Forensic Science School
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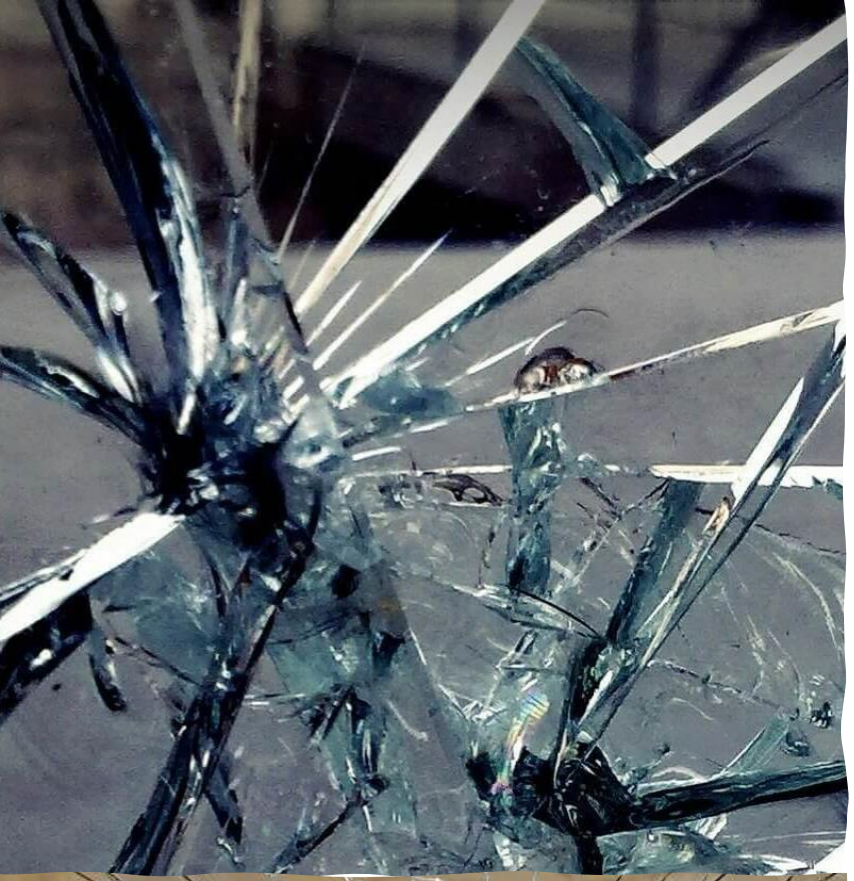
Chapter 4: Glass and Soil



Introduction

- Crime scenes often involve the force of violent events.
- Hit-and-run, forced entry, and burglary can all involve damage and breakage of glass.
- Glass breakage may also leave behind small fragments of shattered glass.
- Many times this evidence is considered trace evidence.

Introduction Continued

- Tiny glass fragments may also be embedded in shoes and clothing of a suspect.
- When glass fragments are found on a suspect, and are large enough, to be matched to their original site, the link between the suspect and the crime scene is enhanced.
- Glass breakage may indicate the direction and velocity of a projectile and the crime scene.

Glass As Evidence

- Glass will only provide *circumstantial evidence.*
- Files of color, chemical composition and physical characteristics are kept on all automobile headlight glass.
- Often, paint chips found with broken glass help to provide the clues which will link an object with a crime scene.

More On Glass ☺

- Burglary may involve window glass breakage.
- Glass objects are sometimes used in assaults and homicide cases.
- Broken glass is often present at the scene of the crime and its careful recovery and analysis can be a valuable tool to the crime scene investigator (CSI).

Why Is The Glass Broken?

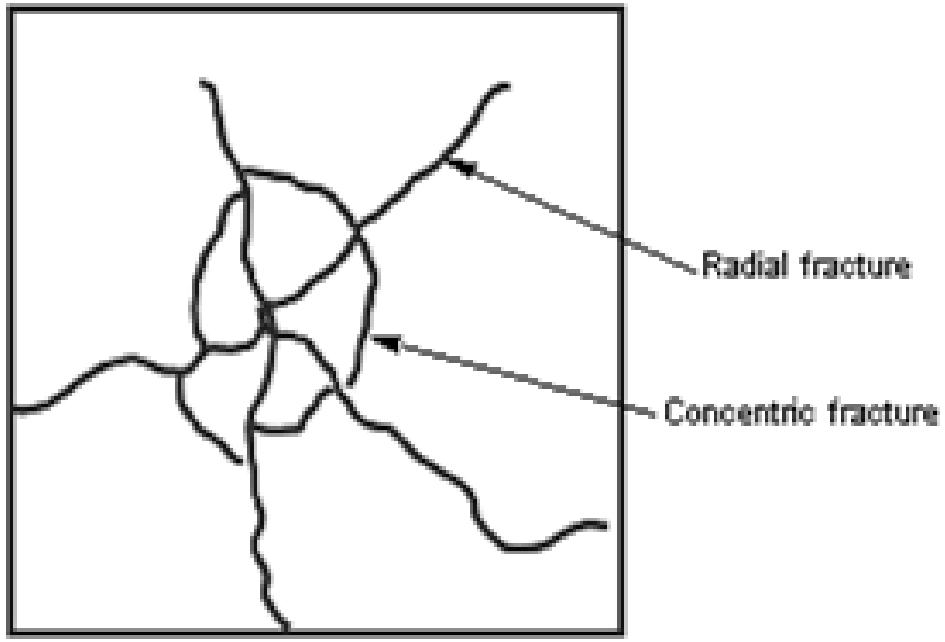
- The direction of breakage is an important clue at a crime scene.
- Was the glass broken from the inside or the outside of the residence?
- What object was used to break the glass?
- Answers to these questions provide a valuable piece of the puzzle.

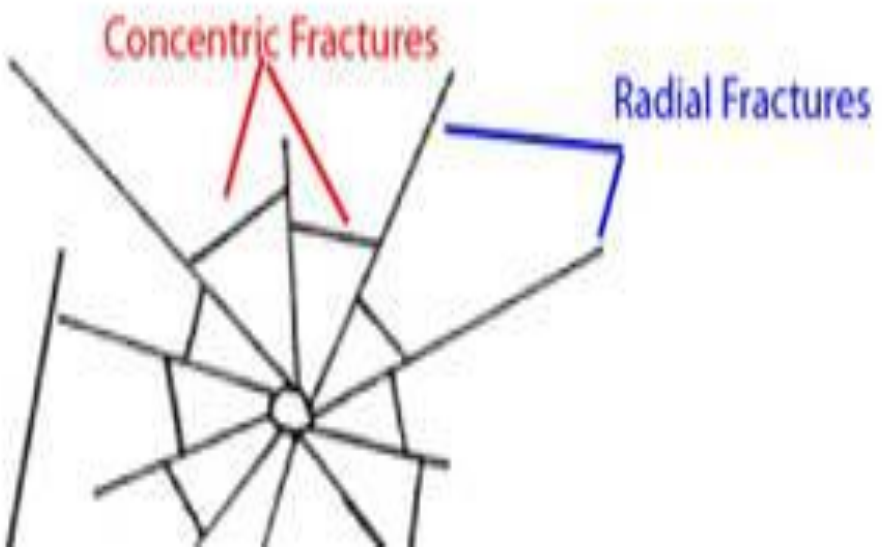
When Glass Is Broken….

- Conchoidal Fracture lines appear along the broken edges.
- These fracture lines form a series of curved lines. They begin @ right angles to the fracture (the side the force in acted upon).
- These fracture lines help the investigator to determine the direction of the force applied to break the glass.

When An Object Passe Through A Pane Of Glass….

- Two types of breakage patterns occur.
- **1st : Radial Fractures** which appear as fracture lines which radiate outwards (Like the spokes on a bicycle wheel) from the center of the break.
- **2nd: Concentric Fractures** which are circular cracks which occur from one radial fracture to another.



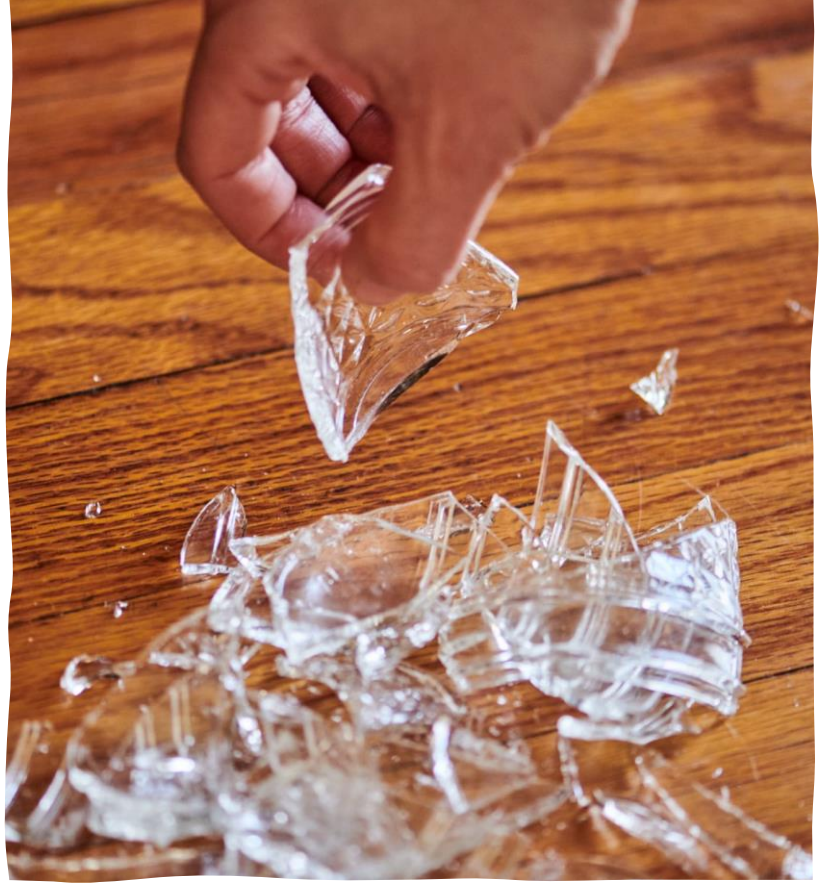


When The Projectile Is A Bullet HIGH VELOCITY PROJECTILE

- There is a hole produced with a crater formed at the rear of the glass.
- The strength of Glass is on its **surface**.
- When the surface is damaged, the inner portion of the glass is easily fragmented.
- Glass is slightly flexible and will bend away from a point of impact.
- The is observed with any high velocity projectile that passes through the glass.

Low Velocity Projectiles

- If the impact is caused by a non-penetrating projectile (such as a rock or BB) a cone shape plug is ejected in a forward direction, while tiny glass fragments are projected in the backward direction.
- Got it?…good…let’s move on!



Glass Is Unpredictable

- **The majority of glass will fall in the direction of the applied force.**
- **However, tiny particles do fly back, opposite the applied force.**
- **Small shards of glass might land on the suspect's clothing.**
- **Tiny metal fragments and GSR may be discovered on the glass fragments closest to the entry point of the bullet**
- **Holes produced by small stones (thrown from a car tire, or propelled by a sling shot) produce very similar breakage patterns to those produced by bullets.**

Collection Of Evidence

- Photographs and sketches should be accomplished at the beginning of the recovery of glass fragments.
- Glass analysis consists of shape and edge match of the fragment with the source.
- Smaller glass fragments are tested for color, density, thickness, chemical composition, refractive index and light dispersion in order to identify the type of glass and provide a comparative identification.

At The Crime Scene

- When glass is broken at the crime scene, the suspect and the suspects clothing are thoroughly searched for fragments of glass.
- Glass is packaged in sheets of paper (to prevent breakage in transit) and packed in a box.
- Each piece should be marked and labeled, on the crime scene sketch.
- This is very important when a large number of pieces of glass are collected and the investigator is asking the technician to reconstruct the original glass object.

Thanks For Your Attention!

Please be sure to turn in all your assignments

as soon as possible!