collectively? In looking objectively at some other forensic science errors, I soon realized that the mistakes were made by people who looked more like me than my 20-30 year-old colleagues in this audience.

Now it's time to confront some of my colleagues here

who work in the laboratory: Training and experience in the absence of demonstrative evidence mean little to me. A reputable examiner should be able to show the decision makers—the prosecutor, the defense attorney, the judge and the jury—the basis for a conclusion that is understandable and can be justified by data or images. If the examiner resorts to the “trust me, I know what I am doing logic,” a red flag should immediately go up: DON’T TRUST HIM!

Some arguments that I have encountered recently advocated advancing forensic science by bringing in more theoreticians and academics while leaving practitioners or prosecutors out of the discussion of “true science,” whatever that is. This sounds more like breaking eggs than making omelets. There are certain terms that are used in these arguments against forensic science which have taken on a life of their own and which I believe have no scientific meaning in the realm of applied science. One of these is “error rate.”

The term had its legal genesis in *Daubert v. Merrill Dow Pharmaceutical*.⁵ Prior to 1993, I had never heard this term used as a requirement of any science. And even if it purportedly is a requirement of science, which it isn’t, *Daubert* does not require an error rate. Interesting, if you turn to page [594 of the published opinion], the *Daubert* decision speaks specifically of error rate in relation to voice print examinations, where many errors do occur.

Let’s discuss for a moment the term “error rate.” Rate means numerator over denominator. And until someone credibly and consistently defines the numerator and then the denominator in evaluating a forensic science discipline, it is illogical to discuss a calculation of error rate that applies to that scientific discipline. One can calculate the number of unacceptable results in a proficiency test in a forensic science discipline administered to a defined number of test takers. However, this number cannot be used to extrapolate to a conclusion regarding the number of unacceptable results that would occur in actual casework in the same forensic science discipline.

During the first week of May, I attended a Council of Scientific Society Presidents meeting in Washington, DC. I especially enjoyed this meeting because I listened to and learned from other scientists with similar and different experiences whose thought-processes were close to my own. They were, after all, trained in the scientific method that requires testing an hypothesis with data.

Two days later I spoke at a superior court judges conference in Washington, DC. This conference was designed to examine the “Role of the Court in an Age of Developing Science and Technology.” What an eye-opener that was! I was one of a few forensic scientist speakers on the program who had actually worked in a laboratory. When I accepted

the invitation, I thought this opportunity to speak in a “lawyers’ forum” would be self-fulfilling and all that other “feel good stuff” I had come to expect from similar experiences behind a microphone. It didn’t quite work out that way. I walked away from that conference experiencing a “wake-up call” best described as something from two movies I had recently viewed: *No Way Out* and the beach landing scene from *Saving Private Ryan*.

Social scientists do not view the world through the same prism as those who use the scientific method in directed problem solving. What I experienced was this: The validity of the arguments, “truth” or “fact” or call it whatever you choose, in the discussions that day, were not based on what I regard as substantive definitions of terminology.

In the legal setting, “truth” may be, and too often is, determined by the most passionate argument. In many instances speakers defined their own terms with their own definitions. That day, “error rate” was defined by many different people in many different ways. In discussions among some lawyers, truth has a way of being annoying yet negotiable.

There are those who believe in a forensic science discipline when it works for them, and are against the same forensic science discipline when it does not work to their advantage. I realize that this apparent inconsistency forms the basis for the adversary system. In one case an attorney is expected to challenge the validity of a forensic science method if it is in his client’s best interest. In a totally different case, he may embrace the same forensic science method if it is in his client’s best interest. In science we test a hypothesis with data. One can be more confident in an opinion specifically because the weight of the science supports the conclusion.

Many of us have encountered some legal settings where a conclusion seems to have been constructed by finding the citation of someone who, no matter how obscure, agrees with them, while overlooking the opinions of those myriad of others who disagree.

In reading much of the commentary and discussing some purported factual statements which are out there regarding “The Report,”⁶ I am convinced that many who have access to Wikipedia or Google, no matter how limited their backgrounds, believe they are experts at defining the rules for the forensic sciences. Actually, they are tailoring these rules to suit their own agendas.

I am confident that the United States Congress in the pending draft outline of forensic reform legislation will bring those who have experienced forensic science in the laboratory in the real world on a daily basis into the process to play a major role in determining the best legislation to

strengthen forensic science. The Inter-Agency Working Groups (IWGs) for the White House Subcommittee on Forensic Science of the executive branch will also examine how best to accomplish this goal. I admire the efforts from both these branches of government for reaching out to forensic scientists from laboratories across this country and bringing forensic scientists into their fact-finding processes.

I believe that the framework which will emanate from the legislative and executive branches of government on how best to strengthen forensic science will be based on the fact that what happens in the next 25 years will be predicated on our experiences and shortcomings of the past 25 years. Let's not make the same mistake again by falling into the "it's good enough trap." Good enough seldom is.

A lot of "justice," exonerations and convictions, have occurred in our court system because of the advances in the forensic sciences. However, we have a long way to go to ensure that the best forensic science possible will be the work-product of the discussions and consensus building that will take place over the next few months.

President Obama, when speaking about those who have differing opinions, said, "America evolves and sometimes those evolutions are painful. People don't progress in a straight line."

Scientists are people and therefore science never has and never will progress in a straight line. Even though some mistakenly believe "linear" defines "good science," those of us who have worked in a laboratory realize that the line does not always pass through all the data points. We look for the "best fit" of the data.

To my colleagues in the laboratory, I say: These next few years may be painful. People are reluctant to rock the boat when they are in the boat. However, it is time we acknowledge the fact that we will not move forward by continuing to do things in the same way. Face the fact that all of us must pay attention to what we knew pre-February 2009. We must do a better job formulating our conclusions, writing our reports, and enhancing the science in our scientific methods. I am talking about revisions in the way we approach our responsibilities to the justice system.

Let's "get over it" and realize that while change can be painful, change is never permanent. Yet change for the sake of scientific improvement MUST be embraced. To my younger colleagues I suggest that you buckle up because you will probably be doing this again in a few years. You will be responsible for keeping this process moving forward. NFL Commissioner Roger Goodell delivered a commencement speech at the University of Massachusetts-Lowell Saturday, one week ago. He used a concept that I have used in many speeches. The quote was related to what

some perceive as his attempts to bridge a gap between the NFL owners and the players' union. His words are on target for what we are now facing regarding tough decisions in forensic science. Here is what he said:

Listen to many different viewpoints, especially with those whom you disagree. Resist the temptation to make premature decisions and be open to finding a better solution. And if it's a better solution, it doesn't matter who it came from. The world needs a lot less finger-pointing and a lot more solutions.'

Thank you all very much for your attention this afternoon.

- 1 Reprinted with permission of the speaker.
- 2 Begley, Sharon "But it Works on TV: Forensic 'science' often isn't" *Newsweek*, April 12, 2010.
- 3 Simpson, Alan "No One Forgives Anyone," *Newsweek*, April 12, 2010.
- 4 National Academy of Sciences, *Strengthening Forensic Science in the United States: A Path Forward*, February 18, 2009.
- 5 509 U.S. 579 (1993).
- 6 See fn. 4.

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