

INTERNATIONAL JOURNAL OF LAW MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

Volume 7 | Issue 3

2024

© 2024 *International Journal of Law Management & Humanities*

Follow this and additional works at: <https://www.ijlmh.com/>

Under the aegis of VidhiAagaz – Inking Your Brain (<https://www.vidhiaagaz.com/>)

This article is brought to you for “free” and “open access” by the International Journal of Law Management & Humanities at VidhiAagaz. It has been accepted for inclusion in the International Journal of Law Management & Humanities after due review.

In case of **any suggestions or complaints**, kindly contact Gyan@vidhiaagaz.com.

To submit your Manuscript for Publication in the **International Journal of Law Management & Humanities**, kindly email your Manuscript to submission@ijlmh.com.

Using Forensic Science in the Analysis of Homicidal Crimes

DEEPIKA TEOTIA¹ AND SANYAM POKHRIYAL²

ABSTRACT

Forensic science is pivotal in the examination of crime scenes and the gathering of evidence, including items like garments, cigarette remnants, and biological samples, to scientifically substantiate a suspect's culpability. DNA testing in cases of assault and homicide verifies the identity of the victim. This evidence aids in expediting the investigative process and the judicial proceedings. Nonetheless, forensic science is not infallible and possesses inherent constraints. Therefore, initial investigators, including the Crime Laboratory Ultimate Evidence System crew and forensic specialists, must be cognizant of these restrictions when collecting and analysing samples to avoid inaccurate findings. Erroneous outcomes can arise from inadequate sample sizes, incorrect collection techniques, or delayed analyses. The enforcement of standardized procedural protocols is crucial; without them, the legal acceptance of forensic evidence to conclusively establish guilt is jeopardized. Consequently, the judiciary may exonerate the defendant, extending the benefit of the doubt. This article focuses the role and boundaries of forensic science within the Indian Criminal Justice System and underscores the imperative of adhering to established procedures to obtain reliable.

Keywords: *Forensic Science, Homocial Crimes, D. N. A., Fingerprint.*

I. INTRODUCTION

In our modern era, novel challenges have led to the creation of fresh investigative methodologies. A significant relationship has developed between the realms of science and the administration of justice. Science is the methodical approach to comprehending, articulating, quantifying, and predicting both commonplace and extraordinary natural occurrences, employing all available cognitive and physical instruments. As such, empirical methods encompass observation, quantification of potentially numerical items, data gathering, and analytical interpretation, which stand in contrast to emotion-driven approaches.

Undoubtedly, scientific progress periodically allows for the broadening of case categories that encompass both corroborative and refutative evidence. The pursuit of crime prevention

¹ Author is a LL.M. student at Libra School for Higher Studies, Dehradun, India.

² Author is a LL.M. student at Jagran School of Law, Dehradun, India.

necessitates endowing the State with extensive powers to employ the criminal justice system against individuals. However, in a democratic society, the rights of individuals to liberty cannot be wholly overlooked; hence, while the State is granted coercive powers, mechanisms are instituted to thwart their random and whimsical application. Bearing this equilibrium in mind, nearly every well-established legal system operates under the presumption of innocence for every accused individual until proven otherwise.

The judicial framework is composed of four principal subsystems: the police, prosecutors, courts, and correctional institutions. To fulfil the primary objectives of the criminal justice system, each subsystem must not only execute its designated legislative duties but also synergistically enhance the functions of the others. However, in practice, these subsystems often operate independently, sometimes even at odds with one another. Structural synchronization is necessary for them to collaborate effectively towards the shared goal of shielding society from anti-social behaviour and illegal acts.

In contemporary society, the escalating scale and complexity of crime have significantly undermined public safety, while the criminal justice system's failure to provide prompt and effective justice has severely eroded public trust. The excessive time taken by police and courts to resolve criminal cases, coupled with a protracted, burdensome, and costly legal process, and the dismal conviction rates in criminal trials, have all contributed to the rapid decline of confidence in the criminal justice system, bringing it perilously close to a breakdown.

II. CLASSICAL TECHNIQUES OF INQUIRY

The conventional instruments of inquiry are often summarized by the triad of 'Ts': information, interrogation, and instrumentation.

(A) Information

The concept of 'information' encompasses the knowledge an investigator acquires from pertinent documents and individuals familiar with the case's details and context. It also covers insights gained from the investigator's confidential police connections and informants, who, under meticulous police guidance, monitor criminal activities. This amassed information often paves the way to evidence, though it is seldom considered evidence on its own. Indeed, even the most adept investigator may not fully recognize the significance or ultimate worth of each piece of information gathered during the investigation's various phases.

(B) Interrogation

Interrogation stands as a pivotal element in criminal proceedings. It is an art honed through

study and practice. In cases where physical evidence is scarce, interrogation becomes crucial. It serves as a primary method for evaluating evidence and resolving conflicts, with police and investigators relying on it extensively. Interrogation involves the adept questioning of witnesses and suspects to glean details about the crime, demanding more precision than a standard interview, particularly when dealing with uncooperative or antagonistic individuals. Hence, while victims and witnesses are interviewed, suspects and offenders are subjected to interrogation. The questioning of the accused and suspects is a critical component of criminal investigations, especially in the absence of eyewitnesses, as the true account of events is known only to the accused. In India, confessions made to police are not admissible as evidence, so the goal of interrogation is to uncover the truth, especially in cases enveloped in mystery, such as the Arushi Talwar murder case.

(C) Instrumentation

Instrumentation refers to the use of tools and techniques from the physical sciences to extract information from tangible evidence discovered at a crime scene, on the suspect or victim, or on other items present. Identifying physical evidence is crucial in establishing connections between the suspect, the crime scene, the victim, or the location of the crime. This becomes especially important when bodies are transported over distances for disposal. Instrumental analysis can sometimes associate a suspect with the crime's weapon found at the scene or in their possession, as in cases where a bullet extracted from a victim is matched to a firearm found with the suspect. The constitutional mandate necessitates that the legislative system implement necessary actions to apply scientific principles within the legal framework for justice. In this regard, the Indian government has undertaken comprehensive efforts to incorporate contemporary scientific and technological advancements into the nation's legal statutes.

III. CONTEMPORARY METHODS OF CRIMINAL INVESTIGATION

The history of crime is as old as human society itself. As civilizations advance, the nature of crime evolves alongside them. Particularly in the 20th century, science and technology have undergone significant advancements. The pace of modern scientific and technological progress is unprecedented. This swift advancement has transformed the methods used to commit crimes. Contemporary criminal activities are emerging due to increased connectivity, rapid communication, privacy concerns, and offenders' access to computer technology. Criminals are now utilizing the latest innovations in science and technology to carry out their illicit acts.

In the modern age, traditional criminal activities have transformed into technologically-driven cybercrimes. In such scenarios, traditional investigative methods like eyewitness testimony,

confessions, consent, or standard witness statements are often impractical. Eyewitnesses may be unwilling or unable to testify, confessions are not easily obtained due to legal protections against self-incrimination and privacy rights, and in meticulously planned crimes, cooperative witnesses or informants may not be available.

The pressing necessity for the utilization, examination, and implementation of forensic science can be concisely ascribed to several key factors and domains:

- Social changes,
- Hiding facilities,
- Technical knowledge,
- Expanding scope of criminal activities, and
- Enhanced quality of evidence.

Forensic science has become an influential and formidable tool within the arsenal of the justice system.

(A) Circumstantial Evidence: Indirect Proof in Legal Proceedings

The term “circumstantial evidence” is used because it depends on an array of other facts to substantiate its claims regarding the veracity of a case. It consists of a set of facts that, when collectively considered, allow for the inference of the nature of an unknown aspect. It strengthens the theory of interconnected occurrences. Proper reasoning to affirm the occurrence of any event is formulated by piecing together multiple pieces of corroborative evidence, each being circumstantial on its own. In both civil and criminal proceedings, corroboration is often supplied by specialists presenting forensic testimony.

(B) Forensic Evidence

Forensic evidence comprises scientific findings from the analysis of material clues, which can be instrumental in inferring additional details and reconstructing events. It plays a vital role in ascertaining the culpability or innocence of individuals in legal disputes. Integral to both civil litigation and criminal prosecution, the examination of forensic evidence can establish connections between seemingly related offenses. DNA evidence can interlink multiple crimes or scenes, while in vehicular incidents, the analysis of tire and skid marks can reveal the trajectory and velocity of a vehicle involved. Similarly, fingerprints at a crime scene serve as tangible indicators of an individual’s presence.

IV. CRIMINAL JUSTICE SYSTEM

On November 26, 1949, the Constitution of India was adopted, establishing the nation as a union of states. India is composed of 29 states and 7 union territories. Due to its historical ties to British colonialism, India follows the common law legal system inherited from the Anglo-Saxons. The Constitution's 7th Schedule, under Article 246, delineates three distinct lists. The Union List (List-1) enumerates subjects over which the Indian Parliament has exclusive legislative power. The State List (List-2) includes matters that state legislatures have the authority to regulate. The Concurrent List outlines subjects on which both the Indian Parliament and state legislatures can legislate. However, in cases of conflict or inconsistency between laws made by the Indian Parliament and those of state legislatures, the law made by the Union Parliament prevails.

(A) Criminal law and justice system components

India's criminal justice system is structured into four key components: the police, the judiciary, the prosecution, and the prison and correctional services. Here's a brief overview of their organizational structure and functions:

- **The Police:** According to the Indian Police Act of 1861, state-sponsored police forces are established. As a diligent researcher of the law, it is essential to understand the core responsibilities of a police officer. These responsibilities encompass meticulously documenting crimes, carrying out investigations in accordance with the Code of Criminal Procedure, and ensuring a smooth trial process.
- **The Judiciary:** This branch is responsible for interpreting the law, resolving legal disputes, and ensuring justice is served. It includes a range of courts, starting from the lower courts all the way up to the Supreme Court of India.
- **The Prosecution:** This segment is tasked with presenting the case against an accused individual in a court of law. Prosecutors carefully examine the evidence collected during investigations and make informed decisions on whether to proceed with filing charges.
- **Prison and Correctional Services:** These services oversee the confinement and reformation of individuals who have been found guilty. They are responsible for ensuring the execution of sentences and overseeing the welfare and reform of prisoners.

Furthermore, the Central Bureau of Investigation (CBI), established by the Delhi Special Police Establishment Act of 1946, is a central government agency dedicated to investigating crimes of national and international significance. Although it has jurisdiction in Union Territories, it needs

the approval of state governments to function within their territories.

V. FORENSIC SCIENCE: A COMPREHENSIVE PERSPECTIVE

Crime has been an enduring presence throughout the course of human history, predating the existence of written documentation. Throughout history, different types of criminal activities have consistently disrupted the balance of society. When an act goes against the established norms or laws of a society, it is considered criminal. In 2011, Krishnamurthy highlighted the importance of societal rules in fostering harmonious coexistence. The goal was to identify and punish those who deviated from these norms and to separate them in order to maintain the integrity of society. As a result, systems were established to focus on the examination and legal action against criminal activities, alongside institutions that prioritize fairness and neutrality.

(A) The Role of Forensic Science in Investigation, of Crime

Using forensic science, the suspect's personality can be identified. The collected evidence provides clarification regarding the nature of the crime. The context offers valuable information regarding the time period in which the offense took place. Forensic evidence isolates the location of the offense. The method by which the perpetrator operates is revealed via forensic analysis.

As a final step, forensic science illuminates the motivations that lie beneath a criminal act. Before being presented in court, evidence gathered from the crime site or individuals is examined in a forensic laboratory. The meticulous examination of physical evidence is critical to the functioning of the criminal justice system, as it permits the certain identification of the offender via distinctive characteristics such as fingerprints, imprints, blood samples, or strands of hair. The criminal's involvement in the crime is inferred from the evidence seized from the victim or left at the crime site. On the contrary, in situations where the evidence fails to establish a connection between the suspect and either the crime site or the victim, it reinforces the presumption that they are innocent. Thus, forensic science contributes to the exoneration of the innocent as well. By virtue of the traces left at the crime site, DNA technology furnishes investigators with copious data that can be utilized to identify the perpetrator.

(B) Legal Provision, of Forensic Science in India

Forensic science is crucial in criminal investigations and court proceedings, despite legal constraints. To address the pertinent questions:

- 1. Extent of Forensic Use:** Forensic techniques can be utilized in criminal investigations in accordance with the law, thereby safeguarding individual rights.

2. **Self-Incrimination Protection:** Asserting guilt is not possible prior to establishing guilt, Article 20(3) of the Constitution of India forbids compelling an individual to depose against themselves in a criminal trial.
3. **Presumption of Innocence:** The legal system maintains that an accused is innocent until proven guilty beyond a reasonable doubt, aligning with the Universal Declaration of Human Rights which asserts the right to a fair trial and necessary legal defences.
4. **Right to Silence:** Article 20(3) also enshrines the right to silence, preventing self-incrimination and ensuring that no individual is forced to provide incriminating evidence against themselves.
5. **Forensic Evidence in Court:** The findings of forensic experts carry significant evidentiary weight in court, contributing to the determination of guilt or innocence, provided they are collected and presented in accordance with the law.

The Bombay High Court, in the case of *Ramchandra Reddy and Others v. the State of Maharashtra*³, validated the use of P300 brain fingerprinting, polygraph tests, and narco-analysis. Abdul Karim Telgi, the key figure in the counterfeit stamp paper case, underwent these scientific examinations as part of the investigation by the Special Investigation Team (SIT), authorized by a distinct court directive. The court's decision also recognized the admissibility of evidence obtained through truth serum. Furthermore, in 2005, the Code of Criminal Procedure, 1973, was amended to permit the collection of extensive medical data from suspects at the time of their arrest.

It is considered justifiable to presume that inspecting an accused person could yield proof pertinent to the crime, as per Section 53 of **the Cr. P. C.**⁴ The scope of such examinations, expanded in 2005, “encompasses the analysis of blood, semen, and other bodily substances using advanced scientific methods, including DNA profiling, as deemed necessary by a medical professional in specific cases. Following sexual assault, women are mandated to undergo a medical examination, which includes DNA testing, within twenty-four hours. According to the **Indian Medical Council Act**, any medical practitioner meeting the criteria of Section 2(h) is authorized to collect DNA samples”. However, the capability of all medical practitioners to collect and preserve DNA evidence effectively may vary based on their training and resources. The integrity of DNA evidence is contingent upon the correct collection and preservation of samples. Any error or misunderstanding can lead to contamination, rendering the sample

³ 1976 SCC (Cri) 473.

⁴ Code of Criminal Procedure, 1973.

useless. Under the **I. E. A.**⁵, a forensic expert's report is considered an "opinion." An expert is defined as a person who has developed specialized knowledge in a particular field through extensive education and experience. The trustworthiness of an expert witness is judged by the logic and methodology they apply to reach their conclusions. Consequently, a court may choose to overlook an expert's report if other evidence presents a stronger case for judgment.

(C) Forensic Science Techniques: Their Role in Judicial Administration

a. Analytical Test for Drugs

Narcolepsy is the name for the narcotic-induced state of narcosis. Narco-analytics is the method for you if you've ever wondered what it's like to be put into a drugged slumber and then interrogated. This method may help improve a witness's memory. The drugs given to a subject during a narco-analysis test cause him to go asleep.

b. Lie Detection or Polygraph Test

The term "Polygraph" refers to an instrument that records multiple physiological indicators simultaneously, commonly known as "many writings". It is based on the idea that deceptive responses will result in unique physiological reactions that can be distinguished from those linked to truthful answers. The polygraph device is designed to measure and record different physiological indicators, including blood pressure, pulse, respiration, and skin conductivity. These measurements are taken while the subject is being asked a series of questions and providing answers. It is believed that providing incorrect answers will result in physiological reactions that can be differentiated from those linked to truthful responses. The term "Polygram" is used to describe the recorded graph that shows the physiological responses during a polygraph test. Examiners analyse this graph to identify any signs of emotional stress, which could indicate deception.

c. P300 or Brain Mapping

Brainwave fingerprinting serves as an alternative designation for this investigative approach. It involves the utilization of this technique to conduct interviews and interrogations of suspects to ascertain the concealment of crucial information. The process entails equipping an individual with head-mounted sensors and positioning them before a computer. Unexpected visual and auditory stimuli are presented to the suspect, triggering electrical responses and P300 brain waves—indicators of recognition - captured by the attached sensors. This method operates without posing direct questions to the individual. Through this process, it's possible to align a

⁵ Indian Evidence Act, 1872.

person's unique neural responses with the specifics of an incident or crime scene. Absence of the P300 wave suggests the individual's honesty. Bangalore's forensic laboratory pioneers this technique in India, employing it as a scientific piece of evidence, which the Court considers and values for its probative significance in legal cases.

In cases where two individuals are under investigation. for the same offense, with one being the victim, the validity of this test comes into question. It relies solely on memory-based information to place them at the crime scene, yet fails to distinguish their specific involvement. Consequently, an innocent bystander could be wrongfully associated with the crime, inadvertently providing the actual perpetrator. with an opportunity to deflect suspicion. Information to place them at the crime scene, yet fails to distinguish their specific involvement. Consequently, an innocent bystander could be wrongfully associated with the crime, inadvertently providing the actual perpetrator with an opportunity to deflect suspicion.

d. DNA. Profiling

DNA. profiling stands as a highly credible investigative technique within forensic science. The term "DNA" stands for "Deoxyribonucleic Acid," a unique organic compound found in all living cells that serves as a genetic identifier. Various biological materials such as blood, semen, bone, and saliva are sources for DNA extraction. The molecule was first identified by Fredrick Miescher in 1869. DNA's uniqueness to each individual, barring identical twins, renders DNA analysis exceptionally precise, with the probability of two individuals sharing identical DNA. being one in three billion. Its resistance to tampering solidifies its status as a trustworthy evidence source. DNA testing. applications are diverse, ranging. from establishing paternity to identifying disfigured remains.

e. Paternity

In India, the legitimacy. of a child is protected under the **I. E. A.**⁶ The Act ensures that a child is not prejudiced by parental misconduct. The judiciary typically prevents interference with evidence considered as conclusive proof of another fact. Liability exemption is granted only if a party can demonstrate that there was no access between the parties at the time of conception. In paternity. disputes, the burden of proof lies with the party challenging paternity. Furthermore, Section 125. of the **Cr. P. C.**⁷, stipulates that a man is obligated to financially support his legally married wife, offspring, and parents should they be unable to sustain themselves.

⁶ Indian Evidence Act, 1872.

⁷ Code of Criminal Procedure, 1973.

f. Fingerprint

Fingerprints stand as a crucial piece of evidence in criminal investigations. Each person's finger ridges are distinct, with the pattern of these sweat-soaked ridges remaining fixed for life. Even if skin is removed, it will regenerate in the same pattern. The most prevalent patterns found in fingerprints are arches, loops, and whorls. At a crime scene, fingerprints consist of the residue left by these substances, along the finger ridges.

VI. LATEST JUDICIAL PRONOUNCEMENTS'

Based on the DNA evidence and testimonies, "the Sessions Judge in Nagpur found the defendant guilty and imposed the death penalty for the heinous killing of a young boy, approximately 10 years old, following sexual assault and subsequent strangulation, in the case of *Anil alias Anthony Arikswamy Joseph v. State of Maharashtra*⁸.

In the murder case of Nitish Katara, involving Vishal Yadav in Uttar Pradesh, identification was possible through a single unscathed hand with fingers. DNA profiling enabled the conclusive identification of the deceased by matching the DNA profiles with those of the parents. "The Delhi High Court utilized this evidence to corroborate the conviction of the accused."

In the case titled, "*State by the Inspector of Police v. Manoharan*⁹", DNA evidence led to the conviction and death sentence of an auto rickshaw driver for the abduction and homicide of a 10-year-old schoolgirl, whose body was subsequently disposed of in a running canal.

In the case against *Sujeet Kumar v. The State of NCT. Delhi*¹⁰, a girl from the slums who suffered a brutal assault and was forced into an unnatural sexual act was investigated by the Delhi police. DNA profiling played a key role in linking the perpetrator to the atrocious crime. The court agreed with the investigation's findings, which included DNA evidence, and convicted the accused, thereby reversing the Trial Court's initial acquittal that had relied on the child's testimony.

Following the death of his son, Sushil Mandal challenged the DNA profiling findings in the case of *Sushil Mandal v. The State Represented by CBI*¹¹. The deceased boy, who was experiencing early romantic feelings for a peer, prompted school authorities to alert both sets of parents to monitor their children. Subsequently, the boy went missing, and after a week, a

⁸ (2014) 4 SCC 69, (2014) 22SCC (Cri) 266, 2014 SCC OnLine SC 148.

⁹ 2006 SCC OnLine Mad 1235, 2006 Cri LJ 4671.

¹⁰ (2011) 10 SCC 192, (2012) 1 SCC (Cri) 240, 2011 SCC OnLine SC 1344.

¹¹ (1996) 2 SCC 199.

decomposed body was found in a lake, unrecognizable. The father stated in his petition that he could not confirm the identity of the remains or the clothing. Opting for legal recourse, he approached the Supreme Court with a habeas corpus petition, accusing the girl's father and requesting the court to direct the CBI to investigate. The autopsy. revealed that the DNA of the deceased matched that of his parents (the petitioner and his spouse). Despite repeated DNA. tests, the petitioner remained unconvinced by the scientific evidence. The Supreme Court dismissed the case, placing its trust in the scientific validity. of DNA profiling.

The Supreme Court has emphasized that crime scenes must be managed meticulously and scientifically to avoid any errors. Forensic science plays a vital role in criminal cases that rely on indirect evidence, as it can help confirm the occurrence of a crime, identify the perpetrator, and ascertain the guilt or innocence of the suspect. One of the key responsibilities of a crime scene investigator is to meticulously search for evidence that could lead to the conviction of the criminals. The Investigating Officer is tasked with safeguarding the physical evidence from contamination risks during its collection, packaging, and dispatch from the crime scene. Following specific safety measures is crucial to preserve the integrity of the evidence and prevent any possible tampering or harm.

VII. CONCLUSION

Forensic science plays a vital role in helping detectives uncover the objective truth in homicide cases. It plays a crucial role in identifying and examining tangible evidence related to a victim's death. By utilizing techniques such as autopsies, DNA profiling, trace evidence analysis, and ballistic examination, forensic experts can gather significant scientific evidence that is admissible in a court of law. Therefore, forensic science plays a crucial role in the pursuit of justice and in uncovering the truth behind homicide cases. Nevertheless, the efficacy of forensic science in aiding investigators can be hindered by various obstacles, including limited resources, environmental barriers, and disagreements among experts. It is crucial to recognize and tackle these obstacles, as they play a significant role in resolving homicide investigations. This perspective aligns with the assertion made by Baskin & Sommers that forensic evidence, although helpful, is not definitive in determining the outcome of murder investigations.
