B37 Where Are the Scientists?

John J. Lentini, BA, Applied Technical Services, Inc., 1190 Atlanta Industrial Drive, Marietta, GA 30066*

After attending this presentation, attendees will understand the need for scientists on the crime or fire scene. This will be one of five presentations in a two-hour discussion on this topic.

This presentation will stimulate some thought about how to solve the problem of fire investigations being conducted by individuals with little or no scientific training, and to stimulate some interest on the part of forensic scientists in becoming involved in fire investigations.

Fire investigation is a forensic science that is a world unto itself. The investigator who ventures here risks exposure not only to a unique and possibly dangerous physical environment, but to scientific, professional and personal challenges not found in any other field of forensic science. Scientists from traditional forensic science laboratories may feel overwhelmed and unprepared for the analytical challenges, many of which make mastery of a laboratory analysis seem like child's play. At first blush, it seems like nothing we learned in our study of chemistry or physics will explain the chaos that presents itself after nearly every fire, but with patience, and practice, and a careful application of the scientific method, the truth can usually be teased out of the ashes.

Unlike a homicide or a robbery or almost any other incident that requires investigation, a fire is unique in that the first major task, and often the most daunting one, is to determine whether a crime has taken place. It is necessary to look pretty carefully to find another field of investigation in which this is true. Unexplained death comes to mind, but in that case, there is a clearly defined set of protocols, the forensic autopsy, that will usually resolve the question unequivocally. The medical analogy is a useful one because the fire investigator is called upon to perform a forensic autopsy of a structure or vehicle to determine the cause of the fire. The deviations from the analogy, however, are what make it interesting.

The medical examiner performing the autopsy has an undergraduate degree, usually in a natural science, a four-year medical education, and several more years of internship and residency in pathology and/or forensic medicine. The fire investigator, on the other hand, may have no education beyond high school, and a forty-hour "basic arson" school, followed by an eighty-hour "advanced arson" school, and continuing education taught by people with the same training, and more experience. Certainly there are many skilled fire investigators who can and do perform careful, science-based investigations, even without the benefit of formal scientific training, but that is certainly not the rule.

The methodology of the medical examiner is also likely to be very predictable, in that he or she will follow a written, peer-reviewed protocol, and will feel no discomfort at publishing and sharing the results of the autopsy with colleagues. The methodology of the fire investigator, on the other hand, depends almost entirely on who the investigator is and by whom he or she is employed. There is a constant, and frequently fierce debate on what standards, if any, fire investigators should be held to, on whether fire investigation is an art or a science or a mixture of both, and on the level of training and certification required to do this difficult job.

How did this situation come about? How is it possible that an individual with no formal scientific training in chemistry and physics, and no certification, filled with misconceptions about the phenomenon he professes to have expertise in, is allowed to opine before a jury on issues of life and death? More importantly, what can be done about it?

This situation arose, quite simply, by default. Comfortable in clean, air-conditioned laboratories, only occasionally venturing out into a crime scene, forensic scientists, with few exceptions, have left the field of fire scene investigation to the non-scientists. They have been content to participate in the modest task of determining whether a sample of debris contains ignitable liquid residue. While proper chemical analysis is important, and improper analyses have "verified" otherwise unsupportable hypotheses, the bulk of the hypothesis formation and testing (when the investigator chooses to follow the scientific method) takes place in the field, in the dark, dirty, smelly burned out hulks of former residences, offices and factories. One of the purposes of this session is to encourage interested scientists to overcome their aversion to disorder and bring their scientific talents and knowledge to a field sorely in need of it.

But stepping into the field without proper training in the investigation of fire may have worse results than going forth without the benefit of a scientific education. The current occupants of the fire investigation community do not yield their territory gladly, and a scientist not affiliated with a federal agency may find actual hostility from local law enforcement investigators. If scientists are to take over the lead in the determination of fire causation, they need to be at least as thoroughly trained as those whom they would replace. They need to go to "arson school," to light fires and watch them burn, and to conduct experiments. The forensic science community needs to find the will to do this job that has so far been left to non-scientists. It needs to find the money to provide the necessary training. It needs to find the scientists willing to get their hands dirty, and it needs to introduce those scientists to the field in such a way that they are welcomed as legitimate and necessary participants in the investigation.

Fire Investigation, Scientific Method, Training

 ** Presenting Author*