

# Forensic Science: Introduction

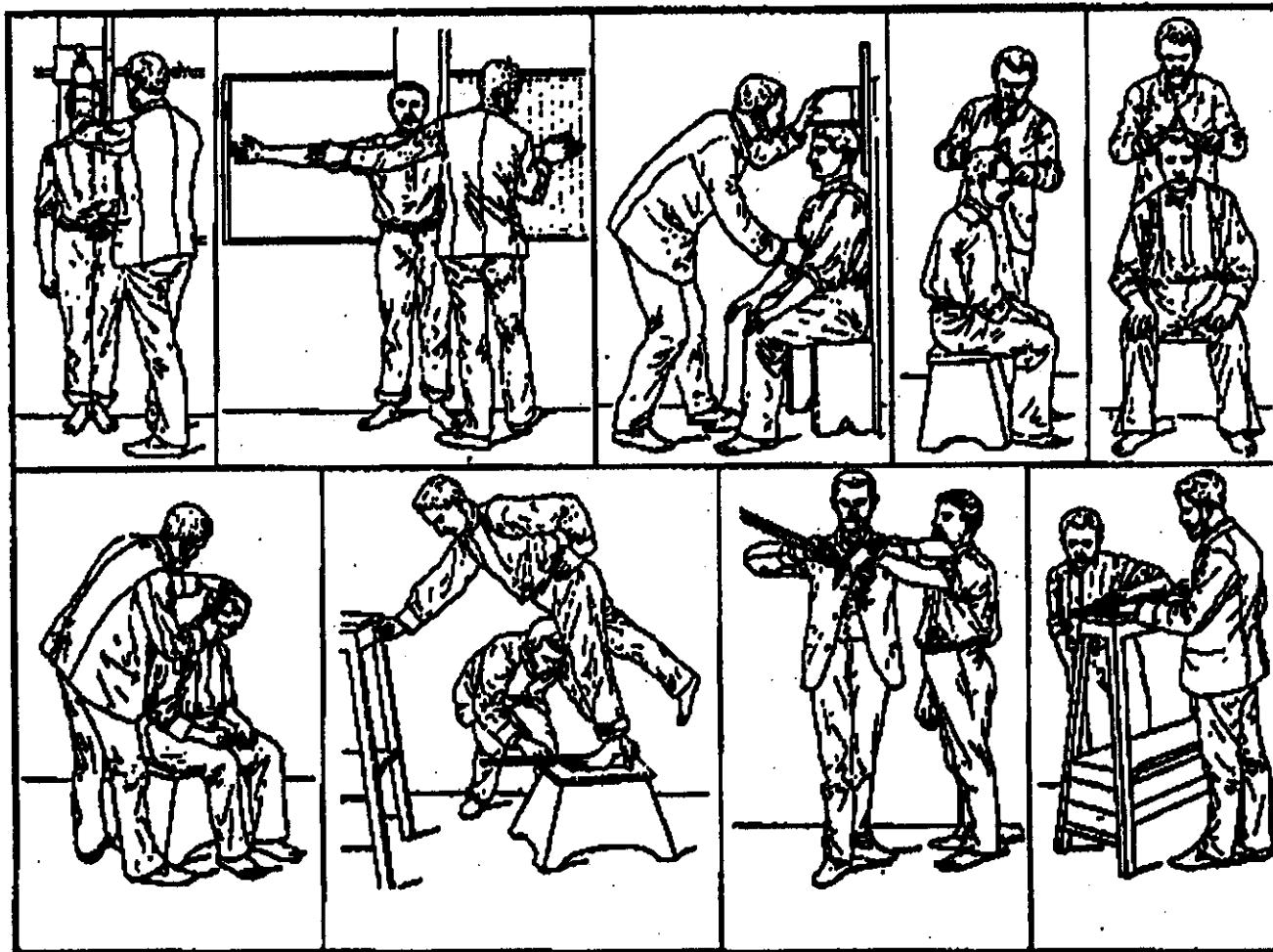
- *Forensic Science* - Application of the scientific method and techniques to law and criminal justice.
- Encompasses many fields: Chemistry, Physics, Biology, Earth Sciences, Mathematics, Psychology, Anthropology, etc...

# History

- Began formally in late 1700's.
- Real application of the scientific method and techniques in 1900's.
- Important Names:
  - Sung T'zu
  - Mathieu Orfila (toxicology)
  - Aphose Bertillion (anthropometry)
  - Francis Galton (Fingerprinting)
  - Leone Lattes (blood grouping)
  - Calvin Goddard (Ballistics)
  - Alexandre Lacassagne (anthropology)
  - Edmond Locard (scientific criminal investigation)
  - Crime Writers: A.C. Doyle, A. Christie

# Aphonse Bertillion

## Bertillon Measurements



# Edmond Locard

- 1877-1966  
Application of scientific techniques to criminal investigations.
- Set up first real forensics lab.



# Locard's Exchange Principle

- The most basic concept of Forensic Science:
  - When a criminal in contact with an object or person at a crime scene, a cross transfer of evidence occurs
    - Examples: dust, biological samples, fingerprints, chemical residues, etc.
- Links a person to the crime scene

# Arthur Conan Doyle

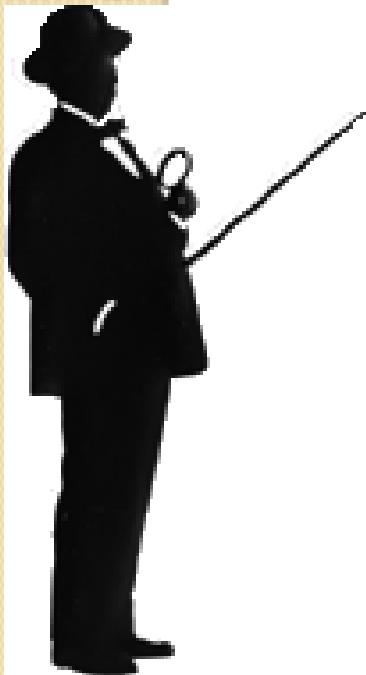


- Creator of Sherlock Holmes - Based upon real life Prof. Joe Bell (U. Edinburgh).
- Preceded and foretold many chemical analyses for forensic investigations

# Agatha Christie

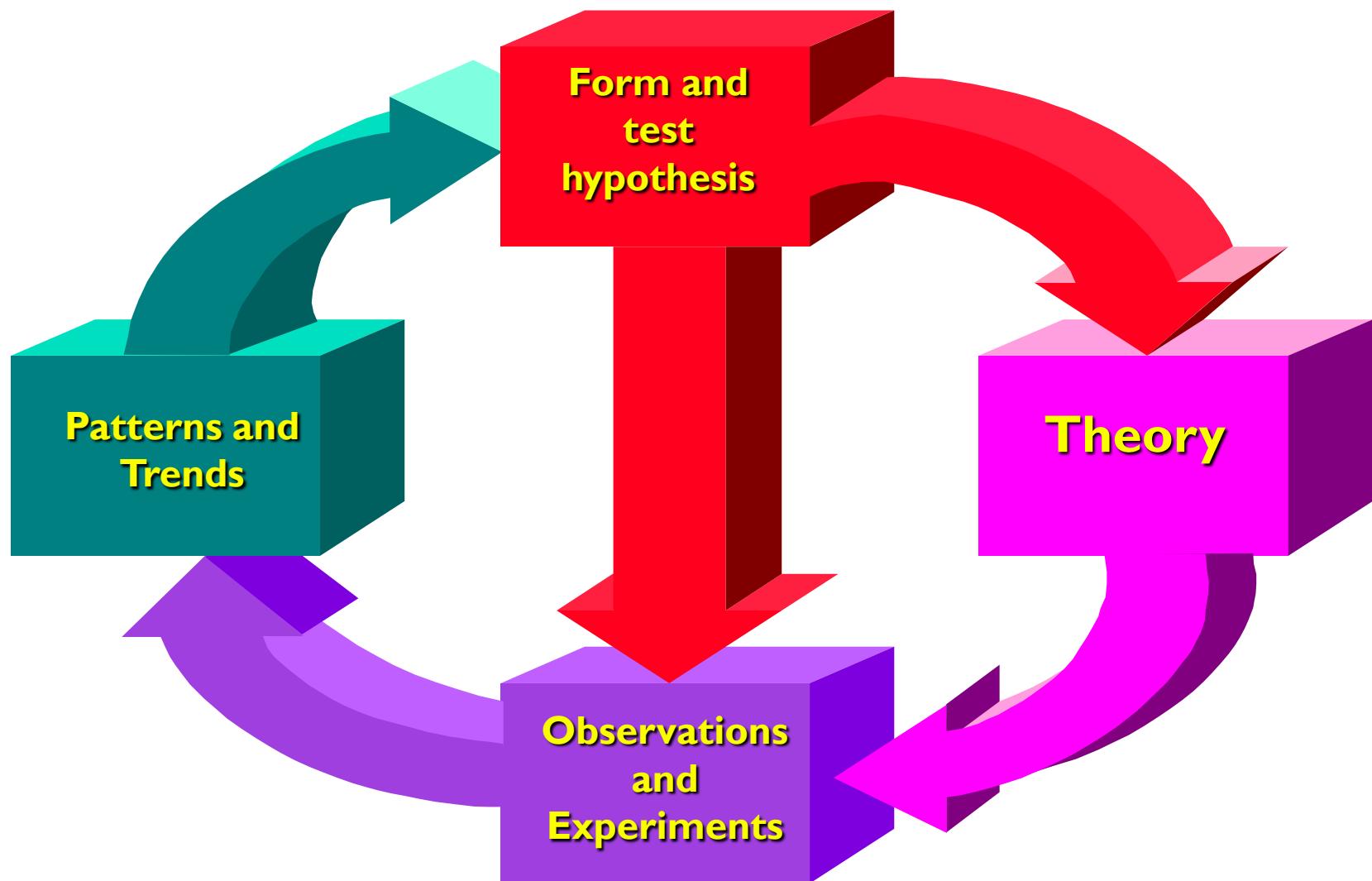


© Harvard Theatre Collection

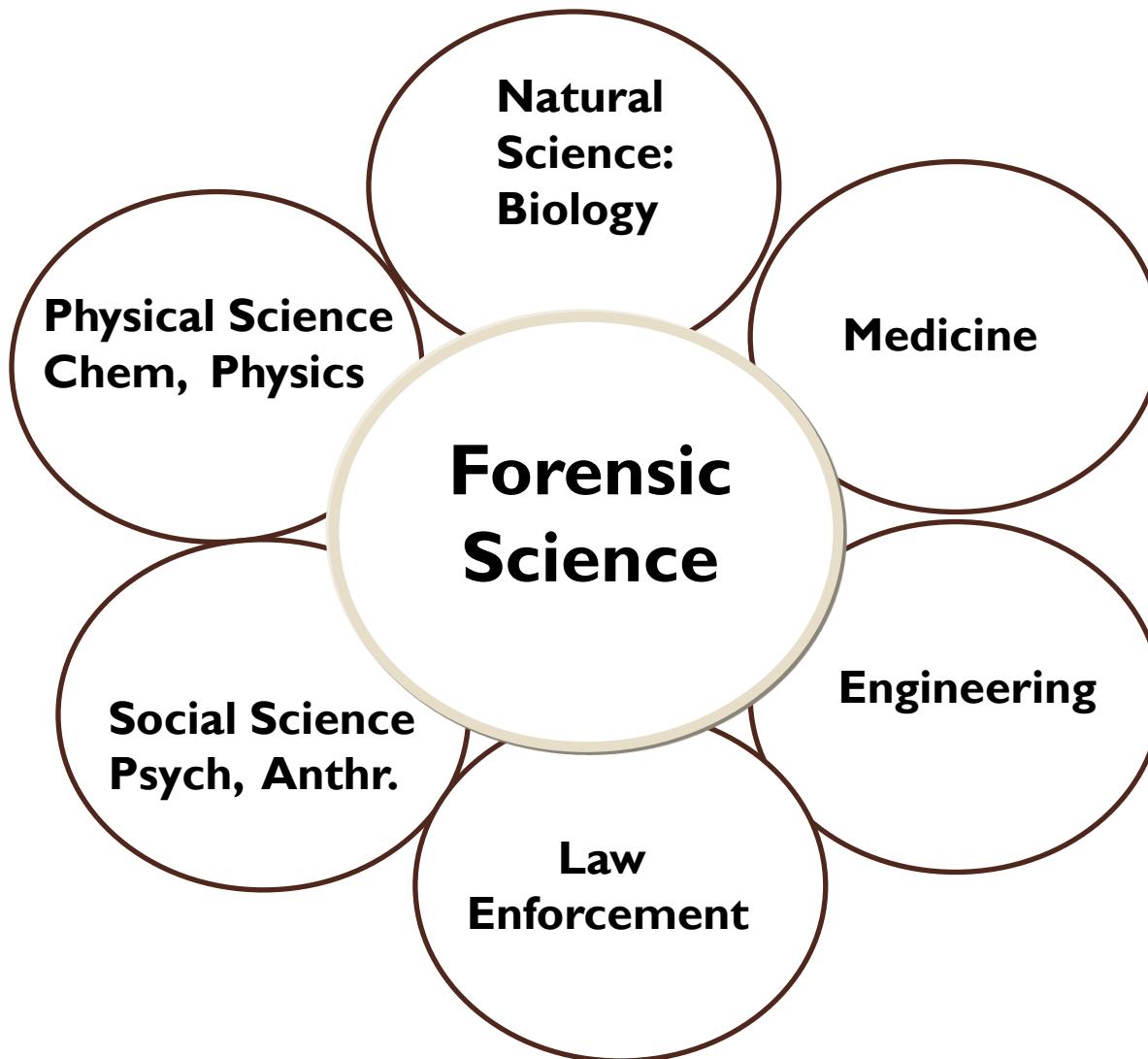


- Creator of Hercule Poirot and Miss. Jane Marple.
- Most read of crime/forensics writers

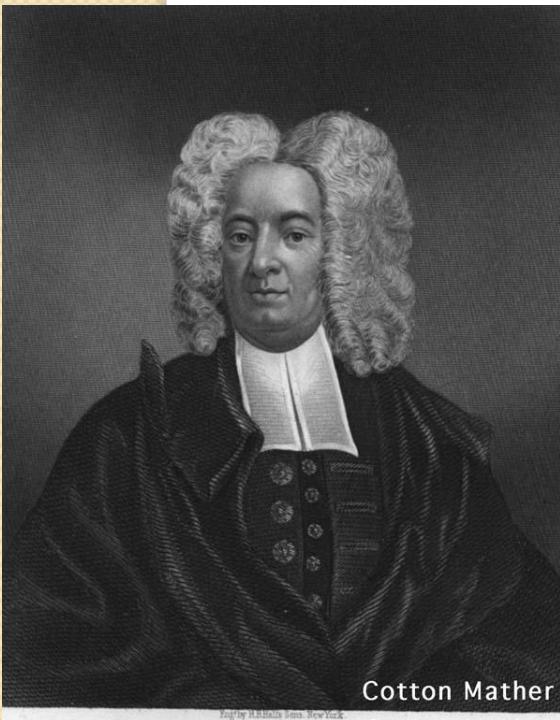
# Scientific Method



# Multidisciplinary Approach



# Example of the Multidisciplinay Approach and Needs of Forensic Science – Salem Witch Trials



Cotton Mather

**"In February of the exceptionally cold winter of 1692, young Betty Parris became strangely ill. She dashed about, dove under furniture, contorted in pain, and complained of fever. Cotton Mather had recently published a popular book, "Memorable Providences," describing the suspected witchcraft of an Irish washerwoman in Boston, and Betty's behavior mirrored that of the afflicted person described in Mather's widely read and discussed book...."**

# I690 Medicine



*The symbol of medicine*



# Salem Witch Trials

A Modest Enquiry  
Into the Nature of  
**Witchcraft,**

A N D

How Persons Guilty of that Crime  
may be Convicted: And the means  
used for their Discovery Discussed,  
both Negatively, and Affirmatively,  
according to SCRIPTURE and  
EXPERIENCE.

By John Hale,  
Pastor of the Church of Christ in Beverly,  
Anno Domini 1697.

*When they say unto you, seek unto them that have  
Familiar Spirits and unto Wizzards, that peep, &c.  
To the Law and to the Prophets; if they speak  
not according to this word, it is because there is no  
light in them, Isaiah VIII. 19, 20.  
That which I say not teach thou me, Job 34: 32.*

BOSTON in N. E.  
Printed by B. Green, and J. Allen, for  
Benjamin Eliot under the Town House: 1702

From June through September of 1692, twenty men and women, all having been convicted of witchcraft, were executed. Hundreds of others faced accusations of witchcraft. Dozens languished in jail for months without trials. Then, almost as soon as it had begun, the hysteria that swept through Puritan Massachusetts ended.

## “Examination of a Witch”



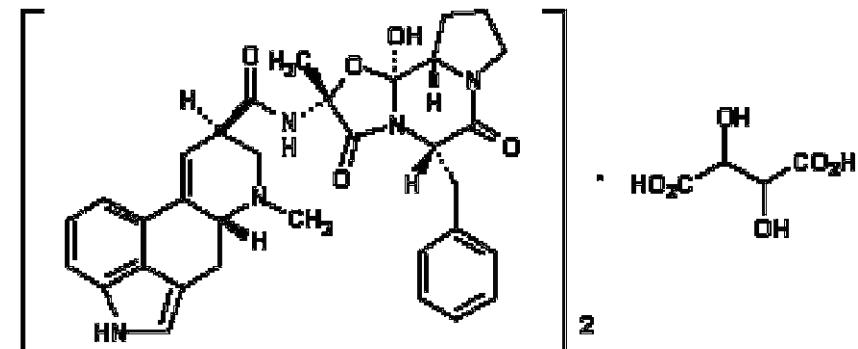
# Ergotism (St.Anthony's Fire)

**Ergot** - A toxic fungus found as a parasite on grains of rye.

**Gangrenous ergotism (gang-green)** - nausea, pains in the limbs, bodily extremities turn black, dry and become mummified

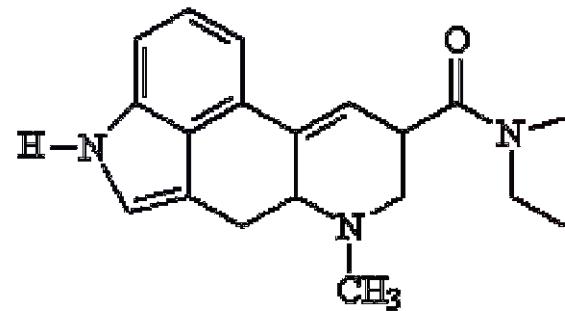
**Hallucinogenic ergotism** - vivid hallucinations nervousness, physical and mental excitement, insomnia and disorientation, strange dances with wild, jerky movements accompanied by hopping, leaping, screaming, and dancing compulsively until exhaustion lead them to collapse unconscious.

# Ergotism



(*3S*)-3-Benzyl-12-hydroxy-2-methylergotamine-3,6,18-trione hemitartrate

Ergotamine tartrate



Lysergic acid diethylamide

- Localization
- Weather
- Timing
- Symptoms (including recovery)
- Accounts for full series of events
- Others

