

History of Forensic Science

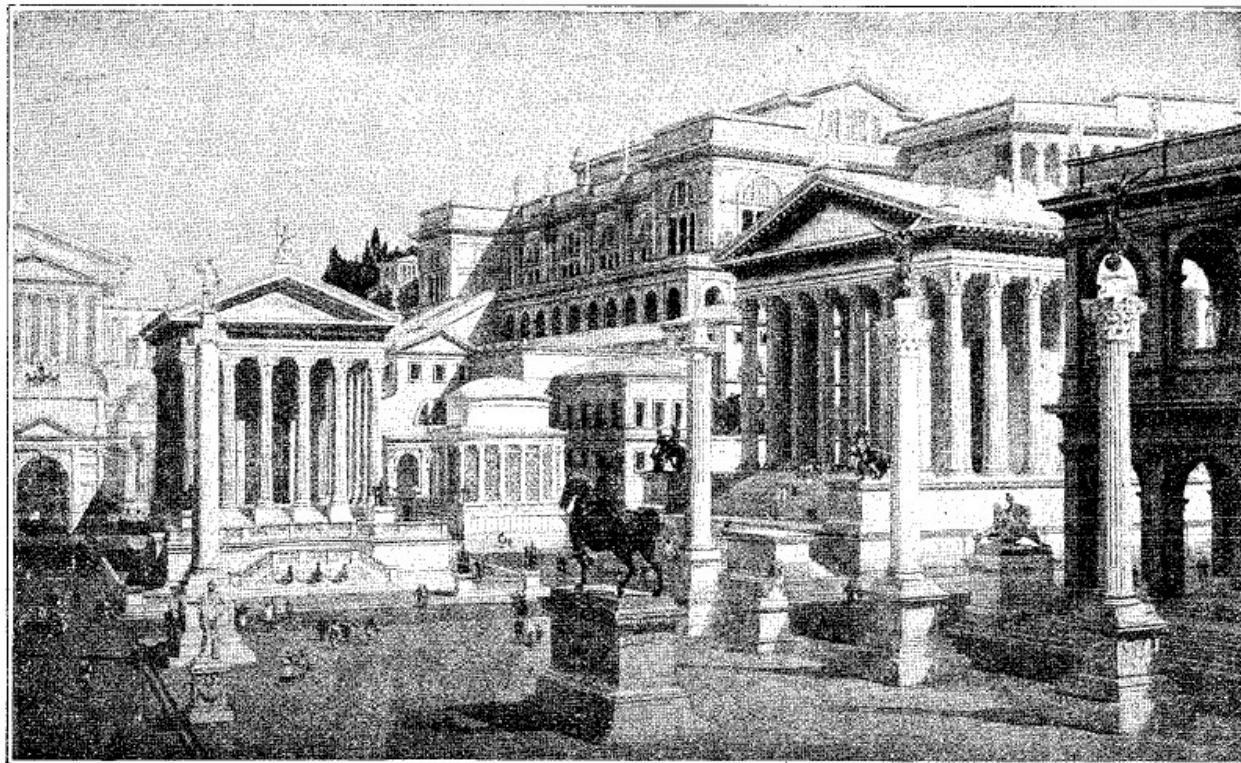


What is forensics?

- Forensic Science
= the application
of science to
criminal and civil
law



- “Forensic” comes from the Latin *forensis*, meaning a public forum . . . in Roman times judicial proceedings were held in the forum.



Temple of
Venus and
Roma

Temple of Julius
Caesar

Temple of
Vesta
Equestrian Statue
of Vespasian

Palace of the Caesars
Hall of Vesta

Temple of Castor
and Pollux

Basilica Julia

A PART OF THE ROMAN FORUM

(Restored by Bechetti.)

When in Rome...



- “Forensic” comes from the *Latin* word “*forensis*” meaning forum.
- During the time of the Romans, a criminal charge meant presenting the case before the public.
- Both the person accused of the crime & the accuser would give speeches based on their side of the story.
- The individual with the best argumentation would determine the outcome of the case.

History

St. Thomas, the Doubter

The Patron Saint of Forensic Science



Famous Criminalists

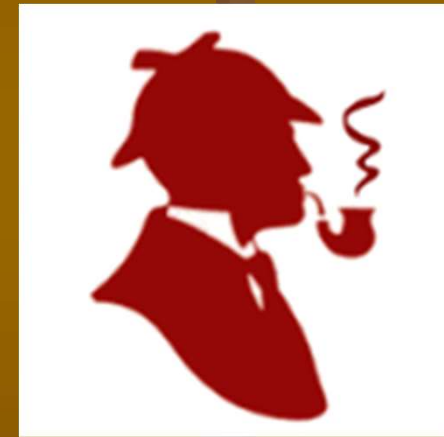
- 1. Vidocq—
Frenchman and
former criminal
 - Master of disguise and
escape
 - Applied these abilities
and his amazing eye for
detail to criminal
investigation
 - Created first dept. of
investigation in Paris



Eugène François Vidocq
1775-1857

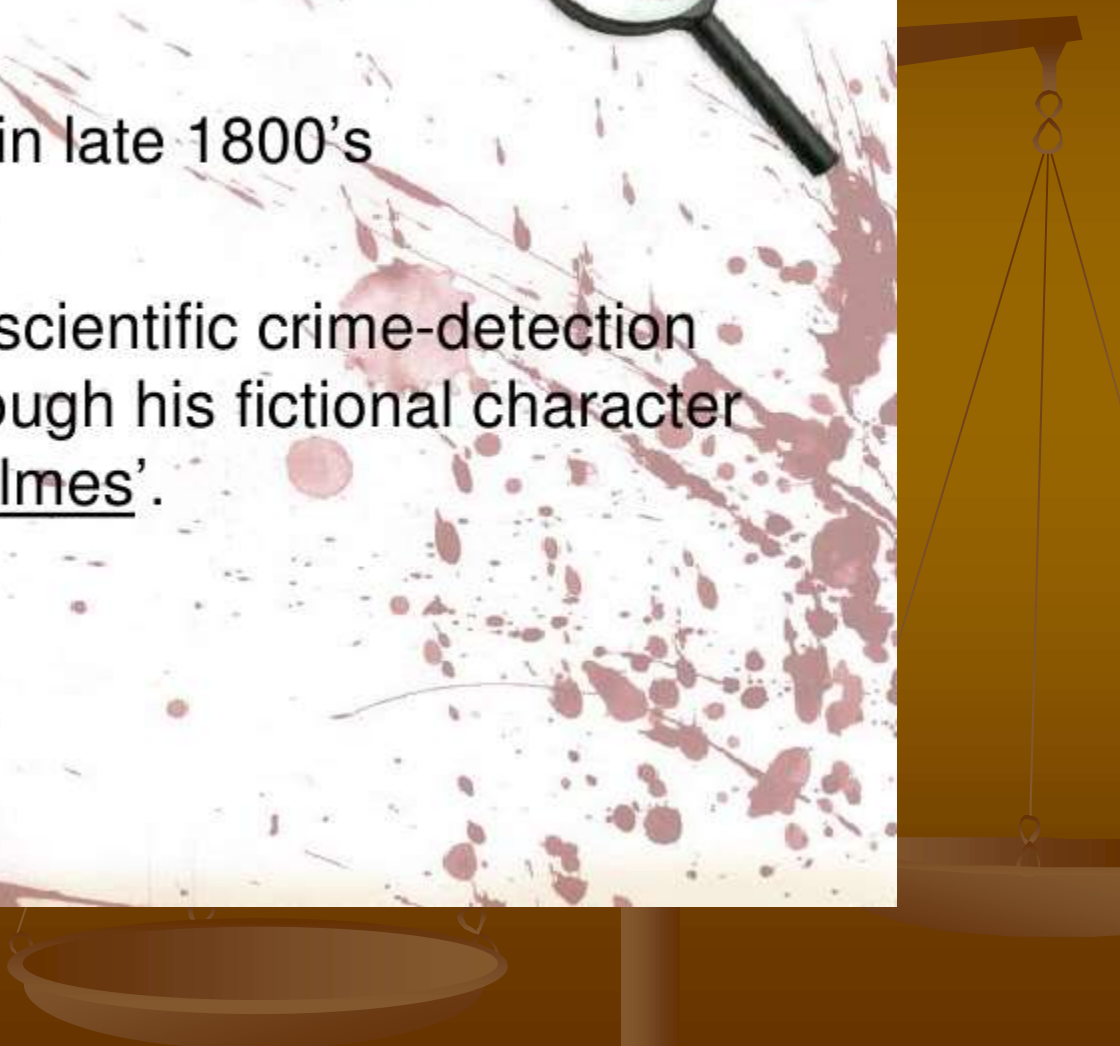
Vidocq (cont.)

- Popular origins of forensics or criminalistics are attributed to the historic Vidocq . . . Sherlock Holmes is based, largely, on Vidocq



Sir Arthur Conan Doyle



- Sci-fi author in late 1800's
 - Popularized scientific crime-detection methods through his fictional character 'Sherlock Holmes'.
- 

Famous Criminalists (cont.)

■ 2. Hans Gross

- Austrian

- Public prosecutor and judge

- Published description of applying scientific disciplines to the field of criminal investigation.



Edmond Locard

(1877-1966)



- “Father of the Crime Lab”
- In 1910, he started the 1st crime lab in an attic of a police station.
- With few tools, he quickly became known world-wide to forensic scientists & criminal investigators & eventually founded the *Institute of Criminalistics* in France.
- His most important contribution was the **“Locard’s Exchange Principle”**

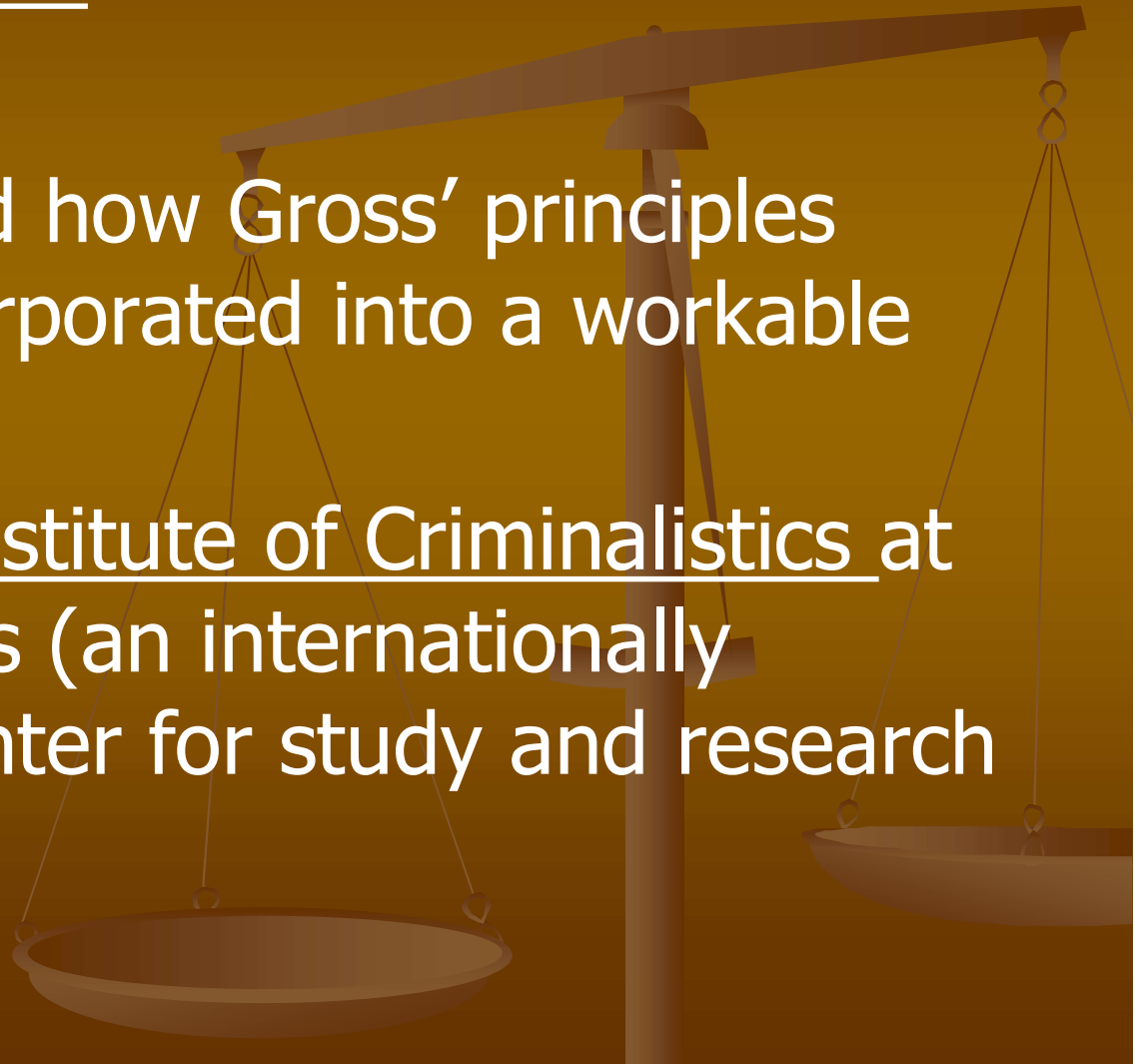
Famous Criminalists (cont.)

■ 3. Edmund Locard

- Frechman

- Demonstrated how Gross' principles could be incorporated into a workable crime lab

- Founder of Institute of Criminalistics at Univ. of Lyons (an internationally renowned center for study and research in forensics)



Locard's Principle

When a criminal comes in contact with a person or object, a dual exchange of particles takes place.



Mathieu Orfila

(1787-1853)

- “Father of Toxicology”
- Wrote about the detection of poisons & their effects on animals.



Alphonse Bertillon

(1853-1914)

- “Father of Anthropometry”
- Developed a system to distinguish one individual person from another based on certain body measurements.

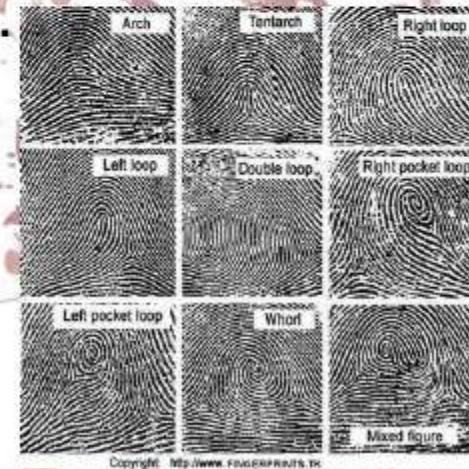


Francis Galton

(1822-1911)



- “Father of Fingerprinting”
- Developed fingerprinting as a way to uniquely identify individuals.



Copyright: <http://www.FINGERPRINTS.IN>

Leone Lattes

(1887-1954)



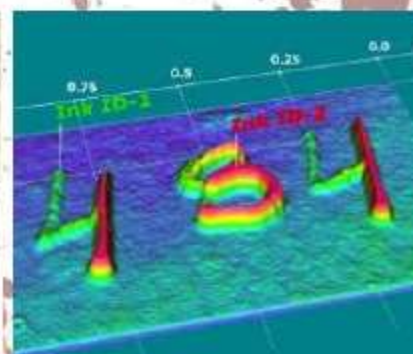
- “Father of Bloodstain Identification”
- He developed a procedure for determining the blood type (A, B, AB, or O) of a dried blood stain.

Albert Osborn

(1858-1946)



- “Father of Document Examination”
- His work led to the acceptance of documents as scientific evidence by the courts.



J. Edgar Hoover

- “Father of the FBI” - Director of Federal Bureau of Investigation during the 1930’s
- Hoover’s leadership spanned 48 yrs & 8 presidential administrations. His reign covered Prohibition, the Great Depression, WWII, the Korean War, the Cold War, & the Vietnam War.
- He organized a national laboratory to offer forensic services to all law enforcement agencies in the U.S.



FBI forensics laboratory

- Established under J. Edgar Hoover
- Most ambitious commitment to forensics





Criminal Justice Information Data Bases

- AFIS – Automated Fingerprint Identification System
- CODIS – Combined DNA Index System
- NIBIN – National Integrated Ballistics Information Network
- CJIS – Criminal Justice Information System
- NCIC – National Crime Information Center
- NCMEC – National Center for Missing and Exploited Children



Crime Scene Basics

Forensic Science

T. Trimpe 2006 <http://sciencespot.net>

Crime Scene Vocabulary

CRIME SCENE: Any physical location in which a crime has occurred or is suspected of having occurred.

PRIMARY CRIME SCENE: The original location of a crime or accident.

SECONDARY CRIME SCENE: An alternate location where additional evidence may be found.

SUSPECT: Person thought to be capable of committing a crime.

ACCOMPLICE: Person associated with someone suspected of committing a crime.

ALIBI: Statement of where a suspect was at the time of a crime.

CRIME SCENE DO NOT CROSS

Source: http://www3.sc.maricopa.edu/ajs/crime_scene_technician.htm

Types of Evidence

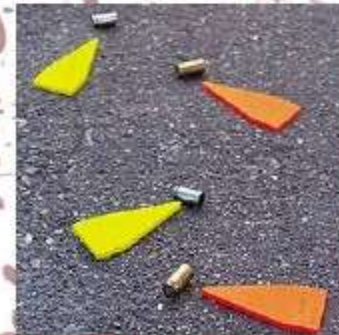
Testimonial evidence includes oral or written statements given to police as well as court testimony by people who witnessed an event.

Physical evidence refers to any material items that would be present at the crime scene, on the victims, or found in a suspect's possession.

Trace evidence refers to physical evidence that is found in small but measurable amounts, such as strands of hair, fibers, or skin cells.

What will evidence collected at a scene do for the investigation?

- May **prove** that a crime has been committed
- Establish **key elements** of a crime
- Link a **suspect** with a crime scene or a victim
- Establish the **identity** of a victim or suspect
- Corroborate verbal **witness** testimony
- Exonerate the **innocent**.
- Give **detectives** leads to work with in the case



Source: http://www3.sc.maricopa.edu/ajs/crime_scene_technician.htm

Crime Scene Personnel

POLICE OFFICERS are typically the first to arrive at a crime scene. They are responsible for securing the scene so no evidence is destroyed and detaining persons of interest in the crime.

The **CSI UNIT** documents the crime scene in detail and collects any physical evidence.

The **DISTRICT ATTORNEY** is often present to help determine if any search warrants are required to proceed and obtains those warrants from a judge.

The **MEDICAL EXAMINER** (if a homicide) may or may not be present to determine a preliminary cause of death.

SPECIALISTS (forensic entomologists, anthropologists, or psychologists) may be called in if the evidence requires expert analysis.

DETECTIVES interview witnesses and consult with the CSI unit. They investigate the crime by following leads provided by witnesses and physical evidence.

Source: <http://science.howstuffworks.com/csi.htm>

Crime Scene Protocol

Step 1: Interview

The first step in investigating a crime scene is to interview the first officer at the scene or the victim to determine what allegedly happened, what crime took place, and how was the crime committed. This information may not be factual information but it will give the investigators a place to start.

Step 2: Examine

The second step in the investigation of a crime scene, which will help identify possible evidence, identify the point of entry and point of exit, and outline the general layout of the crime scene.

Step 3: Document

The third step in the protocol involves creating a pictorial record of the scene as well as a rough sketch to demonstrate the layout of the crime scene and to identify the exact position of the deceased victim or other evidence within the crime scene.

Step 4: Process

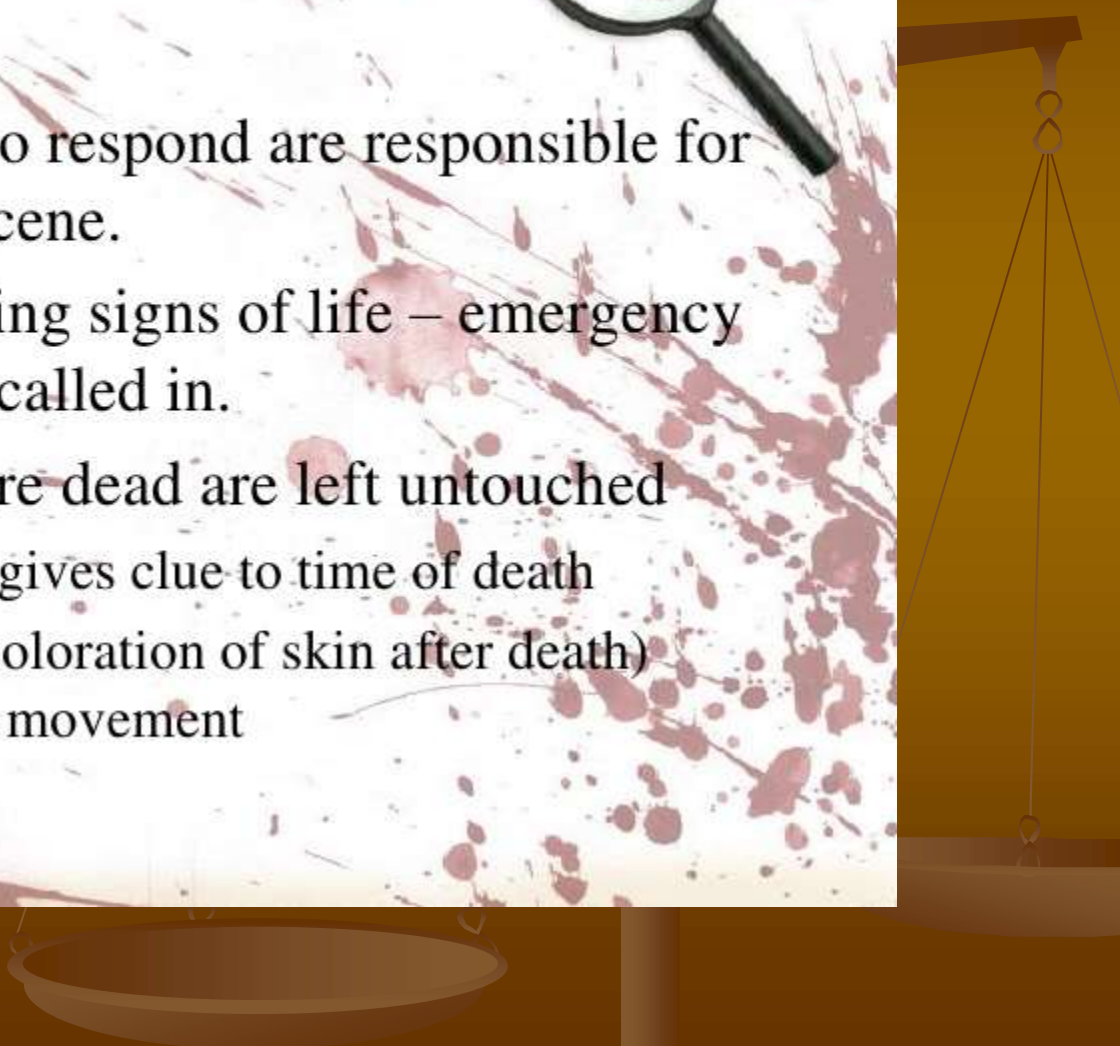
This is the last step in the protocol. The crime scene technician will process the crime scene for evidence, both physical and testimonial evidence. It is the crime scene technicians responsibility to identify, evaluate and collect physical evidence from the crime scene for further analysis by a crime laboratory.

Adapted from <http://www.feine.net/cs-proc.htm>



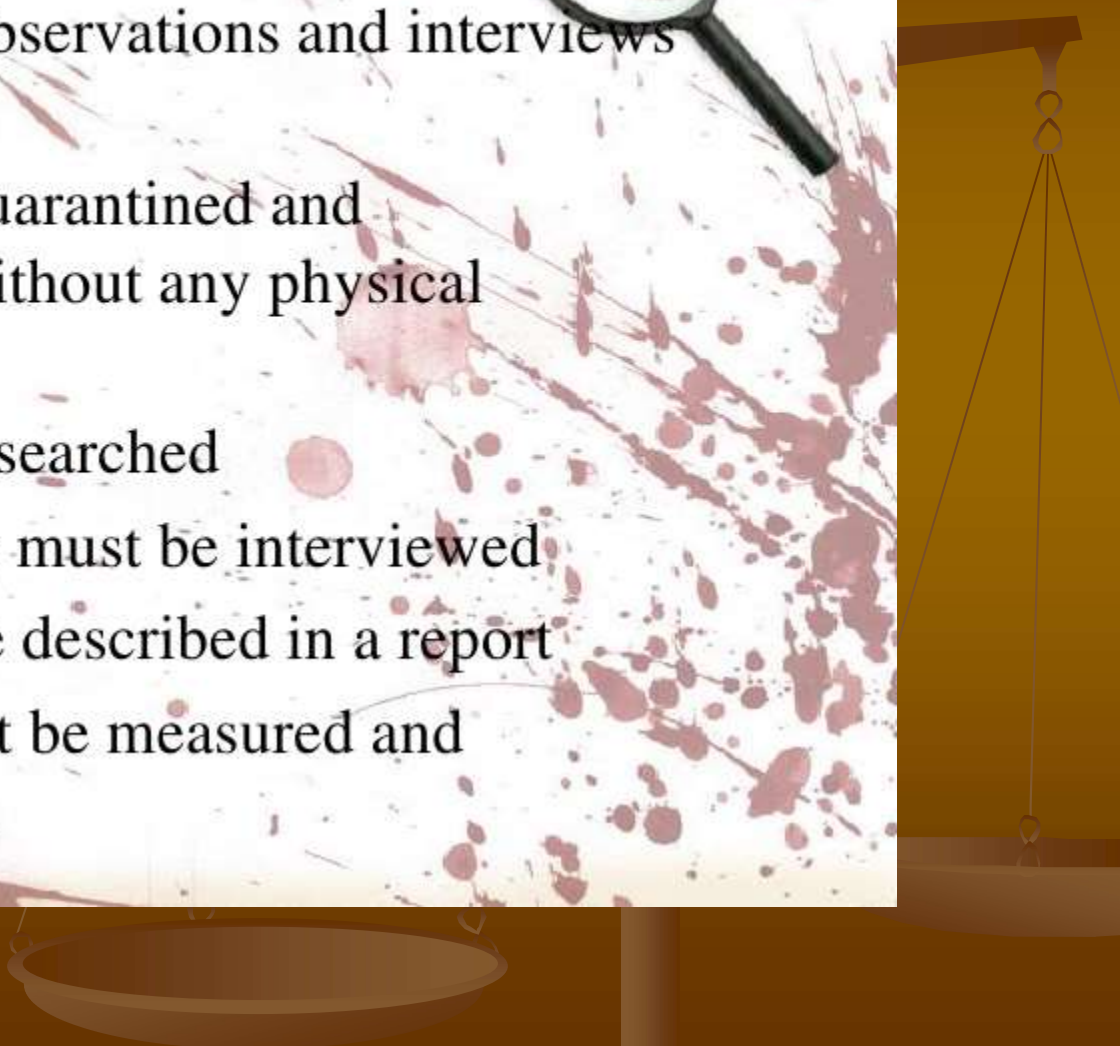
Securing the Crime Scene



- First officers to respond are responsible for securing the scene.
 - Victims showing signs of life – emergency personnel are called in.
 - Victims that are dead are left untouched
 - Rigor mortis gives clue to time of death
 - Lividity (discoloration of skin after death) changes with movement
- 

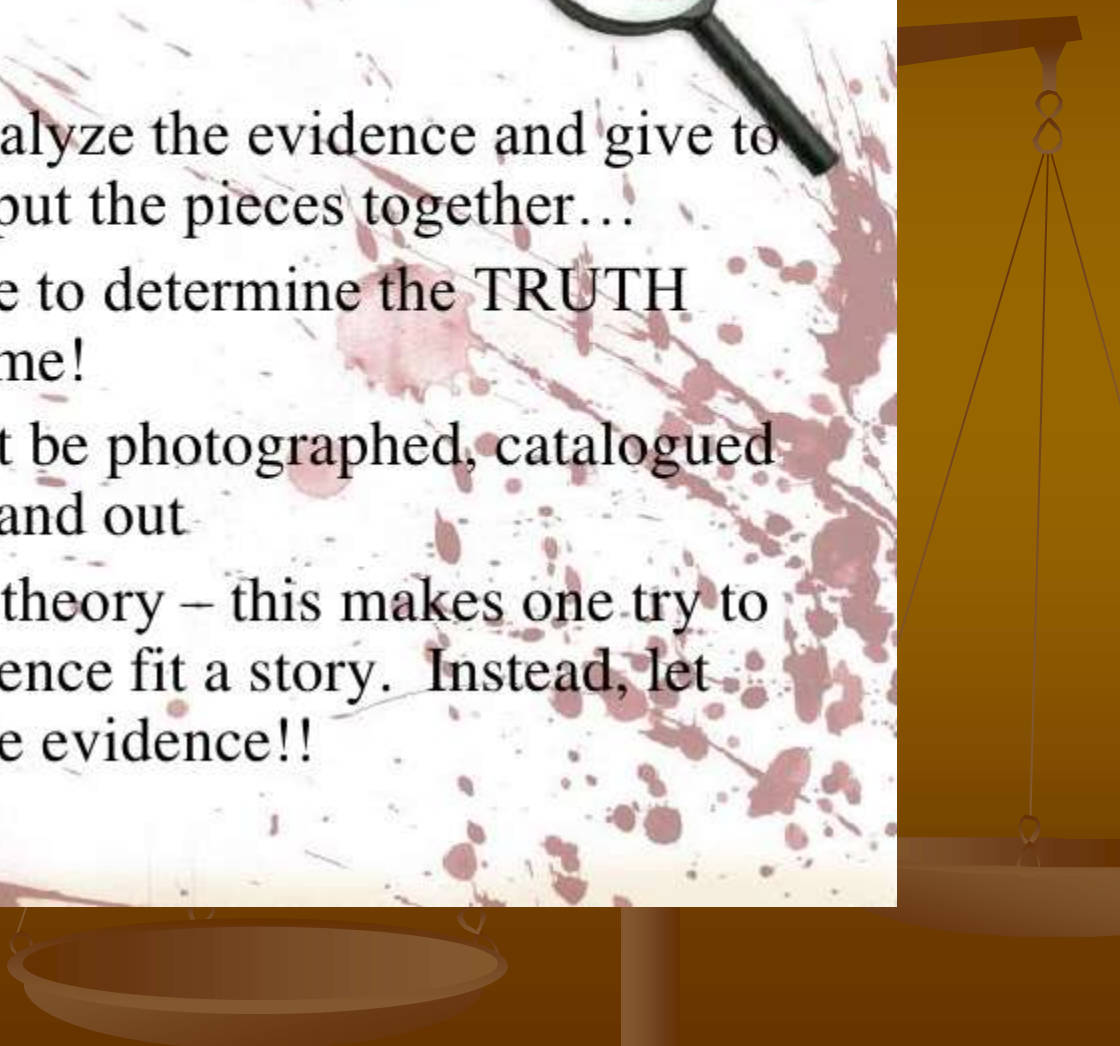
Crime Scene (con't)



- Preliminary observations and interviews will be done
 - Victims are quarantined and questioned, without any physical disturbance
 - Area must be searched
 - Initial officers must be interviewed
 - Scene must be described in a report
 - All items must be measured and photographed
- 

Collecting Evidence



- CSI's must analyze the evidence and give to a *detective* to put the pieces together...
 - CSI's are there to determine the TRUTH behind the crime!
 - All items must be photographed, catalogued and signed in and out
 - Don't make a theory – this makes one try to make the evidence fit a story. Instead, let the story fit the evidence!!
- 

Determining Cause of Death

A magnifying glass with a black handle and a silver rim is positioned over a white surface covered in red blood splatters. The magnifying glass is focused on a specific area of the splatter, making it appear larger and more detailed. The background of the slide is a dark brown gradient with faint, stylized images of a scale of justice and a balance scale.

- Coroner, or medical examiner, make preliminary appraisal of cause of death
- If death is of unnatural or suspicious nature, an autopsy is ordered.
- Coroner pronounces death of a victim.

Retrieving Victim

- CSI will cover the head, hands and feet with plastic bags and secure with tape.
- Body is wrapped in a sheet and placed in a WHITE body bag.
- Rooms for autopsy must be kept at 3 C (38 F) to prevent decomposition and bacterial growth.
- Average autopsy takes 1-2 hours.

Determining Time of Death



- Average corpse cools down 1 degree every hour. Not very accurate.
 - Rigor mortis
 - Stiffening of the joints between 30 min – 3 hours
 - Begins with eyelids and jaw
 - Lasts 6-12 hours
 - Lividity
 - Takes 6 hours for full effect
- 