



B152 Scientific Crime Scene Investigation

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After attending this presentation, attendees will have learned that crime scene investigation both requires a scientific examination and can meet the criteria mandated by the scientific method.

The most critical problem in forensic science today is the examination of crime scenes. It is the initial forensic science examination and its results are the predicate for all the highly technical and sophisticated examinations that follow. Any unreliability in the crime scene examination can seldom be rehabilitated by subsequent laboratory examinations. Proper investigation requires a scientific examination. This presentation lays the foundation for a scientific approach to crime scenes.

The foray initiated by the *Daubert* decision seems not to have impacted crime scene examinations as it has the rest of forensic science. In large part, this seems to be due to the prevailing opinion that crime scene examinations are a technical activity, not a scientific one. There are some, however, who advocate that crime scene examinations not only are included in the overall discipline of forensic science but are the fundamental examination. There is little question but that it is the initial examination and that the reliability of all subsequent examinations depends on the quality of the evidence collected at the scene. But merely being the precursor for a scientific examination does not make it scientific. This presentation will advocate that the nature of a crime scene examination requires that it be performed scientifically and delineates the criteria that it must meet.

There are those who accord scientific stature only to disciplines based on technology. Science, however, is as much a thought process as a testing process. A scientific examination must have been based on a valid theory, conducted according to a reproducible, empirical protocol, and evaluated according to objective decision criteria. These criteria apply to crime scene examinations.

There are those who accord scientific stature only to endeavors that have a corresponding academic discipline. The investigation of evidential materials associated with crimes and accidents requires a wide-ranging set of background knowledge and skills incorporating aspects of most of the scientifically based forensic science disciplines. In particular, background knowledge touching on engineering (vehicular accidents and materials science), medicine (cause and manner of trauma and death), and criminology (criminal motivation and conduct of crime) is required. Obviously, one must have a sound grounding in the basic sciences of chemistry, physics and biology, as well as mathematics, logic, and statistics, to conduct competent investigations of evidential materials.

There are those who would deny scientific status to crime scene investigations because they are performed by non-scientists, (i.e., investigators). This is similar to the argument used against some of the other forensic sciences and is fallacious. The two major considerations of a crime scene investigation are reliability and relevance. The characteristics of a scientist are required for reliability – conducting valid, reproducible and objective examinations to obtain and interpret data. The characteristics of an investigator are required for relevance – applying inferences from the data obtained in order to solve crimes. Unfortunately, because our society is split into a dichotomy of scientists and non-scientists, mirrored by a dichotomy of forensic scientists and investigators, this combination investigator/scientist currently is a rarity. It does not have to remain so.

The distinguishing characteristic between a technician and a scientist is that the scientist interprets evidence while a technician only collects evidence. To begin the educational process to upgrade crime scene technicians into crime scene scientists, the field needs further analysis of the decisions that are made by crime scene investigators. The decisions required to interpret evidence vary according to the issue being investigated, i.e., the question being asked. Although the crime scene investigator will commonly be expected to reconstruct the events (explain what happened), on occasion he will be required to classify materials and to individualize them. Consequently, courses must be designed to develop facility in making all three types of decisions, not just how to properly collect and document objects and the changes in them.

Crime Scene Investigation, Scientific Examination, Crime Scene Science