Types of Explosives Part4

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Low Explosives

- Low explosives include the black powder and smokeless powder we talked about in our firearms discussion; both of these are commonly used in pipe bombs, where a section of metal pipe is stuffed with a low explosive, and when the bomb is detonated, the pipe fragments or sharp objects inside the pipe become shrapnel.

High Explosives

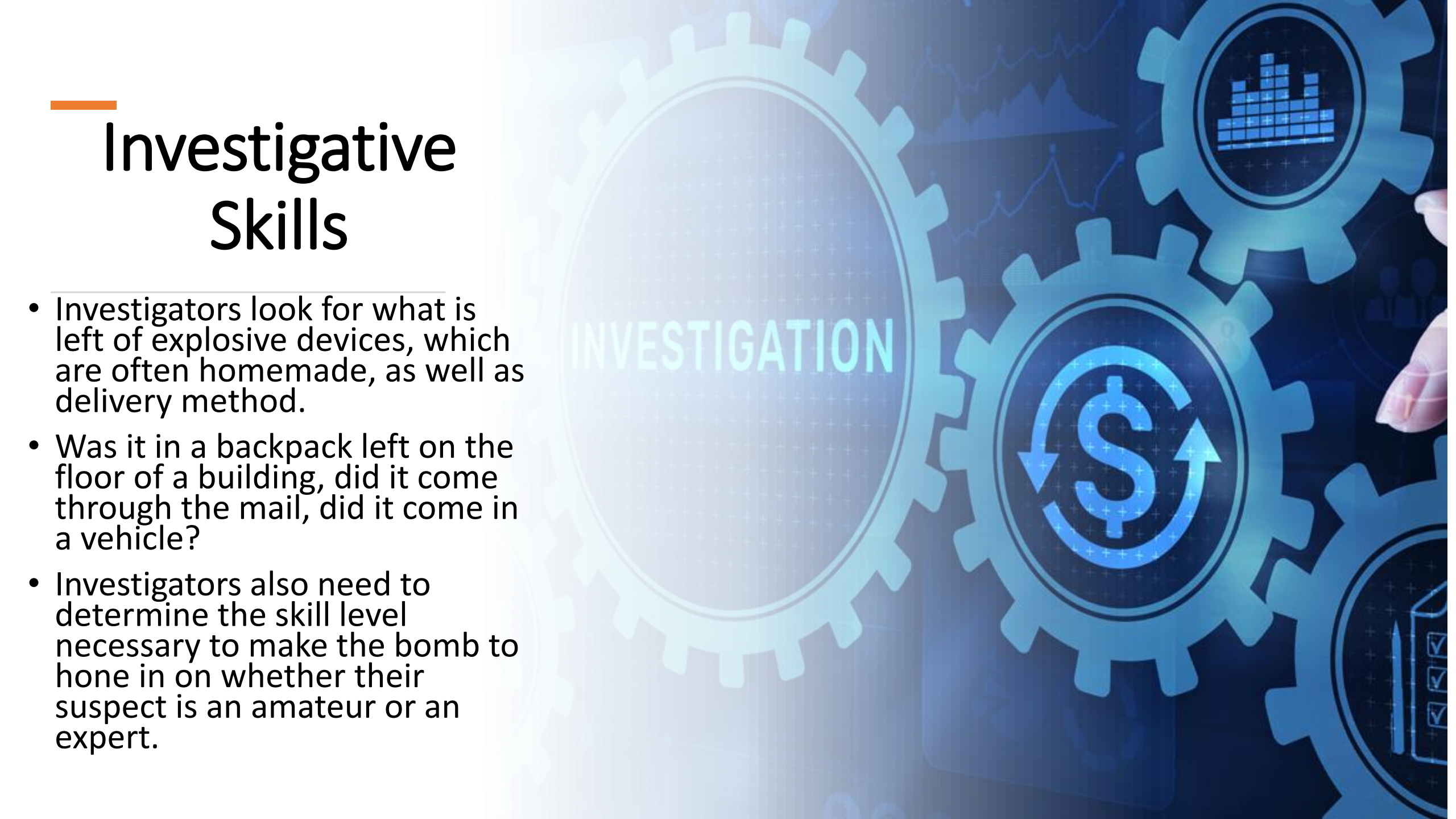
- High explosives include things like nitroglycerin, dynamite (which is nitroglycerin mixed with diatomaceous earth and calcium carbonate)
- TNT (or tri-nitro-toluene), and the military explosive called C4.
- Some high explosives, including nitroglycerin, are quite sensitive to heat and shock and are only used in small quantities as a primary explosive to detonate a secondary explosion.

Secondary High Explosives

- Secondary high explosives are more stable, easier to transport, and need a booster charge to detonate.
- Dynamite, TNT, and C4 are examples of secondary high explosives.
- Plastique, that moldable explosive sometimes seen in movies, is an example of a booster.
- Where Fire Science Meets Other Forensics

Investigative Skills

- Investigators look for what is left of explosive devices, which are often homemade, as well as delivery method.
- Was it in a backpack left on the floor of a building, did it come through the mail, did it come in a vehicle?
- Investigators also need to determine the skill level necessary to make the bomb to hone in on whether their suspect is an amateur or an expert.

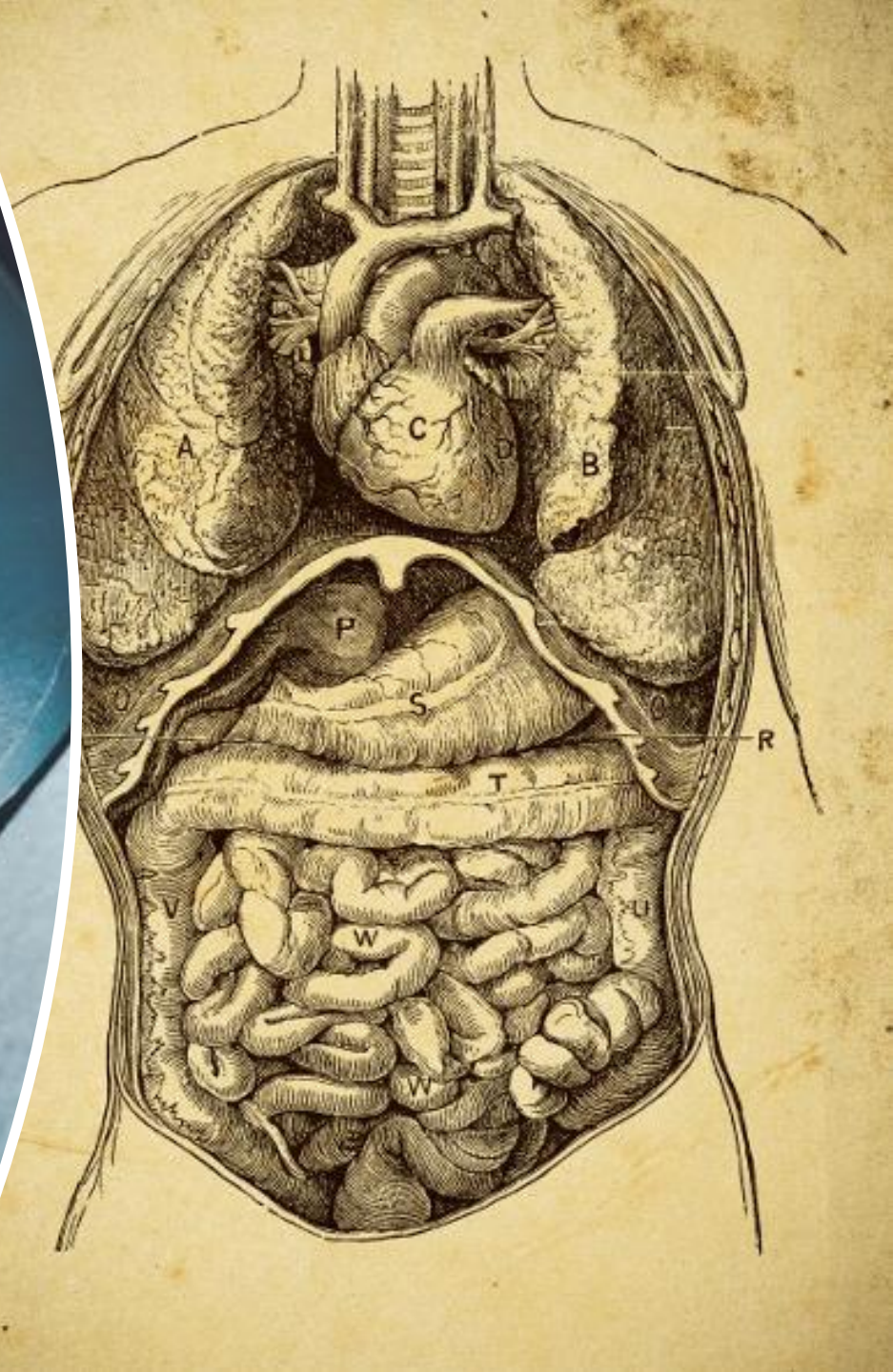


When Is A Fire Truly An Accident?

- In a business, investigators collect partially destroyed papers for analysis.
- Questioned-document examiners and forensic accountants may be able to piece together the evidence, establish a pattern of destroyed or missing documents, and establish a motive.
- Where there are injuries and fatalities, arson and explosives investigators may have to work with emergency-room personnel or some fires are truly accidents, such as when an appliance malfunction causes a house fire, but others are not.

Forensic Pathologists Role In An Autopsy

- Forensic pathologists collect evidence in or on the victim's body.
- An autopsy will also help establish whether the fire or explosion was the actual cause of death or whether the victim was murdered and then the blaze or blast executed to cover up the killing.



Research On Death Investigations

- Recent research suggests that setting a fire to cover up a murder is much more common than formerly thought.
- It was once believed that a human head would explode during a fire because so often incinerated remains would show a badly fragmented skull.
- Now, many previous death investigations involving fire scenes have been called into question; badly fragmented skulls are much more indicative of blunt-force trauma from bludgeoning, or shattered skulls from gunshot wounds.

Evidence Collection

- Other typical evidence may be present at fires and explosions, like glass, fibers, hair, shoe prints, or blood.
- This evidence is collected differently than it would be at a non-fire scene.
- Any evidence needs to be kept in sealed, airtight containers because many accelerants are volatile and could evaporate.
- Explosives are not volatile, so that evidence does not have to be packaged in the same way.

Suicide Bombings

- In suicide bombings, there are often telltale signs of who was carrying the bomb among the human remains.
- The bomber clearly sustains the most body fragmentation from the blast, and many body parts cannot be recovered because they were literally blown to bits.

To Fuel Or Not To Fuel- That Is The Question

- If any natural fuels that would have normally been present at the scene could not have reached the projected temperatures on their own, that usually points to an accelerant.
- When investigators see a pile of wood or rags in a structure where they would not normally be located, that is a clue to the origin of an arson fire.

The Arsonist At Work

- Arsonists also typically start fi res on the lower floors of a large building.
- If the point of origin is on the 14th floor of an office building, it is less likely to be arson since it would have taken much more time for the perpetrator to get out—and think of all the witnesses or surveillance cameras they might have to pass during their exit.

The Point Of Origin

- If the point of origin seems to be a space heater, or a candle left burning on a dining room table, investigators may quickly have their answer and move on, but regardless of the circumstances, point of origin determination is standard in all fire investigations.
- This not only helps establish the cause, which can be important for insurance purposes, but can lead to safer appliances and lives saved.

Thank You For Your Attention!

Questions and Comments