



# TRACE EVIDENCE: FOOTWEAR & TIRE IMPRESSIONS

*Forensic Science*

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# TYPES OF IMPRESSIONS

- Patent impression – visible, two-dimensional (ex. bloody shoeprints)
- Latent impression – hidden, visualized by chemical or physical development
- Plastic impression – three-dimensional imprints (ex. left in snow, soil, etc.)



# CLASS CHARACTERISTICS

- Characteristics that are common among similar articles of footwear
- Examples:
  - size
  - tread pattern
  - brand



# INDIVIDUAL CHARACTERISTICS

- Unique characteristics observed only on an individual piece of footwear:
  - An unusual wear pattern
  - A pebble stuck in a part of the tread pattern
  - Damages (cuts, tears, abrasions, etc.)

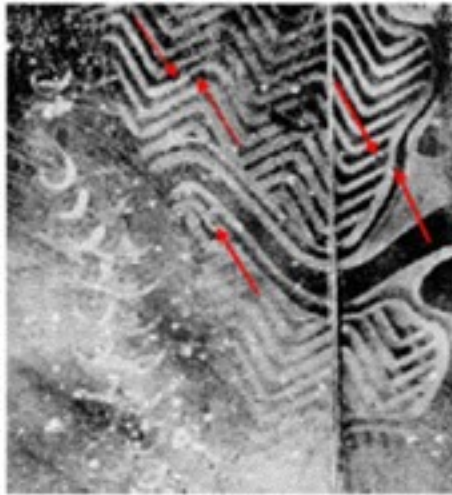


Figure 2(A)  
Questioned Footwear Impression

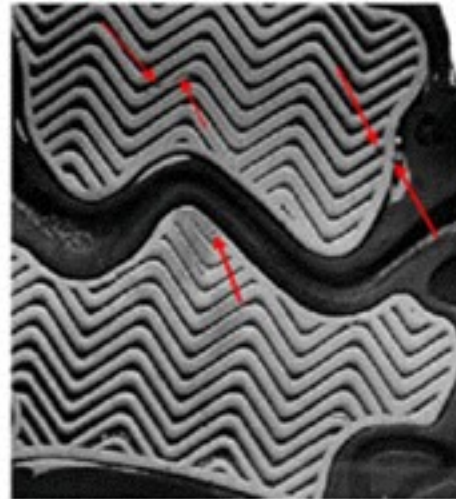


Figure 2(B)  
Known Shoe

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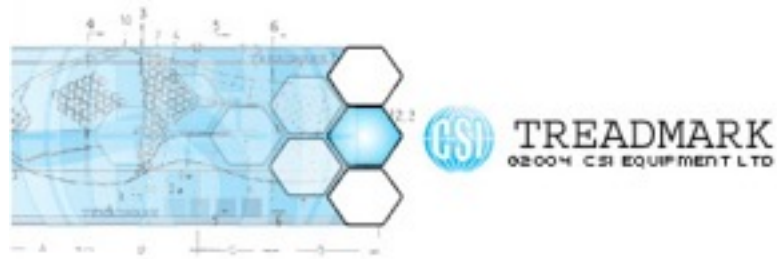
# TYPICAL CLUES DETERMINED FROM SHOW IMPRESSIONS

- Size of the footwear
- Brand of the footwear
- Sex of the wearer
- Weight of the wearer (based on the depth of the impression)
- The type of footwear (high heels, work boots, etc.)



# IMPRESSION DATABASES

- TreadMark
- SoleMate
- TreadMate



# FACTORS AFFECTING SHOE WEAR PATTERNS

- Walking habits (walking on toes or heels, feet straight or toes pointed in/out)
- Body weight
- Shape of the feet
- Activities often engaged in
- Surface walked on
- Unique debris, holes, cuts





# COLLECTION & PRESERVATION OF IMPRESSION EVIDENCE

- Photograph that includes a ruler
- Lifting with electrostatic dusting or gel lifting
- Casting with plaster of Paris ( $\text{CaSO}_4$ ) or dental stone (on snow)



# RESOURCES

- Saferstein, Richard. *Forensic Science: An Introduction*. New Jersey: Pearson Prentice Hall, 2008.
- Bertino, Anthony J. *Forensic Science: Fundamentals and Investigations*. Mason, OH: South-Western Cengage Learning, 2009.
- Dr. Murray's Footprint Lab  
<http://science.marshall.edu/murraye/Footprint%20Lab.html>
- Federal Bureau of Investigation  
<http://www.fbi.gov/about-us/lab/handbook-of-forensic-services-pdf/>