

INTRODUCTION TO FINGERPRINTS

History of Fingerprints

1. In ancient Babylon (1750 B.C.), fingerprints pressed into clay tablets marked contracts.
2. The documents showing fingerprints date from third century B.C. China _____.
3. In 1788, Johann Mayer noted that the arrangement of skin ridges is never duplicated in two persons. *He was probably the first scientist to recognize this fact.*

What Are Fingerprints?

- All fingers, toes, feet, and palms are covered in small ridges. _____.
- These ridges are arranged in connected units called *dermal*, or *friction*, *ridges*.
- These ridges help us get or keep our grip on objects.
- Natural secretions plus dirt on these surfaces leave behind an impression (a print) on those objects with which we come in contact.

3 Principles of Fingerprints

There are 3 fundamental principles:

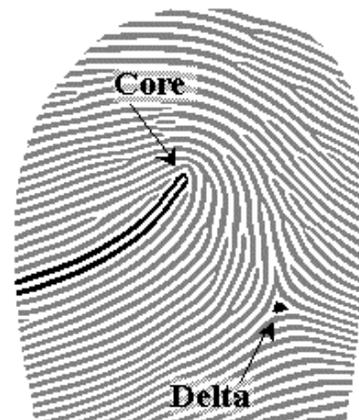
- 1) A fingerprint is an individual characteristic; no two people have been found with the exact same fingerprint pattern.
- 2) A fingerprint pattern will remain unchanged for the life of an individual; however, the print itself may change due to permanent scars and skin diseases.
- 3) Fingerprints have general characteristic ridge patterns that allow them to be systematically identified.

Fingerprint Characteristics

- Forensic examiners look for the presence of a core (the center of a whorl or loop) and deltas (triangular regions near a loop).

Types of Fingerprints

- There are 3 general fingerprint distinctions:
 - Arches _____
 - Loops _____
 - Whorls _____



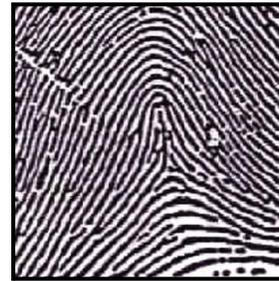
Arches

Arches are the simplest type of fingerprints that are formed by ridges that enter on one side of the print and exit on the other. No deltas are present.

2 types: plain arch & tented arch



Plain Arch



Tented Arch

Ridges enter on one side and exit on the other side
center

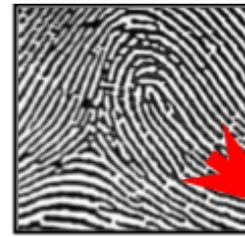
Similar to the plain arch, but has a spike in the

Loops

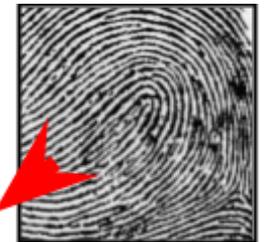
- Loops must have one delta and one or more ridges that enter and leave on the same side.
- These patterns are named for their positions related to the radius and ulna bones, i.e. the bone the loop opening is facing towards.

Types

- **Radial**—opens toward the thumb _____
- **Ulnar**—opens toward the “pinky”



L – Radial Loop
R – Ulnar Loop



L – Ulnar Loop
R – Radial Loop

Whorl

- A plain or central pocket whorl has at least one ridge that makes a complete circuit.
- A double loop is made of two loops.
- An accidental is a pattern not covered by other categories.
- Whorls have at least two deltas and a core.

Types

- Plain whorl

Figure 6-5 Three basic fingerprint ridge patterns occur at different frequencies in humans.



Arches 5%



Whorls 30%



Loops 65%

- Central _____ Pocket whorl
- Double Loop whorl _____
- Accidental whorl _____

Plain Whorl

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



Central Pocket Loop

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



Double Loop

- Two loops
- Two deltas
- Appears to have an “S” in the print



Accidental

- All other prints

