

FORENSIC INVESTIGATION PROCESS: A CRITICAL APPRAISAL

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Abstract: *The extent and importance of crime scene management are increasing daily, as are the challenges the local and national authorities face. Forensic Science works on principles such as laws of individuality, exchange principles, and many others. The Directorate of Forensic Science is an authority established by the Government of India, which is found to dispense forensic services that are timely and quick. It, therefore, must be emphasized much while investigating any criminal case as many instances lose track due to fault in the investigation, causing the infringement of the individual's fundamental rights. The crime scene process starts with lodging the FIR, and, in some cases, the investigation starts even before the FIR is lodged. Crime scene investigation encompasses many steps, including searching the crime scene, collecting evidence, securing the crime's location, interrogating various persons, and finally arresting the suspect. The provision involved in the crime scene investigation is dealt with under Chapter XII of the Criminal Procedure Code and the Indian Evidence Act, explicitly dealing with expert evidence, which will be discussed in the research paper.*

The purpose of this research paper is to find those gaps by analyzing the cases and studying the laws which exist in India and provide suggestions that will effectively reduce the challenges faced by the police in conducting the investigation and also pave the way for smooth and more precise research leading to a speedy and fair trial being provided to the victim.

Keywords: *Forensic Investigation, Crime Scene, DFS, Role of Police*

I. INTRODUCTION

Forensic science has always been a powerful, irresistible, and influential weapon in the hoard of the regulation of justice. The criminal justice system is incomplete without the use and involvement of forensic science. When a crime is committed, and the first responding officer reaches the crime scene, his first task is to secure the crime scene so that no evidence present at the crime location is hampered and destroyed.¹ The investigation of the scene of crime starts with the search of the place where the crime has been committed, known as the crime scene, followed by collection and preservation of evidence and then sending all the preserved evidence to the forensic science laboratory to be examined by the forensic expert.² This whole process starting from collection, recognition, preservation, and consignment of physical evidence has to be done under the utmost care and precaution of the investigating officer because if the physical evidence gets destroyed or hampered, it directly affects the evidence

testimony that has to be presented by the expert in the court.

Nevertheless, can forensic experts' testimony be fully trusted and relied upon? Another question that arises from the research is whether the forensic department is fully developed and equipped to handle the cases? Is there any standardized procedure according to which the tests in these labs are conducted so that no question can be raised? These questions become very relevant when talking about crime scene investigation and forensic science because these questions create a gap between the two significant aspects governing the criminal justice system.³

Although forensic science has developed in the past decades, there is a long way to go. In this research paper, we highlight the gaps between forensic science and the investigation undergone by the police. The gaps present in our system are a lack of information on the part of the police and a lack of interest in the officials to learn about forensics and the handling of

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¹ Taroni, F., & Aitken, C., *Forensic Science at Trial. Jurimetrics*, 37(3), 327-337(1997), <http://www.jstor.org/stable/29762477>

² Morgan, R. M., *Forensic science revealing the unseen and the unknown*. In R. M. Morgan & P. Coldwell (Eds.),

Picturing the Invisible: Exploring interdisciplinary synergies from the arts and the sciences (pp. 11-24) (2022), <http://www.jstor.org/stable/29762477>

³ Collins, R. L., *Improved Crime Scene Investigations*, *The Journal of Criminal Law, Criminology, and Police Science*, 52(4), 469-470(1961), <https://doi.org/10.2307/1141278>

evidence⁴. Another gap that has been put forward is a lack of a standardized procedure to govern the forensic study in India, which is due to a lack of empirical research and a shortage of infrastructure and workforce that is required to work on significant and complicated pieces of evidence due to which the pendency increases which causes a delay in the criminal justice system. Judiciary also plays an indispensable role in reforming the criminal administration in the country.

Still, as far as forensic science is concerned, there is no regulation that the courts impose on the production, verification, and testing of the evidence, which also poses a massive question as to the truth and reliability of the evidence produced in the court and also the testimony of the expert and forensics in the court of law.⁵

The paper highlights the gaps in the system. It provides suggestions that will effectively reduce the challenges faced by the police in conducting the investigation and pave the way for smooth and more precise research leading to a speedy and fair trial for the victim⁶. The suggestions put forward in the paper include establishing the central and state forensic science regulatory bodies. Establishing above-said bodies is necessary to regulate forensic science and the policies regarding forensic evidence, which can be done by setting such bodies. Post the formation of procedures governing the forensic evidence, a uniform accreditation and testing system should be introduced, which will strengthen the reliability of the forensic evidence and will also pose no question on the evidentiary value of the evidence and testimony of the forensic expert produced in the court of law. Police also play a vital role in crime scene investigation and handling evidence.

Therefore, their training is also required along with the junior staff working in the laboratories to reduce the workload present on the superior experts. Training would help the officials understand the importance of forensic science and also add to their skills in efficiently handling the crime scene. Other suggestions include building quality infrastructure and circumventing bureaucratic delay, which is a significant cause of uncertainty in testing forensic evidence and judicial regulation. By implementing the above recommendations, we

can undoubtedly boost forensic science in our country and strengthen the pillars of justice in the criminal system.

II. CRIMINAL JUSTICE SYSTEM AND FORENSIC SCIENCE

Forensic corroboration is a legal structure that operates in the whole of the legal system of the country. The vindication is to aid in criminal investigations and provide courts with accurate information they can depend on when settling criminal cases. The usage of the technology has swept into the legal system as well and it has also occurred to be a considerable step in the criminal justice system evolution.

Therefore, forensic science and the criminal justice system are dependent on each other. The disposition, and the psyche of the accused who is suspected to have committed the offense is described in forensics. The evidence reveals the nature of the crime.⁷ The scenario explains the occurrence's timing. The crime site is proven by forensic evidence.

The offender's method of operation is discovered through forensic investigation. Finally, it exhibits the mens rea behind the commission of the crime. After this stage, evidence is preserved and collected from the scene of the commission of the act and hence the proof established is presented in the front of the court during trial.

The technology used in forensics is essential in the justice system of the country as it furnishes reliable information by assessing the evidence present in the physical form and also in ascertaining the identity of the perpetrator by the help of unique and individual indicators, for example, the hair, DNA, fingerprints, blood, footprints and many more⁸.

The mentioned things are done in order to connect the person accused to the evidences and the victim⁹. But if the forensic proofs do not match the suspected person to that of the sufferer, his innocence is proved in front of all. And therefore, we can conclude that the innocent person can also be rescued by the help of forensic evidence. Due to the development of the DNA technology used by the police in the investigation process, which has helped them to detect the culprit using evidence left at the crime

⁴ Ibid.

⁵ Mnookin, J. L., *The Uncertain Future of Forensic Science*, Daedalus, 147(4), 99–118(2018), <https://www.jstor.org/stable/48562989>

⁶ *New Advances in the Field of Forensic Science and Medical Jurisprudence*, (2005) 1 LW (JS) 85

⁷ Rules and Principles of Identification Evidence under Criminal Justice System, 2020 SCC OnLine Blog OpEd 116

⁸ Garrett, B. L., & Neufeld, P. J., *Invalid Forensic Science Testimony and Wrongful Convictions*, Virginia Law Review, 95(1), 1–97(2009), <http://www.jstor.org/stable/25475240>

⁹ W. Heisenberg, *The Evolution of the Expert Witness*, [2009] AJFL LEXIS 11[1969] Ch 17.

scene¹⁰, the whole process has been eased a little.

The evidence acquired from nature is accurate because it is actual, but the way it has been handled may have affected its credibility. The care and attention with which substantial evidence is collected, preserved, analyzed, and interpreted determine the evidence's credibility. Some courts are now demanding certainty when accepting evidence obtained through forensic methods. This is an absurdity since, even in science, no one can anticipate total assurance. For example, the OPERA experiment recently disproved the widely held belief that, according to theory of relativity developed by Albert Einstein, not a thing could surpass the speed of light, held since 1905¹¹. There is no such thing as assurance in legal fact-finding.

We attempt to introduce something into the legal system that is strange to attorneys and judges unfamiliar with scientific disciplines.¹²

It is inevitable for legal individuals to be familiar with the scientific technique's validity and reliability while examining it. Furthermore, therefore the findings may be repeatedly incorrect, but it is a validity issue, not a reliability one. It is evident from this explanation that the scientific correctness of a finding has no bearing on its credibility. The approach, which has already gained widespread respect for its dependability, produces only the same results when used under the same conditions.

However, if it is not applied under identical conditions, it may produce different results, affecting the validity of its application rather than the technique itself. The DNA typing process, for example, is always trustworthy for identifying individuals. Still, the validity of the test findings produced would be questioned if the technology was misused under identical conditions.¹³

As a result, in a legal situation, judges may take cognizance of the validity of a specific approach provided it has demonstrated its scientific

reliability adequately. At the same time, its applicability will always be determined by the appraisal of the situation in question¹⁴. It is vital to remember that slight adjustments to the approach can impact its dependability. Taking judicial notice of a particular scientific approach has several drawbacks. Only the fundamental propositions wherein the method is developed are subject to judicial scrutiny.¹⁵

Thus, the criminal justice system and forensic science are very closely interlinked with each other. So it becomes crucial to understand the importance of both and make efforts to harmonize both the branches of law effectively to protect the interest of every person involved as the stakeholder in the criminal justice system and also the experts and forensic scientists researching to channel the criminal trial and aid the design of the court to provide justice.

III. THE LEGALITY OF FORENSIC SCIENCE IN INDIA

The significance of forensic science in investigations of the crime scene and trials must be balanced against legal constraints¹⁶.

The main issues are as follows:

- i. What is the congenital validity of such techniques?
- ii. To what extent does the legal system permit forensic procedures used in criminal investigations?

None of the persons charged with an offense may be obligated to self-incriminate themselves on the oath in the court of law. This provision is mentioned in the Article 20(3) of the Indian Constitution.

The assumption that an accused person is innocent unless proven guilty is based on Article 20(3) Indian Constitution. It also shields the accused from possible mistreatment while in police custody for an inquiry.¹⁷ The Supreme Court, in one of its important decisions in the case of Justice K.S. Puttaswamy v. Union of India¹⁸ voiced concerns about keeping and abusing DNA profiles, which

¹⁰ William L. Foster, *Expert Testimony, Prevalent Complaints and Proposed Remedies*, vol. 11, No. 3 Harv L Rev 169 to 186 at 176 (25th October 1897).

¹¹ Faster than Light? Neutrino Finding Puzzles Scientists, Science Daily, 23rd September 2011, <http://www.sciencedaily.com/releases/2011/09/110923095005.htm>

¹² Gabel, J. D., *Realizing Reliability in Forensic Science from the ground up*, The Journal of Criminal Law and Criminology, Vol. 104, (2019) No. 2 (Spring Stable URL: <https://www.jstor.org/stable/44113391> REALIZING RELIABILITY. 104(2), 283–352.

¹³ The Journey from One Cell to Another: Role of DNA Evidence, (2004) 8 SCC J-17.

¹⁴ Edwards, H. T. *The National Academy of Sciences Report on Forensic Sciences: What it Means for The Bench and Bar*, *Jurimetrics*, 51(1), 1–15(2010), <http://www.jstor.org/stable/41307115>

¹⁵ Edmond G. & Cunliffe E., *Cinderella Story? The Social Production of a Forensic "Science"*, *The Journal of Criminal Law and Criminology* (1973), 106(2), 219–273(2016), <http://www.jstor.org/stable/45163262>

¹⁶ *Forensic Science Plays a Pivotal Role in the Legal System*, <https://ifflab.org/the-importance-of-forensic-science-in-criminal-investigations-and-justice>

¹⁷ *The Role of Forensic Expert in Protection of Human Rights*, 21 ALJ (2013-14) 89

¹⁸ (2017) 10 SCC 1

might lead to intrusions into people's private lives¹⁹. In criminal code, a person is believed to be innocent unless he is proved guilty beyond a reasonable doubt. "Everyone accused of a crime has the right to be assumed innocent unless proven guilty according to the law in a public trial in which he has had all the protections required for his defense," declares Article 11 of the Universal Declaration of Human Rights.

The constitution of India assures the right given in Article 20(3) which is a right against self-incrimination, as is the privilege against compelled testimony of any witness. This provision was established to certify that a suspect is not obligated to acknowledge any inquiry, and provide any document, and object if the content has the potential to lead to a criminal conviction²⁰.

- iii. What forensic information is acquired from the experts' evidential value? The Indian Evidence Act, Section 73, gives the court the authority to order anybody, even a suspected person, to give his fingerprints if they are required during the investigation in the course of the trial.

In another major decision, Ramchandra Reddy and Ors. v. the State of Maharashtra²¹, the High Court of judicature situated at Mumbai supported the legitimacy of the usage of P300 for brain fingerprints, narco analysis, and lie-detector test. The court upheld a special court order allowing the SIT, including the main suspect Abdul Karim Telgi, to conduct lab experiments on the defendants in the forged stamp paper incident. Additionally, the decision declared that truth serum-influenced evidence is admissible.²²

In 2005, the Criminal Procedure Code was modified to collect various medical information from the persons suspected of their arrest.²³ According to Section 53 of the Code of Criminal

Procedure of 1976, an accused person may be put through to a medical test after being arrested provided "reasonable grounds for thinking" that the analysis would yield evidence of the crime.

The medical test of a lady who is an alleged sufferer of rape is required to be conducted under 24 hours of the FIR lodged or the complaint filed in the police station provided under Section 164A of the Code of Criminal Procedure, 1973.²⁴ The above-mentioned test includes the DNA of the female as well. The DNA of the female is permitted to be taken by any qualified medical practitioner which is provided under Section 2(h) of the Indian Medical Council Act, 1956.²⁵ The question that arises here is whether every doctor can collect and preserve DNA evidence.²⁶ It is common knowledge that DNA evidence relies on appropriate sample collection and preservation. Any simple oversight or misunderstanding might taint the sample, rendering it useless.²⁷

In the most important ruling of *Selvi v. State of Karnataka* ("Selvi"), the Supreme Court issued a few pieces of advice on the standards to be applied when evaluating the scientific evidence's trustworthiness. The Supreme Court in *Selvi* was entrusted with examining the legal and medical credibility of polygraph, and Brain Electrical Activation Profile (BEAP) examinations used in the investigations.²⁸

A criminological record is deemed "opinion" by a professional under the Indian Evidence Act of 1872. An expert may be described as a individual who has acquired expertise in any discipline or skill through practice or observation²⁹. He is a person who has given flow and research to a particular field of study and is therefore exceptionally knowledgeable in the subject in which he is asked to provide his findings.³⁰ The credibility of an expert testimony is determined by the reasoning given in reinforcement of the result and the tool

¹⁹ *The Journey from One Cell to Another: Role of DNA Evidence*, (2004) 8 SCC J-17

²⁰ Justice U.C. Shrivastava, *Immunity from Self-Incrimination under Art. 20(3) of the Constitution of India*, JJTRI, U.P., <http://ijtr.nic.in/articles/art19.pdf>.

²¹ A.I.R. 1961 S.C. 1808.

²² Knight, B., *Forensic Science, Medicine, and the Law*, RSA Journal, 138(5405), 354-363 (1990), <http://www.jstor.org/stable/41378321>

²³ Parag Agarwal, *Role of Forensic Science in Criminal Justice Administration*, <https://www.judicere.in/role-of-forensic-science-in-criminal-justice-administration/>

²⁴ Preeti, *Development of Forensic Science and Criminal Prosecution in India*, <https://journal.indianlegalsolution.com/2019/04/15/development-of-forensic-science-and-criminal-prosecution-in-india-preeti/>

²⁵ *Overview and Concerns Regarding the Indian Draft DNA Profiling Act, Council for Responsible Genetics*, http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/India_DNA_Bill

²⁶ Joseph L Peterson and others, 'Forensic Science and the Courts: The Uses and Effects of Scientific Evidence in Criminal Case Processing' National Institute of Justice January 1986, <https://www.ncjrs.gov/pdffiles1/pr/102387.pdf>

²⁷ *Narco-Analysis and its Evidentiary Value in India*, (2011) PL July S-36.

²⁸ (2010) 7 SCC 263.

²⁹ *Faulty Foundations: A Socio-Legal Critique of the Regulation of Forensic Science Laboratories in India*, 7.2 NLUJ LR (2021) 191.

³⁰ National Research Council, 'The Evaluation of Forensic DNA Evidence' The National Academic Press, SPA Report (n 57).1997, <https://doi.org/10.17226/5141>

technique and particulars used to get that conclusion. On the other hand, the court can disagree with the expert's findings and depend on other evidence in reaching a judgment³¹.

The Supreme Court said in *Dharam Deo Yadav v. State of Uttar Pradesh*, a case involving the admission of evidence of DNA, that "Crime scenes need to be scientifically managed without any error." Forensic science plays an integral part in criminal proceedings based on circumstantial evidence. It may help establish the proof of the offense, identify the accused person, and determine the culpability or freedom from culpability of the accused³².

One of the significant responsibilities of the police officer investigating the case on the place of the offense is to conduct an exhaustive probe for any evidence that may be used to prove the crime. The officer investigating may be guarded from physical evidence contamination at the crime site during collecting, packaging, and sending at the crime site. To preserve evidence, proper precautions must be taken and guard any effort to meddle with the material or cause defilement or injury.

IV. CRITICAL ANALYSIS

It is truly stated that it is only the man who manipulates the facts and the truth. The process comes under suspicion as and when the human race is involved. The process of investigation is hampered at every stage, there is an unregulated forensics framework, the system of the criminal justice itself rarely considers giving cogency to the novel scientific techniques which might become a determining factor in the criminality of the accused. The major reason for the system's failure is blind confidence in the existing forensic science, keeping in mind another ethical challenge which is the professional incompetence of a forensic scientist. There are numerous instances that some persons may appear as court-appointed experts or defense experts to evaluate the scientific underpinnings of evidence given by an expert in a case, even if he has no professional competence.³³ The judges construct and apply

the factors determining the reliability of scientific evidence according to their whims and fancies. The Indian Evidence Act is also silent concerning the standards which should be used by the trial judges while evaluating scientific evidence. The forensic scientists endure the absence of research culture, lack of infrastructural requirements by the government and, in return, provide the layman with a lack of transparency in the investigation.³⁴

Some improvements that can be made in the system are –

1. Accreditation of crime/forensic laboratories with standardized procedures- It is the process by which the accrediting bodies measure the laboratory or system of laboratories against specific standards formulated by recognized forensic scientific groups.³⁵ These standards are written procedures consensually made by the members of the forensic scientists working groups.

2. Proficiency Tests- Blind proficiency exams must be included in the regular activity of Indian forensic science laboratories. Laboratory employees are given samples as genuine cases and are unaware that they are being tested during blind proficiency examinations.³⁶ The outcomes of the above-mentioned tests are subsequently analyzed to determine veracity, unfairness, and mistake rates and are then scrutinized, and reviewed with employees in order to refine, and upgrade their performance.³⁷

3. Accrediting Bodies- For all FSLs (public and private), there is a requirement to develop consistent testing procedures and accreditation processes in line with established worldwide standards within each laboratory's internal regulation.³⁸ At this time, forensic practitioners worldwide acknowledge and follow the standards created by the International Organization for Standardization (ISO).³⁹ These worldwide standards improve the forensic scientific community's dependability, openness, and uniformity, which benefits police, attorneys, and the general public.

³¹ Gaurav Aggarwal, *Smart study series forensic medicine & toxicology* 73 (Elsevier A division of Reed Elsevier India Private Limited, Gurgaon Haryana, 2009)

³² 2014(5)S.C.C. 509.

³³ Oliver C. Schroeder, JR, *Ethical and Moral Dimensions in Forensic Science*, Journal of Forensic Science Society 27, 31-32(1986).

³⁴ Scientific Expert Evidence, *Determining Probative Value and Admissibility in the Courtroom* by VR Dinkar, Eastern Law House.

³⁵ David H Kaye, *Hypothesis Testing in Law and Forensic Science: A Memorandum*, 130 (5) (2017) Harvard Law

Review Forum 127, 132; also see Edward K Cheng, 'The Burden of Proof and Presentation of Forensic Results' 130 Harvard Law Review 154, 156 (2017).

³⁶ Glen Whitman & Roger Koppl, 'Rational Bias in Forensic Science' 9 Law, Prob & Risk 69, 85 (2010).

³⁷ Robin Mejia and others, *Implementing blind proficiency testing in forensic laboratories: Motivation, obstacles, and recommendations*, 2 Forensic Science International Synergy 293 (2020).

³⁸ Law Commission No 271 (n 127).

³⁹ NAS 2009 Report (n 22); Wilson-Wilde (n 21) 301

4. Conducting Empirical Research- There has been a lack of literature on latest forensic sciences techniques which should be used as evidence and which subsequently plays a consequential role in the life of the accused. There should be no delay in adopting new practices and awarding the staff about the same with changing times⁴⁰. The same can be done when the staff members get time to conduct the ground-level research practically.

5. Judicial Regulation- There is a need for the judiciary to intervene when hearing the experts' testimonies and for which the judges must have prior information and knowledge of forensic science⁴¹. This will ensure that the reliability of the evidence given in the court increases and there is also some accountability on part of the court.

6. Staff Training- Staff training is essential to make them well acquainted with the systems and usages in the labs so that they become efficient enough to handle critical cases without their superiors supervising them. Training will also make them conduct the research and tests in a more effective manner which will then not raise a question about the validity of the tests as well⁴².

7. Developing Quality Infrastructure & Circumventing Bureaucratic Delay- When it comes to laboratory design, there can be no strict approach. Each lab must be built to meet specific criteria, in order to fulfill the requirements of the system, and disciplines that are to be followed. Such labs must also have sufficient and upgraded instruments, equipment and tools to help strengthen, and fasten the tests to be done in the laboratory.⁴³

Environmental factors, for example enough lighting, supplies including energy, and neat and clean rooms with the right temperature, should be ensured, according to experts, and unwanted interferences must be avoided. Also, bureaucratic delays should be avoided to make quick decisions and avoid pendency.⁴⁴

V. CONCLUSION

As the crime rate increases day by day and criminals are getting smarter, the police are also

actively taking the help of forensics to be up to date. Scientific evidence is neutral evidence. The way crime is not static. Similarly, the law should also be dynamic. Technology advancements have provided the globe with a valuable and accurate instrument for criminal investigation. Currently, forensics has a critical role to play in criminal investigation and the detection of crime. The basic tenet of the system of criminal justice is to provide equal relief to all people. Visual evidence is undeniably more genuine than forensic evidence. The criminal justice system benefits from forensic science as a source of scientific evidence. If and when conclusive proof is generated that is relatively dependable, scientific means of uncovering lies in and out of courtrooms become available; the legal profession should use these procedures as soon as possible. Therefore, it becomes essential to consider the suggestions to fulfill the hiatus between the criminal investigation and forensic science and increase the reliability and credibility of the testimony and the reports of the forensic experts.

⁴⁰ Ibid.

⁴¹ Randolph N Jonakait, *Forensic Science: The Need for Regulation* 4 (1) Harvard JL & Tech 109, 119(1991), also see Brandon Garrett, *Forensics, Statistics and Law: Ten Years After 'A Path Forward'*, 69 Duke Law Journal Online 22(2020).

⁴² Robert L Zimmerman Jr, *10 Best of Good Laboratory Practices for Forensic Facilities: A Key to Satisfying Daubert's Gatekeeper and Rule*, 702 (2) (4) Forensic Science Policy & Management 187, 191 (2011).

⁴³ Revised Work Norms of National Forensic Science Laboratories and Government Examiners' (2002) Ministry of Home Affairs, Government of India, November, <http://dfs.nic.in/pdfs/worknorms2002.pdf>

⁴⁴ National Institute of Standards and Technology, *Forensic Science Laboratories: Handbook for Facility Planning, Design, Construction, and Relocation*, US Department of Commerce, June (2013), https://tsapps.nist.gov/publication/get_pdf.cfm?pub_Id=913987