

From Galton to the First Repository: Fingerprint Analysis During the Pre-AFIS Period

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At the present time, fingerprints are utilized to confirm or refute an individual's identity within the confines of criminal justice systems throughout the world. Today, fingerprints are used to identify individuals who were present at crime scenes even after fleeing, to link one crime scene to another by comparing prints from both locations, often connecting them to the very same individual, to differentiate inmates housed in correctional facilities, to track the criminal record of repeat offenders, and to even ;put a name to the face of many a John and Jane Doe in the custody of the Office of the Chief Medical Examiner (OCME). All of this comparing, tracking, differentiating, and linking is done with advanced computer technologies whose system houses an infinite repository of fingerprints and identifies the individuals to whom each print belongs. However, this high-tech database known as the Automated Fingerprint Identification System (AFIS) did not come into existence until the year 1980 (Crime Scene Forensics, 2018). Prior to that, anything regarding fingerprint analysis and sharing was done the old-fashioned way. The purpose of this paper is to highlight the establishment of fingerprint usage during the pre-AFIS period, specifically 1) Sir Francis Galton's concepts of minutiae, 2) Sir Edward Henry's pattern classification, 3) the William West conundrum, 4) the Thomas Jennings case, and 5) the growth of the Federal Bureau of Investigation's fingerprint repository.

Sir Francis Galton of England recognized the distinctiveness and personal exclusivity of fingerprints during the late 1800s. His very nature was to detect and take note of his observations. If genetics has anything to do with one's keenness of scientific inquiry, this investigatory mindset would definitely be expected of Galton, as his first cousin was none other than renowned scientist Charles Darwin. Galton published the world's first book on fingerprints

in the year 1892, where he introduced the unique features of fingerprints, referring to their individuality. “These will officially become known as minutiae; they are sometimes still referred to as Galton’s Details” (Crime Scene Forensics, 2018). The spots where ridge lines stop or fork out into different directions are, in fact, the minutiae. “The minutiae points are often called the local ridge discontinuities and can be of many types” (Clark, 2022). Galton recognized minutiae including ridge endings (a suddenly ending ridge), ridge bifurcation (one ridge that splits into two or more ridges), ridge dots (minute ridges), ridge islands (ridges a bit lengthier than ridge dots and inhabit a center space between two separating ridges, lakes or ponds (the vacant space empty in between two separating ridges, spurs (a protuberant of a ridge), bridges (tiny ridges that seam together two elongated head-to-head ridges), and crossovers (two intersecting ridges) (Clark, 2022). Galton’s minutiae-based fingerprint observation was the foundation upon which all future fingerprint studies were based.

Sir Edward Henry's fingerprint classifications were accepted as the “sole official method employed in the identification of habitual criminals” (Faulds, 1911) in England a mere year after Galton’s book was published. The year was 1893 and Henry's pioneering system depended upon the division of “finger impressions into four types: arches, loops, whorls and composites” (Faulds, 1911). Within these four categories, he identified subcategories including plain arches, tented arches, ulnar loops, radial loops, double loops, plain whorls, central pocket loop whorls, and accidental whorls. Rather than examining the bulbs of people’s fingers and thumbs, directly with a hand lens, Henry relied on acquiring the impressions of the bulbs of people’s fingers and thumbs by way of inking the bulbs and pressing them onto paper or cardboard. He would then demarcate the print with a magnifying hand lens or sometimes enlarged the print by

“photographic processes” (Roland, 1959). Paper and cardboard were replaced with official forms, or ink print cards, that were dispensed for the recording of fingerprints of criminals. These ink print cards were shared among law enforcement officials to uncover whether or not a prisoner had already committed a prior offense for which he was previously fingerprinted. They were also used to compare to imprints found on articles at a crime scene as well.

As we fast-forward just passed the turn of the century and reach the year 1903, Galton’s minutiae discovery would be eleven years old and Henry’s arche/loop/whorl/composite categorization would be ten years old. It was that very year that the William West conundrum would be what brought fingerprint usage into prison systems across America. Up until this point, anthropometry was used within prisons to identify inmates. Anthropometry, “a system of collecting physical measurements from the head, foot, middle finger, and other bony parts of the body to help identify individuals” (Identification, 1896), was brought forth originally by French anthropologist, Alphonse Bertillon. Bertillon’s claim was that once a man’s measurements “were reduced by a formula, his numbers would be unique solely to him as an individual” (Identification, 1896), and would not change with the passing of time. However, “a man named Will West was sentenced to the US Penitentiary at Leavenworth, Kansas. It was discovered there was already a prisoner at the penitentiary named William West. Upon investigation, it was determined there were two men who looked very similar. Their names were William and Will West, and their Bertillon measurements were similar enough to identify them as the same person. However, fingerprint comparisons quickly and correctly determined the biometrics were from two different people” (Wilton, 1963). Bertillon’s claim of anthropometrical reliability was brutally crushed then and there by the William West conundrum. From that point forward,

fingerprint cards were the gold standard in prisons for the identification of and differentiating between inmates.

Time marched on, and a mere eight years after the puzzling situation of William West, “fingerprints were first accepted by U.S. courts as a reliable means of identification” (Crime scene Forensics, 2018), as the Illinois State Supreme Court upheld its admissibility as evidence on the twenty-first of December, 1911. The individual to be the first man convicted of murder based on fingerprint evidence in the United States would be Thomas Jennings. Jennings, a recent parolee, was arrested a half-mile away from a home he invaded. During the home invasion, a scuffle with the homeowner ensued. By the end, Jennings shot and killed the homeowner, a Chicago railroad clerk named Clarence Hiller, while Hiller’s wife and fifteen-year-old daughter screamed in terror. When arrested, Jennings was donning “a torn and bloodied coat and carrying a revolver. But it was what he left behind that would be the focal point of his trial—a fingerprint from a freshly painted railing that he used to hoist himself through a window at the Hiller house” (Uenuma, 2018). Convicted and sentenced to death, Jennings appealed to the Illinois Supreme Court. He asked for consideration due to the fact that fingerprint evidence was unprecedented as evidentiary material in a capital murder trial; it was considered a fledgling science to some. To his dismay, the Illinois Supreme Court upheld the conviction, setting the precedence that the use of fingerprints is indeed a reliable means of identification. A few short months after, “Jennings was executed by hanging on February 16, 1912” (Lupton, 2021).

Twelve years after Jennings' death sentence was carried out by the State of Illinois, law enforcement agencies across America began religiously submitting their official fingerprint forms to the Federal Bureau of Investigations (FBI). In fact, between the years 1924 and 1933, the FBI's fingerprint card collection increased in size "more than six-fold to 2,000 cards daily" (Dickerson-Cook, 1954), and the number of repetitive suppliers to the fingerprint card collection rose "five-fold to 5,282 routine contributors" (Dickerson-Cook, 1954). On an extremely steep incline, by the time 1938 rolled around, "The FBI's Identification Division files included more than 9,500,000 fingerprint cards" (Dickerson-Cook, 1954). These very cards were the basis for Federal Bureau of Investigation's fingerprint repository, which later became computerized.

It is often said that Rome was not built in one day. The same can be said with regard to AFIS. While in today's world, the technology-driven database makes the storage and sharing of fingerprints simplistic for law enforcement agencies worldwide, we must remember the lengthy, painstaking foundation upon which AFIS was established. The studies of Sir Francis Galton and Sir Edward Henry lead to the ability to solve the William West conundrum. From there, the Thomas Jennings case set a precedence and led to the growth of the Federal Bureau of Investigation's fingerprint repository due to police agencies' readiness to contribute their fingerprint cards. From these scrupulous beginnings, AFIS was born and currently continues to thrive.

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