Chapter 4: Fingerprints

"Fingerprints can not lie, but liars can make fingerprints."

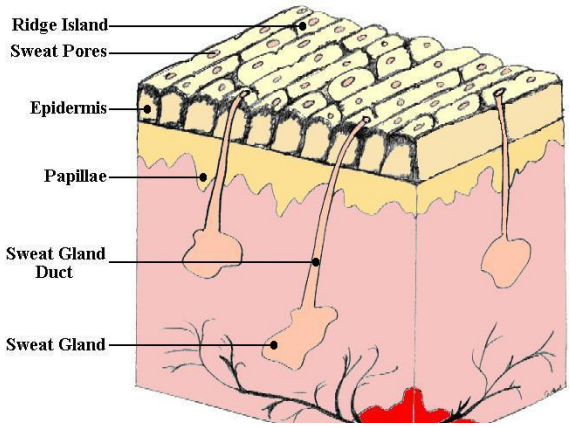
—Unknown

Human Fingerprints

- Definition: an impression of the pattern of ridges on the last joint of person's fingers.
- Why do humans have fingerprints?
  to provide a better grip
  a sense of touch
  better perspiration

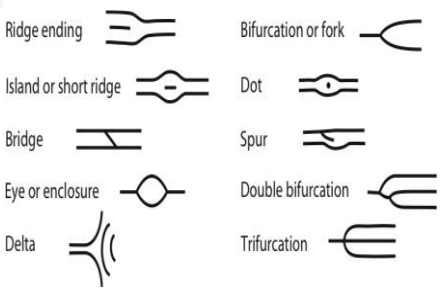
Fundamental Principles of Fingerprints

- A fingerprint is an individual characteristic.
- A fingerprint will remain unchanged during an individual's lifetime.
- Fingerprints have general characteristic ridge patterns that permit them to be systematically classified.

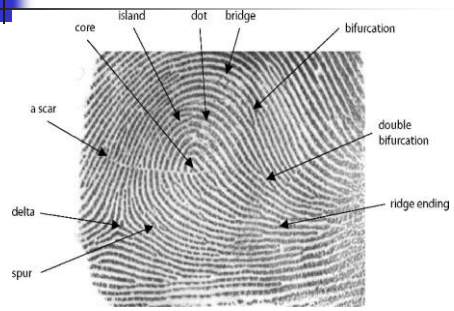


Ridge Characteristics

- **Minutiae**-(150-200 minutiae) characteristics of ridge patterns



Fingerprint Minutiae



Comparison

- AFIS (automated fingerprint identification system) is the national database for storing and retrieving fingerprints.
- Criminal courts usually will accept 8 to 12 points of similarity out of the possible 13 total points.

Arches-No Deltas or Cores

An arch is formed by ridges entering from one side of the print, rising slightly and exiting on the opposite side.

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Plain Arch

The simplest of all fingerprint patterns; a plain arch is formed by ridges entering from one side of the print, rising slightly and exiting on the opposite side

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Tented Arch

- A tented arch rises sharply upward causing the center of the print to look like a tent.
- By definition, the angle of the lines on a tented arch meets at less than a 90-degree angle.

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Plain

Tented

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Loops-One Delta & One Core

A *loop* must have one or more ridges that enter from one side of the print, re-curve, and exit the same side

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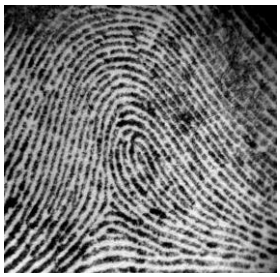
Ulnar Loops

An ulnar loop opens toward the little finger



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Print from the right hand

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Radial Loops

A radial loop opens toward the thumb

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Print from the right hand

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Whorls

- One or more cores
- At least two deltas

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Plain Whorl

- At least one ridge that makes a complete circuit
- The ridge may be in the form of a spiral, oval, or any variant of a circle
- If an imaginary line is drawn between the two deltas contained within the pattern and the line does not touch any of the spiral ridges, then the pattern is a plain whorl.

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Plain Whorl

- Two Deltas
- One Core
- Displays a degree of symmetry

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Central Pocket Loop

- At least one ridge makes a complete circuit
- Ridges may be in the form of a spiral, oval, or any variant of a circle
- If an imaginary line is drawn between the two deltas contained within these two patterns and the line touches any one of the spiral ridges, then the pattern is a central pocket loop.

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Central Pocket Loop

- Two Deltas
- One Core
- Lacks Symmetry
- A delta is often observed near the core

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Double Loop

A *double loop* is made up of two loops combined into one fingerprint.

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Double Loop

- Two Deltas
- Two Cores
- Appears to have an "S" in the print

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