Fiber Evidence

Forensic Science

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Types of Fibers

Natural fibers are derived in whole from animal or plant sources.

Examples:

Wool

Mohair

Cashmere

Furs

Cotton

Types of Fibers

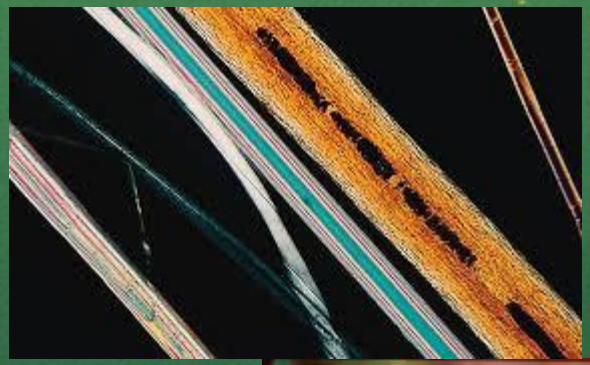
Man-made fibers are manufactured.

Regenerated fibers are manufactured from natural raw materials and include rayon, acetate, and triacetate.

Synthetic fibers are produced solely from synthetic chemicals and include nylons, polyesters, and acrylics.

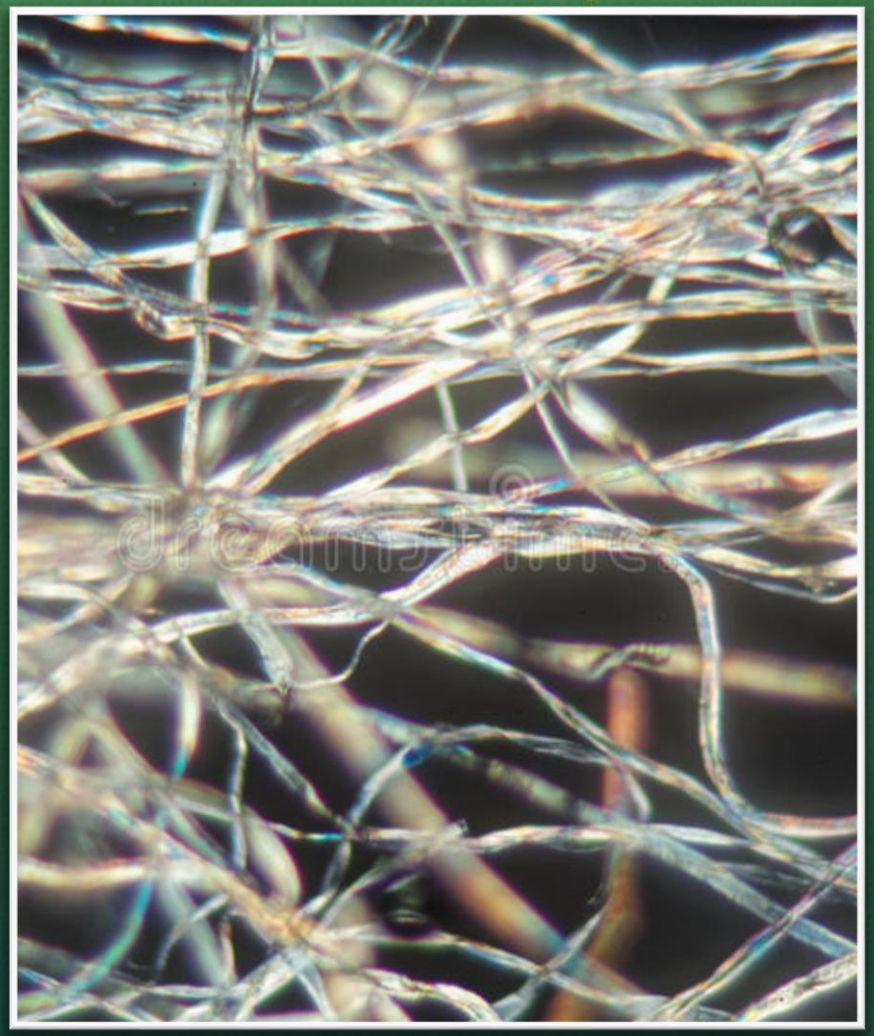
Fiber Evidence

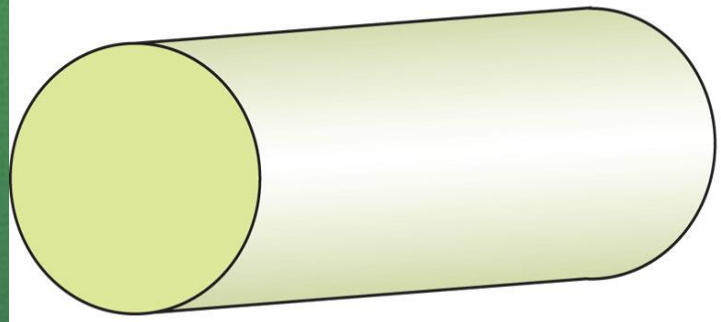
- The quality of the fiber evidence depends on the ability of the criminalist to identify the origin of the fiber or at least be able to narrow the possibilities to a limited number of sources.
- Obviously, if the examiner is presented with fabrics that can be exactly fitted together at their torn edges, it is a virtual certainty that the fabrics were of common origin.



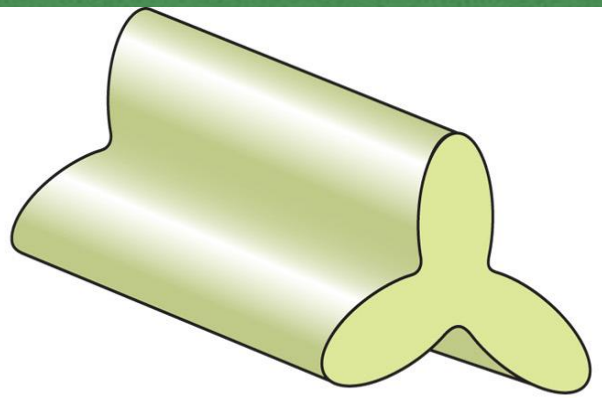
Fiber Evidence Continued

- Microscopic comparisons between questioned and standard/reference fibers are initially undertaken for color and diameter characteristics, using a comparison microscope.
- Compositional differences may exist in the dyes that were applied to the fibers during the manufacturing process.
- Other morphological features that could be important in comparing fibers are:
  - Lengthwise striations on the surface of the fiber
  - The presence of delustering particles that reduce shine
  - The cross-sectional shape of the fiber

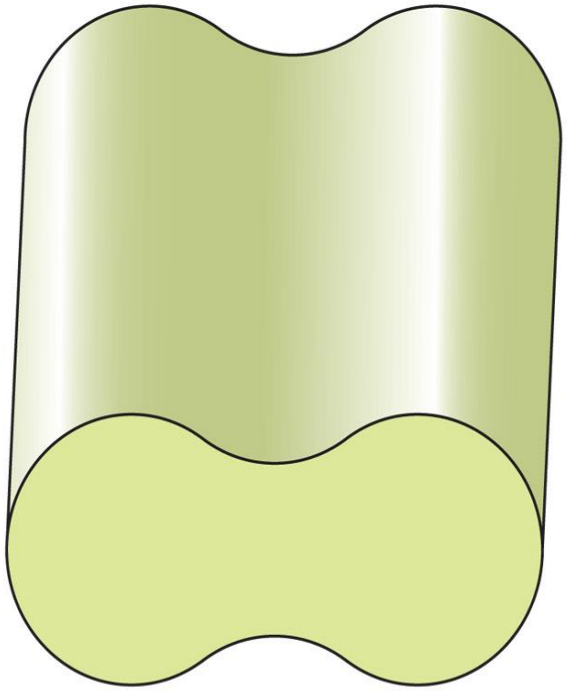




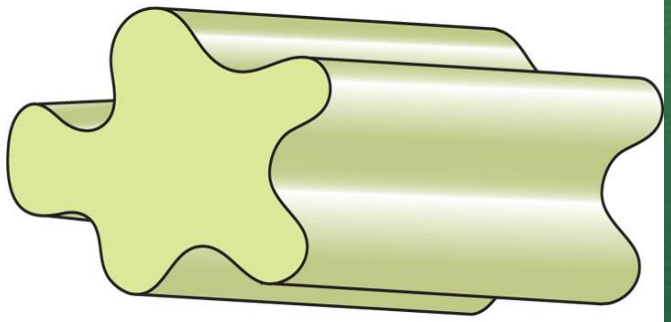
Round



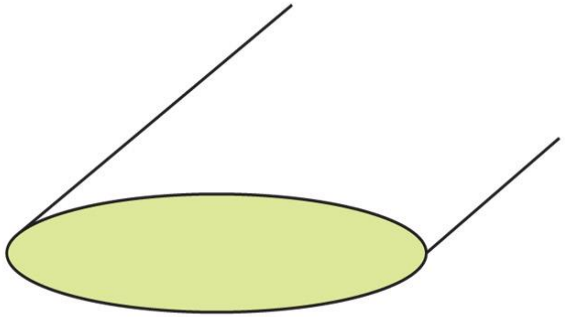
Trilobal



Dumbbell



Multi-lobed



Flat

Methods for Fiber Comparison

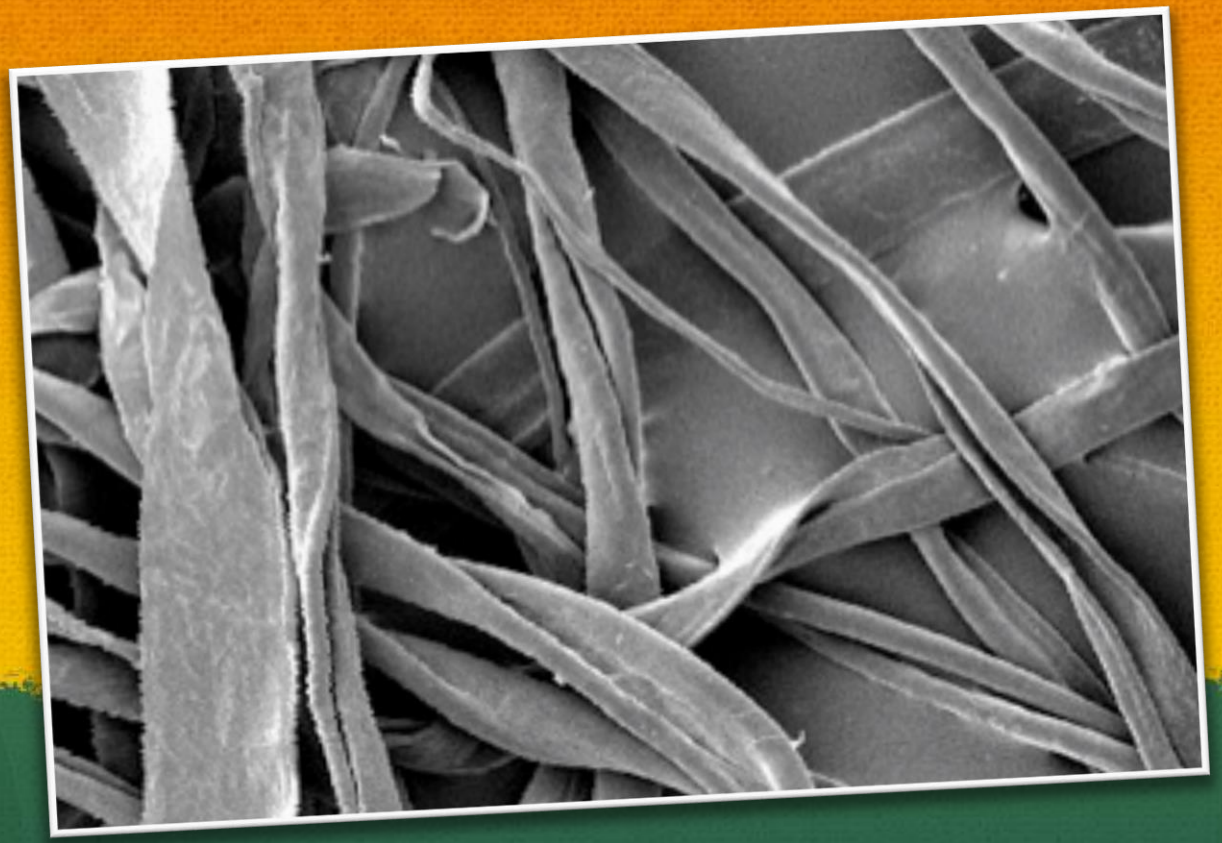
- Infrared spectrophotometry is a rapid and reliable method for identifying the generic class of fibers.
- The molecules that compose a manufactured fiber selectively absorb infrared light to form a characteristic pattern.

Methods for Fiber Comparison Continued

The microspectrophotometer is a combination of a traditional light microscope and a spectrophotometer.

It allows a forensic analyst to view an object under a microscope while simultaneously obtaining its visible of infrared absorption pattern.

The visible light microspectrophotometer is a convenient way for analysts to compare the colors of fibers through spectral patterns.



Collection and Preservation

The investigator's task of looking for minute strands of fibers often becomes one of identifying and preserving potential "carriers" of fiber evidence.

Collection and Preservation Continued

Relevant articles of clothing should be packaged carefully in separate paper bags. If it is necessary to remove a fiber from an object, the investigator must use clean forceps, place it in a small sheet of paper, fold and label the paper, and place the paper packet inside another container.

Thank You
For Your Attention!

Questions and Comments