

# ***Criminal Investigation,***

Seventh Edition

## Chapter Nine

The Crime Laboratory and the Criminal  
Investigation Process

# *Criminalistics and Forensic Science*

- Forensic science is that part of science applied to answer legal questions.
- Criminalistics is that branch of forensic science that deals with the study of physical evidence related to crime.

# *Criminalistics and Forensic Science*

- James Osterburg wrote why there crime laboratories are underutilized. His ideas include:
  1. Lack of knowledge about how the laboratory can aid the criminal investigator.
  2. Unfamiliarity with the more exoteric varieties of clue material, resulting in evidence not being preserved for examination.

# *Criminalistics and Forensic Science*

3. Failure to collect physical evidence. This may be caused by a fear of cross-examination on some technical, legal, or scientific requirement that may be overlooked. It may be due to inadequate training or experience or to the over cautiousness of field investigators and the fear of destroying evidence.

# *Criminalistics and Forensic Science*

4. Overrepresentation of laboratory capabilities.
5. Inconvenience to the investigator when there is not local laboratory available or backlogs are so great as to prohibit timely reports of laboratory results.

# *Measures of Effectiveness of Laboratories*

- Quality – judged by technical capabilities of the laboratory and the abilities of the personnel who staff the laboratory.
- Proximity – laboratories need to be convenient for the investigators to use.
- Timeliness – is the laboratory able to provide results in a timely manner.
- Admissibility of results – are the results allowed in court.

# *Technologies*

- DNA Analysis – with the appropriate body fluid laboratories are able to determine with a high degree of certainty that the individual is a specific person.
- Automated Fingerprint Identification systems (AFIS) – by the use of computers and readers laboratories are able to compare latent prints against “ten print” cards.

# *Technologies*

- Ceasefire and Drugfire – automated systems for comparing spent bullets and cartridge cases.
- Emission Spectrograph – capable of identifying the elements of some item.
- Mass Spectrometer – is able to chemically analyze specimens including drugs, poisons, accelerants, explosive residues, and biological samples.

# *Technologies*

- Visible Spectrophotometer – used for studying color and coloring agents such as dyes and pigments.
- Infrared Spectrophotometer – allows for the identification of compounds.
- Atomic Absorption Spectrophotometer – used to determine the concentration of specific elements in a sample.

# *Technologies*

- Gas Chromatograph – analyzes organic material.
- X-Ray Diffraction Spectrophotometer – used to identify and compare unknown crystalline substances.

***The End***