

Scientific Principal

- “For any doctrine a standard must be established. To expound a doctrine without a standard is like determining the directions of sunrise and sunset on a revolving potter’s wheel.
- Therefore, for any doctrine there must be the three standards. There must be the Basis, a foundation: There must be an examination; and there must be a practical application.”
- Basis, Examination, Application.
 - › Mo Tzu – about 450 B.C.

Definition of Forensic Science

- NOT chasing bad guys
- NOT arresting people
- NOT solving crime in one hour
- NOT knowing everything about everything
- NOT an advocate
- IS locating evidence
- IS deciphering evidence
- IS helping investigation
- IS the whole truth
- **IS the application of science to those criminal and civil laws that are enforced by criminal justice agencies.**

Review – Advent of F.S.

- Sir Arthur Conan Doyle – Doctor & Author – Sherlock Holmes, A Study in Scarlet in 1887
- Mathieu Orfila – Forensic Toxicology – Published 1st treatise on detection and effect of poisons on animals in 1814
- Alphonse Bertillon – Anthropometry – a systematic system of taking body measurements for personal identification in 1879
- Francis Galton – Fingerprint Classification – published the 1st statistical proof of the uniqueness of fingerprints in 1892

Review – Advent of F.S.

- Dr. Karl Landensteiner – Discovered blood types – A,B,AB,& O in 1901
- Leone Lattes – Determined method of identifying typing of blood stain in 1915 which he applied to forensics
- Col. Calvin Goddard – Established comparison microscope for bullet comparison
- Albert S. Osborn – Principles of Document Exam – published “*Questioned Documents*” in 1910



Review – Advent of F.S.

- Dr. Walter C. McCrone – Preeminent Microscopist – taught thousands of forensic scientists to use the microscope.
- Hans Gross – Advocate of F.S. to assist invest.
- Edmond Locard – Locard’s Exchange Principle – in 1910 began the crime lab in Lyon France.
- Vollmer – 1923 created first lab in U.S. @ LAPD in 1923, a former police chief from Berkeley

Review – Types of F.S. Units

- Physical Sciences – Chemistry, Physics, Geology
- Biology – DNA, Blood, Body Fluids, Hairs, Fibers, Wood, Plants
- Firearms –Guns, Bullets, Casings, GSR, Distance of shot, Toolmarks
- Document Exam – Handwriting/typewriting, Paper, Ink, Indented Writing, Obliterations, Erasures, Burned/charred.
- Photography – Unique photo techniques, Infrared, Ultraviolet, X-ray.

Review – Types of F.S. Units

- Latent Fingerprint – Prints, AFIS.
- Polygraph – Interrogation tool, NOT F.S.
- Voiceprint – Voice Comparison, Sound Spectrograph
- Evidence Collection
- Forensic Pathology – Coroner, Who is the victim? What caused death? What injuries are there? When did injuries occur? Why and how were they produced?

Review – Types of F.S. Units

- Forensic Anthropology – Human skeletal remains.
- Forensic Entomology – Study of insects, Blow flies are 1st to infest body.
- Forensic Psychiatry – Human Behavior, Competence
- Forensic Odontology – Teeth, Bites, Mouth structure.
- Forensic Engineering – Failure analysis, Collision reconstruction, Cause/origin of fires & explosions.
- NO Pastry Sciences

Review – Court Decisions

- Frye vs. U.S. 1923 D.C Circuit Court
 - “The thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.”
 - Intent is to eliminate “garbage science”.
 - The systolic blood pressure deception test.



Review – Court Decisions

- Federal Rules of Evidence # 702
 - 1) the testimony is based upon sufficient facts or data.
 - 2) the testimony is the product of reliable principles and methods.
 - 3) AND the witness has applied the principles & methods reliably to the facts of the case.

Review – Court Decisions

- Daubert vs. Merrell Dow Pharmaceutical 1993 U.S. Supreme Court
 - Trial judges are the “gatekeepers” for the admission of scientific evidence.
 - Applies only to Federal Courts.
 - Judge determines admissibility and reliability of evidence.
 - Case was over safety of silicone breast implants

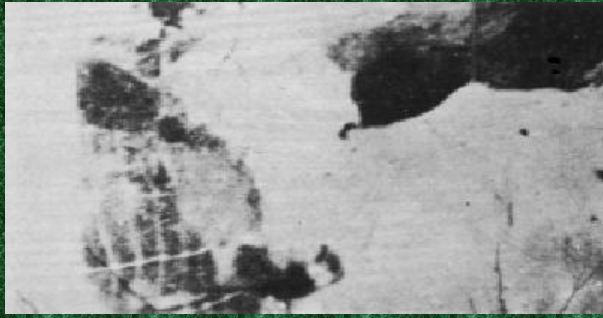
Review – Court Decisions

- Kumho Tire Co. vs. Carmichael 1999 Supreme Court
 - “gatekeeping” role applies to ALL expert testimony not just that of scientific experts.
 - Case involved a tire failure resulting in death.
 - Testimony was determined to be observational and not scientific, therefore Daubert did not apply. Overturned.

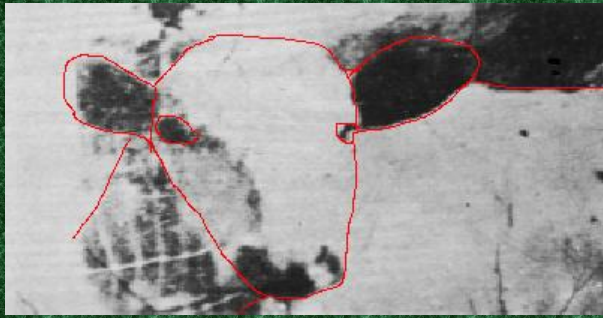
Without Context,
nothing has any meaning

Forensic Science (Criminalistics)
seeks to provide that context;
or
the facts necessary to derive
context.

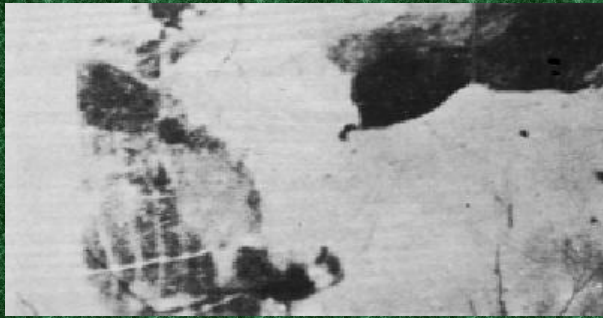
Context



Context



Context



Review – Terminology

- Identification – the determination of the physical or chemical identity of a substance with as near as absolute certainty as existing analytical techniques will permit.
- Comparison – subjecting a suspect specimen and a standard to the same tests for the ultimate purpose of determining whether or not they have common origins.

Review – Terminology

- Individual Characteristics – Properties of evidence that can be attributed to a common source with an extremely high degree of certainty.
- Class Characteristics – Properties of evidence that can only be associated with a group and never with a single source.



The Most Important Skill

Note Taking

Upon Dispatch
On way to location
On arrival at location
Entire duration of time on case
Entire Lab period
Entire Court period
Until case is closed for good.

Dispatch time, location
Arrival time
Other people
Initial Observations
Assignments
Analysis
Evidence obtained
Etc, Etc, Etc.

The 2nd Most Important Skill

Photography

The approach
The exit
Each piece of evidence
 Before moving
 During harvest
 With/without measure
 In context
 During bagging

Overall area
Intermediate scene
Immediate area
Close-up
Overhead
Macro/Micro
People
Day/Night/Bad Weather, etc.

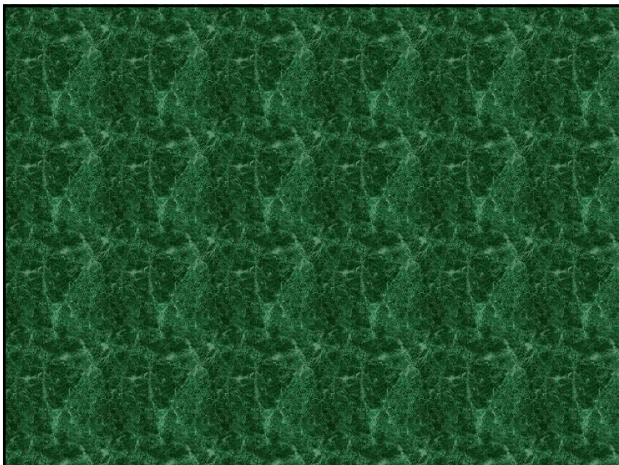


QUIZ Week #1

- 1) Define forensic science.
- 2-4) Name three pioneers of forensic science. NOT Holmes
- 5) What does Locard's Exchange Principle state?
- 6-8) Name three Units in a crime lab.
- 9) Define individual characteristics.
- 10) Define Identification.

A Study in Scarlet starring Detective Sherlock Holmes

By
Sir Arthur Conan Doyle



Project #1 – Due week 5

Counts as Mid-term

Obtain 1 old headlight & surgically remove filament.
Examine 4 other light filaments.
Attach all to a card and submit with your observations of each.

Obtain a small broken section of glass and provide a written analysis of the fracture. Submit the glass, OR photographs of the glass.

Project #1 – Due week 5



In Class Project (hands-on)



Exhibit 85. After a round sealed beam lamp is set to spinning on a smooth, level surface, a pencil-point propane torch flame can heat a circular strip on the reflector around the contact lugs.



Exhibit 86. After about half a minute of heating, the lamp reflector is suddenly cooled by covering with a wet towel. Normally, a crack forms in the reflector along the heated strip, thus opening the lamp.

Project #2 – Due week 8

Team Project

Obtain and submit at least 10 latent fingerprints from at least 5 different surfaces.

One sample must be obtained using your own devices (no kits).

Classify the fingerprints and provide as complete a description as possible.

Project #3 will be final. It will be to process a crime scene.
