WHAT IS FIRE SCIENCE?
By
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My first class in "fire science" was at Santa Ana College in the early 1960s. I remember thinking when I first entered the fire service that I was going to get into some real "science" to be able to fully understand what I was doing as a firefighter. Before I started my new career, I was a biology student and was accustomed to the scientific method of inquiry. Not unlike many of you, I was really enamored with the early textbooks that attempted to define exactly what that science was all about. I recall that in one of my first classes, the textbook for the class was the "NFPA Handbook." I think it was the 5th Edition at the time. The book was massive and contained many articles that I simply did not understand. I diligently read the homework assignments and periodically found myself "in over my head".

Why? Well, because I am not an engineer and I simply did not understand some of the things that I was being told. Until I could visually see them they did not really exist in my mind. This led me through decades of burning buildings as part of the state fire training process to gain experience in fire behavior and building construction. Even then, what we lacked in instrumentation, we made up for with observation. Our definition of fire science was still woefully inadequate. I don't know how many thousands of hours I spent lying on my stomach trying to create flashover conditions in a room with contents. I conducted numerous burn activities actually trying to create backdraft. I remember studying the concept of rate of heat release as part of the vocabulary of dealing with fire flow. I continued calling it fire science but it was really a practitioner's science.

You might be wondering why I am raising this issue now. Well, it is because fire science is now actually coming to the forefront as realistic science to support our operations. What I am referring to specifically is the work of Steve Kerber at UL, and Dan Madrzykowski at NIST and many others who are contributing through experimentation and documentation to the growth of our knowledge. If you are not following their efforts and their publications you are missing out on a big part of your own education and experience. I am not going to elaborate on what they are actually doing because I hope that you will spend the time going to the UL or NIST website and finding out for yourself. Check out the following websites *nist.gov/public-safety-security-portal.cfm* and *ul.com/global/eng/pages/newscience/firesafety/*. Better yet, put these two websites under your favorites or post them on your iPad so that you can periodically go back and look at them. It is not good enough to check them out just one time. You need to look at them

about every six months. What is posted there is going to change and you need to know about those changes.

What I do want to place emphasis on is the importance of this type work. As I look back on the past of the fire service, I realize that there were significant authors who helped shape the philosophy of modern firefighting tactics and strategy. How can anyone even begin to discuss the topic of tactics and strategy without mentioning Lloyd Layman? Or, Manny Fried – or Bill Clark. Each of these gentlemen contributed significantly to the development of our tactics and strategy through their wisdom and experience.

I learned a long time ago that there is a difference between a demonstration and a test. Demonstrations are when you attempt to show somebody something that you want them to learn, and you are trying to make the point, but you are not sure how it is going to work out. A test is something that you design so that every time you do that test, you get the same identical results. We, as firefighters, deal a lot with demonstration. Scientists deal a lot with tests. It appears that there may well be a really strong need for us to bring these two concepts together in a much more formalized fashion.

What I am in reference to is modern fire ground tactics and strategy. There are many individuals in the fire service that don't believe that they need to learn anything new because they have been around for a long time. I am reminded of the old adage "a person can have 25 years' experience – or one year experience, 25 years in a row". My friend Shane Ray and others have now coined a term called the "smart firefighter". I can recall the London Fire Brigade in the 1990s talking about the "safe firefighter". In other words, how do we fireproof the firefighter?

As one who is experiencing the waning years of a career, I would love to have the opportunity to use the way-back machine and start all over again. I am convinced that we have a whole new generation of firefighters that have the opportunity to alter their behavior towards fire by using science instead of intuition. It will not happen by accident. It will only happen when people become firmly committed to changing their vocabulary and their behavior based on the strongest possible evidence that is emerging from the work of science.

I don't want to disparage the experience that I had, because it was valuable. I once worked on a project that took us almost a year to burn down the business district of a town called Willows. We obtained thousands of hours of experience in a relatively short period of time. That type of training environment doesn't exist very much anymore. I will guarantee you that no matter how sophisticated a simulator is it is not the real world. We need to do everything in our power to understand the real world as we use our knowledge as a tool. Go to the UL and NIST sites, read

the information they are offering us and then ask yourself how does this apply to me. If you are in operations, it could apply on the next fire that you are going to. If you are in fire prevention, it could apply to the next fire investigation you conduct. If you are a fire chief, it could apply to your future plans for protecting your community. We all have a stake in science.