
BRIDGING JUSTICE AND SCIENCE: THE SYNERGY OF FORENSIC SCIENCE IN INDIAN CRIMINAL LAW

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ABSTRACT

Digital forensics, ballistics, DNA analysis, toxicology, fingerprint analysis, and other scientific disciplines are all covered in forensic science. Investigating crime scenes, obtaining, evaluating, and presenting evidence in court all depend on these domains. In recent years, there has been an increased awareness of the importance of forensic science in the Indian "Criminal Justice System" (CJS). It is essential to the CJS because it provides scientific evidence to back up the investigation and resolution of criminal cases. When using forensic science, the Indian criminal justice system faces several challenges that affect the reliability and quality of forensic evidence. These problems include outdated forensic facilities, inadequate forensic education for law enforcement personnel, a lack of certification and standards for forensic laboratories, and ambiguous procedures for collecting, storing, and evaluating forensic evidence. These issues might lead to contaminated evidence, poor evidence management, and unreliable results, which could harm criminal case outcomes and result in injustices. Overcoming these challenges would allow for the fair and reliable administration of justice, the strengthening of the criminal justice system in India, and an improvement in the caliber and dependability of forensic evidence. It is essential to evaluate and enhance the use of forensic science in the Indian criminal justice system to ensure that it is robust, trustworthy, and in line with international best practices. This research project aims to investigate several forensic science disciplines, the current legislative framework, and pertinent court judgments in the Indian criminal justice system in order to identify problems and offer recommendations for future growth.

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KEYWORDS: Forensic Science, Scientific Disciplines, Criminal Justice System, Challenges India

INTRODUCTION:

Forensic science, a multidisciplinary domain employing scientific methodologies to investigate and resolve criminal cases, has attained considerable significance within the global criminal justice system. It offers essential assistance in the gathering, analysis, and interpretation of evidence, which can aid in establishing facts, identifying suspects, and delivering justice to offenders. Forensic science is used in investigations and court proceedings and is recognized as a crucial component of the criminal justice system in India.

However, even though forensic science is important, there are still problems that make it unreliable and ineffective in India's criminal justice system. The issues include training, standards, infrastructure, and whether forensic evidence may be used in court. In addition, the dynamic nature of illicit activities and technological advancements in India present new challenges for forensic science. The quality and dependability of forensic evidence can be negatively impacted by unclear standards and procedures, inadequate training and resources for forensic specialists, and flaws in forensic infrastructure, which may lead to erroneous convictions or acquittals. Consequently, a comprehensive research is urgently required to assess the current state of forensic science in India's criminal justice system, pinpoint problems, and provide solutions supported by evidence.

This article seeks to address shortcomings in India's forensic science methods, enhance the caliber and dependability of forensic evidence, and ensure the fair and trustworthy operation of the criminal justice system while upholding the principles of justice and due process.

COMPREHENDING FORENSIC SCIENCE IN RELATION TO THE INDIAN CRIMINAL JUSTICE SYSTEM:

The intriguing discipline of forensic science, which employs scientific investigation to unravel the secrets of criminal activity, is currently an essential part of the Criminal Justice System (CJS) in India. This multidisciplinary discipline includes a broad range of scientific methods and approaches that support the gathering, preserving, analyzing, and presenting of evidence in legal proceedings.² To investigate and prosecute crimes in India, forensic science—from

² Sonia Kaul Shali, *Applicability of Forensic Science in Criminal Justice System in India with Special Emphasis on Crime Scene Investigation*, Medico-Legal Desire Media and Publications (June 25, 2018), <https://ssrn.com/abstract=3220169>.

fingerprint analysis to DNA profiling—is crucial because it reveals the truth in even the most complicated situations. It has developed into a potent instrument for locating criminals, connecting them to the site of the crime, and providing proof in court.

AREAS OF FORENSIC SCIENCE WITHIN THE INDIAN CRIMINAL JUSTICE FRAMEWORK:

In India, forensic science is a broad and varied discipline that includes several specialist fields that support the criminal justice system. These domains comprise, but are not restricted to:³

1. **Fingerprint Analysis:** In forensic science, fingerprint evidence is frequently regarded as the gold standard. To identify suspects, fingerprint specialists match known prints with fingerprints collected from weapons, crime scenes, and other objects using scientific procedures.⁴
2. **DNA Profiling:** DNA profiling is a state-of-the-art method that uses DNA sample analysis to identify people, identify family groups, and connect suspects to crime scenes. In India, DNA profiling has transformed criminal investigations and played a key role in the resolution of many intricate cases.⁵
3. **Ballistics and weapons Examination:** In this discipline, the type of weapon used in a crime, the trajectory of projectiles, and other crucial details that assist in reconstructing the events are ascertained by analyzing weapons, ammunition, and ballistics evidence. By bringing to light the hidden risks that exist within the field of ballistics and offering insights that aid in the investigation of crimes and the prosecution of those responsible, it is an essential pillar in the pursuit of justice and the truth.⁶
4. **Questioned Document Examination:** In instances involving fraud, forgery, and other document-related crimes, this field analyzes papers to ascertain their validity and connect them to suspects by looking at handwriting, signatures, paper, ink, and other characteristics.
5. **The study of insects and arthropods in relation to criminal investigations** is the focus of the rapidly developing field of forensic entomology in India. It helps find timelines of neglect

³ Gowsia Khan and Sheeba Ahad, *Role of Forensic Science in Criminal Investigation: Admissibility in Indian Legal System and Future Perspective*, Int'l J. Advanced Res. Sci. & Eng'g, 220-34 (2018), https://www.ijarse.com/images/fullpdf/1524846716_JK1433IJARSE.pdf.

⁴ Manupatra, <https://articles.manupatra.com/article-details/Evidentiary-value-of-Fingerprints-in-Indian-Criminal-Justice-System> (last visited Dec. 27, 2024).

⁵ SSRN, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4315756 (last visited Dec. 28, 2024).

⁶ G. Keerthna, *FORENSIC EVIDENCE IN RESPECT OF BALLISTICS: AN INTERNATIONAL PERSPECTIVE*, 120 IJPAM, 61-73 (2018), <https://acadpubl.eu/hub/2018-120-5/1/26.pdf>.

or injury, detect medications and poisons, and pinpoint the time and place of incidents.⁷ Despite being in its infancy, it is undergoing ongoing investigation and testing, opening the door for developments in criminal law.

6. Forensic toxicology⁸ is the study of how medicines and poisons affect living things. Forensic toxicologists analyze bodily fluids like blood and urine to detect traces of substances such as alcohol, drugs, and other toxic compounds and to determine their participation in criminal cases such drug-related offenses and poisoning.
7. Forensic Psychiatry⁹: This special branch of medicine and law explores the complex field of mental health within the framework of Indian judicial processes. With its specific expertise, forensic psychiatry evaluates the accused's mental health, offers professional judgments, and helps the legal system make defensible conclusions. It provides clarity to complicated issues at the nexus of psychiatry and law, from assessing criminal guilt to deciding competence to stand trial, and its deep insights and skills help pursue justice.
8. Forensic anthropology¹⁰, a scientific examination of human skeletal remains within a legal framework, is gaining popularity in India's forensic discipline. Using methods from anthropology, anatomy, and archaeology, forensic anthropology's multidisciplinary approach helps identify human remains, determine age, sex, size, and ancestry, and recreate the events leading up to death. In the fight for justice in India's judicial system, it is essential to solving puzzles and illuminating the past.
9. Forensic Odontology¹¹: The use of dental expertise in legal investigations is known as forensic dentistry, and it is becoming a useful instrument in India's forensic scene. Forensic dentistry helps solve crimes and identify human remains by analyzing dental evidence and identifying bite marks, dental records, and dental remnants.
10. Cyber Forensics: This field involves the expert application of advanced investigation and analytical methods to gather and preserve digital device data in a way that may be used as evidence in court. Cyber forensics' main objective is to uncover the truth about what happened on a digital device and find the person responsible by doing a methodical investigation while maintaining the chain of custody's integrity. A careful and methodical

⁷ Heli Dubey and Siddhi Nigam, *FORENSIC ENTOMOLOGY IN INDIA: A ROAD LESS TRAVELLED*, 1(1) JLFJ, 15-21 (2022), [https://jlfj.nfsu.ac.in/Uploads/EJournal/1/1/\(15-21\)%20FORENSIC%20ENTOMOLOGY%20IN%20INDIA%20A%20ROAD%20LESS%20TRAVELLED.pdf](https://jlfj.nfsu.ac.in/Uploads/EJournal/1/1/(15-21)%20FORENSIC%20ENTOMOLOGY%20IN%20INDIA%20A%20ROAD%20LESS%20TRAVELLED.pdf).

⁸ SSRN, <https://ssrn.com/abstract=4367707> (last visited Dec. 30, 2024).

⁹ Shubha Deshpande, *A MEDICO-LEGAL STUDY OF FORENSIC PSYCHIATRY IN INDIA*, 2(1) IJLLR, 1-9 (2021), <https://www.ijllr.com/post/a-medico-legal-study-of-forensic-psychiatry-in-india>.

¹⁰ National Library of Medicine, <https://pubmed.ncbi.nlm.nih.gov/30661453/> (last visited Dec. 30, 2024).

¹¹ National Library of Medicine, <https://pubmed.ncbi.nlm.nih.gov/29657486/> (last visited Dec. 30, 2024).

approach to the preservation, acquisition, extraction, analysis, and presentation of evidence from digital sources, including computers, mobile devices, cameras, and other digital media, is a fitting description.¹²

LEGAL FRAMEWORK GOVERNING FORENSIC SCIENCE IN INDIA:

A variety of laws that have been included into the criminal justice system in India regulate the use and admission of forensic testimony in court. These provisions ensure that evidence from forensic investigations is collected, preserved, and analyzed in a manner that is reliable and valid from a scientific perspective. The following are some of the most significant legislation in India that deal with forensic science:

1. The Bhartiya Sakshya Adhiniyam, 2023¹³ (BSA):

It offers the legal foundation for forensic evidence appraisal and admission in Indian courts. Forensic science is significantly impacted by the Act as it sets the rules for the admissibility, significance, and weight of evidence in Indian courts, including forensic evidence. On the other hand, the “forensic experts” are essential in helping the courts reach reasonable and equitable decisions in criminal cases by offering professional opinions, interpretations, and analyses of forensic evidence. The following are a few pertinent Bhartiya Sakshya Adhiniyam clauses that have a direct bearing on forensic science:

- i. Section 39¹⁴: Expert opinions are covered. It permits expert opinions—including those of forensic experts—to be used as evidence in court. Ballistics, DNA profiling, fingerprinting, handwriting analysis, and other scientific or technological issues are only a few of the many topics on which forensic specialists may provide their thoughts.
- ii. Section 41¹⁵: This section addresses the examiner's viewpoint about electronic evidence. In situations involving electronic records, such as computer-generated documents, emails, or other digital evidence, it permits the opinion of specialists in digital forensics or other similar subjects to be included as evidence.
- iii. Section 72¹⁶: This section addresses the comparison of handwriting, finger imprints, and signatures. In situations when the identity or validity of documents is in doubt, it permits

¹² ResearchGate,

https://www.researchgate.net/publication/332597850_Comparative_Study_of_Digital_Forensic_Tools (last visited Dec. 30, 2024).

¹³ Bhartiya Sakshya Adhiniyam, 2023, No. 47, Acts of Parliament, 2023 (India).

¹⁴ Bhartiya Sakshya Adhiniyam, 2023, § 39, No. 47, Acts of Parliament, 2023 (India).

¹⁵ Bhartiya Sakshya Adhiniyam, 2023, § 41, No. 47, Acts of Parliament, 2023 (India).

¹⁶ Bhartiya Sakshya Adhiniyam, 2023, § 72, No. 47, Acts of Parliament, 2023 (India).

the acceptance of expert judgments in comparisons of signatures, handwriting, or finger impressions.

- iv. Section 168¹⁷: This provision addresses the court's authority to examine witnesses. To explain or illustrate technical or scientific issues pertaining to the evidence provided, the court may interrogate forensic specialists or other witnesses.

2. The Bhartiya Nagarik Suraksha Sanhita, 2023¹⁸ (BNSS):

The BNSS and forensic science work together to ensure that evidence from forensic investigations is “collected, analyzed, and presented” in criminal cases in a proper and legal manner. They are closely related since the BNSS provides procedural guidelines for the investigation, prosecution, and trial of criminal matters, including those where forensic evidence is crucial. A few relevant BNSS provisions that directly affect forensic science are as follows:

- i. Section 43¹⁹: It addresses the police's authority to conduct arrests as well as the protocols that must be adhered to. Forensic techniques such as the identification of fingerprints, DNA profiling, and other identifying techniques may be employed to establish the identification of the accused during the arrest procedure.
- ii. Section 51²⁰: This part deals with medical professionals' examinations of accused individuals, including the gathering of body samples for forensic examination. Forensic investigation of bodily fluids, DNA samples, or other physical evidence may be used to establish the guilt or innocence of an accused individual.
- iii. Section 230²¹: This section addresses providing the accused with copies of documents and statements. As part of the due process, the accused may be given access to forensic reports, lab results, and other pertinent documents, which will enable them to contest or refute the forensic evidence used against them.
- iv. Section 329²²: The admissibility of reports from government scientific experts is covered in this section. Subject to specific standards and restrictions, forensic reports or scientific analyses carried out by government specialists may be admitted as evidence in court.

¹⁷ Bhartiya Sakshya Adhinyam, 2023, § 168, No. 47, Acts of Parliament, 2023 (India).

¹⁸ Bhartiya Nagarik Suraksha Sanhita, 2023, No. 46, Acts of Parliament, 2023 (India).

¹⁹ Bhartiya Nagarik Suraksha Sanhita, 2023, § 43, No. 46, Acts of Parliament, 2023 (India).

²⁰ Bhartiya Nagarik Suraksha Sanhita, 2023, § 51, No. 46, Acts of Parliament, 2023 (India).

²¹ Bhartiya Nagarik Suraksha Sanhita, 2023, § 230, No. 46, Acts of Parliament, 2023 (India).

²² Bhartiya Nagarik Suraksha Sanhita, 2023, § 329, No. 46, Acts of Parliament, 2023 (India).

3. The Bharatiya Nyaya Sanhita, 2023²³(BNS):

The Act is a thorough criminal law that lists all of India's offenses and associated penalties. In contrast, forensic science uses scientific procedures and methodologies to gather, examine, and evaluate evidence in criminal investigations. The Act and forensic science are closely intertwined since forensic analysis is often necessary for the inquiry and prosecution of criminal crimes. The relevant BNS statutes provide a statutory structure for the use of forensic testimony in criminal proceedings to establish guilt or innocence and ensure justice. Forensic science is covered under a number of BNS provisions, including:

- i. Section 123²⁴: It addresses offenses involving the use of poison, caustic materials, or other toxic chemicals to cause harm or injury, as well as the penalties associated with such acts.
- ii. Sections 274 to 280²⁵: These sections address offenses involving the adulteration of food or drink, the distribution of infections, and the use of counterfeit pharmaceuticals. Forensic investigation may be necessary to identify the presence of hazardous materials in these offenses.
- iii. Sections 231²⁶ and 336²⁷: These provisions deal with document tampering and forgery, and they may call for forensic analysis of handwriting, signatures, or other evidence pertaining to documents.
- iv. Sections 80²⁸ and 86²⁹: These provisions address crimes involving cruelty to married women and dowry deaths, which may call for forensic examination of wounds, reasons of death, or other types of evidence.

4. The Information Technology Act, 2000³⁰(IT Act):

This significant component of Indian legislation governs a number of information technology and cybersecurity-related topics. It provides a legal structure for the collection, preservation, investigation, and prosecution of digital proof in addition to safeguarding data security and privacy. Section 65B³¹ of the Act, for instance, deals with the “admissibility of electronic

²³ Bharatiya Nyaya Sanhita, 2023, No. 45, Acts of Parliament, 2023 (India).

²⁴ Bharatiya Nyaya Sanhita, 2023, § 123, No. 45, Acts of Parliament, 2023 (India).

²⁵ Bharatiya Nyaya Sanhita, 2023, § 274-280, No. 45, Acts of Parliament, 2023 (India).

²⁶ Bharatiya Nyaya Sanhita, 2023, § 231, No. 45, Acts of Parliament, 2023 (India).

²⁷ Bharatiya Nyaya Sanhita, 2023, § 336, No. 45, Acts of Parliament, 2023 (India).

²⁸ Bharatiya Nyaya Sanhita, 2023, § 80, No. 45, Acts of Parliament, 2023 (India).

²⁹ Bharatiya Nyaya Sanhita, 2023, § 86, No. 45, Acts of Parliament, 2023 (India).

³⁰ The Information Technology Act, 2000, No. 21, Acts of Parliament, 2000 (India).

³¹ The Information Technology Act, 2000, § 65B, No. 21, Acts of Parliament, 2000 (India).

records.” It describes the conditions that must be fulfilled, such as obtaining certification from a person in a responsible official position, in order for electronic documents to be accepted as evidence in court. Forensic experts may be very beneficial in ensuring the admissibility of electronic documents by following the rules and providing expert testimony in court.

4. The NDPS Act, 1985³²:

In India, the Narcotic Drugs and Psychotropic Substances Act and forensic science work hand in hand since the former handles crimes involving drugs, narcotics, and psychotropic substances, while the latter is essential to the investigation, prosecution, and conviction of such crimes. The following are a few pertinent NDPS Act sections that have a direct bearing on forensic science:

- i. Section 50³³: This section addresses the authority of a law enforcement official to conduct a search and make an arrest without a warrant, as well as the protocols that must be adhered to during such searches. To determine the type and amount of narcotics or drugs, forensic science methods including drug identification, analysis, and weighing of confiscated materials are crucial.
- ii. Section 67³⁴: This section addresses the penalties for disseminating or publishing content that encourages the use of psychotropic or narcotic drugs. To determine the nature and content of digital or printed materials, forensic analysis may be required.

ADDRESSING CHALLENGES OF FORENSIC SCIENCE IN THE INDIAN LEGAL FRAMEWORK:

Forensic science, which is the scientific application of knowledge and techniques to investigate crimes and assess evidence, is a crucial part of India's criminal justice system. The use of forensic science has revolutionized the way that crimes are solved and justice is administered. DNA profiling and fingerprint analysis are two examples of forensic science, which has grown into a powerful tool for tracking down perpetrators, linking them to the scene of the crime, and producing evidence in court. Despite its significance, forensic science in the Indian criminal justice system faces a number of challenges that compromise its effectiveness and trustworthiness.

³² Narcotic Drugs and Psychotropic Substances Act, 1985, No. 61, Acts of Parliament, 1985 (India).

³³ Narcotic Drugs and Psychotropic Substances Act, 1985, § 50, No. 61, Acts of Parliament, 1985 (India).

³⁴ Narcotic Drugs and Psychotropic Substances Act, 1985, § 67, No. 61, Acts of Parliament, 1985 (India).

- i. **Lack of Standardization:** The absence of standardized protocols and processes is one of the main issues facing India's forensic science industry.³⁵ Inconsistencies and mistakes in the forensic examination process can emerge from inconsistent evidence collection, preservation, and analysis, which jeopardizes the validity of the findings.
- ii. **Limited Resources and Infrastructure:** Older equipment, a lack of skilled workers, and poor infrastructure are common problems in India's forensic labs.³⁶ Investigations and judicial processes may be delayed as a result of this impeding the prompt and correct interpretation of the evidence.
- iii. **Accreditation and Quality Control:** Ensuring the reliability and integrity of forensic evidence is crucial in the field of criminal justice. However, the lack of accreditation and quality control procedures in many Indian forensic labs raises doubts about the accuracy and integrity of forensic judgments.
- iv. **Case Backlog:** The backlog of cases awaiting forensic analysis is one persistent problem with the Indian criminal law system. Evidence sometimes remains unanalyzed for long periods of time due to the increasing number of cases and the forensic laboratories' limited capability, which causes delays in investigations and trials.³⁷
- v. **Lack of Knowledge and Education:** Law enforcement organizations, legal experts, and the Indian public all face a lack of knowledge and instruction on the significance of forensic science.³⁸ Inappropriate evidence collection, improper evidence management, and a poor use of forensic techniques in inquiries & trials might result from this.

SIGNIFICANT JUDICIAL RULINGS INFLUENCING FORENSIC SCIENCE IN INDIA:

Numerous important decisions made by the Indian courts have impacted the acceptance and use of forensic testimony in court. These decisions have established precedents and defined the role of the forensic field in the Indian criminal law system. Several significant court decisions concerning forensic science in India include:

³⁵ ScienceDirect, <https://www.sciencedirect.com/science/article/pii/S2665910721000463> (last visited Dec. 31, 2024).

³⁶ The Pioneer, <https://www.dailypioneer.com/2022/columnists/inadequate-forensic-labs-delay-justice.html> (last visited Jan. 3, 2025).

³⁷ SCC Online, <https://www.scconline.com/blog/post/2022/12/10/integrating-forensic-techniques-in-indian-criminal-justice-system/> (last visited Jan. 3, 2025).

³⁸ SpringerOpen, <https://ejfs.springeropen.com/articles/10.1186/s41935-017-0010-1> (last visited Jan. 6, 2025).

- i. In the *Selvi v. State of Karnataka*³⁹ case, the Apex Court established guidelines for the admissibility of narcoanalysis, brain mapping, and lie detector examinations as evidence in court. The court decided that these tests breach the protection against self-incrimination provided by Article 20(3)⁴⁰ of the Indian Constitution and cannot be conducted on an accused individual without that person's consent..
- ii. In the case of *Tomaso Bruno and Anr. v. State of Uttar Pradesh*⁴¹, the Hon'ble Supreme Court held that the investigative process must be seamlessly integrated with the cutting-edge fields of information technology and scientific knowledge because electronic evidence can be a crucial tool for law enforcement in establishing unquestionable facts. The Court wisely maintained the admission of electronic evidence while establishing suitable controls to guarantee its legitimacy and validity.
- iii. In the case of *Sandeep v. State of Uttar Pradesh*⁴², the victim was forced to have an abortion against her will by the accused, who then committed the horrible crime of murder when she refused. Following a thorough DNA study of the fetus that was extracted from the deceased's womb, it was conclusively determined that the accused was the unborn child's biological father. The Court was right to acknowledge that DNA evidence was essential to determining the accused's purpose for committing the offense when paired with other pieces of evidence.
- iv. In the *State of Tamil Nadu v. Nalini*⁴³ case, which became famous as the Rajiv Gandhi Assassination case, DNA evidence was crucial since it linked the accused to the crime and helped identify the victims and the assailant. Although material evidence was lost in this landmark case by the explosion and corpse mutilation, DNA testing was expertly employed to establish important connections..
- v. The court discussed the evidential relevance of handwriting expert opinions in the context of a contested signature in the case of *S.P.S. Rathore v. CBI & Anr.*⁴⁴. It underlined that expert testimony on handwriting is just subjective and cannot be regarded as definitive proof. The evidence of a handwriting expert alone is not enough to prove identification or authenticity. It emphasized the importance of exercising

³⁹ *Selvi v. State of Karnataka*, (2010) 7 SCC 263.

⁴⁰ INDIA CONST. art. 20, cl. 3.

⁴¹ *Tomaso Bruno and Anr. v. State of Uttar Pradesh*, (2015) 7 SCC 178.

⁴² *Sandeep v. State of Uttar Pradesh* (2012) 6 SCC 107.

⁴³ *State of Tamil Nadu v. Nalini* (1999) 5 SCC 253.

⁴⁴ *S.P.S. Rathore v. CBI & Anr*, (2017) 5 SCC 817.

caution while assessing the judgments of handwriting experts in forensic document analysis.

- vi. The situation in the gripping case of *Sushil Kumar v. State (N.C.T of Delhi)*⁴⁵ was bleakly dire. The culprit, Sushil Sharma, ruthlessly killed his wife, Naina Sahni, with a gun and attempted to hide his horrible deed by burning her body in a tandoor fireplace. A pistol and blood-stained clothes were found thanks to the investigating authorities' hard efforts, and they were wisely put to forensic investigation. Additionally, the victim's parents' blood samples were collected, and the resulting DNA testing unquestionably verified that the burned remains belonged to their (dead) daughter.
- vii. In the case of *Surendra Koli v. State of U.P.*⁴⁶, sometimes referred to as the Nithari case, which was ultimately resolved by the careful use of forensic science. The accused underwent a wide range of forensic procedures, such as "narco-analysis," which included brain mapping, narco-analysis drugs, and polygraph examinations. To understand Koli's complicated inclinations toward necrophilia, paraphilia, and pedophilia, forensic specialists performed a comprehensive psycho-analysis of him. High-level forensic specialists also carried out "craniofacial reconstruction" on the found skulls, using cutting-edge forensic methods to recreate the facial characteristics for identification.

CONCLUSION:

Forensic science has emerged as a potent and crucial tool in the Indian penal justice system by applying scientific investigation to unravel the secrets of crime. The collection, preservation, analysis, and presentation of evidence in court cases depend heavily on forensic science fields like profiling of DNA and fingerprint evaluation. Legal laws provide a structure for the acceptance and use of forensic testimony in courts, even though court decisions have reiterated the importance of forensic science in establishing guilt beyond a reasonable doubt. Forensic science will remain essential in revealing the truth, guaranteeing victims' justice, and maintaining the rule of law as India moves closer to having a stronger and more effective criminal justice system. The future is full of opportunities for more developments and breakthroughs in this fascinating field, which makes it an exciting area of research and exploration for criminal justice practitioners, forensic experts, and legal scholars alike. This is due to the rapid advancements in technology and the ongoing evolution of forensic science.

⁴⁵ *Sushil Kumar v. State (N.C.T of Delhi)*, (2014) 4 SCC 317.

⁴⁶ *Surendra Koli v. State of U.P.*, (2011) 4 SCC 80.