

## Role and Impact of Forensic Evidence in the Indian Criminal Justice System

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### ABSTRACT

*"CUI LIBET IN ARTE SUA PERITA CREDENDUM EST"* - Any skilled person is to be believed in his own art. Since there have been so many significant advances in science and technology throughout the 20th century, it has been dubbed the "era of science." Early in the 20th century, forensic science institutes also emerged in India. The networking of these institutions persisted during the 20th century and became more intense in the 21st. In India, several forensic facilities have been built to expeditiously resolve criminal cases using laboratory and field research and help the criminal justice system. The facilities built, however, have not kept up with the growing volume of criminal cases. There is still work to be done to develop more labour infrastructure as well as equipment, science, and technology to modernise forensics in India. There is still a need for forensics capacity building in India even though attempts are currently being made to develop new manpower, equipment, scientific, and technological infrastructure to modernise forensics in India. The article examines the current legal situation specially Bharatiya Sakshya Adhiniyam, 2025, issues in the justice delivery system, academic and research activities, future directions by the courts, and requirements of forensics in India and discusses them.

**Keywords:** *Forensic, Criminal, DNA, DDT, Justice, Evidence Bharatiya Sakshya Adhiniyam.*

### 1. INTRODUCTION

The Latin word for the public forum is where the word "forensic" comes from. The Forum, a public gathering area where political and policy matters were discussed and debated, was where the Senate met in ancient Rome. Technically, the term "forensic" refers to concerns or the general public. When used collectively, the term "forensic science" refers to the profession of a scientist who provides reports and testimony to the court to address issues. Therefore, forensic science would refer to the science applied in legal proceedings. Sir William Herschel submitted the fingerprint evidence for the identification of the culprit in Argentina in 1902, making it the first nation to use forensic evidence in a criminal case. Forensic evidence is a vital component in the justice delivery system throughout the world. Forensic evidence is such kind of evidence where science meets the law. For a fair judgment forensic evidence has not yet found a paramount role as they are considered secondary evidence. It depends upon all branches of science i.e., biology, chemistry and physics. It is also employed for a variety of other objectives, including the investigation of criminal and civil matters and the examination of violent crimes including rape, murder, and drug trafficking. Modern technology including DNA testing, fingerprint profiling, narcotics testing, and polygraph tests are all included in forensic evidence, which helps the nation's justice delivery system. "Modern scientific development has made a serious impact on the law of evidence in several areas such as blood stains, blood group, alcohol and breath test in case of traffic accident tape recording, automatic photographs, computers, identification of fibres including human hairs, arson investigation, truth drugs and lie detector, finger and footprints, and even hypnotism, the law of evidence tries to keep pace with scientific knowledge and utilize its result to arrive at the truth"<sup>3</sup>. The word forensic evidence is not defined in the Indian statutes but the word evidence had been defined in the Indian Evidence Act 1872 under section 3<sup>4</sup> which says that "evidence means and includes:

- (1) all statements made by the witnesses in front of the Court with its permission or when the court requires that, about the facts being investigated; these statements are referred to as oral evidence;
- (2) Every document, including electronic data, prepared for the Court's review or which are produced before the court of law for inspection is referred to as documentary evidence."

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<sup>3</sup> Law of Evidence, 7<sup>th</sup> Edition, Vepa. P. Sarathi, pg 221.

<sup>4</sup> Section 3, Indian Evidence Act 1872.

In the new legislation 'Bharatiya Sakshya Adhiniyam, under section 2 (e) <sup>5</sup> the words evidence has been define as "evidence" means and includes—

(1) all statements including statements given electronically which the Court permits or requires to be made before it by witnesses in relation to matters of fact under inquiry and such statements are called oral evidence;

(2) all documents including electronic or digital records produced for the inspection of the Court and such documents are called documentary evidence.

It can be noticed that in new definition of evidence the words includes the statement given electronically and 'digital records' have been first time included as evidence.

Section 45<sup>6</sup> explains the phrase "Science and Art," which contains the view of the expert that has been reached based on his science. According to Section 45 of the Indian Evidence Act, 1872, an "Expert" is defined as a person who possesses specialised knowledge, skill, or experience in any of the following areas, such as those relating to medical officers, chemical analysts, explosive experts, ballistic experts, fingerprint experts, etc. "

Similarly, under Section 39 (1) <sup>7</sup> of the Bharatiya Sakshya Adhiniyam, 2023 expert has been defined as -

*"When the Court has to form an opinion upon a point of foreign law or of science or art, or any other field, or as to identity of handwriting or finger impressions, the opinions upon that point of persons specially skilled in such foreign law, science or art, or any other field, or in questions as to identity of handwriting or finger impressions are relevant facts and such persons are called experts."*

"Under Section 45A of the Indian Evidence Act 1872, which is incorporated under section 39(2) of the Bharatiya Sakshya Adhiniyam, 2023 says that the opinion of the Examiner of Electronic Evidence is also important when it comes to experts' opinions." Without independent and reliable corroboration, the evidence of an expert is a weak type of evidence and courts consider it unsafe to rely on it<sup>8</sup>. Therefore, the court is not bound by the opinion of an expert but it has to form its own opinion. Admissibility of Expert opinions always depends upon possibilities of truthiness.

There are provisions like Section 159 read with Section 160 of the Bharatiya Sakshya Adhiniyam, 2023 and Section 329 of the Bharatiya Nagarik Suraksha Sanhita, 2023 show that expert opinion or other kinds of scientific evidence must be corroborated by the court before their admissibility, as observed in Buckley v. Rice Thomas<sup>9</sup>.

## 2. CRIMINAL JUSTICE SYSTEM AND EVIDENCE

The justice delivery system in criminal law is a fair process in which any victim of crime is awarded fair justice. In criminal proceedings, the said process always commences from investigation to judgment. Need for evidence is always required from investigation to trial. These all things are known as the administration of justice. 'Having a law is not enough, the law

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<sup>5</sup> Section 2, Bharatiya Sakshya Adhiniyam, 2023.

<sup>6</sup> Section 45, Indian Evidence Act 1872

1) foreign law,  
2) science  
3) art  
4) handwriting or  
5) finger impression and such knowledge has been gathered by him—  
a) by practice,  
b) observation or  
c) proper studies.

<sup>7</sup> Section 39(1), Bharatiya Sakshya Adhiniyam, 2023

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<sup>8</sup> S Gopal Reddy v. State of Andhra Pradesh (1996) 4 SCC 596.

<sup>9</sup> (1554) 1 Plowd 118.

needs to be interpreted and applied' same during imparting justice having evidence is not enough but the evidence needs to be effective, reliable and probative.

The main purpose of a Criminal Justice System is to have one of the goals of improving, providing justice for all (also known as due process) so that convicted criminals can be brought to justice just deserts theory states that those convicted should be punished appropriately. The system assists convicted criminals (such as probation and restorative justice). A law-abiding society requires both justice and prisons) to stop future crimes even after they have served their sentence. Developing criminal justice systems also improves public safety. The Criminal Justice System assists victims of crimes, as well as protects the innocent and the vulnerable. (For example, children). Detecting and prosecuting criminal activity is also the responsibility of the Criminal Justice System, with the police force being the primary law enforcement agency. In the courts, there is a purpose (e.g., collecting fines) to carry out court orders and sentence fairly without prejudice.

### **3. A BRIEF HISTORY AND PLETHORAS OF FORENSIC EVIDENCE**

The word "forensic" is derived from the Latin word "forum," which means "public place." In ancient Rome, the Senate convened in the Forum, a public space where political and policy concerns were discussed and debated. In a technical sense, "forensic" refers to as applied to the public or issues. When used together, the phrase "forensic science" is a good way to describe the profession of a scientist whose work provides the court with answers through reports and testimony. Therefore, forensic science would refer to the science employed in legal proceedings.

#### **3.1 Forensic Identification by DNA Profiling Technique (DNA tests)**

Deoxyribonucleic acid is the abbreviation for DNA. Genes make up all living things in the body. The protein is found only in white blood cells and not red blood cells. The genetic identification of all human beings is proceeded by the DNA, so their behaviour character, body structure and characteristics are determined by DNA. Every human being has its own unique DNA structure. In the case of Monozygotic twins, DNA is generally identical. In 1984, Sir Alec Jeffrey developed the technique for using DNA to identify people, and the UK police utilised forensic DNA profiling for the first time in 1985.

#### **3.2 Ballistics**

The usage and study of weapons are known as ballistics. The development of ballistics as a science has made it easier to examine weapons, ammo, and other related materials. The art term "ballistics" refers to the study of a bullet's path from a weapon through the air and into a target. However, in criminal investigations, the term "ballistics" refers to the practice of tying recovered bullets and their casings to the gun from which they were fired. The identification of firearms is frequently considered to be a branch of tool mark identification. A specialist in tool markings makes an effort to match the marks left by instruments like crowbars and screwdrivers to the objects they were employed on. Ballistics experts are more than just experts in tool marks. They usually testify on matters ranging from whether a specific object is, legally, a firearm to elaborate reconstructions of crime scene evidence because they are specialists in many different elements of firearms. Calvin Goddard, a pioneer in this field, invented the forensic ballistic for the first time. In *Jurnail Singh v. the State of Punjab*,<sup>10</sup> it was held by the Supreme Court that expert evidence was not necessary in the case of the double-barrel gun which could be fired by first filling it with gun powder. In the case of *Sukhpal v. the State of Haryana*,<sup>11</sup> the accused was found in possession of rifles and cartridges for which he had no license, it was observed that making of test of firing by the expert for purpose of ascertaining whether or not the rifle was capable of firing is not at all necessary.

#### **3.3 Fingerprints**

"Fingerprints are God's seals, given to us that we may recognize his greatest creation-MAN." The best and certain method of identification was fingerprinting which was discovered during the fag end of the nineteenth century till the advent of a similar method DNA Fingerprinting. One of the most frequent types of evidence that may be found and gathered at a crime scene is pattern and impression evidence. Impression evidence is created when two objects come into contact with one

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<sup>10</sup> AIR 1999 SC 321

<sup>11</sup> AIR 1995 SC 578

another forcefully enough to leave a "impression." It usually has two dimensions, like a fingerprint, or three dimensions, like the barrel-induced impressions left by a bullet.

There are several reasons why fingerprints are important as evidence. Their unique qualities include being permanent, universal, inimitable, classifiable, and frequently used as evidence when a crime has taken place. The value of fingerprints as a proof is due to several factors. Their distinctive characteristics include permanence, universality, originality, classifiability, and regular usage as proof of crimes. Incriminating evidence that can connect a suspect to a crime is often found in latent fingerprints. Experts use chemical or physical means to remove them from the crime scene. The captured fingerprint images might subsequently be utilised to search an automatic fingerprint identification system after being marked up for distinguishing characteristics by latent fingerprint examiners (AFIS). An AFIS is a computer system (not accessible in India) that criminal justice organisations frequently employ to keep databases of people's fingerprints. It maintains fingerprint photos in an ordered, searchable data structure for those who are arrested or incarcerated. There is a controversy regarding the inventor of fingerprints. It is accepted by many that Henry Faulds is the true inventor of the Fingerprint. Although there is evidence that fingerprints have been used since ancient times, the English first started utilising them in July 1858 when Sir William Herschel, the Chief Magistrate of the Hoogly District, used them for the first time on local contracts.

### **3.4 Forensic Toxicology**

Toxicology is used in forensic toxicology together with other fields including clinical chemistry, analytical chemistry, and pharmacology to assist in medical or legal investigations into drug use, poisoning, and death. The technology and methods used to gather and interpret the data are more important to forensic toxicology than the legal conclusion of the toxicological investigation. Different types of samples can be used for toxicological examination. Mathieu Orfila produced published the first thorough work on forensic toxicology in 1813. He was a distinguished scientist from Spain and the man frequently referred to as the "founder of toxicology." His writings stressed the necessity of sufficient identifying proof and quality control. Additionally, it acknowledged the use of forensic toxicology in the sectors of pharmaceuticals, medicine, industry, and the environment. The application of forensic toxicology in the fields of pharmaceuticals, medicine, industry, and the environment was also recognised.

### **3.5 The deception detection tests (DDT)**

The deception detection method is applied where investigating agencies are unable to collect or gather the ocular evidence from the witnesses, and in some exceptional circumstances there is no witness available at the place where the crime has occurred, only the accused person or the prime culprit is the sole person present at the scene, then a Deceptive test is applied upon the accused person, culprit and sometimes upon the prime witness to the crime scene to collect the evidence upon which the prosecution can be initiated.

The deception detection tests DDT includes the following scientific methods such as:

- (1) polygraph,
- (2) narco-analysis
- (3) brain-mapping

The DDTs are helpful to know the concealed facts related to crime. They all have significant clinical, scientific, ethical, and legal implications<sup>1</sup>. Sometimes, the only person who has access to this information is the subject of a criminal inquiry. The investigative agencies frequently employ DDTs. However, the information-extracting organisations are aware that it cannot be used as evidence in the courtroom. They have disputed the claim that it is less dangerous than certain investigators' "third-degree procedures." In this case, it is asserted that employing these allegedly "scientific processes" will directly assist the investigative authorities in assembling scraps of evidence, hence boosting the rate of guilty people being prosecuted and innocent people being exonerated.

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<sup>12</sup> Selvi v. State of Karnataka AIR 2010 SSC 1974

#### 4. HIGH COURTS ON NARCO ANALYSIS AND BRAIN FINGER MAPPING TEST VALIDITY

The Bombay,<sup>13</sup> Madras,<sup>14</sup> Kerala,<sup>15</sup> Gujarat,<sup>16</sup> Andhra Pradesh<sup>17</sup> and Allahabad,<sup>18</sup> High Courts held the Narco-analysis and use of P300 or brain-finger printing, lie-detector tests and use of mouth serum to be valid under Article 20(3) of the constitution. The Karnataka High Court<sup>19</sup> held it to be unconstitutional.

#### 5. SUPREME COURT ON NARCO TEST

In *Selvi v. the State of Karnataka*,<sup>20</sup> the Supreme Court in a batch of Criminal appeals relating to the involuntary narco-analysis, polygraphy examination and the brain electrical activation profile (BEAP) test to improve investigation in criminal cases summing up the legal position and held 'Forcing an individual to undergo any of the standards of 'substantive due process which is required for restraining personal liberty. Such a violation will occur irrespective of whether these techniques are forcibly administered during an investigation or for any other purpose since the test results could also expose a person to adverse consequences of a non-penal nature. The impugned techniques cannot be read into the statutory provisions which enable medical examination during investigation in criminal cases, i.e. the explanation to Sections 53, 53-A and 54 of the Code of Criminal Procedure, 1973.

Due to the rule of *ejusdem generis* and the considerations governing how to interpret scientific advancement statutes, such an expansive interpretation is not possible. An individual's mental privacy should not be intruded upon in any unjustified way by the application of any of these techniques.

In the evolving language of standards for human rights, it may also constitute "cruel, inhuman, or degrading treatment. Additionally, relying on the results of these techniques violates the right to a fair trial. It is not justified to erode constitutional rights such as the right against self-incrimination based on a compelling public interest.

The techniques in question should never be forced on anyone, whether they are used in the context of criminal investigations or otherwise. An unwarranted interference with personal liberty would result from such a move. However, if proper protections are in place, voluntary implementation of the controversial practices would be acceptable. The test results by themselves cannot be admissible as evidence, even when the subject has granted consent to conduct any of these tests, as the subject does not have conscious control over their reactions while the test is being administered. However, under Section 27 of the Evidence Act of 1872, any information or material that is subsequently discovered with the use of voluntary administered test results may be admitted. The same contention is mentioned proviso of Section 23 of Bharatiya Sakshya Adhiniyam, 2023. The Supreme Court referred to the guidelines published by 'Polygraph Test on an Accused' by the National Human Rights Commission in 2000 which must be strictly adhered to and guidelines should also be adopted regarding the "Narco analysis technique" and "Brain Electrical Activation Profile" test.

These guidelines are as follows:

1. The only way to administer Lie-Detector Tests is with the consent of the accused. The accused need to have the option to undergo such a test if he wishes to.
2. Lie-Detector Tests are physically, emotionally, and legally damaging to the person who volunteers for them. Before the test is conducted, the police should go over the possible physical, psychological, and legal repercussions with him and his attorney.
3. A Judicial Magistrate should record the consent.
4. When the alleged agreement before the Magistrate was heard, the person should have a lawyer appear on his or her behalf.
5. The subject of the inquiry should also be informed that any statements they make to the magistrate will not be considered "confessional" statements; rather, they will be viewed as statements to the police.

<sup>13</sup> Ram Chandra Reddy v. the State of Maharashtra, 2004 ALL MR (Cr) 1704.

<sup>14</sup> Dinesh Dalmia v. State, 2006 Cr LK 2401 Mad.

<sup>15</sup> Rajo George v. Dy Supdt. Of Police, 2066 (2) KLT 197.

<sup>16</sup> Santokhbhen Sharmnbhai Ladeja v. State of Gujarat, 2007 Cr LJ 4566.

<sup>17</sup> State of A.P. v. Inapuri Padma, 2008 Cr LJ 3992 (AP).

<sup>18</sup> Abhay Singh v. State of U.P., 2009 Cr LJ 2189 (All) (Lko Bench).

<sup>19</sup> AIR 2010 SSC 1974.

<sup>20</sup> AIR 2010 SSC 1974, Per K.G. Balkrishnan C.J.I. R.V.Raveendran and J.M. Panchal JJ.

6. The Magistrate must evaluate all circumstances of the detention, such as its duration and the type of questioning, before deciding whether to order release.
7. Lie-Detector tests must be recorded by an impartial agency (like a hospital) and must be administered with a lawyer present.
8. It is important to record specific medical information as well as details of how the information was acquired.

In the case of *State of Bombay v. Kathi Kalu*,<sup>21</sup> The Supreme Court ruled that giving a finger impression or sample signature might be seen as giving evidence in the wide meaning of "to be a witness." In these circumstances, he is not providing firsthand testimony. They serve solely as comparative tools. Therefore, neither search warrant was used,<sup>22</sup> It would not be against the law to compulsorily take an accused person's photos, fingerprints, or specimen writing under Article 20(3).<sup>23</sup> According to Article 20(3), it is unlawful to compel someone to share information about the charge against them. The law of evidence has been significantly impacted by recent advances in science. The law of evidence tries to keep up with scientific knowledge and use its findings to determine the truth in a number of areas, including

- (a) bloodstains,
- (b) blood groups,
- (c) alcohol and breath tests in case of traffic accidents,
- (d) tape-recording,
- (e) automatic photographs,
- (f) computers,
- (g) identification of fibres,
- (h) including human hairs,
- (i) arson investigation,
- (j) truth drugs and lie-detectors, and
- (k) finger and footprints.

## **6. BLOODSTAINS AND BLOOD GROUPS**

Every human being has blood which belongs to one of four major groups--A, B, AB and O, differentiated by the presence or absence in the corpuscles and serum, of certain substances (agglutinogens and agglutinins). When blood from incompatible groups is mixed, agglutination or sticking together of red corpuscles occurs which may lead to fatal results. A compatible transfusion is ensured by using the blood from the same blood group or from Group O. The blood group is fairly easily determined by simple tests.

The evidence of an expert is a weak type of evidence and courts consider it unsafe to rely on it without independent and reliable corroboration.<sup>24</sup> The expression "science or art" in Section 45 is of wide import and cannot have a narrow meaning. It includes the study of type-writing, that is, whether a particular type of script came from a particular type-writer.

The reason it was not mentioned in the section may be because type-writers had not become common in 1872 when the Act was passed. "Handwriting should be interpreted as including type-writing since type-writing is now more common than handwriting"<sup>25</sup>.

In Section 29(1) the Bharatiya Saksha Adhiniyam, 2023, the expression "or any other field" are added . Thus, scope expert opinion in judicial proceedings is expanded greatly.

## **7. CONCLUSION**

According to the aforementioned information, it can be deduced that forensic science is an investigative method that makes use of cutting-edge tools like DNA testing, fingerprint profiling, and narco tests to identify the culprit and data relevant to the crime. It was discovered that several nations, including Canada, the United States, and Australia, have embraced forensic

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<sup>21</sup> AIR 1961 SC 1808.

<sup>22</sup> M.P. Sharma v. Satish Chandra, AIR 1955 SC 300 at p.304.

<sup>23</sup> State of Bombay v. Kathi Kalu, AIR 1961 SC 1808.

<sup>24</sup> S. Gopala Reddy v. State of A.P.,(1996) 4 SCC 596: 1996 SCC (Cri) 792.

<sup>25</sup> State v. S.J.Chaudhary, (1996) 2 SCC 428: 1996 SCC (Cri) 336.

science investigative technology in the examination of crime and the discovery of evidence against criminals in criminal and civil proceedings. To build databases and conduct criminal investigations, the governing bodies of several nations have also formed forensic science organisations including the Automated Fingerprint Identification System (AFIS), Combined DNA Index System (CODIS), and National DNA Index System (NDIS).

Additionally, it was discovered that the Supreme Court of India's legal protections for individual rights declares a person innocent until and unless proven guilty by a court of law. Indian Criminal law also presupposes a presumption on behalf of the accused person i.e. presumption of innocence to maintain the principle of natural justice that a person must be treated as innocent unless the law establishes that they have committed a crime. To quickly resolve issues, the Indian government must encourage scientific knowledge, humanism, and research in many sectors. It becomes clear that the role of forensic evidence is more vital in the administration of the criminal and civil justice delivery system. It has an important function not only in the delivery system of judgement but during the investigation for identifying the person for making the fair arrest of the accused person and sometimes it also plays an illustrative role to recognise the actual victim of crime

In Civil cases, forensic evidence has also played a lucid role that is in paternity determination and also in marital disputes like divorce cases not only in foreign countries but in India and also some investigating and enquiry agencies produce and use forensic science and scientific evidence by using different scientific tools and methods such like DNA profiling, lie detector test, brain mapping, ballistic test, fingerprints profiling, blood group determination test, but during admissibility of such scientific and forensic evidence some legal barriers are faced and due to this the role of the forensic evidence becomes less reliable.

In *Ishwari Prasad Mishra versus Mohammed Isha*,<sup>26</sup> Justice Gajendragadkar observed that evidence given by an Expert can never be conclusive because after all, it is opinion evidence.

It is also accepted that after substantial corroboration the forensic and scientific evidence may be reliable but the reliability and admissibility ability can be fully established if the expertise of the person and availability of laboratories Centre or increase

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