

# Fingerprints

## 1. History

### A. Early Use

- 1) ~3000 years ago - Chinese used fingerprints to sign legal documents
- 2) 1850s - William Herschel - English civil servant in India, started requiring natives to sign contracts w/an imprint of the right hand
- 3) 1880 - Henry Fauld - Scottish physician, suggested that skin ridge patterns could be important for the identification of criminals. Offered to set up a fingerprint bureau @ Scotland Yard to test the methods practicality. He was turned down.  
It was reversed 20 years later

### B. Early Classification of Fingerprints

- 1) 1892 - Francis Galton proposed classifying prints to 3 pattern types - loops, arches, & whorls. Said no 2 prints are identical & unchanging over time.
- 2) 1891 - Dr. Juan Vucetich - Argentinian police officer devised a workable classification system. It's been revised over time & is still widely used today in most Spanish-speaking countries
- 3) 1897 - Sir Edward Richard Henry - an Englishman, proposed a different classification system. It was adopted by Scotland Yard & some version is still used today in English-speaking countries, including the U.S.

### C. Adoption of Fingerprinting

- 1) 1901 - 1<sup>st</sup> systematic and official use of fingerprints for personal identification was used by the NYC Civil Service Commission, used to certify all civil service applications.
- 2) 1904 - U.S. Police officials received instruction in fingerprinting at the St. Louis World Fair from Scotland Yard
- 3) 1924 - Fingerprint records of the Bureau of Investigation & Leavenworth were merged to form the new records of the FBI
  - a) FBI has the largest collection of fingerprints in the world
- 4) 1999 - U.S. v. Byron C. Mitchell - defendants argued that prints could not be proven unique under the Daubert ruling. After arguing for 4½ days, the judge upheld Daubert & the admissibility of fingerprints as scientific evidence
  - a) human friction ridges are unique and permanent
  - b) human friction ridge skin arrangements are unique and permanent

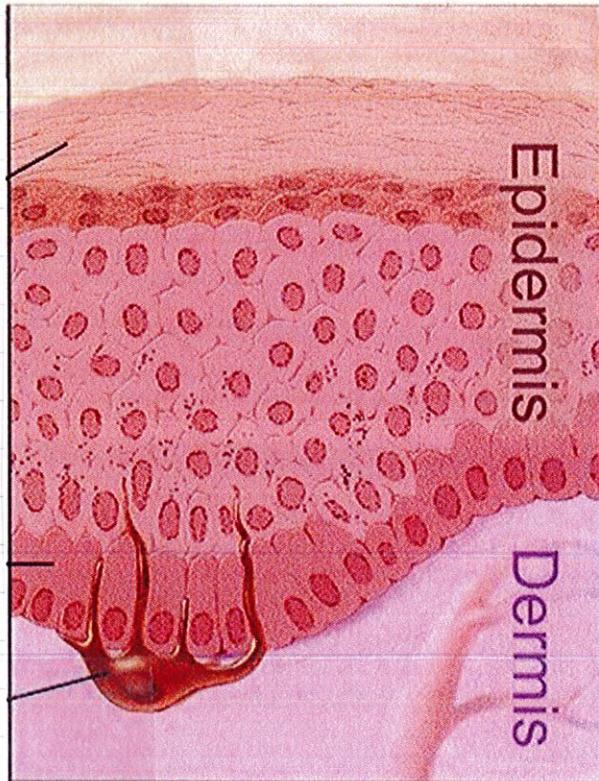
## 2. Fundamental Principles of Fingerprints

A. Fingerprints - raised ridges of skin on your fingers & toes, called friction ridges. Water, oil, salts, & dirt can leave an impression behind when you touch something

- 1) Formation - pattern starts to develop at 10 weeks gestation & complete when the fetus is 6 mos. along.
  - a) occurs in the basal layer.
  - b) the basal layer grows faster than the rest of your skin & it "folds" in on itself, creating ridges.

### C. purpose -

to provide our fingers, hands, & feet with a firm grasp & resistance to slippage.



### Stratum:

corneum

lucidum

granulosum

spinosum

basale

Basal  
Layer

contain  
dermal  
papillae

which  
determine  
the form and  
pattern of  
the ridges.

B. 1<sup>st</sup> Principle - Fingerprint is an individual characteristic, no 2 fingers have been found to possess identical ridge characteristics

### 1) General ridge characteristics

a) Loops

(65% of pop.)



have one delta

Whorls

(30% of pop.)



have 2 deltas

Arches

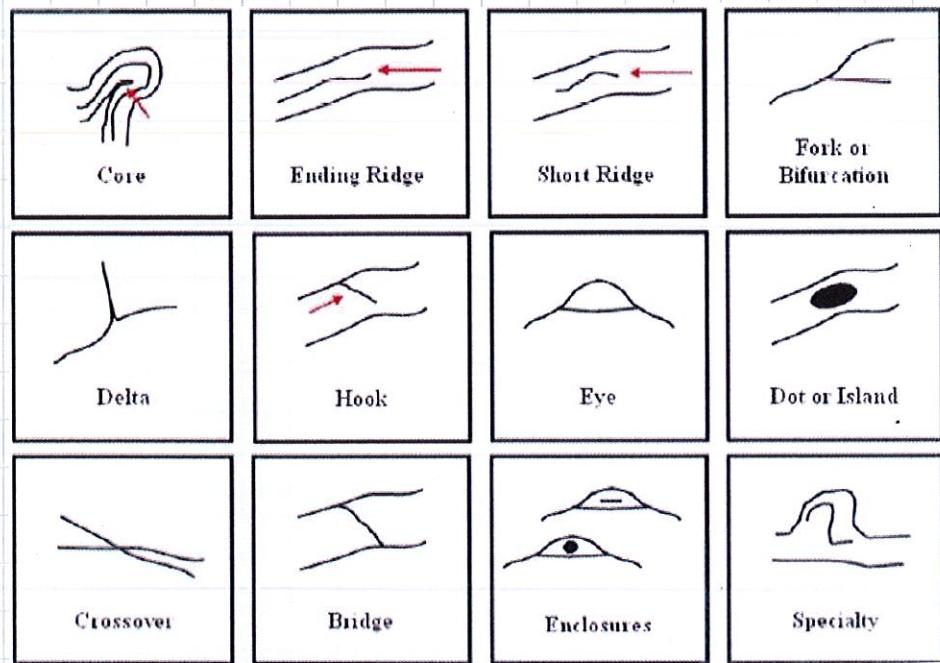
(5% of pop.)



do not have deltas

b) Minutiae (specific ridge characteristics) - impart originality to fingerprints. If 2 prints are to match, they must have the same minutiae in the same relative location to one another

- i) average print has 150 individual minutiae
- ii) most crime scene prints are only partial prints
- iii) experts agree that 8-10 minutiae must match to prove a print matches another.



Ridge ending     

Island or short ridge     

Dot     

Spur     

Double bifurcation     

Trifurcation