

FIRE INVESTIGATOR:
A Thirty-Year Perspective
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Introduction:

After thirty-plus years of being a fire investigator for both the public and private sectors, I have learned that the community of fire investigators has a serious deficiency in our make-up. That deficiency is in our lack of skepticism. Hopefully, by the conclusion of this paper you will agree.

One evening in early 1972, I was a sheriff's deputy on patrol when I came upon a house fire close to where I lived. I called in the alarm and watched while the local volunteer fire department arrived and extinguished the blaze. I was invited back to the engine house for a cup of coffee with the firefighters. After socializing with them I realized that being a volunteer firefighter looked like an exciting activity. So, I joined.

Shortly after joining the Fire Department, the Fire Chief said: "You are a firefighter. You are a police officer. Therefore, you should be a fire investigator." Since I had no concept what a fire investigator did, I agreed. The next fire scene that I went on I watched the Chief go into one room of a multi-room fire, kick around some debris with his boot, and declare the fire was "electrical." At that point, I said to myself, "I can do this!"

Since then, I have been a fire investigator for both police and fire departments, an insurance company, and two private businesses, of which the latest one is one that I own. I have been at it long enough now that I can finally say those words that I used to hate to hear from others: "I've been doing this for 30 years!"

In my opinion, the most significant result in thirty years of doing fire investigation is the changes that I have seen in the business that we call fire investigation. I think that many of these changes were significant and many of them would have been better welcomed had we, as investigators, maintained a higher level of skepticism in the years past.

Skepticism:

Skepticism has one definition that reads: “The philosophical doctrine that absolute knowledge is impossible and that inquiry must be a process of doubting in order to acquire approximate or relative certainty.” Dr. Carl Sagan, the noted astronomer, and scientist characterized the value of skepticism to science in his book, A Demon-Haunted World: Science as a Candle in the Dark. He addressed it in several chapters but two of my favorites are in the chapter, Science and Hope. He said:

“The scientific way of thinking is at once imaginative and disciplined. This is central to its success. Science invites us to let the facts in, even when they don’t conform to our preconceptions. It counsels us to carry alternative hypotheses in our heads and see which best fit the facts. It urges on us a delicate balance between no-holds-barred openness to new ideas, however, heretical, and the most rigorous skeptical scrutiny of everything – new ideas and established wisdom.”

And, he further said:

“There are no forbidden questions in science, no matters too sensitive or delicate to be probed, no sacred truths. That openness to new ideas, combined with the most rigorous, skeptical scrutiny of all ideas, sifts the wheat from the chaff. It makes no difference how smart, august, or beloved you are. You must prove your case in the face of determined, expert criticism.”

He concludes with:

“The tenets of skepticism do not require an advanced degree to master, as most successful used car buyers demonstrate. The whole idea of a democratic application of skepticism is that everyone should have the essential tools to effectively and constructively evaluate claims to knowledge. All science asks is to employ the same levels of skepticism we use in buying a used car...”

My take on Dr. Sagan’s perspective is that we should be more skeptical than we have been in the past. Let me explain.

When I first became that fire investigator in the early 1970’s, I knew nothing about what fire was, how it spread, how materials responded to fire exposure, how fast fire could move through fuel packages, etc. So, I began to attend fire seminars, many put on by “recognized experts” in

the field. I learned many valuable things such as these statements taken from old seminar notes:

1. If a fire scene has melted copper wiring, then it was abnormally hot and had to have been accelerated by gasoline.
2. Fire only burns upward; therefore a hole in a floor must have been the result of burning liquid accelerants.
3. Alligator char is created by a rapidly-developing, intense fire and is evidence of burning accelerants.
4. Color of flames and smoke are proof of burning liquid accelerant.
5. Fully-involved compartments in a few minutes of time are too fast to be accidental fires.
6. Spalling of masonry floors is proof of burning liquid accelerants.
7. Collapsed furniture springs are proof of burning liquid accelerants.
8. Burning under doors can only occur from the ignition of pooled liquid accelerants.
9. I have eliminated all potential accidental fire causes, therefore it must be arson [Negative Corpus] (“Absence of evidence is not evidence of absence”)
10. And the list goes on and on and on...

I heard these “facts” presented by notable, well-regarded experts in the field of fire investigation. I continue to be friends and associates with many of these people today. Many of these same people learned from their previous generation similar concepts and “facts.” I not only accepted these tenants as facts, but I repeated them in lectures that I gave once I became an accepted expert in this field. I made an assumption that anything that I heard said from a podium at a fire seminar was accurate and factual. This sort of on-the-job training was the accepted, and for the most part the only, means for fire investigators to learn their trade. It certainly was the primary means for my educational development.

One of my favorite concepts, passed down by the generation of fire investigators that preceded mine, is from the book, Fire Investigations by a gentleman only known to me as H. Rethoret, who wrote in 1945:

“The sense of taste can also be used to good advantage. Prior to relying on the sense of taste, it has been recommended that fresh breadcrumbs be chewed for a while and then expectorated in order to get a clean taste in one’s mouth. The suspected place is then lightly touched with a piece of bread which, in turn, is chewed for a while. The taste of combustible material is then noted, even if only a slight trace of it adheres to the bread. While this is an

unappetizing method, it is useful. Practically everyone can recall from time to time tasting kerosene if the food accidentally (sic) touched that liquid.”

When I learned these “facts” from these friends and fellow experts, I never thought to doubt that the facts were wrong or oversimplified to the point of being valueless. On the contrary, I accepted them willingly and gratefully. Grateful, generally, because they made my investigations so much easier! If I have some or most of these characteristics on my fire scene, it clearly must be an arson fire aided by the use of liquid accelerants.

As a consequence, I worked many fires where I determined that the cause was arson. In fact, the numbers of fires that I worked that were judged to have been arson were approximately 40% of the total number of investigations that I did in my early career as a fire investigator. I have encountered fire investigators, in recent times, as well as in the past that have made determinations of arson in near to 100% of their cases. In the 1970's and 80's, in America, the incidents of arson were increasing at an unbelievable rate and there was considerable concern in this country. Most of us old-timers will remember when arson was upgraded to a Type I crime and began to be listed in the FBI crime statistics. Further, then-President Nixon convened a blue ribbon committee to study the unbelievable increase in arson in this country. The National Commission on Fire Prevention and Control, in turn, published the report, America Burning in 1973 that specifically addressed, among other things, the inordinate increases in arson. I certainly did my part in keeping these numbers high.

In 1984, the National Fire Protection Association formed the Technical Committee on Fire Investigations. I was fortunate to be named to that committee. Although I had been having misgivings about some of the benchmarks that I was using in my fire determinations, it was at this time that I became aware that the benchmarks I had long relied upon were false.

The Technical Committee consisted of several people who were scientifically knowledgeable but were not “dirty-knuckle” fire investigators. Once they heard of the investigative benchmarks that I had long relied upon, they were aghast! I became aware in short order how wrong these concepts were. Of course, NFPA 921, Guide for Fire and Explosion Investigations, explained in great detail these errors, euphemistically called “misconceptions” in the earliest editions. As a consequence of NFPA 921's impact on the fire investigation community, the Technical Committee was convinced in removing the terminology

“misconceptions” from the document. The rationale was that this term triggered vigorous cross-examination in depositions and trials. The argument to remove such wording was to make the document more user-friendly! Apparently, facing the truth was too painful to some of us.

What has not been widely discussed was why we were misled and misinformed to begin with? I believe we were misled and misinformed because we wanted to be! Someone somewhere decided some concept was scientifically valid and began to discuss that concept to others. Such actions are proper within the scientific community. The breakdown came when the listener heard the concept and did not express any degree of skepticism. We took it upon face value because: we respected the author; accepted the concept because it fit nicely into our problem that needed to be solved; the concept gave an answer that seemed to fit the circumstances and our common sense; or a myriad of other equally perceived valid reasons.

I do not believe that most of the misconceptions that I labored under in my early days as a fire investigator were created by persons that deliberately intended to deceive us. I believe that the person who developed the mistaken concepts used their common sense and ability to speculate and offered up the concept. This practice is common in mankind and quite allowed in science. The listener is the one who has the burden to question the concept and view the unproven ones with the appropriate skepticism. Unfortunately, the wholesale acceptance of unproven speculation is also quite common in mankind. How else do you think we got UFO's, the Loch Ness monster, crop circles and religious charlatans?

A second problem has developed regarding the applications of incorrect fire science principals to our work. This problem is the refusal by some to accept the debunking of the misconceptions. Dr. Sagan discussed this aspect as well in his aforementioned text. He said:

One of the saddest lessons of history is this: If we've been bamboozled long enough, we tend to reject any evidence of the bamboozle. We're no longer interested in finding out the truth. The bamboozle has captured us. It's simply too painful to acknowledge, even to ourselves, that we've been taken. Once you give a charlatan power over you, you almost never get it back. So the old bamboozles tend to persist as the new ones rise.”

We have seen such perspective in recent times when fire investigators, who have been informed that the concepts that we used in the 1970's and 80's were incorrect or misapplied, refuse to accept the scientific

proof and continue to rely on the old misconceptions. Instead of accepting the change that has occurred, they have attacked the messenger arguing, for instance, that the messenger is “not authoritative”, “only a guide”, “written by people in white lab coats” and “a tool developed by the plaintiff or defense attorneys.”

Change Is Coming:

The upcoming years will see considerable change in the fire investigation field. There is research, some already complete and some still in the development stage, that will begin to quantify fire patterns. This is a huge issue when you consider that fire pattern analysis is the primary means that we use to identify the fire’s origin. A preview of some of this research can be seen in the following reports:

- USFA Fire Burn Pattern Tests, report issued by the Federal Emergency Management Agency of the United States Fire Administration.
- Full Scale Room Burn Pattern Study, report issued by the National Institute of Justice, United States Department of Justice.
- Flammable and Combustible Liquid Spill/Burn Patterns, report issued by the National Institute of Justice, United States Department of Justice.
- Pyrophoria, Doctorial Dissertation by Bernard Robert Cuzzillo for University of California at Berkeley.

These representative documents indicate that there is an absence of scientific validation for most of the fire pattern analyses. Further, some of the initial findings suggest that we are working with another group of “misconceptions.”

Another area of change is the methodology we use to process fire scenes. Spoliation, “other interested parties”, large loss fire scenes, Daubert, Kumho Tire, Benefield and NFPA 921 are all impacting the manner in which fire scenes are processed. It is no longer sufficient for an expert to discuss his or her opinions. Now, the methodology utilized to gather the facts and reach those opinions is subject to legal scrutiny. The ultimate end of this area of change will be that fire scene processing will become more costly and time consuming. I believe that fire scene analysis today is substantially more thorough than what we did in my early years.

With these types of changes in our lives, we need to develop a means to judge the multitude of issues that arise. We need to have a “baloney detection kit” ready to go. What might we put in our kit? Dr. Sagan

provided me with a great list and I modified it somewhat to suit the needs of the fire investigation community:

1. Whenever possible there must be independent confirmation of the facts
2. Substantive debate of evidence by knowledgeable proponents of all perspectives
3. No arguments from authority (there are no authorities in science)
4. Develop multiple hypotheses for testing each issue
5. Don't get too attached to any one hypothesis just because it is yours
6. Look at every link in the argument's chain for weaknesses
7. Remember Occam's razor (Two hypotheses with equal weight – choose the simpler one)
8. Is the hypothesis untestable? (Experiments are the great equalizer. Einstein said "No amount of experimentation can ever prove me right; a single experiment can at any time prove me wrong")

Likewise, there are things that one should not do in testing for baloney:

1. Attack the arguer and not the argument
2. Argue from authority (I know it when I see it!)
3. Argue from adverse consequences (What? Let an arsonist go free?)
4. Appeal to ignorance (negative corpus)
5. Observational selection (Saw accelerant patterns created in 'test' burn or "counting the hits and forgetting the misses")
6. Statistics of small numbers (I did it once and it proved me right.)
7. Exclude the middle ground (Either you are with us or against us.)
8. Create a caricature or straw man to make it easier to attack (Expert arguing against me is a whore for the plaintiff [or defense])
9. Use weasel words (heavy char, hot fire, too fast.)

Conclusion:

A time will come when you will be attending a fire seminar with the purpose of broadening your education and hearing new concepts. Keep an open mind to the new concepts that you will hear. But, as Doctor Sagan said, "Don't open your mind so far that your brain falls out!" Be skeptical. Ask questions. If the explanation does not make sense, beware. If the concept offered cannot pass your baloney test, beware.

Likewise, if you are an insurance representative or lawyer or someone else who is a consumer to the fire investigation community, challenge your expert to explain his or her findings. Does the answer make sense? Does the answer pass the baloney test? If not, how can the findings be sensible to a jury? Ask the expert to explain the science behind the

theories and opinions. Does it sound like what you just read in a reference book? Remember, skepticism is a good word. You should use it as a measure of anything related to fire investigation.