

Criminal Investigation,

Seventh Edition

Chapter Four

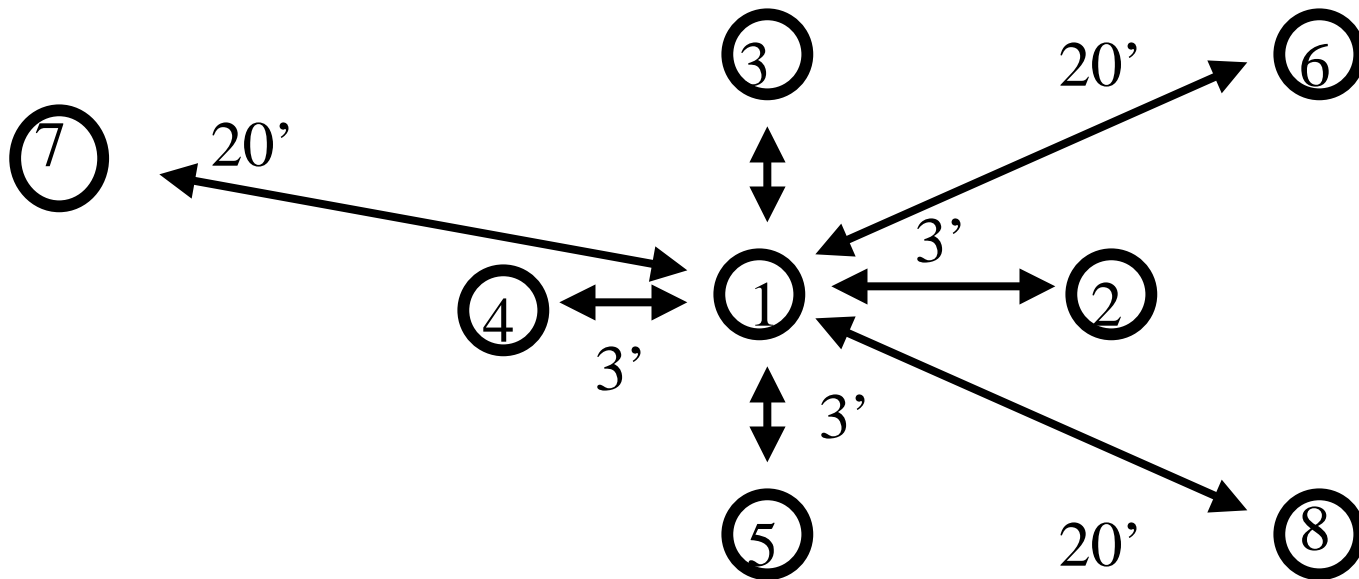
Physical Evidence

Class Versus Individual Characteristics

- A class concerns an item, such as shoe heels, they may be of one brand, but as the heel is worn the heel develops individual characteristics.
- Soil:
 - Soil is a combination of particles of earth materials – soils, rock, minerals, and fossils.
 - Soil may, or will be specific to an area.

Class Versus Individual Characteristics

- Soil: Collection
 - The soil samples may be critical when a suspect is arrested (as a comparison)



Preserving Shoeprints/Tire-tread Prints and Impressions

- Photograph first.
 - Use a ruler to show size, or some device.
- Whenever possible, the original item should be submitted to the laboratory.
- Shoeprints and Tire-tread prints occur when someone/something contacts moldable material.
 - It is difficult to cast these prints and the individual assigned to the task needs to have experience and training.
 - It is possible to collect prints from snow or other medium.

Paint

- Paint may be in the form of chips or smears (from brushing against old (chalking) or new paint (smears)).

Glass

- There are many formulas for the making of glass and the glass can be compared.

Fibers, Cloth Fragments and Impressions

- When one surface contacts another surface, something is left behind (generally). The issue is finding the debris, or markings. Fibers can be identified from fragments left behind. Additionally, in one case the investigators made comparisons of the wadding from a shotgun to shells that had not been fired. The shells were old and the content of the wadding (cotton, wood, etc.) had changed over the years.
- String, cord and rope may leave similar strands or fragments that can be compared.

Fingerprints

- Different parts of the body, such as palms, fingers, toes and the soles of bare feet have friction ridges that can form “fingerprints.”
 - Plastic prints: fingers touch against some material such as a newly painted surface.
 - Contaminated/visible prints: a finger contaminated with foreign matter such as soot, oils, face powder, ink, and some types of insulation, touch a clean surface.

Fingerprints

- Latent/invisible prints: are associated with small amounts of body perspiration and oil that are normally found on the friction ridges.

Identification of Fingerprints

- The ridge detail of fingerprints (this applies to all friction ridges) including ends of ridges, their separations, and their relationship to each other – constitutes the basis for identification of fingerprints.
- To establish individual identity, some courts require 10 to 12 points, although no specific number is universally demanded.

Identification of Fingerprints

- Points are identical characteristics that are found in fingerprints from known and questioned sources. Positive identification cannot be made when an unexplained difference appears, regardless of the points of similarity.

Conditions Affecting the Quality of Latent Fingerprints

1. The surface upon which the fingerprint is deposited.
2. The nature of the material contaminating the fingerprint.
3. Any physical or occupational defects of the person making the print.
4. How the object on which the prints appear was handled.
5. The amount of contamination.

Major Fingerprint Patterns

1. Plain arch.
2. Tented arch.
3. Loop.
4. Double loop.
5. Central pocket loop.
6. Plain whorl.
7. Accidental.

Methods of Developing Fingerprints

1. Traditional powders – use of traditional powders and a soft brush, (colors vary based on the surface color).
2. Chemicals – applied using a spray, brushing the surface, by fuming, or by dipping the object on which there are prints in a solution. (Note: the use of chemicals may interfere with blood typing so care should be used).
3. Cyanoacrylate or Superglue Fuming – through the use of glue and fuming some prints may be collected. This approach has been used to develop prints on bodies.

Methods of Developing Fingerprints

4. Visualization under laser – use of an alternative light to see and collect prints.

Marking and Identifying Print Lifts

Lifted prints need to include the basic information on the person who lifted the print, date, location, crime scene, etc.

Dental Evidence

Forensic dentistry can be used to:

1. Identify individuals when a body has been found.
2. Identify bite marks.

Hair as Evidence

Hair is of greater value if the root is attached, however, hair may be used to establish the following:

1. The area of the body from which the hair came, as well as the race of the donor.
2. The manner in which the hair was removed, such as having been cut or forcible pulled out.

Hair as Evidence

3. Differentiations between hair samples based on shampoo residues.
4. Whether the hair has been bleached or dyed.
5. What contaminants are in the hair, such as blood, semen, soil, paint, pet hair, or fibers.
6. Whether the hair has been subject to some force, such as burning or blunt instrument trauma.

Hair as Evidence

7. Identification of drugs ingested, as well as how long ago they were taken based on a hair growth rate of one millimeter per day.

Blood as Evidence

Blood can be difficult to collect, and protect as evidence. Blood can provide critical evidence in a case, thus the proper collection and preservation of blood is critical. Blood can be useful to investigators in the following ways:

1. Is this stain blood?
2. What is the origin of the blood?
3. How old are the blood stains?
4. What was the condition of the donor of the sample of blood.
5. What does the blood show about the crime?

Blood and other Body Fluids as Evidence

- Blood spatter is an important part of crime scene investigation that can provide many details about the nature of the crime and additional leads.
- Other body fluids include: saliva, urine, semen, perspiration, vaginal secretions, feces, and vomitus. These items can be valuable evidence when analyzed by a lab.

Other Evidence from Humans

- There are other sources of evidence, including lipstick, lip prints and other items that may assist with the identification of a suspect.

Firearms

- Evidence from or about firearms can be very valuable:
 1. Was the bullet fired from a particular weapon?
 2. Findings from the bullet include:
 - Characteristics of the weapon.
 - Class of the firearm.
 - Material collected by the bullet as it enters the wound, or other item(s).

Firearms

3. Findings from the cartridge:

- A cartridge may be traced by use of markings back to a specific weapon.
- The class of weapon.

4. Other findings:

- Trigger pull – was the shooting accidental.
- Some malfunction.
- Recovery of serial numbers.

Tool Marks

A tool mark is any impression, cut, gouge, or abrasion made when a tool comes into contact with another object.

- A laboratory may be able to connect a specific tool with a specific mark.

Questioned Documents

- Document Examination:
 - Handwriting and handprinting Examinations:
 1. Traced forgery – tracing over the signature.
 2. Simulated forgery – mimicking the signature.
 3. Freehand forgery – no attempt to mimic the signature of the genuine signature.

Questioned Documents

- Handwriting samples: When obtaining a handwriting sample use the following guidelines:
 1. Provide the person with the same type of paper and writing instrument as were used in the questioned document.
 2. Direct the person to use the same writing style – cursive or printed – as was used in the questioned document, to write the same words, and to execute the same signature.

Questioned Documents

3. Remove each page of writing from the person's sight as soon as it is completed.
4. Provide no instructions as to format, spelling or punctuation.
5. Where the writing in question is short – such as a forged check – have the person repeat it 10 to 20 times; for longer documents – such as death threats – dictate the entire text word for word and get at least three full copies.

Questioned Documents

6. In forgery cases, get at least 10 samples of the victim's signature.
7. If the person does not appear to be writing normally, have him or her speed up, slow down, or alter the slant of the writing.
Another technique is to have the person provide some writing with the other hand.
8. Obtain samples of non-dictated writing from employment records or correspondence.

Questioned Documents

9. At the end of the session have the writer and a witness initial and date each page.

Other Comparisons

- Photocopier Examinations – analysis and comparison is possible. Examine the document for faint lines.
- Paper Examinations – torn parts can be matched, watermarks and paper type can be compared.
- Documents can be compared for age.
- Burned and charred paper can be analyzed and in some cases the writing recovered.

Other Comparisons

- It is possible to make comparisons of the ink used to write documents.
- Typing from typewriters can be compared.
- Comparisons of computer printed documents is difficult if not impossible. Some type of defect may allow some comparisons.

The End