

Directions: Read the article "Fingerprint Pioneer" before answering Numbers 1-8 on your answer sheets.

Fingerprint Pioneer

Take a close look at your fingertips and you'll see friction ridge skin, raised layers of skin that have openings for sweat glands. Each fingertip has an intricate pattern of friction ridge skin, the pattern of a fingerprint. Governments and businesses take advantage of friction ridge patterns to identify people by their fingerprints.

The ability to connect a person with a fingerprint found at a crime scene depends upon three basic principles. First, friction ridges form complex patterns during fetal development and remain unchanged during a person's life. Second, every fingerprint has a unique pattern of friction ridges that distinguishes it from other fingerprints. Third, fingerprints share general characteristics that allow a systematic classification.

General characteristics of fingerprints include the common patterns of friction ridges: loops, arches and whorls. These characteristics provide a starting point to classify a fingerprint. More detail is needed to match the patterns of two fingerprints. This detail can be found in the unique and complex contours of individual friction ridges that divide and cross each other. Take another look at your fingertip. It may contain as many as 175 of these tiny friction ridge characteristics that make your fingerprint unique.

Law enforcement agencies did not rush to adopt fingerprint systems of identification. During the 1870s, Henry Faulds tried to interest London's Scotland Yard in fingerprints as a means of identifying criminals. At the time, Scotland Yard had invested in a complicated identification method called the Bertillon System. The method required police to record a person's measurements, take full-length and profile photos, and note details about scars, tattoos, hair color, and eye color. They were not interested in trying a new fingerprint system.

Page 2

Faulds did not give up. He published a paper on his fingerprint research and sent a copy to Charles Darwin, the famous scientist. Darwin passed the paper on to his cousin, Francis Galton. The idea of fingerprint identification sparked Galton's interest. He performed his own studies, and presented his findings in scientific articles and in a book, *Finger Prints* (1892).

Galton's method of analyzing fingerprints failed to convince Scotland Yard to switch to fingerprint identification. Almost ten years would pass before the Yard would begin to experiment with the new technique by opening a three-person Fingerprint Branch. One South American police department showed greater enthusiasm for the technology.

Guillermo Nunez, Chief of Police in La Plata, Argentina, read about Galton's work. In 1891, he ordered Juan Vucetich to look into it. Vucetich was the head of the Office of Identification at the Central Police Department in La Plata. After studying Galton's experiments with fingerprints, Vucetich started his own investigations. He collected fingerprints from arrested men, examined fingerprint characteristics, and invented the first practical method of fingerprint identification.

In June 1892, an opportunity arose to test fingerprint identification in the town of Necochea, a small coastal village in the province of Buenos Aires. On the evening of June 19, Francesca Rojas burst into a neighbor's shack on the outskirts of town. She cried that Velasquez, a laborer at a nearby ranch, had murdered her children. Velasquez had wanted to marry Rojas, but earlier in the day, she told him that she planned to marry a younger man. According to Rojas, Velasquez became furious at the news. He swore revenge.

When the police searched Rojas' hut, they found the bodies of a young boy and girl with fatal head wounds. They arrested Velasquez and questioned him. The farm hand refused to confess, even under torture. Then, the police began to hear rumors about Rojas. Gossipers said that a young man had told Rojas that he would marry her if she did not have the two children. Unable to extract a confession from Velasquez and wondering if Rojas might be the murderer, the police sought help from La Plata regional headquarters.

La Plata Police Inspector Eduardo Alvarez reexamined the Rojas hut. After several hours of searching, he noticed a dark, brownish mark on the door of the children's bedroom. It was the imprint of a bloodstained human thumb. Alvarez, an associate of Juan Vucetich, knew about the value of fingerprints. He borrowed a saw and cut a piece of the door that contained the finger mark. Alvarez returned to La Plata with the evidence and with Rojas in custody.

At the police station, he rolled Rojas' right thumb on an ink pad, and then pressed it on a sheet of paper. Vucetich matched Rojas' inked print with the bloody thumbprint on the door. Faced with the evidence, Rojas admitted to killing her children. Had the mother denied everything, then she may have escaped conviction, because it was unclear that a jury would be convinced by the microscopic marks left by fingertips. In particular, nobody had yet proved that no two fingerprints are the same among the billions of people on the planet. The case has been hailed as the earliest murder investigation solved with fingerprints.

Fingerprint identification became accepted in Argentina. In 1900, the Argentine Republic issued a new type of passport, one that displayed fingerprints. The governments of other countries eventually required fingerprints on passports. Vucetich perfected his fingerprint identification system and published the details in his book, *Dactiloscopia Comparada* (1904). The Vucetich system is still used in most Spanish-speaking countries.

The Bertillon System



Alphonse Bertillon

Alphonse Bertillon, a Clerk in the Prefecture of Police in Paris, France, devised a very meticulous method of measuring body parts as a means of identifying criminals. Bertillon's system included measurements such as head length, head width, length of the middle finger, length of the left foot; and length of the forearm from the elbow to the tip of the middle finger. In 1888 Bertillon was made Chief of the newly created Department of Judicial Identity where he used anthropometry as the main means of identification. He later introduced Fingerprints but relegated them to a secondary role in the category of special marks.



Dr. Henry Faulds

Faulds was a Scottish physician and medical missionary. While working as a missionary in Japan in 1878, Faulds discovered fingerprints on ancient pottery and soon after began extensive research - including many experiments to reveal permanence and uniqueness of fingerprints. Faulds is credited with being the first European to publish an article suggesting that fingerprints may assist crime investigations by the "scientific identification of criminals".

The following are original student 4 point responses

1 What was the main reason Scotland Yard was not interested in Henry Faulds' system of identification? Use details from the article to support your answer.

READ
THINK
EXPLAIN

The main reason Scotland Yard was not interested in Henry Faulds fingerprint system was because they were already using Bertillion system. This system measured different parts of a persons body and noted scars and tattoos and took pictures they were not interested in a persons fingerprint.

4-point short response question
(Main Idea)

LA.910.1.7.3: Student will determine the main idea or essential message in grade-level or higher texts through inferring, paraphrasing, summarizing, and identifying relevant details.

2 Using details from the article, explain the three basic principles that allow a fingerprint found at a crime scene to be connected to an individual person.

READ
THINK
EXPLAIN

The ability to connect a persons fingerprints to the scene of a crime depends on three basic principles. The first principle is that the friction ridges form complex patterns that never change. Another principle is that these patterns are unique to every persons. The third principle is that fingerprints share general characteristics that allow for a systematic classification such as loops, arches and whorls.

4-point extended response question
(Details and Facts)
A correct answer must include all three principles.

LA.910.1.7.3: Student will determine the main idea or essential message in grade-level or higher texts through inferring, paraphrasing, summarizing, and identifying relevant details.

3 Compare Alphonse Bertillon's system of criminal identification method to Dr. Faulds' system. Use details from the article to support your answer.

READ
THINK
EXPLAIN

Both Alphonse Bertillon and Dr. Faulds invented methods of criminal investigation during the late 1800's. Bertillon used an extensive procedure of measuring and noting everything on a criminal. Dr. Faulds procedure, however, was simple. It only was concerned with being able to collect and identify fingerprints. By studying the ridges on a persons finger you can identify them. The major problem with the Bertillon system was that over the years of ones life the physical attributes such as height, weight, and hair color change but a fingerprint remains the same all their life.

4-point extended response question
(Compare and Contrast)
A correct answer will use the details from the article to explain the differences and the similarities between the systems.

LA.910.1.7.5: Student will analyze a variety of text structures (e.g., comparison/contrast, chronological order, argument support, lists) and text features (main headings with subheadings) and explain their impact on meaning in text.