



E22 Ensuring the Continued Role of Science in the Forensic Examination of Trace Evidence

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The goal of this presentation is to give the audience an understanding of the extent to which a thoughtful and creative scientific approach to the examination of forensic evidence can provide information beyond a standardized, protocol-based examination. Furthermore, the participant will be provided with successful case-based examples of circumstances when such investigations are applicable and why protocol-based approaches can be inherently limiting in the most demanding investigations.

This presentation will impact the forensic community and/or humanity by demonstrating the critical importance for retaining an outlet for a purely scientific-based approach to the examination of forensic evidence that is not subject to protocols and accreditations that are becoming increasingly common amidst the growing legislative pressure for certification and accreditation among forensic scientists and laboratories.

The goal of this talk is to discuss the roles of science, scientists and technicians in forensic laboratories in light of the increasing influence of protocol-based examinations and the growing number of accredited laboratories. It should be noted that purpose of this talk is not an attempt to deconstruct the inevitable growth of protocol-based examinations, but rather to point out the real and necessary need for the presence of non-accredited laboratories that specialize in analyzing non-routine samples within the forensic science framework.

When speaking and writing about forensic science policy, too often the terms science, scientist, and technician are muddled. Simply put, science represents the application of logic to the solution of problems. A scientist is one who applies a scientific approach. A technician follows directions without necessarily understanding the basis for an analysis or its interpretation. In regards to protocol-based examinations, protocols typically are designed by scientists, individuals that understand the science behind a particular type of analysis well enough to standardize a given procedure for the purpose of making a certain subset of analyses routine. In these cases, the standard procedure can be considered scientifically valid when applied to the proper types of samples. However, the person that applies these procedures is *not* a scientist, but a technician. The result of such an analysis *may* be scientifically justified. In drug and DNA analysis, technicians play a necessary and important role in the forensic system and their results are generally adequate. It should be noted that a) when a fixed protocol is applied to any sample, some finite amount of ancillary information will always be lost and b) there is always a finite percentage of cases that do not conform to the protocol.

In categories of evidence that are subject to greater variability (*i.e.*, trace evidence), attempts to confine analyses to standard procedures and protocols have a larger potential for overlooking relevant analytical data or applying the wrong analytical tools, both of which can very easily lead to incorrect interpretations of evidence. In many of the most advanced (*i.e.*, difficult) trace evidence cases, the most significant evidentiary information can only be extracted through analyses custom-tailored to the particular evidence of the case. This can require instrumentation, techniques and expertise not considered in a typical protocol. While these cases may be small in number, the evidence can be certainly no less important than that examined in more routine types of analysis. Arguably, trace evidence may be more important in such cases, because it may be the only remaining avenue of inquiry.

Unfortunately, with the growing prevalence of laboratories that operate on standard and often inflexible protocols, the need for customized analyses of forensic evidence is often overlooked when legislation is considered. As a result, states are beginning to require accreditation for specific types of analyses, or in certain instances, accreditation for all forensic analyses. This leads to a number of problems and contradictions. For example, it is a common practice for accredited laboratories to bring in experts in a particular field from a non-accredited laboratory for advanced training. However, though recognized as an expert by the crime laboratory, such an instructor is not permitted to testify in that state's court system. As another example, a non-accredited laboratory may be used to identify investigative leads from available evidence; however, should these leads come to trial, such an expert would not be permitted to testify. These points will be further illustrated through case-examples.

In conclusion, protocol-based analysis is a necessary reality of forensic science; however, by design, protocol-based analyses encourage a technician mentality. While this may be considered acceptable



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when processing large numbers of relatively similar samples, deficiencies in protocol-based approaches become more significant when attempting to constrain more variable types of evidence to this approach. Therefore, even after protocols have been developed for all types of evidence, there will always be a need (even if not recognized by legislative bodies) for scientific analyses free of protocol-based constraints to be able to extract the most information from possible from a sample. Finally, it should be noted that only by continually applying new (non-standard) techniques that forensic science will continue to develop.

Trace Evidence, Accreditation, Protocol