

The Making of the Criminalistics Maestro

On the knowledge, skills, and abilities to oversee and coordinate the work on non-routine and complex cases

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*“Criminalistics is fundamentally an intellectual endeavor which is concerned with **scientific problem solving**. It is not merely a loose amalgam of sundry techniques and technologies.” (De Forest, 1999)*

- In the beginning, specialists may have been called upon to assist law enforcement in a particular area in an *ad hoc* manner (prior to 1900);
- Specialists most often were consulted in cases that the police were unable to solve and that shocked the public opinion (e.g., 1929 St. Valentine's Day Massacre in Chicago).
- In addition to their main areas of specialty, these experts were then solicited to expand casework to include other areas of science:
- A scientist conversant with more than one subject area = The generalist;
- Once a critical mass of generalists was attained, work was divided up based on type of evidence = specialists in confined disciplines = focus on development of specialists...
- ... at the expense of developing generalists.

*"The GENERALIST. A criminalist that can look at the evidence as a whole and see a **full** picture."* (Hunter, 2000)

- ✦ Conditions for working on complex cases:
 - ✦ Overview of the scientific aspects of the case;
 - ✦ Understanding the RELEVANCY of the evidence with regards to the case at hand;
 - ✦ Identification of RELEVANT questions (hypotheses, alternatives, assumptions);
 - ✦ Informed decisions regarding RELEVANT testing;
 - ✦ Ability to INTERPRET the totality of evidence within the context of the case;
 - ✦ Focus on maximizing the utility, NOT quantity, of analyses done.

Think of criminalistics as an orchestra.

*Each of the specialization areas is required to play a symphony. But a **conductor** keeps them all together, playing the same orchestral piece, in the same time, and lets each section know when their part is required, when solo's begin, when they end.*

*And think of the tools that we acquire, no matter how sophisticated, as a **musical instrument**.*



We will always need those individual criminalists with a broad understanding and general knowledge of physical evidence to maintain the overall perspective, to “direct the orchestra.” (Hunter, 2000)

- Is the composer/conductor a better analogy? Analogies are valuable but have limitations. They are illustrative only.

*"We are surrounded by an **infinite** world of materials; any or all of which could end up as part of evidence on our lab bench. In order for us to **recognize** evidence, the analyst must have the knowledge, skills and abilities to identify and isolate these unknown material(s) as **significant**."*

*This requires that the analyst acquire and maintain **GENERAL KNOWLEDGE, SKILLS, and ABILITIES** of all evidence categories." (Hunter, 2000)*

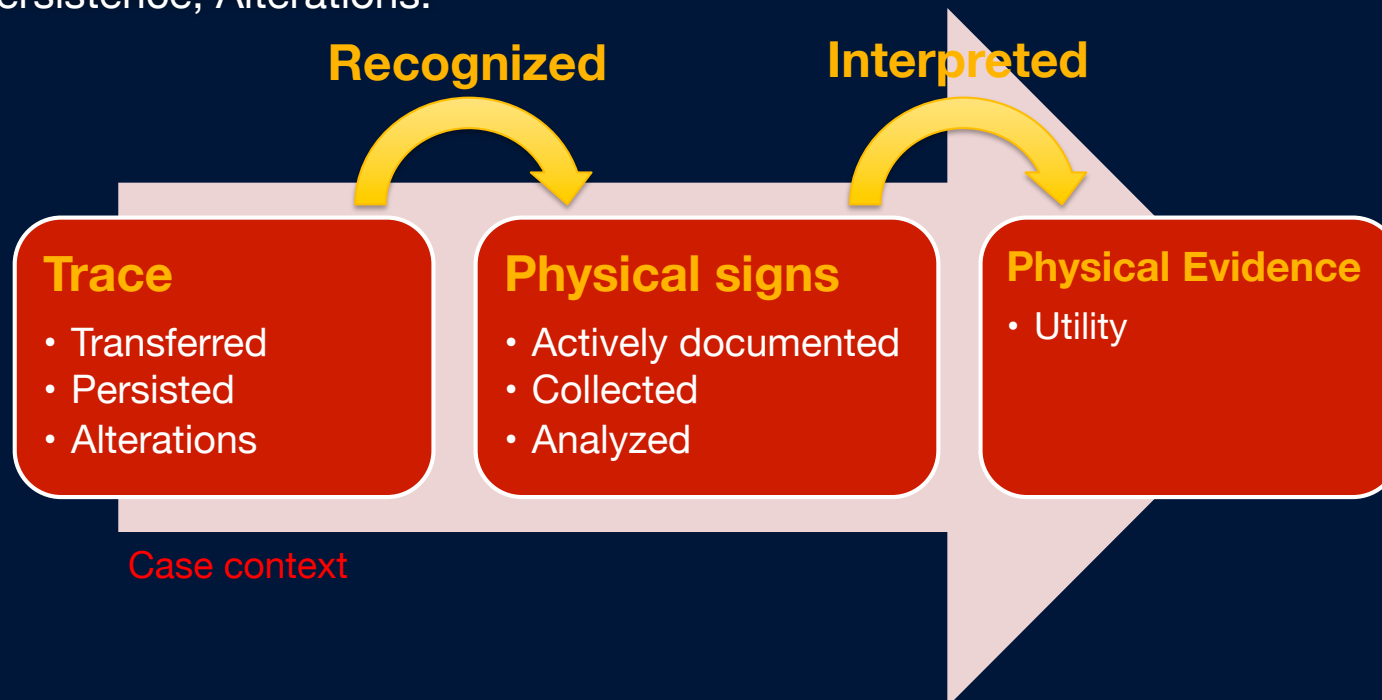
- Laboratory techniques and technologies
- Microscopy
- Photography
- Crime scene investigation
- Communication & Interpersonal skills

- Broad formal scientific education (i.e. chemistry, biology, physics, statistics)
- Learning about various types of physical evidence and their forms
- Learning a methodology for comparative examinations and reconstructions

- Trace evidence experience
- Experience with hypothesis development and testing
- Extensive Experience with experimental design
- Address uncertainties from various steps of physical evidence process
- Evidence interpretation
- Experience with case management
- Extensive experience managing crime scenes

*“The ability to select **relevant** information from a mass of obscuring detail, this eye for patterns half buried amongst other patterns, almost as if the build-up had been observed, is a characteristic of the accomplished investigator.” (Kind, 1987)*

- Knowledge of principles of criminalistics;
- Knowledge of variety of types and forms of physical evidence;
- Knowledge of strengths and limitations of examinations that can be done:
=> Need to know necessity/appropriateness of analytical methods, not detailed specifics.
- Recognition/relevancy: ability to “see”, “hypothesize”, “value”;
- Transfer, Persistence, Alterations.



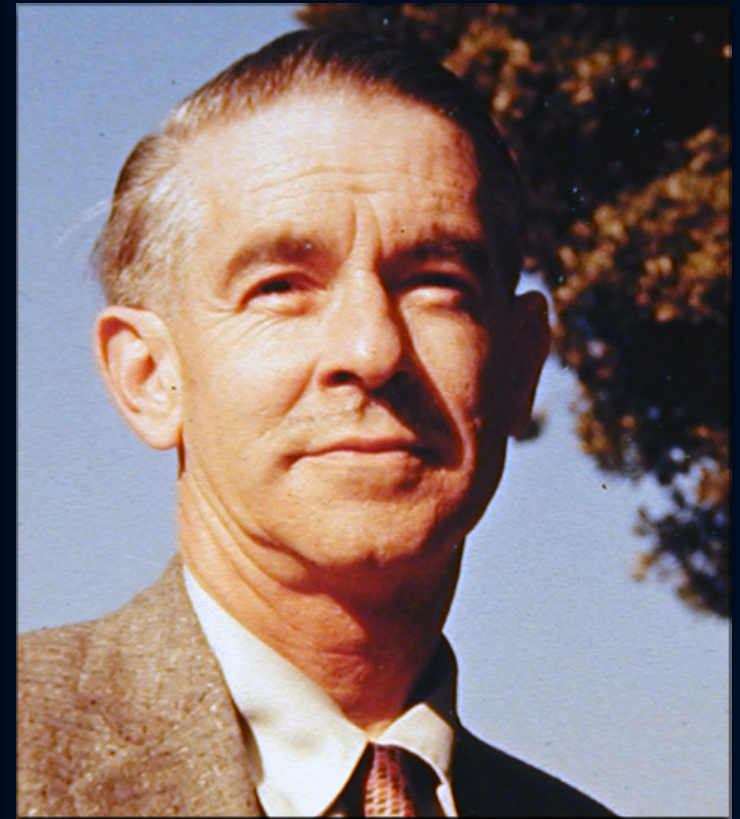
“Nothing shall be neglected and the first notion to be inculcated to the investigator is that he shall not limit himself discovering what he usually sees in the average case, but he needs to turn his mind toward the discovery of new facts.” (Locard, 1920)

Personal attributes:

- ✦ Love of learning;
- ✦ Derive enjoyment from problem solving;
- ✦ Take pride in scientific independence and dispassionate interest;
- ✦ A willingness to reject a favored hypothesis not adequately supported by data and observations;
- ✦ **Imagination** as a source of hypotheses generation. (Abductive reasoning)

*“It is unfortunate that many administrators, the police, the public perhaps, and even many criminalists believe that it is sufficient to engage a chemist to perform chemical operations in the crime laboratory, a serologist to do blood grouping, a spectrographer to operate advanced instruments, and a gun hobbyist to identify firearms. Not one of these persons will know the **basic principles** of scientific crime investigation.” (Kirk, 1969)*

- How can one develop the skills and abilities that a successful maestro needs?
- How can one encourage the development and implementation of the Maestro?



Dr. Paul Leland Kirk (1955)

“Forensic science has developed around practitioners with little science training and education in combination with highly specialized scientists in their own discipline.

*Forensic science is like a hospital serviced by clerics and nurses for most of the activities, and brain surgeons and cardiologists for highly specialized areas of medicine, **but with no medical doctor in the middle.**” (Margot, 2011)*

What can the “Maestro” contribute to forensic investigations?

- A fresh, non-formulaic approach to any issue;
- Better solutions in complex cases;
- More efficient prioritization of focus and efforts;
- More efficient use of and conservation of resources;
- Coordination of the physical evidence aspects from recognition at the crime scene to explication at the time of adjudication;
- Minimize misinterpretation and misuse of physical evidence.