Major Breakthroughs in Forensic Science

BCE  Evidence of fingerprints in early paintings and rock carvings of prehistoric humans

700s  Chinese used fingerprints to establish identity of documents and clay sculpture, but without any formal classification system.

(1000)  Quintilian, an attorney in the Roman courts, showed that bloody palm prints were meant to frame a blind man of his mother’s murder.

1247  A Chinese book, *Hsi Duan Yu* (the washing away of wrongs), contains a description of how to distinguish drowning from strangulation. This was the first recorded application of medical knowledge to the solution of crime.

1784  In Lancaster, England, John Toms was convicted of murder on the basis of the torn edge of wad of newspaper in a pistol matching a remaining piece in his pocket. This was one of the first documented uses of physical matching.

1810  Eugène François Vidocq, in return for a suspension of arrest and a jail sentence, made a deal with the police to establish the first detective force, the Sûreté of Paris.

1813  Mathieu Orfila, a Spaniard who became professor of medicinal/forensic chemistry at University of Paris, Published *Traite des Poisons Tires des Regnes Mineral, Vegetal et Animal, ou Toxicologie General*. Orfila is considered the father of modern toxicology. He also made significant contributions to the development of tests for the presence of blood in a forensic context and is credited as the first to attempt the use of a microscope in the assessment of blood and semen stains.

1823  John Evangelist Purkinji, a professor of anatomy at the University of Breslau, Czechoslovakia, Published the first paper on the nature of fingerprints and suggested a classification system based on nine major types. However, he failed to recognize their individualizing potential.

1836  James Marsh, an Scottish chemist, was the first to use toxicology (arsenic detection) in a jury trial.

1850  In the US, murderer John Webster’s conviction is the first to be made on the basis of medical evidence. Physicians and anatomists tell the jury how they determined the age, sex, and time of death of the victim.

1851  Jean Servais Stas, a chemistry professor from Brussels, Belgium, was the first successfully to identify vegetable poisons in body tissue.

1861  German pathologist, Rudolph Virchow, is the first to study hair and its value as evidence.

1864  Odelbrecht first advocated the use of photography for the identification of criminals and the documentation of evidence and crime scenes.

1877  Thomas Taylor, microscopist to U.S. Department of Agriculture suggested that markings of the palms of the hands and the tips of the fingers could be used for identification in criminal cases. Although reported in the *American Journal of Microscopy and Popular Science* and *Scientific American*, the idea was apparently never pursued from this source.

1880  Henry Faulds, a Scottish physician working in Tokyo, published a paper in the journal *Nature* suggesting that fingerprints at the scene of a crime could identify the offender. In one of the first recorded uses of fingerprints to solve a crime, Faulds used fingerprints to eliminate an innocent suspect and indicate a perpetrator in a Tokyo burglary.

1883  Alphonse Bertillon, a French police employee, identified the first recidivist based on his invention of anthropometry.

1887  Arthur Conan Doyle published the first Sherlock Holmes story in Beeton’s Christmas Annual of London.

1891  Hans Gross, examining magistrate and professor of criminal law at the University of Graz, Austria, published *Criminal Investigation*, the first comprehensive description of uses of physical evidence in solving crime. Gross is also sometimes credited with coining the word *criminalistics*.

1892  (Sir) Francis Galton published *Fingerprints*, the first comprehensive book on the nature of fingerprints and their use in solving crime.

1900  Karl Landsteiner first discovered human blood groups and was awarded the Nobel prize for his work in 1930. Max Richter adapted the technique to type stains. This is one of the first instances of performing validation experiments specifically to adapt a method for forensic science. Landsteiner’s continued work on the detection of blood, its species, and its type formed the basis of practically all subsequent work.

1901  Sir Edward Richard Henry was appointed head of Scotland Yard and forced the adoption of fingerprint identification to replace anthropometry.

1902  Professor R.A. Reiss, professor at the University of Lausanne, Switzerland, and a pupil of Bertillon, set up one of the
first academic curricula in forensic science. His forensic photography department grew into Lausanne Institute of Police Science.

1903 At Leavenworth Federal Penitentiary, Kansas, Will West, a new inmate, was initially confused with a resident convict William West using anthropometry. They were later (1905) found to be easily differentiated by their fingerprints.

1904 Georg Popp pioneered the use of botanical (soil and plant parts) identification in forensic work.

1905 American President Theodore Roosevelt established Federal Bureau of Investigation (FBI).

1910 Edmund Locard, successor to Lacassagne as professor of forensic medicine at the University of Lyons, France, established the first police crime laboratory.

1918 Edmund Locard first suggested 12 matching points as a positive fingerprint identification.

1920 Locard published L'enquete criminelle et les methodes scientifique, in which appears a passage that may have given rise to the forensic precept that “Every contact leaves a trace.”

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1924 August Vollmer, as chief of police in Los Angeles, California, implemented the first U.S. police crime laboratory.

1925 Saburo Sirai, a Japanese scientist, is credited with the first recognition of secretion of group-specific antigens into body fluids other than blood.

1929 Calvin Goddard’s work on the St. Valentine’s day massacre led to the founding of the Scientific Crime Detection Laboratory on the campus of Northwestern University, Evanston, Illinois.

1932 The Federal Bureau of Investigation (FBI) crime laboratory was created.

1936 Alexander Mearns of the Institute of Hygiene at the University of Glasgow uses the life cycle of maggots to estimate time of death in the trail of Buck Ruxton.

1937 Walter Specht fist suggests the use of luminal as a preliminary test for the presence of blood.

1941 Murray Hill of Bell Labs initiated the study voiceprint identification. The technique was refined by L.G. Kersta.

1945 Frank Lundquist, working at the Legal Medicine Unit at the University of Copenhagen, developed the acid phosphatase test for semen.

1950 Max Frei-Sulzer, founder of the first Swiss criminalistics laboratory, developed the tape lift method of collecting trace evidence.

1953 Paul Kirk published Crime Investigation, one of the first comprehensive criminalistics and crime investigation texts that encompassed theory in addition to practice.

1954 R. F. Borkenstein, captain of the Indiana State Police, invented the Breathalyzer for field sobriety testing.

1977 Fuseo Matsumur, a trace evidence examiner at the Saga Prefectural Crime Laboratory of the National Police Agency of Japan, notices his own fingerprints developing on microscope slides while mounting hairs from a taxi driver murder case. He relates the information to co-worker Masato Soba, a latent print examiner. Soba would later that year be the first to develop latent prints intentionally by “Superglue®” fuming.

1977 The FBI introduced the beginnings of its Automated Fingerprint Identification System (AFIS) with the first computerized scans of fingerprints.

1986 In the first use of DNA to solve a crime, Sir Alec Jeffreys used DNA profiling to identify Colin Pitchfork as the murderer of two young girls in the English Midlands. Significantly, in the course of the investigation, DNA was first used to exonerate an innocent suspect.

1991 Walsh Automation Inc., in Montreal, launched development of an automated imaging system called the Integrated Ballistics Identification System, or IBIS, for comparison of the marks left on fired bullets, cartridge cases, and shell casings. This system was subsequently developed for the U.S. market in collaboration with the Bureau of Alcohol, Tobacco, and Firearms (ATF).

1996 In response to continued concerns about the statistical interpretation of forensic DNA evidence, a second National Research Council Committee on Forensic DNA (NRC II) was convened and published The Evaluation of Forensic DNA Evidence.