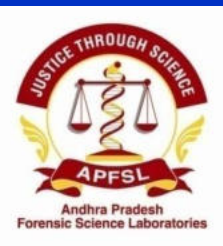


WELCOME TO THE PARTICIPANTS

M.A. (Criminal Law & Forensic Science) -& Advanced Diploma in Criminal Law & Forensic Science Students

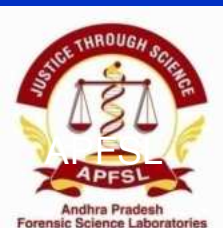


TARUVU SURESH, JOINT DIRECTOR, APFSL





Taruvu Suresh,
M.Sc (Che) ,M.Ed, M.Sc (Psy),. PGDCA,PGDFDR
JOINT DIRECTOR
A P FORENSIC SCIENCE LABORATORY
MANGALAGIRI



NOT CROSS P

TARUVU SURESH,JOINT DIRECTOR, APFSL

OLICE LINE2



CRIME SCENE PROCESSING AND RECONSTRUCTION.



CRIME SCENE PROCESSING

- Crime scene processing is a slow, methodical, systematic and orderly process that involves protocols and a processing methodology.

The plan of investigation consists of the following steps:

- Re-construction of Scene of Crime (SOC)
- Developing understanding about the sequence of events in connection with the commission of crime or the modus operandi.
- Collection of relevant evidence in a systematic manner

INVESTIGATION

- The word 'investigation' has been defined in Section 2(h) of the Criminal Procedure Code as: All the proceedings under the Code for the collection of evidence by a police officer or by any other person (other than a Magistrate) who is authorized by the Magistrate in this behalf.

Types of Crime Scenes

- Indoor
- Outdoor
- Others



DO NOT CROSS POLICE LINE DO NOT CROSS POLICE LINE

Types of Crimes



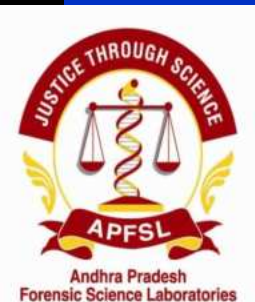
- Property Offences
- Offences involving Life
- White Collar Offences
- Offences against Women & Children
- Offences against Under privileged of the society
- Offences against Human Rights
- International Terrorism
- Anti Social Crime
- Accidents



CRIME SCENE DO NOT CROSS



***CLUES* /// ///**
SCIENTIFIC INVESTIGATION TEAM
A UNIT OF FORENSIC SCIENCE LABORATORIES
HYDERABAD CITY POLICE .



The team consists of the following personnel

1. Scientific Officer
2. Fingerprint Expert
3. Forensic Photographer and
4. Forensic Videographer
5. Other Forensic Examiners / Experts.



The whole team works under the direct supervision of the Director APFSL in headquarters and SPs' in Districts.

Classification of Evidence

Testimonial evidence is a statement made under oath; also known as direct evidence or *prima facie* evidence.

Physical evidence is any object or material that is relevant in a crime; also known as indirect evidence. Examples are hair, fiber, fingerprints, documents, blood, soil, drugs, toolmarks, impressions, glass.

Reliability of Eyewitness

Factors that affect accuracy:

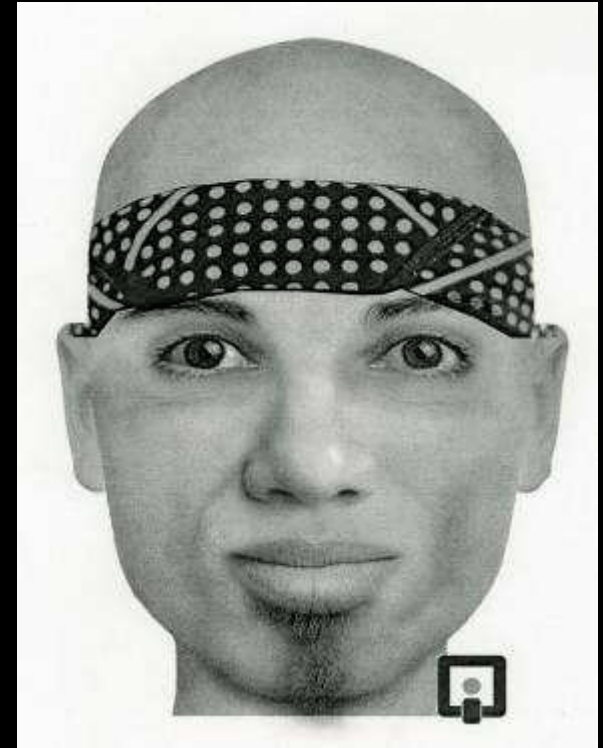
- ◆ Nature of the offense and the situation in which the crime is observed
- ◆ Characteristics of the witness
- ◆ Manner in which the information is retrieved

Additional factors:

- Witness's prior relationship with the accused
- Length of time between the offense and the identification
- Any prior identification or failure to identify the defendant
- Any prior identification of a person other than the defendant by the eyewitness

Eyewitness

A police composite may be developed from the witness testimony by a computer program or forensic artist.



FACES—a composite program by InterQuest

Physical Evidence

As a result of the influences on eyewitness memory, physical evidence becomes critical.

Is generally more reliable than testimonial evidence

- Can prove that a crime has been committed
- Can corroborate or refute **verbal witness** testimony
- Can link a suspect with a victim or with a crime scene
- Can establish the identity of persons associated with a crime
- Can allow reconstruction of events of a crime
- **Protects/ Exonerate the innocent.**



Reconstruction

Physical evidence can be used to answer questions about:

- ◆ What took place at a crime scene
- ◆ The number of people involved
- ◆ The sequence of events

A forensic scientist compares the *questioned* or unknown sample from the crime scene with a sample of *known* origin.

What Is Physical Evidence?

- ✦ In a criminal trial, **physical evidence** is material objects, such as a gun, a knife, bloodstained clothing, a latent fingerprint, or a photograph.



Types of Physical Evidence

- ❖ **Physical evidence** can be broadly classified as
- (a) Fixed evidence,
 - and
 - (b) Movable evidence.

Example for Fixed Evidence



Example for Movable Evidence



Value of Physical Evidence

- Different types of physical evidence serve the following different investigative purposes.
 - Corpus delicti evidence
 - Associative Evidence
 - Tracing Evidence
 - Screening Evidence
 - Identifying evidence

Types of Physical Evidence

Transient evidence is temporary; easily changed or lost; usually observed by the first officer at the scene.

Pattern evidence is produced by direct contact between a person and an object or between two objects.

Conditional evidence is produced by a specific event or action; important in crime scene reconstruction and in determining the set of circumstances or sequence within a particular event.

Transfer evidence is produced by contact between person(s) and object(s), or between person(s) and person(s).

Associative evidence is something that may associate a victim or suspect with a scene or with each other; e.g., personal belongings



—Henry C TARUVU SURESH, JOINT DIRECTOR, APFSL

Revised, 2021

Transient Evidences

Odor—putrefaction, perfume, gasoline, urine, burning, explosives, cigarette or cigar smoke

Temperature—surroundings, car hood, coffee, water in a bathtub, cadaver

Imprints and indentations— footprints, teeth marks in perishable foods, tire marks on certain surfaces



Pattern Evidence

Pattern evidence—mostly in the form of imprints, indentations, striations, markings, fractures, or deposits

Blood spatter	Clothing or article distribution
Glass fracture	Gunpowder residue
Fire burn pattern	Material damage
Furniture position	Body position
Projectile trajectory	Tool marks
Tire marks or skid marks	Modus operandi



Examples of Conditional Evidence

Light—headlight, lighting conditions, lights on or off

Smoke—color, direction of travel, density, odor

Fire—color and direction of the flames, speed of spread, temperature and condition of fire

Location—of injuries or wounds, of bloodstains, of the victim's vehicle, of weapons or cartridge cases, of broken glass

Vehicles—doors locked or unlocked, windows opened or closed, radio off or on, odometer mileage

Body—position and types of wounds; rigor, livor, and algor mortis

Scene—condition of furniture, doors and windows, any disturbance or signs of a struggle

Classification of Evidence by Nature

Biological—blood, semen, saliva, sweat, tears, hair, bone, tissues, urine, feces, animal material, insects, bacteria, fungi, botanical material

Chemical—fibers, glass, soil, gunpowder, metals, minerals, narcotics, drugs, paper, ink, cosmetics, paint, plastic, lubricants, fertilizer

Physical—fingerprints, footprints, shoeprints, handwriting, firearms, tire marks, tool marks, typewriting

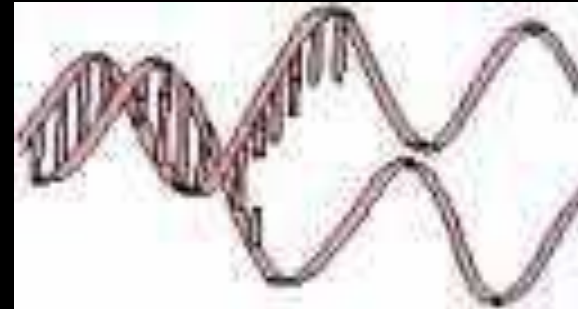
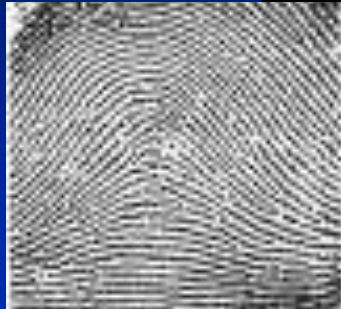
Miscellaneous—laundry marks, voice analysis, polygraph, photography, stress evaluation, psycholinguistic analysis, vehicle identification

Evidence Characteristics

Individual—can be identified with a particular person or a single source

• Fingerprints - 1×10^{60}

- [illegible]



Class—common to a group of objects or persons

Class vs. Individual Evidence

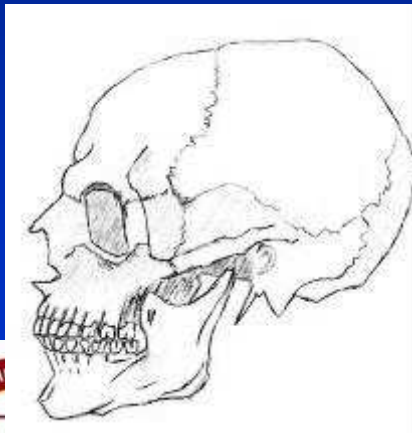
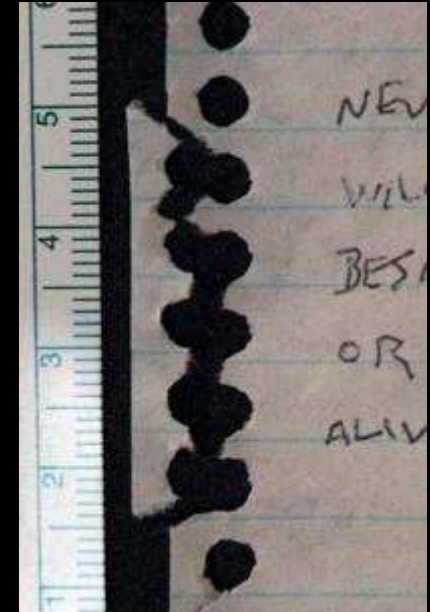


These fibers are class evidence; there is no way to determine if they came from this garment.



The large piece of glass fits exactly to the bottle; it is individual evidence.

Class vs. Individual Evidence, *continued*



Which examples do you think could be individual evidence?

Forensic CS Investigations

Include some or all of these seven major activities:

1. **Recognition**—the ability to distinguish important evidence from unrelated material

Pattern recognition

Physical property observation

Information analysis

Field testing

2. **Preservation** through the collection and proper packaging of evidence

3. **Identification** using scientific testing

Physical properties

Chemical properties

Morphological (structural) properties

Biological properties

Immunological properties

4. **Comparison of class characteristics** measured against those of known standards or controls; if all measurements are equal, then the two samples may be considered to have come from the same source or origin

5. **Individualization** in demonstrating that the sample is unique, even among members of the same class
6. **Interpretation**—giving meaning to all the information
7. **Reconstruction** of the events in the case

Inductive and deductive logic

Statistical data

Pattern analysis

Results of laboratory analysis



—Henry C. Lee and Jerry Labriola, *Famous Crimes Revisited*, 2001

PSLDC

Principles of Forensic Science:

There are 7 basic principles of Forensic Sciences.

- ✓ Law of Comparison.
- ✓ Law of Individuality.
- ✓ Law of Analysis.
- ✓ Law of Progressive Change.
- ✓ Law of Probability.
- ✓ Principle of Exchange.
- ✓ Law of Circumstantial Facts.

Law of Comparison

“ Only the likes can be compared”, is the law of comparison. It emphasizes the necessity of providing like sample and specimens for comparison.

Law Of Individuality

Every object natural or man made, has all individual which is not duplicated in any other object.

Law of Analysis

The quality of any analysis is determined by the quality of the sample under analysis, the chain of custody, and the expertise of the individual who analyses it.

“The analysis can be no better than the sample analyzed.” the principle emphasizes the necessity of correct sampling and packaging for effective use of experts.

Law of Progressive Change

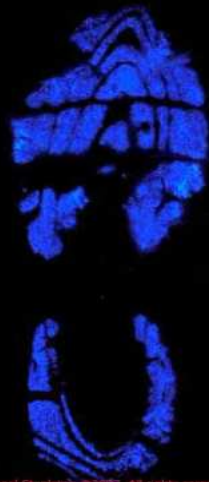
“Every thing changes with the passage of time”. Its impact on forensic science is immense. The criminal, the crime scene and objects involved in the crime all undergo changes, hence may become unrecognizable.

Law of Probability

All the identifications, definite or indefinite, are made consciously or unconsciously, on the basis of probability.

Principle of Exchange

According to this, when a criminal or his instrument of crime come in contact with the victim or the objects surrounding him, they leave traces, and the criminal or his instrument picks up traces from the same contact.



Michael Stapleton ©2007. All rights reserved.

Locard's Principle

'There is an exchange of matter when two or more objects come in contact with each other'



Law of Circumstantial Facts

**“Facts do not lie, men can and do,”
hence the importance of
circumstantial evidence is as good as
oral evidence. Oral evidence depends
upon so many factors such as power
of observation, assimilation, auto
suggestion.**

HOW TO LOOK FOR

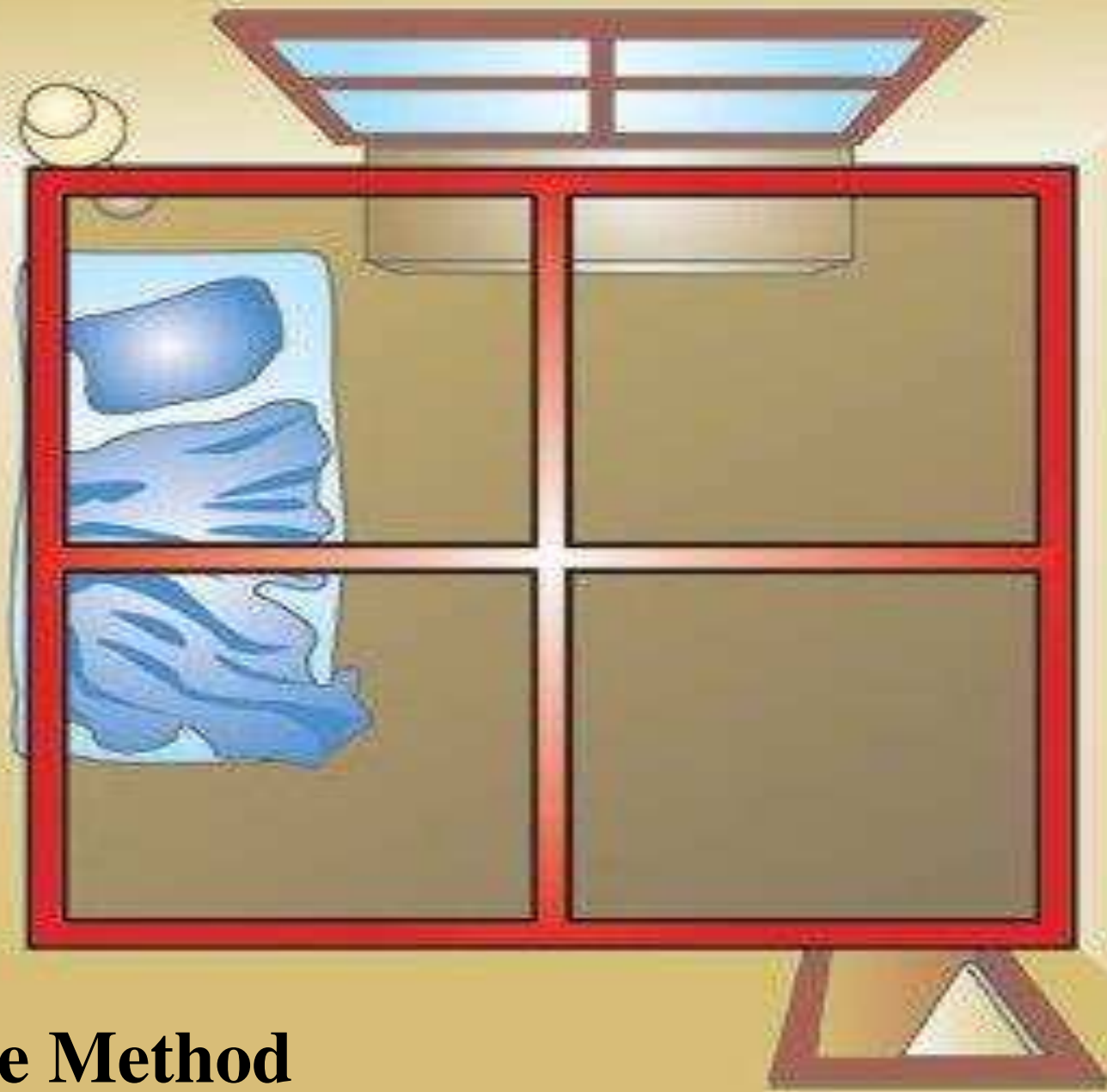


NOT CROSS POLICE LINE DO NOT CROSS POLICE LINE

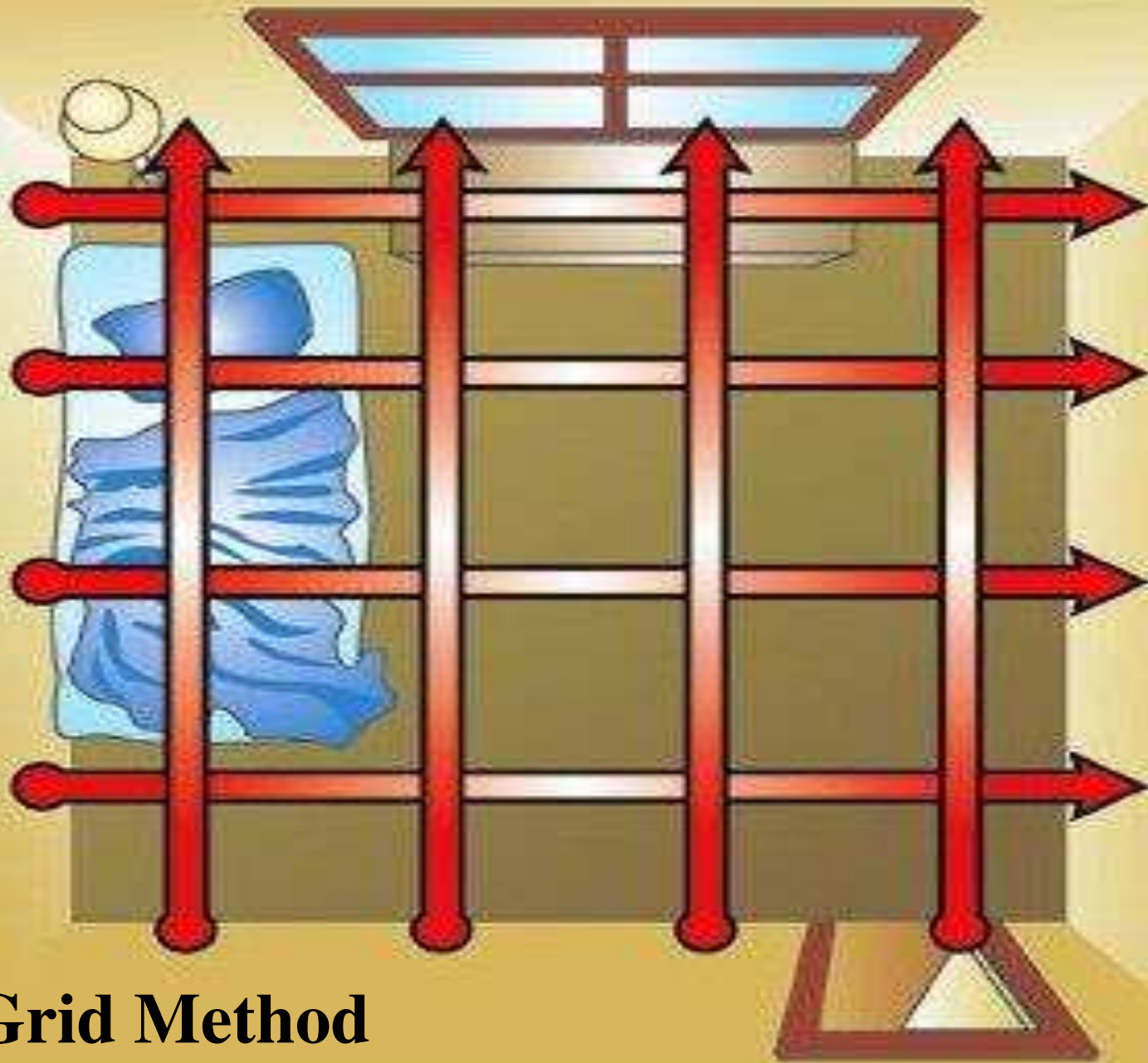
CRIME SCENE

- LINE OF APPROACH
- POINT OF ENTRY
- ACTUAL SCENE
- POINT OF EXIT &
- LINE OF RETREAT

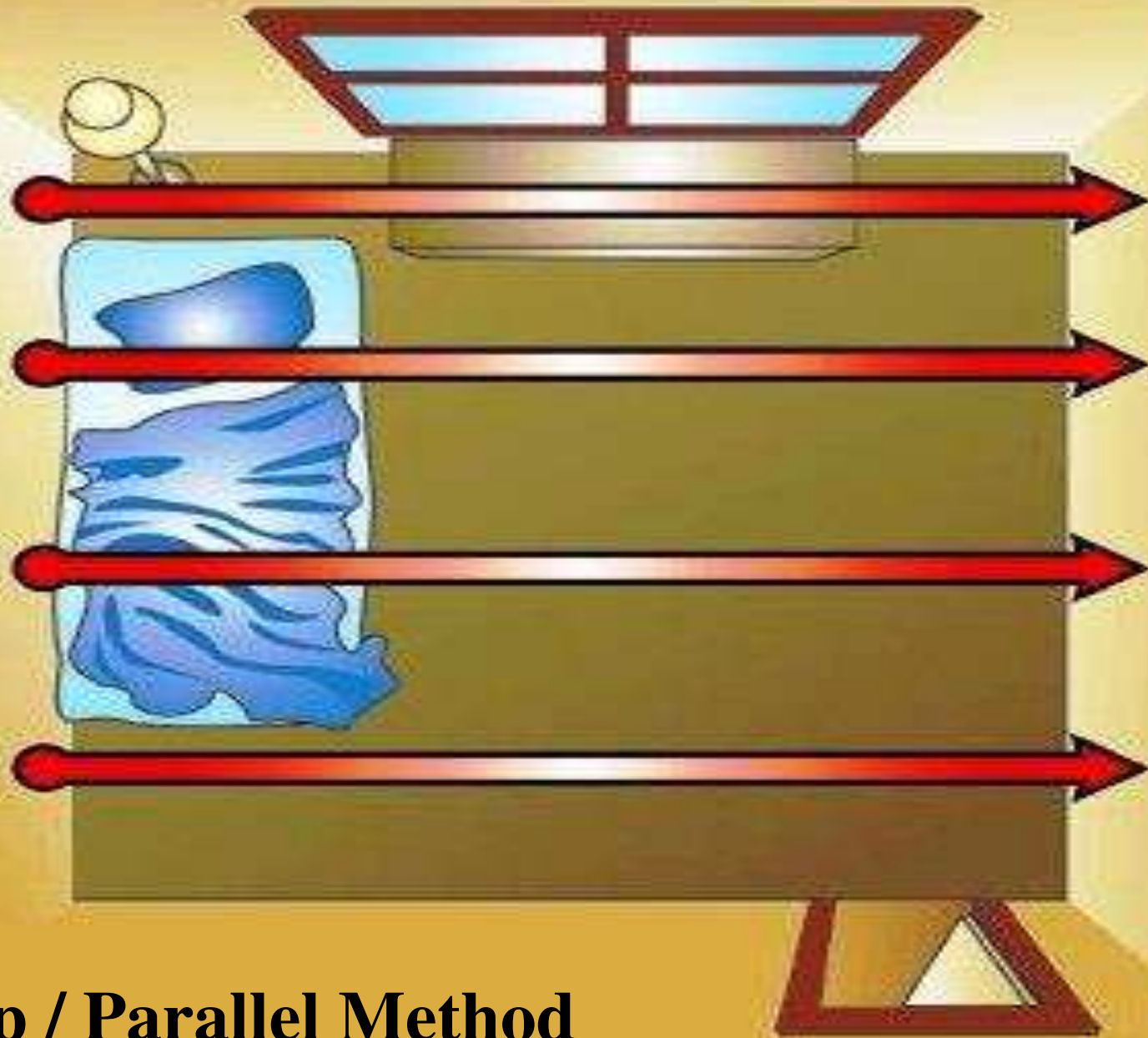




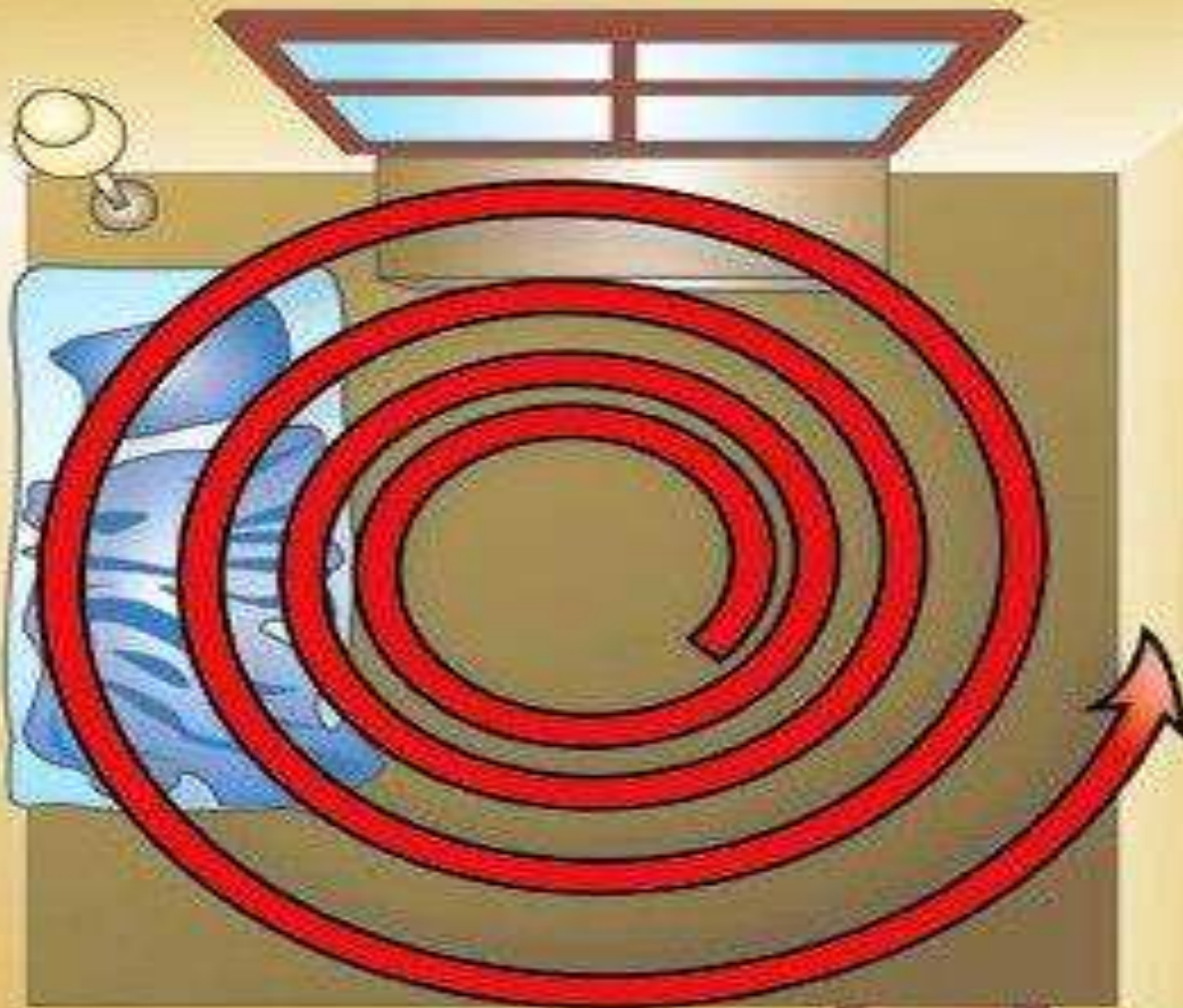
Zone Method



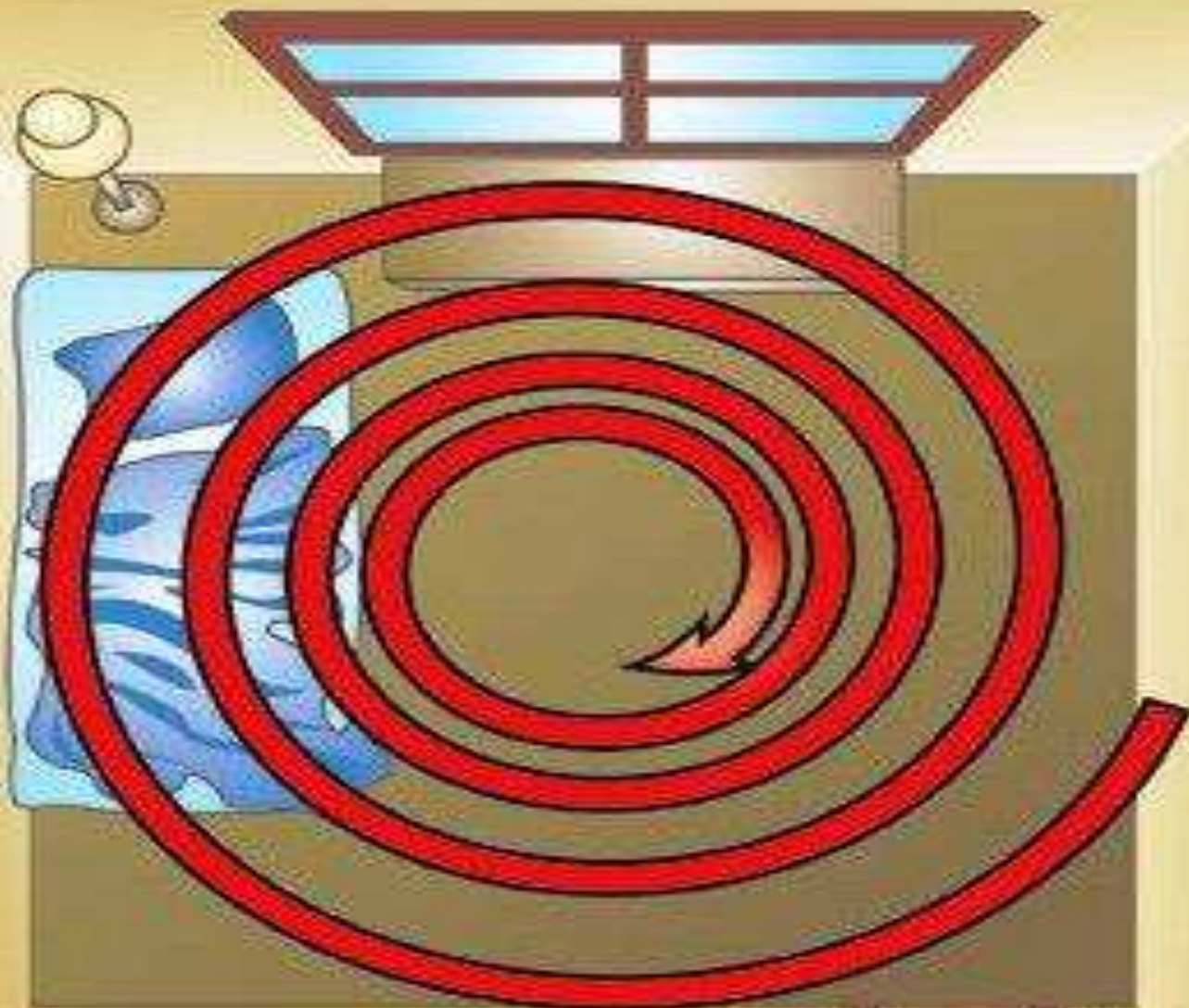
Grid Method



Strip / Parallel Method

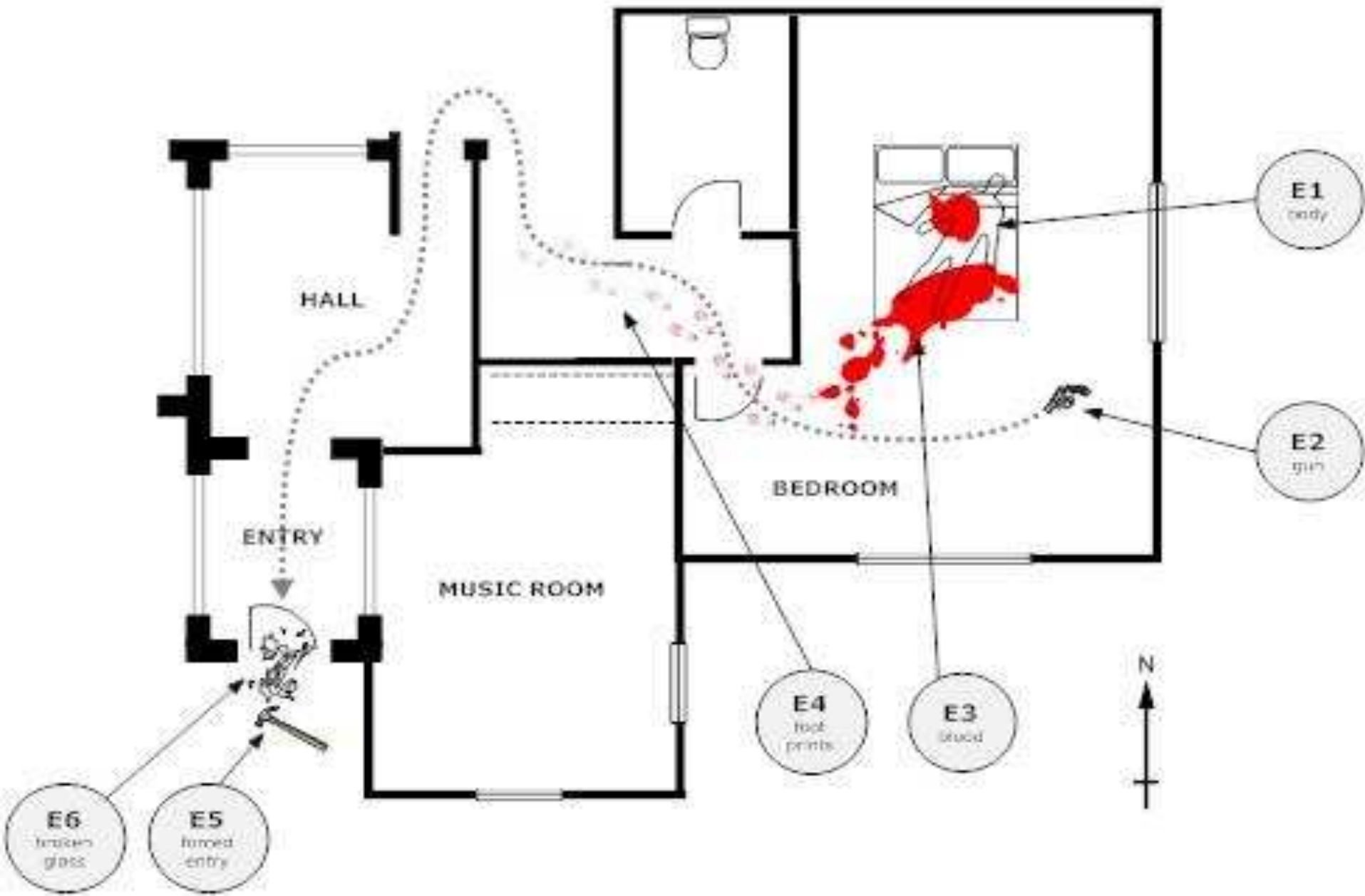


Outward Spiral Method



Inward Spiral Method

Crime scene sketch



Crime Scene Processing

- Recording the scene of Crime by means of Observation Notes, Photography, Videography Sketching and Voice Recording
- Location, Identification, Collection, Preservation and Packing of the Physical Evidence at the scene of crime.



NOT CROSS POLICE LINE DO NOT



Evidence at a Crime Scene

- Testimonial evidence
- Physical evidence.



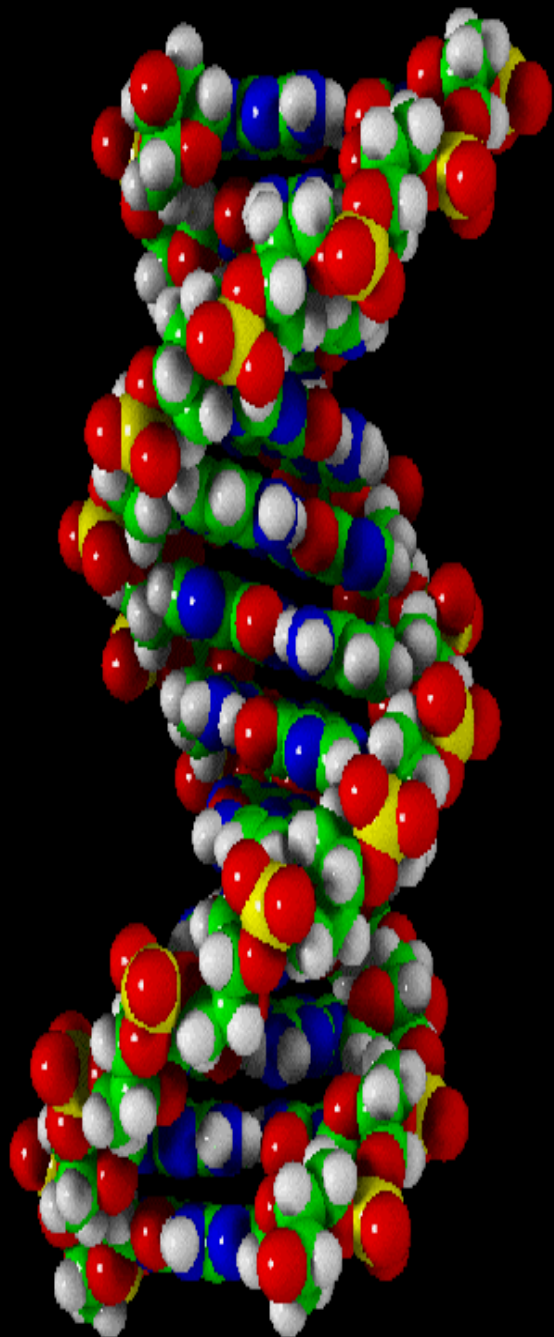
ECTOR, APFSL

Types of Evidence

Marks/Impressions

foot prints,
fingerprints,
tool marks,
footwear,
fabric impressions,
tire marks
bite marks





cut marks
filled out numbers
Oil & grease marks
dagger / glass with blood
/finger prints
explosion residue
pattern,
blood stain patterns

■ Biological evidence

blood

semen

body fluids

hair

nail scrapings

seeds

powders

empty phials

vomit

vegetable



■ Trace Evidence

gun shot residues

accelerants

paint

glass

fibers

lipsticks

shoe polish

nail polish

sand etc.,



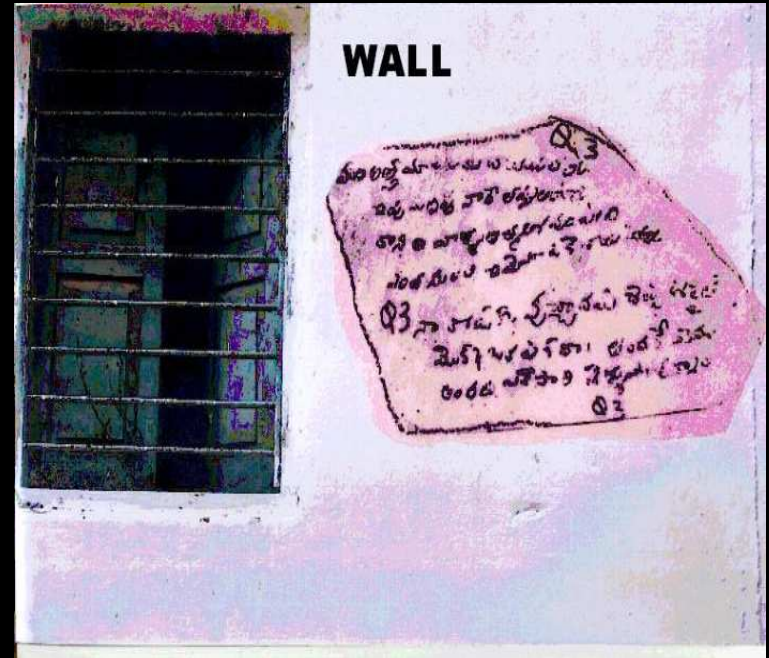


Firearms includes
weapons
gun powder patterns
casings
projectiles
fragments
pellets
wadding
cartridges.

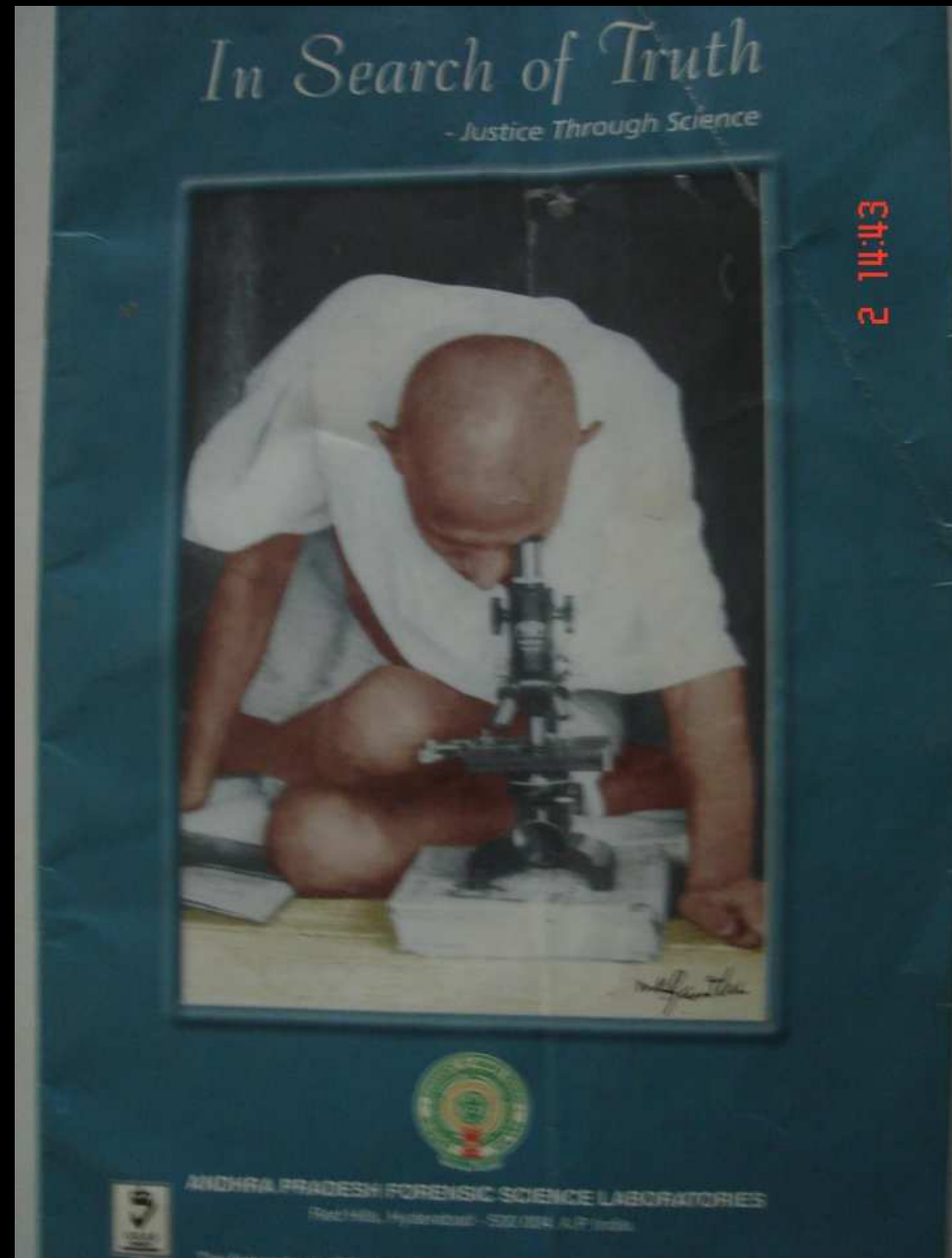


■ Question Documents

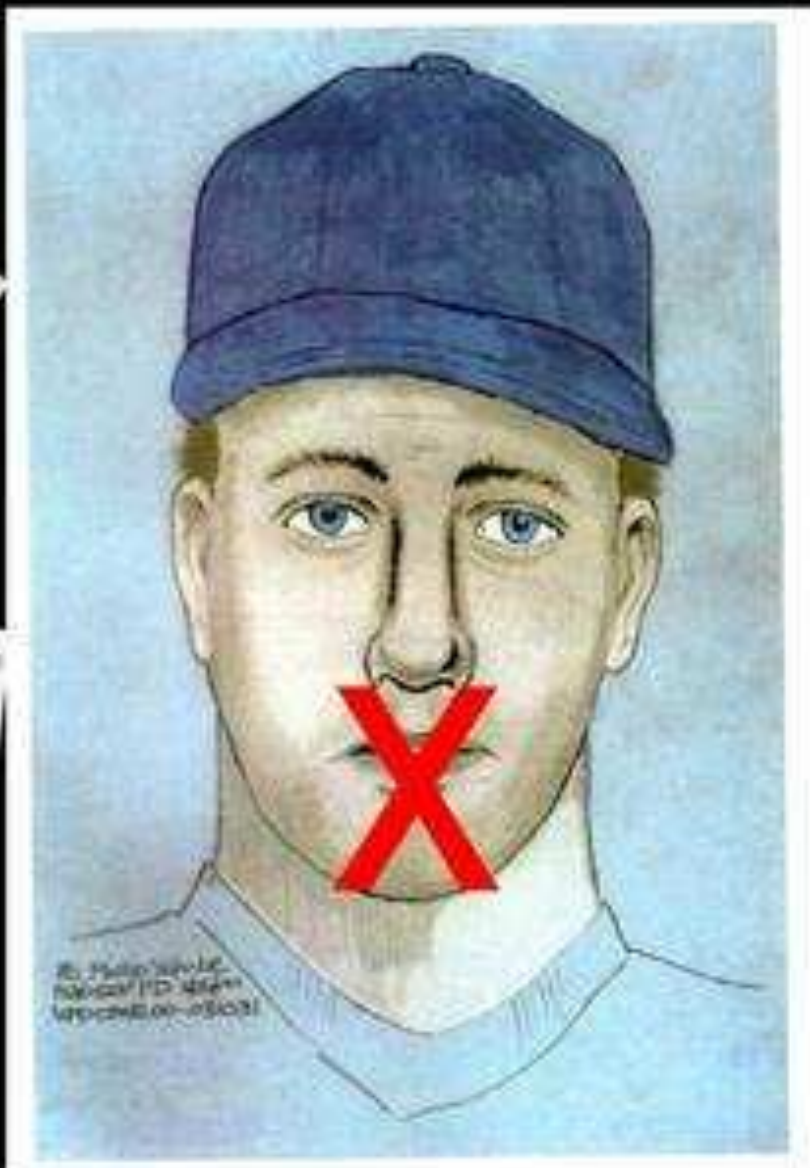
- Computer hard discs
floppys
cd's etc,.



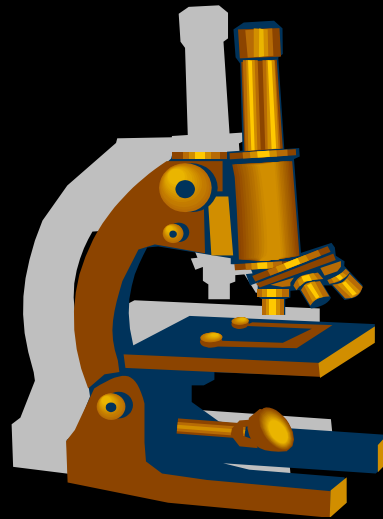
FACTS DONOT LIE
MEN CAN AND DO



TARUVU SURESH,JOINT DIRECTOR, APFSL



SCIENTIFIC EQUIPMENTS ARE BEING USED FOR *CRIME SCENE INVESTIGATION*



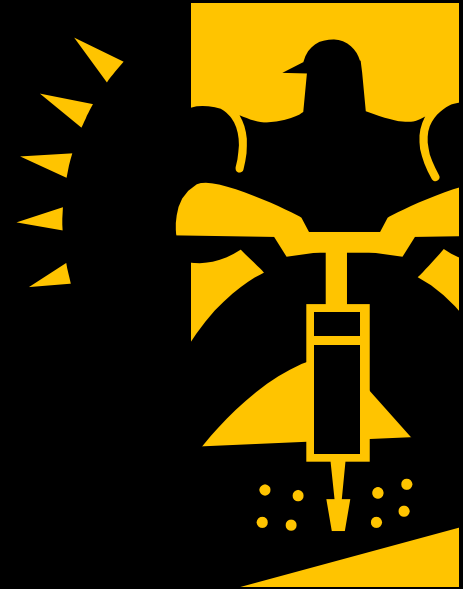
CRIME SCENE RECORDING EQUIPMENT

- **DIGITAL PHOTO CAMERA**
- **VIDEO CAMERA**
- **35mmSLR CAMERA**



CRIME SCENE SEARCHING EQUIPMENT

- **POLI LIGHT**
(MULTIPLE WAVELENGTH LIGHT FOR INDORE)
- **POLIRAY** (FOR OUT DORE)
- **EURO LIGHT**
- **BLUE LIGHTING**



POLILIGHT







Band	Colour	Band Width	General Application
400-680 nm	White light band	280 nm	General searching (footprints)
350 nm	Ultra Violet band	80 nm	General searching (stains, fingerprints)
415 nm	Violet (blood filter)	40 nm	Blood prints, splatter, gunshot residues
450 nm	Blue	100 nm	General searching (semen, urea, fibers)
470 nm	Blue	40 nm	General searching (ninhydrin prints)
490 nm	Blue	40 nm	General (semen, urea, fibers)
505 nm	Blue/Green	40 nm	Superglue and ninhydrin treated prints
530 nm	Green	40 nm	DFO treated prints, background reduction
555 nm	Green/Orange	27 nm	DFO treated fingerprints, background reduction
590 nm	Orange	40 nm	Ninhydrin treated prints, background reduction
620 nm	Orange/Red	40 nm	Ninhydrin treated prints, background reduction
650 nm	Red	40 nm	Ninhydrin treated prints, background





2005 note

Fluorescent
fiber
different



Widened
security
thread







FORENSIC PHYSICS

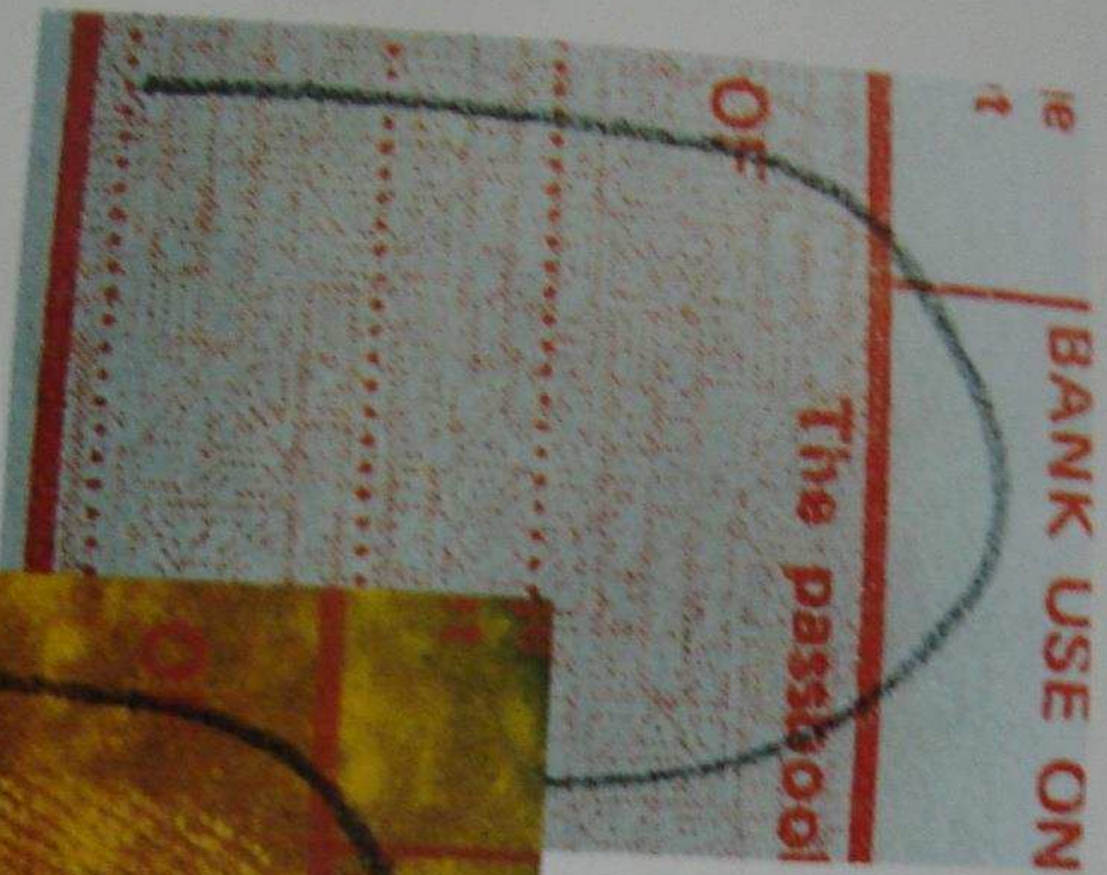
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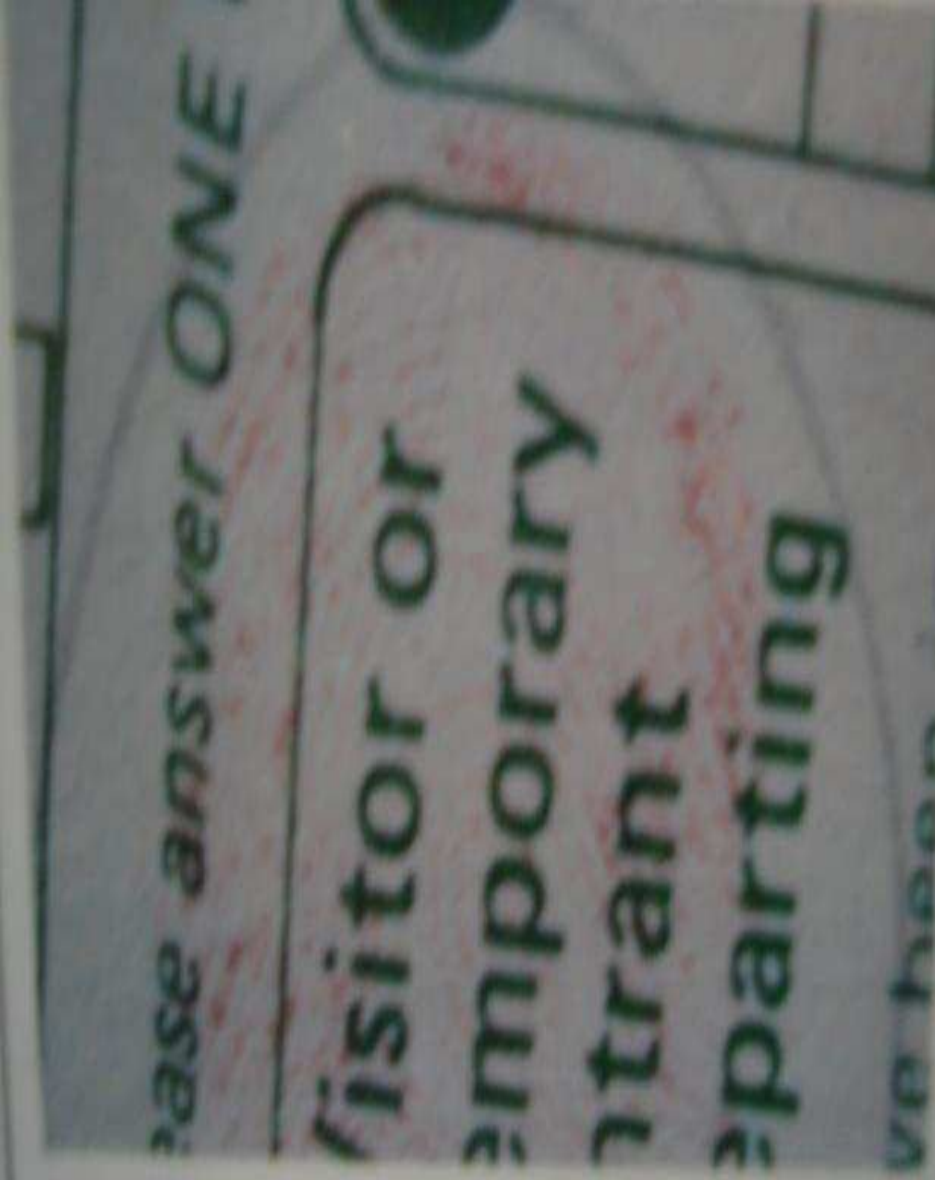








•
B



GSR



SEMINAL STAINS



BA

Australia and New Zealand Bank

RODEN,

A.C.

SQUARE.



BN

Australia and New Zealand Bank

**KODEN, A.C.
SQUARE**

H.W.

2nd 2nd 2nd

ATURRE
EPOSITOR



[REDACTED]

NAME

[REDACTED]

Address

[REDACTED]

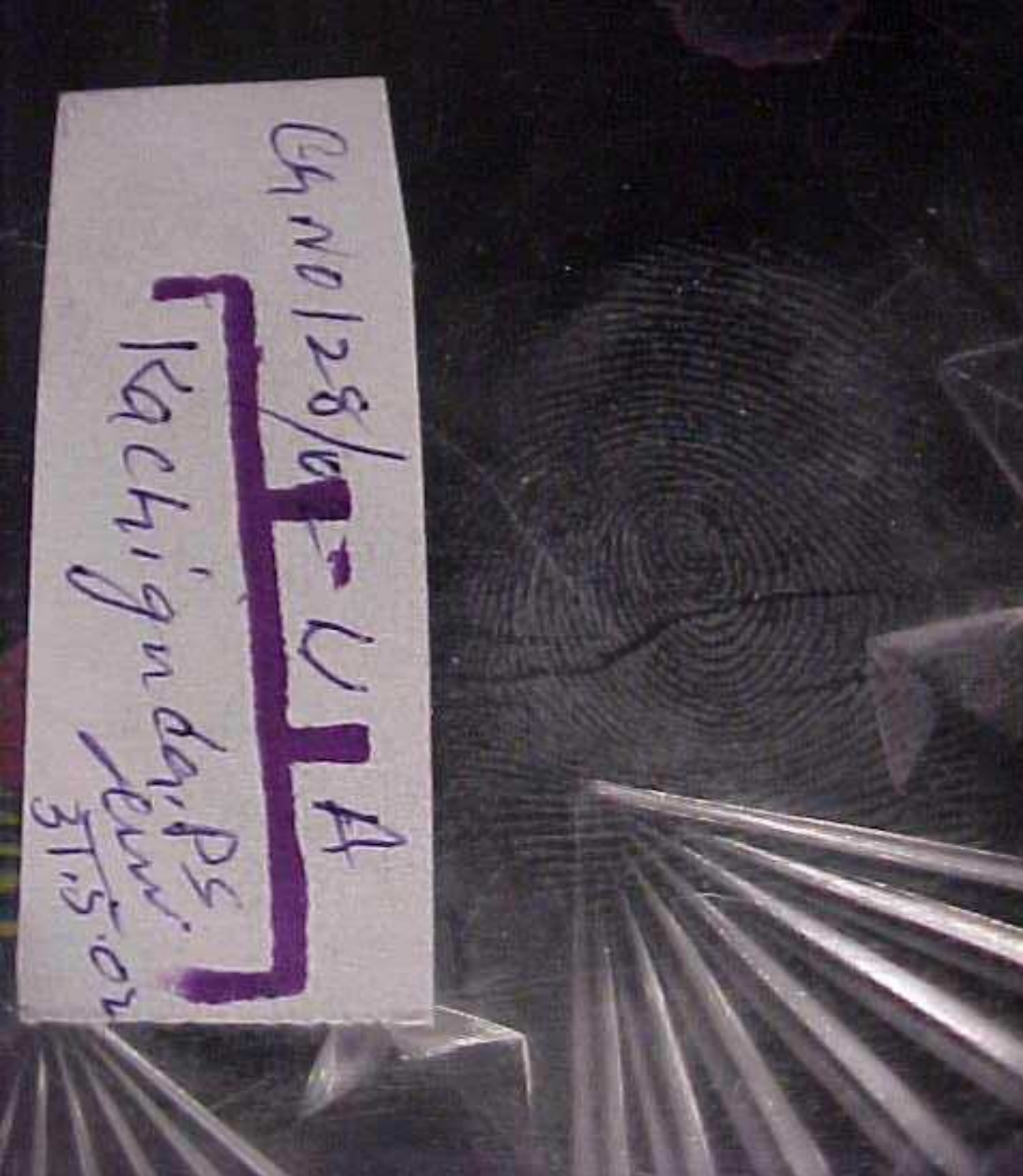
Area Code

Pin





2 12:41





Paid in b (signature)	Cre (Account)	No. of col
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③

0147	0147
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C.











PHYSICAL EVIDENCE COLLECTING EQUIPMENT

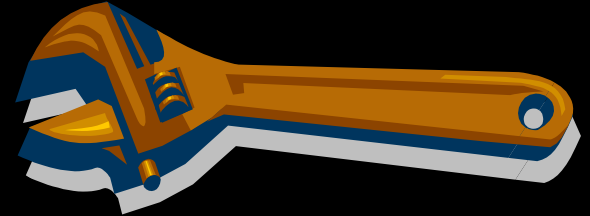
- **SUNKEN FOOT PRINT
COLLECTION KIT**

- **ELECTROSTATIC DUST PRINT
LIFTING KIT**

- **MICROSIL-TOOL / BITE MARK
LIFTING KIT**

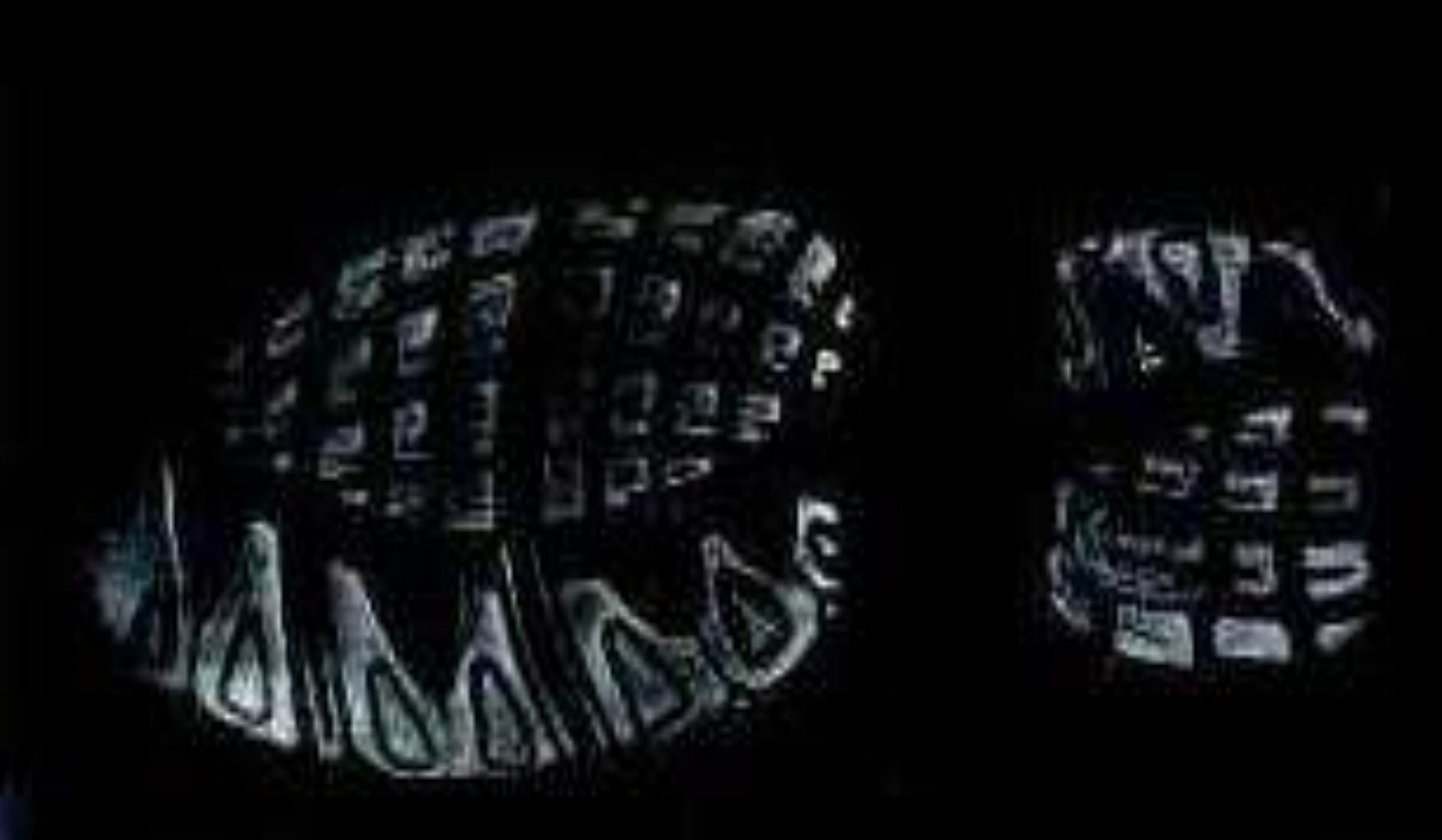
- **ADVANCED PHYSICAL EVIDENCE
COLLECTION KIT**

- **BLOOD EVIDENCE COLLECTION**



ELECTROSTATIC DUST PRINT LIFTING KIT





$d = 1$

 is 4 for the whole





















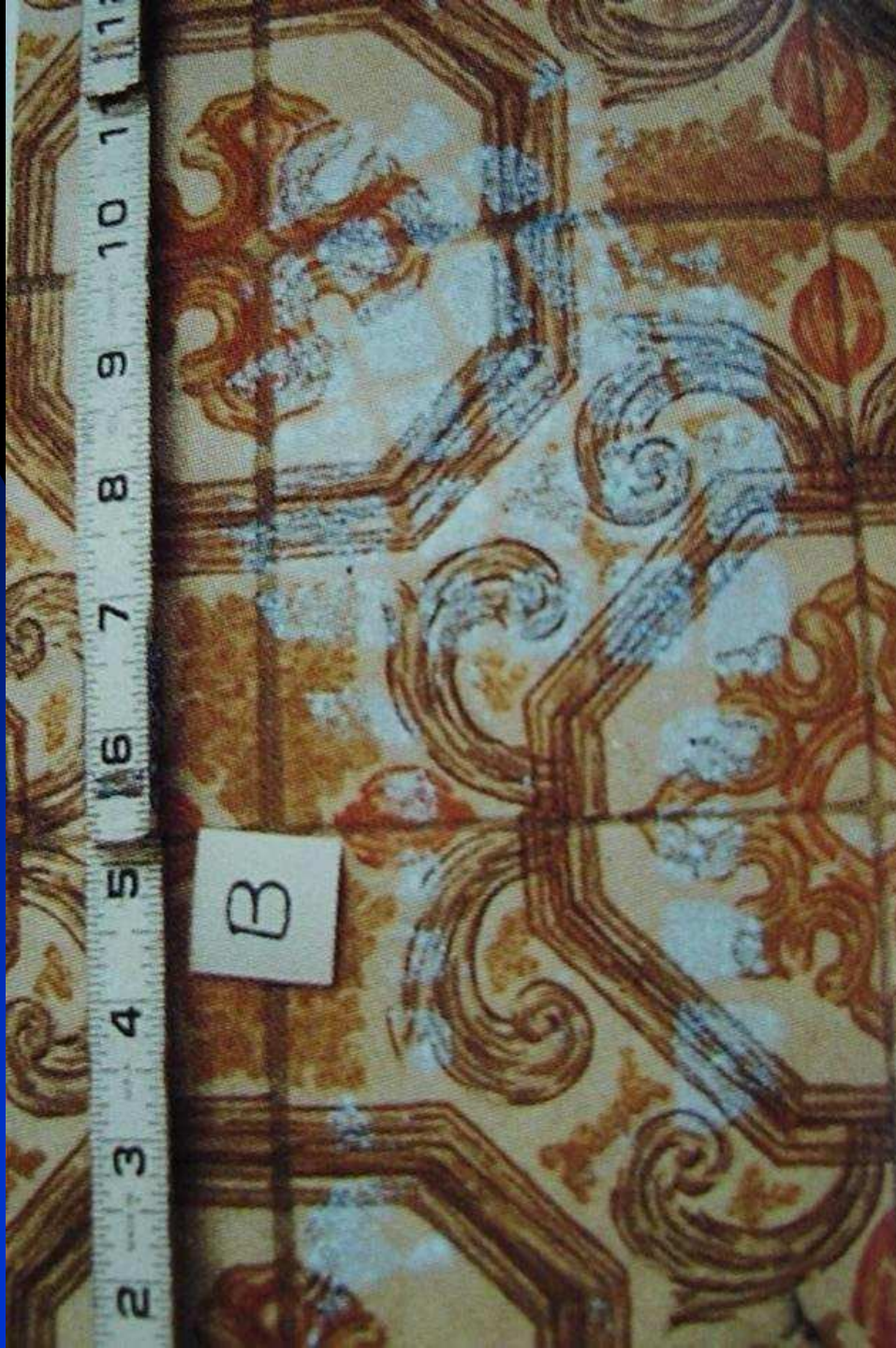
SUNKEN FOOT PRINT COLLECTION KIT

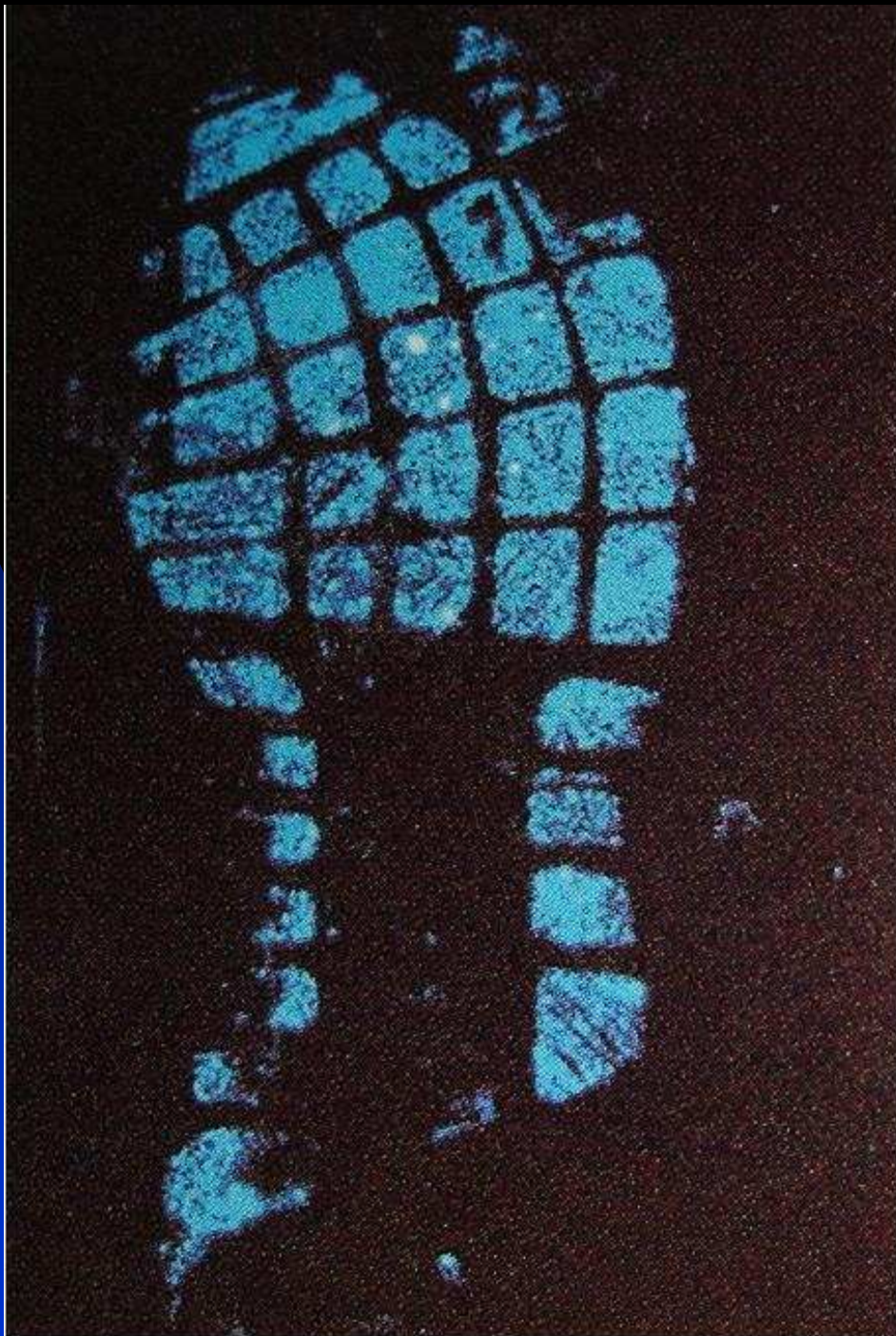




BLOOD EVIDENCE COLLECTION KIT

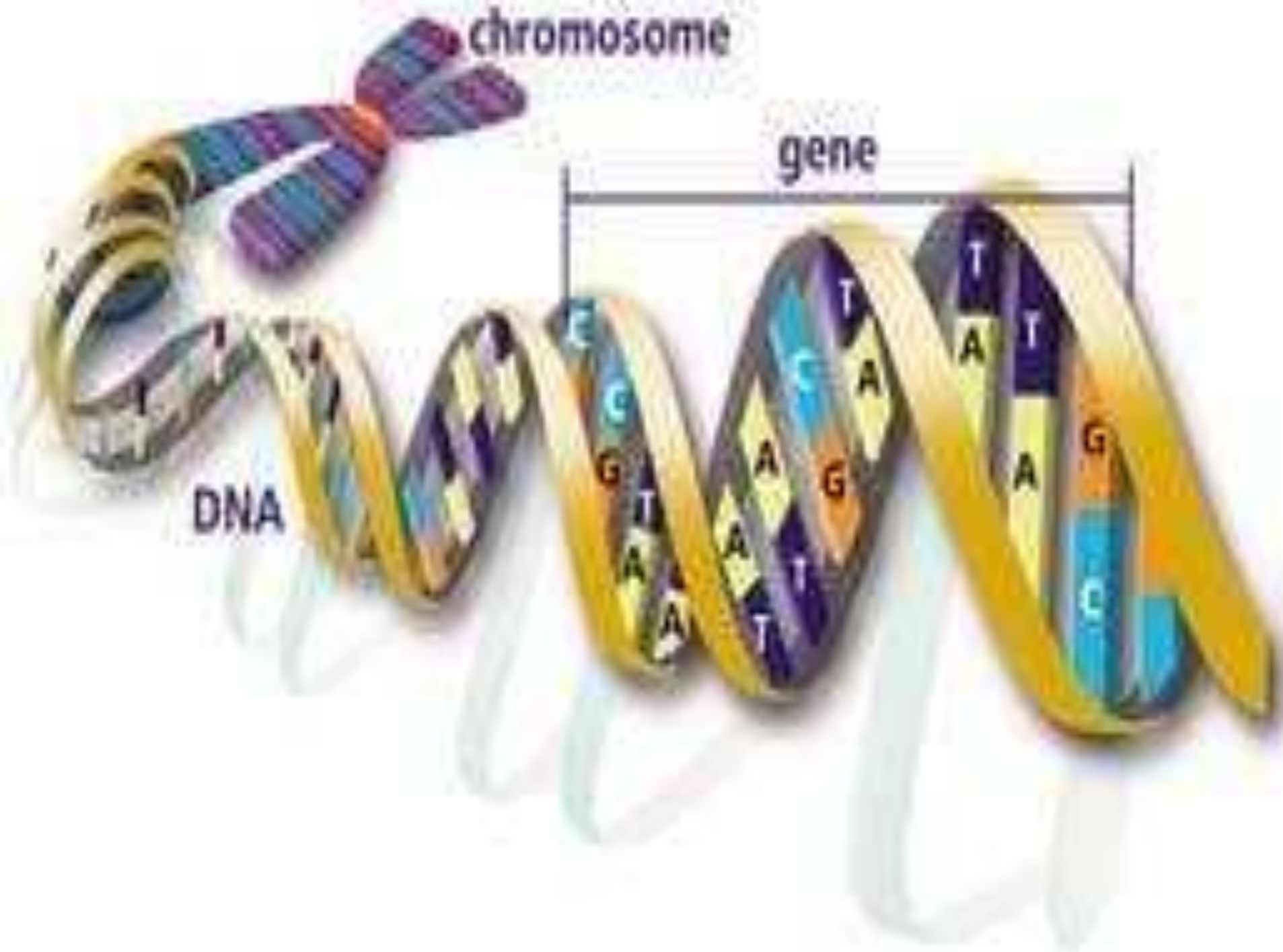








CV NO: 112/98
of J. Hills P.S







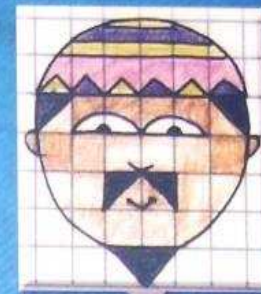
Rape Case : DNA Analysis



Victim



Semen stain



Suspect-1



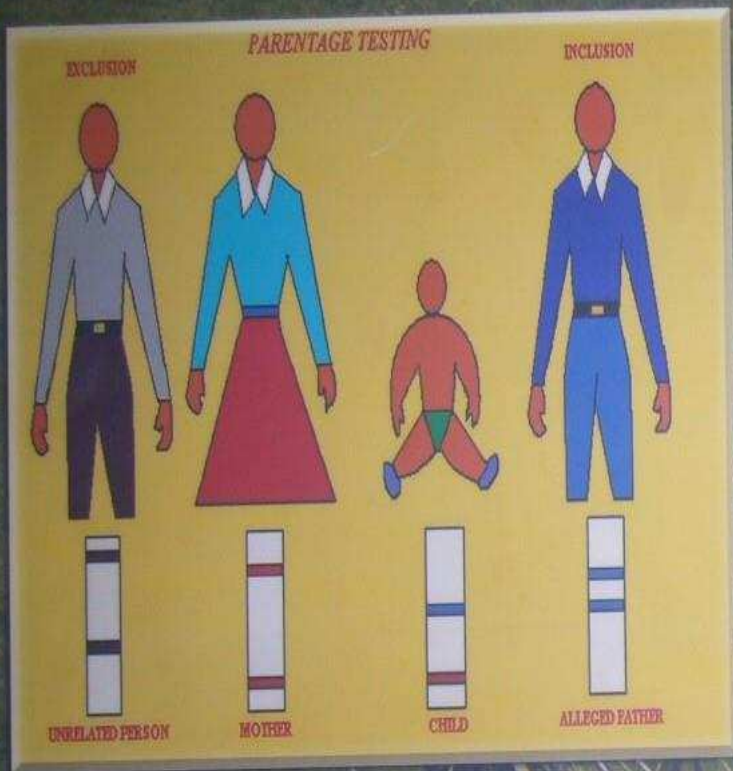
Suspect-2

STR Pattern

STR Pattern obtained from semen stain of victim's garment is identical with those of suspect - 1.

Suspect-2

Disputed Paternity



Alleged Father - 2



Mother



Child



Alleged Father - 1



DNA (STR) Profiling Analysis concluded inclusion of Alleged Father - 1, where as exclusion of Alleged Father - 2, as Biological Father of the Child.



(a)



(b)



(c)



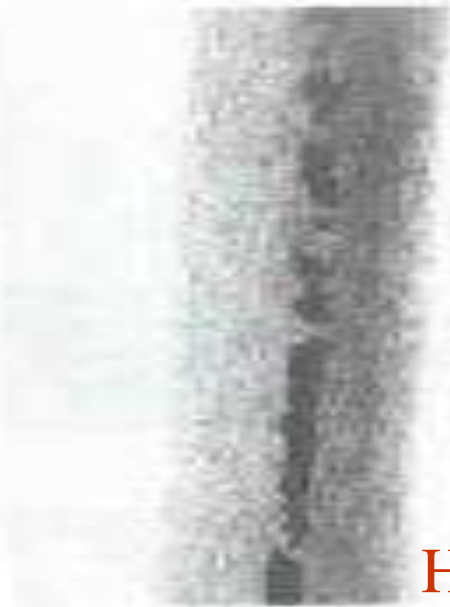
(d)



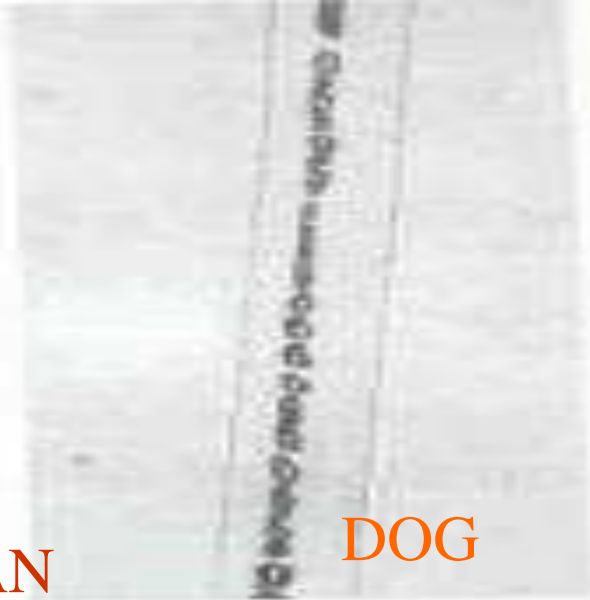
(e)



(f)



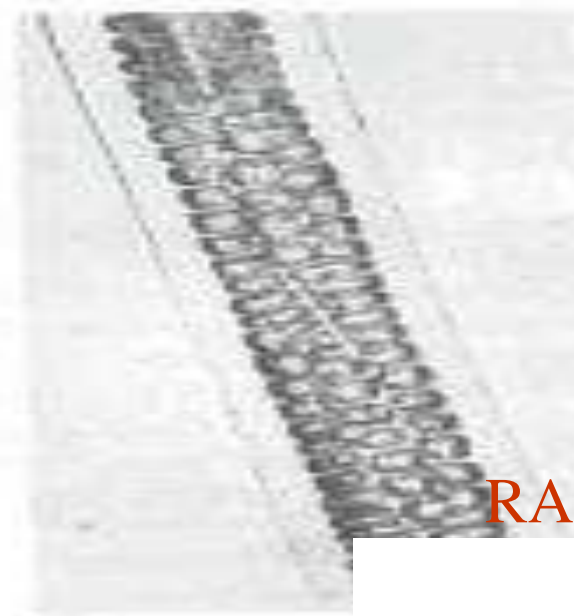
HUMAN



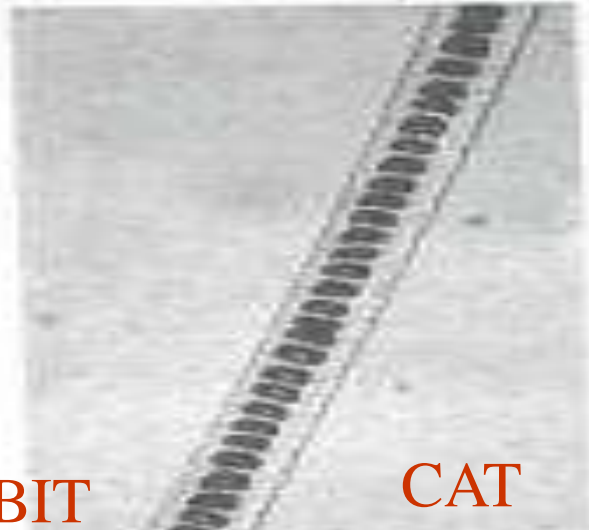
DOG



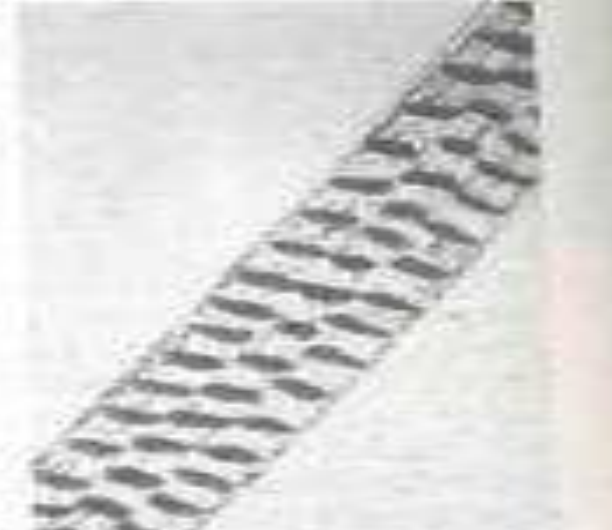
DEER



RABBIT



CAT



MEDULLA PATTERN

Figure 8-4. Medulla patterns for various types of hair. (a) Human head hair (450x); (b) dog (450x); (c) deer (150x); (d) rabbit (450x); (e) cat (450x); (f) cat (450x). All courtesy Linda Jankowski.

D09

15kV X500

50μm 190700



FINGER PRINTS / BARE FOOT PRINTS DEVELOPING EQUIPMENT

- FLUORESCENCE POWDERS
- FLUORESCENCE MAGNA POWDERS
- UNIVERSAL POWDERS
- CYANOWAND KIT
- FEATHER BRUSH POWDER APPLICATORS
- MAGNETIC POWDER APPLICATORS



FINGER PRINT COLLECTION KIT



ROLLED AND PLAIN IMPRESSIONS ON A FINGERPRINT IDENTIFICATION CARD

RIGHT HAND

1. Thumb



2. Index finger



3. Middle finger



4. Ring finger

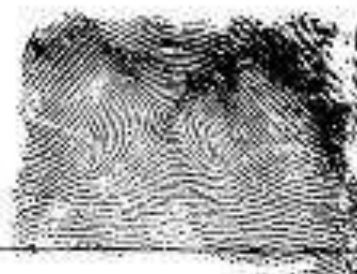


5. Little finger



LEFT HAND

6. Thumb



7. Index finger



8. Middle finger



9. Ring finger



10. Little finger



Left Hand Four fingers taken simultaneously



Note amputations

Thumb Plain Impressions



Right Hand Four fingers taken simultaneously



MICROSIL-TOOL / BITE MARK LIFTING KIT



MICRO EXAMINATION EQUIPMENT



 BINOCULAR MICROSCOPE



ADVANCED MEASURING EQUIPMENT



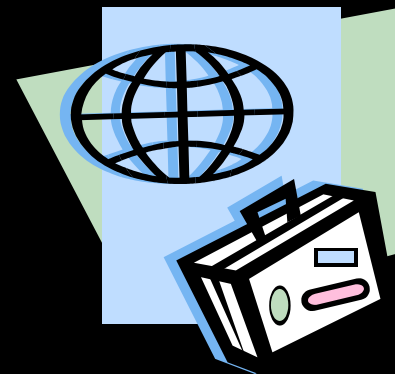
ELECTRONIC PROMEASURE



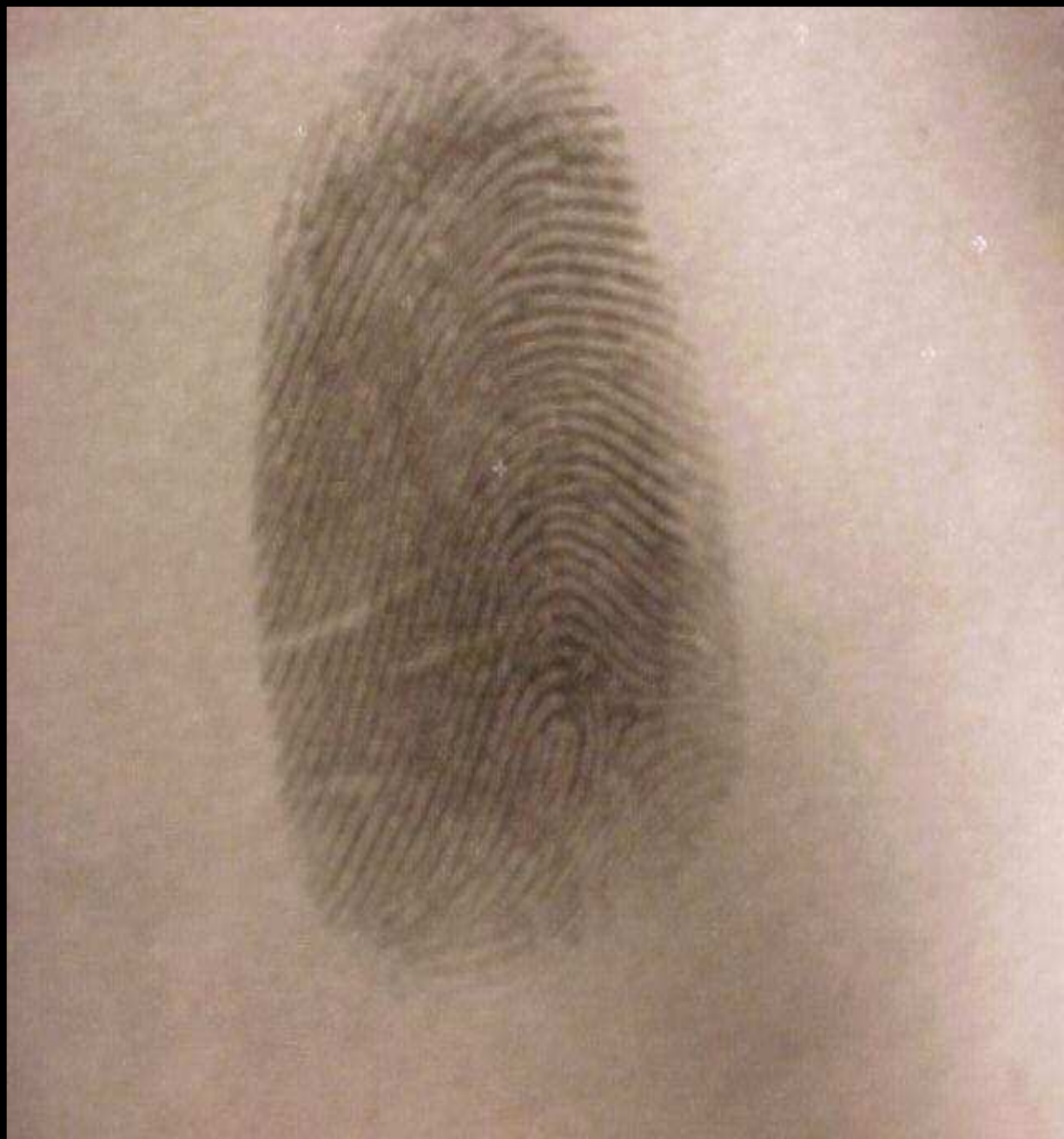
ELECTRONIC PROTAPE

SPOT TEST KITS

- **EXPLOSIVE SPOT TEST KIT**
- **NARCOTIC SPOT TEST KIT**

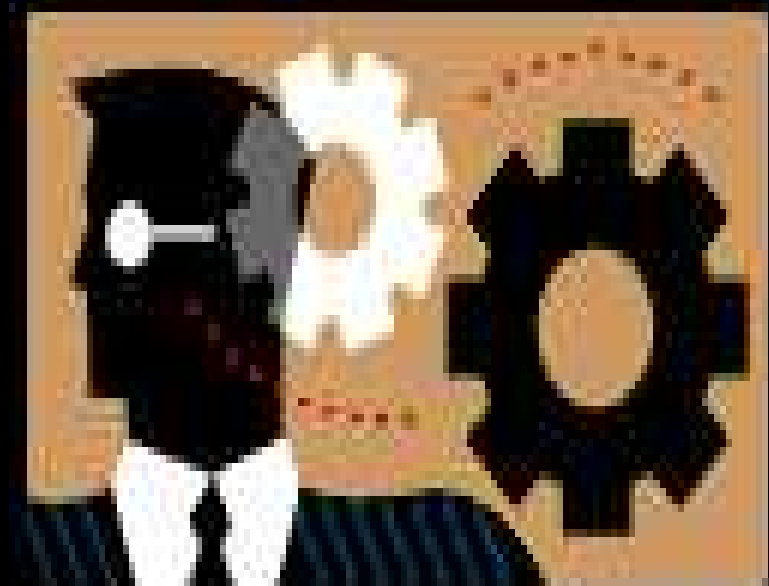






EQUIPMENT FOR COMMUNICATION

- MOBILE PHONE
- VHF WIRELESS SET
- LAND LINE PHONE
- PERSONAL



TRANSPORTATION

- CLUES VEHICLE WITH EQUIPMENT (MARUTHI VAN)



MOST OF THE CASES SOLVED ON THE BASIS OF

- ❑ CRIME SCENE RECONSTRUCTION
- ❑ SUNKEN, BLOOD & DUST FOOT PRINTS
- ❑ TOOL MARKS, TYRE MARKS
- ❑ DNA FINGER PRINTING
- ❑ BLOOD, SALIVA, HAIR ANALYSIS
- ❑ DOCUMENTS
- ❑ OTHER PHYSICAL EVIDENCES



**Scientific Investigating Team CLUES****A field unit of A.P., Forensic Science Laboratory, Red Hills, Hyderabad - 500 004.**

No: SIT/...../APFSL/2001/..... Date

Police Station :

1. Requisition Details:

Crime No :

Name :

Section of Law :

Designation :

Date & Time :

Mode of requisition : Telephone/Messenger/VHF/Pager/.....

Caller Identity :

2. CLUES Team Response Details:a) **CLUES**, Team members

1.

2.

3.

b) Other experts : 1.

2.

c) Date & Time of departure to the scene : Date _____ Time _____

d) Date & Time of reaching the scene : Date _____ Time _____

e) Mode of transport : CLUES Vehicle/Police Vehicle/.....

3. Offence Details:

Date & Time of Occurrence :

Complainant's Name & Address :

Nature of Offence : Murder/Explosion/Arson/Rape/Robbery/Dacoity/House Break /Theft/.....

4. Summary of Inspection:5. **Role of CLUES Team in the detection of crime :** Overwhelming/Supportive/Routine/Not helpful.6. **Expert Advice** (Details with Date, Time, Signature and to whom given):Signature of CLUES In-charge
with Date & Time

A. CRIME SCENE INSPECTION

1. Brief Description of the Scene. (According to CLUES team)

2. Suspect known to victim/Suspect unknown to victim/Suspect identified by eyewitness/ Suspect unidentified/.....

3. Date & Time of Inspection :

Persons Present :

i) Police Officer(s) :

ii) Medical Officer :

iii) Eye witness :

Others :

4. Weather condition :

(a) At the time of incident : Sunny/Rainy/Cloudy/Foggy/.....

(b) At the time of search : Sunny/Rainy/Cloudy/Foggy/.....

5. Natural Light condition :

(a) At the time of incident : Day/(Morning/Noon/Evening)/Night..... Normal/Poor

(a) At the time of search : Day/(Morning/Noon/Evening)/Night..... Normal/Poor

6. Condition of fittings/fixtures (Describe)

Electric lights :

Fans :

Water taps :

Gas regulator:

Doors :

Windows :

B. CRIME SENCE RECORDING DETAILS :

1. Photos taken by :

2. Videography taken by :

3. Digital Photography taken by :

C. TYPES OF PHYSICAL EVIDENCE PROCESSED (Tick mark the appropriate items):

i) Finger prints

ii) Foot prints

iii) Blood stains pattern

iv) Body fluids

v) Tyre marks/Skid marks/Tool marks/Glass pieces

vi) Others

D. DESCRIPTION OF ANY SPECIAL EQUIPMENT USED (Tick mark the appropriate items):

1. Poliray

4. Blood collection kit

7. Narcotic Field test kit

2. Polilight

5. Electrostatic dust print lifter

8. Flash light magnifier

3. Physical evidence collection kit

6. Explosive Field test kit

9. Electronic pro-measure

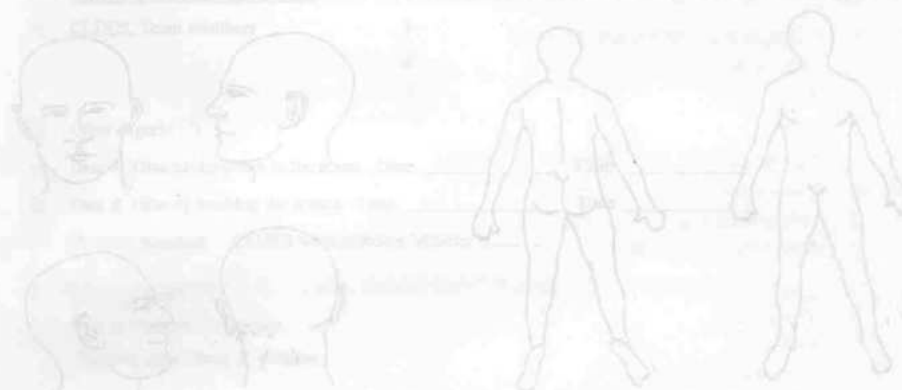
10. Any other

Signature of CLUES In-charge
with Date & Time

E. DETAILS OF PHYSICAL EVIDENCE COLLECTED.

Item No.	Nature of sample Crime/Control	Location (from where collected)	Date & Time of Collection	Collected, packed, labelled & sealed by	Mode & Type of Packing
1.					
2.					
3.					
4.					
5.					

F. CRIME SCENE ROUGH SKETCH.



Signature of the CLUES in-charge

Name & Designation :

G. DETAILS OF DECEASED PERSONS/INJURED PERSONS/WOUND CHART:

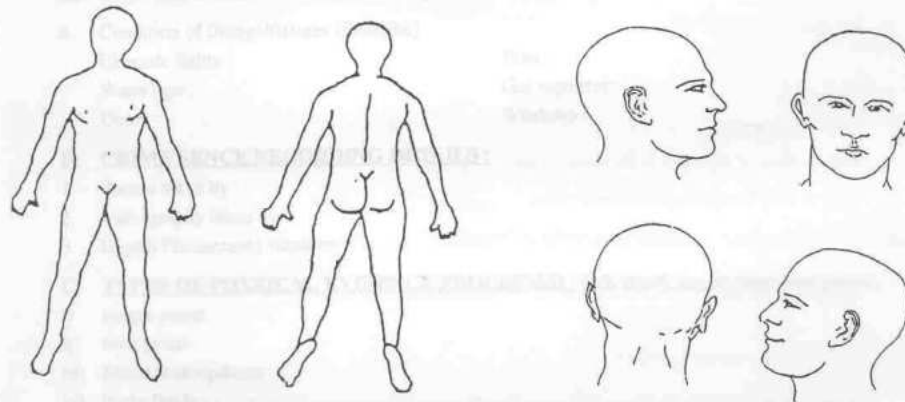
Details of the Deceased :

Name	Male/ Female	Physical Description	Approx. Age	Type of Samples Collected by whom

Details of the Injured :

Name	Male/ Female	Description of the wound (Nature, Causative weapon)	Approx. Age	Remarks

WOUND CHART (use separate charts for each person):



Crime No. _____ P.S. _____ Date : _____
 Name of Deceased : _____ Sex : _____ Age : _____ Height : _____
 Cause of Death : _____
 Address where found : _____
 Home Address : _____
 Police Officer in-charge of case : _____

Signature of CLUES In-charge
with Date & Time

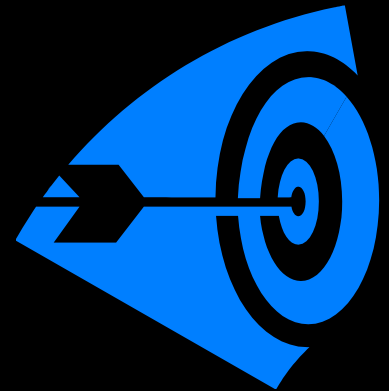
Organization and Procedures for Search Operations

- Preparation
- Basic Stages in a Search
- Approach Scene
- Secure and Protect Scene
- Initiate Preliminary Survey
- Evaluate Physical Evidence Possibilities
- Prepare Narrative Description
- Photograph Scene
- Prepare Diagram/Sketch of Scene
- Conduct Detailed Search/Record and Collect Physical Evidence
- Conduct Final Survey
- Release Crime Scene



"Golden Rule" of Crime Scene Investigation/Management

"Never touch, change, or alter anything until it has been documented, identified, measured, and photographed . . . when a body or article has been moved, it can never be restored to its original position."



Thank You



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TARUVU SURESH, JOINT DIRECTOR, APFSL