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Impact of Forensic Science on Indian Criminal Justice

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ABSTRACT

In this ever-growing society, science has progressed to a great extent. The concept of forensic science, which involves scientific element seeks to render circumstantial evidence as a crucial element of it. Consequently, the availability of science evidence has becoming part and parcel of justice mechanism. The expression "Forensic science" is an umbrella term which includes wide range disciplineswhich includes, digital forensics, toxicology, ballistics, fingerprint examination, and DNA examination among others. It is a mixture of experience and common sense along with expertise from different medical field like surgery and obstetrics. From past few decades, the subject of forensic science has attained important scientific growth. It has become an essential part of criminal investigation as it assists police in suspects identification, and ensures fact finding as to how and when the offence was carried out. It plays a pivotal role in the justice system by rendering relevant scientific evidence to ensure disposal of criminal matters. Certain issues and challenges pertaining to reliability and quality of forensic evidence has been posed in applying forensic science upon Criminal Justice system in India. These problems can result into unreliable outcomes and mishandling of evidence. Addressing these issues can increase the credibility of the evidence and can ensure serving of justice in fair manner. Thus, it comes significant to examine the impact of forensic science on Indian Justice system. In this research paper, the researcher would highlight regarding the foundational concept of forensic science. It would also describe the application of forensic science in criminal justice system. Moreover, the researcher would also deal with the impact and issues related to forensic science on the justice system. The researcher would deal with landmark decision related to role of forensic science on the justice system. Lastly, it will conclude the research with conclusion and relevant suggestions to address the prevailing issues relating to research topic.

***Keywords**: Criminal Justice system, Forensic Science, Evidence, Investigation.*

I. INTRODUCTION

Criminal Justice System helps in the establishment of an organised society as it provides proper

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set of guidelines, rules and regulations, also such institutions and agencies which function as per the norms to maintain social control. Administering justice under any criminal justice system is dependent on courts, prosecution, prisons and police.They play a vital role in prosecution, identification, deterrence, and penalization of criminals in society. "An efficient criminal justice system guarantees a secure and peaceful society. In reality, the complete subsistence of an organized society depends upon good and effective criminal justice system".

In this system, magistrates play major role as the whole accountability depends on them to decide culpability of an offender and provide the punishment but this procedure of deciding the culpability is a complex as it involves to check the facts and circumstances, evidences and to establish the charge sought to be proved. Further, in the above procedure involvement of investigating agencies i.e. police are also present as they were assigned with the function to investigate the crimes and to confine the criminals in order to bring them before justice. Such investigation done by police to find the actual culprit may take certain time and delay the process of justice but with the advancement of technologies and its usage in the criminal justice system, it has become possible to grab the criminals within limited time.

Forensic science is one such advanced tool which helps the investigating agencies to detect the crime scenario and the criminal and even provide assistance to the court of law in determining the culpability of the accused person. Moreover, it can be said that the usage of technological tools in the criminal investigation has become widespread as it not only eased the technical process for investigating agencies but has also provided a boost in the efficiency of the criminal justice system.

(A) About Forensic Science

The term "forensic" has been derived from the Latin term "*forensis*" which refers to forum. Forensic Science is defined as "The application of science to those criminal and civil laws that are enforced by the police agencies in a criminal justice system".[2] In simple terms, forensic science can be defined as a discipline which the forensic investigators use to unravel the crimes. In matters related to analysis of evidences, usages of various disciplines are involved such as DNA profiling, medicine, engineering, computer science, biology and forensic science, physics etc. For instance, biology aids in to find out the unknown suspects or to recognize the dead body, physics aids in recognition of the blood samples and chemistry aids in by providing the

[2]Shivani Jani, Forensic Science under Criminal Law, LEGAL SERVICE INDIA, https://www.legalserviceindia.com/legal/article-8130-forensic-science-under-criminal-law.html (last visited Jun. 2, 2024).

chemical composition of drugs in body or the reasons behind the death.

In India, the concept of forensic science is a traditional as it has been in usage from the ancient times where medical expert's opinions were used as per the requirements under the law. In 1890s, Argentina became the first nation which had incorporated the forensic evidence for a criminal investigation as Sir William Herschel relied on the evidence consisting of fingerprints for identifying the suspects. Further, the Indian courts have been relying on the evidences such as DNA analysis, post-mortem, fingerprinting since ages and after that on the narco-analysis, lie detector etc. as the technological advancements were brought in field forensic science. Nowadays, forensic science is a highly advanced scientific method that is applied in civil and criminal related matter as it is capable of providing significant answers, and is an integral element of the criminal justice system.[3]

II. APPLICATION OF FORENSIC SCIENCE

The branch of forensic science is very wide as it depends on various disciplines of sciences, including chemistry, physics and biology which are used to recognize, identify and evaluate the evidences. It has become a crucial part of the justice system as it helps in providing the useful information which might be missed due to human negligence. Forensic science can prove the existence of a crime, the offender of a crime or its nexus to a crime through[4]:

- Analysis of physical tests
- Administration tests.
- Data interpretation.
- Concise & clear relationships
- Truthful testimonies rendered byforensic scientist.

(A) Application Of Forensic Science In Indian Criminal Justice System

The applicability of forensic science comes into force during the crime investigation as it provides the scientific proofs from the evidences that are collected from the crime-spot. It demonstrates the individuality of the accused who actually is indulged in commission of the crime. The nature and elements of crime accomplished is explicitly provided in the evidence (what). The evidence gained from the surrounding also signifies about the timing ofthe

[3]Shruti Somya, *Forensic Science in Criminal Justice System*, IPLEADERS (Jul. 20. 2020), https://blog.ipleaders.in/forensic-science-criminal-justice-system/
[4]Kunal Kanwat, *The Role of Forensic Evidence in Criminal Justice Investigations in India*, IJCRT 12(3) 118 (2024).

incidents (when). The forensic evidence establishes the place at which the crimewas committed.The forensic investigator also takes into consideration how the perpetrator acts.[5]

Forensic science as an advanced mechanism has provided advancement in the efficacy of the criminal justice system but it shall be used with caution so, that it must be within the limits of law and does not violate it. There were enormous debates related to the usage of forensic evidences and its admissibility in the courts. Art.20(3) of the Indian Constitutiondeals with the "right of self-incrimination"which means that an accused individual of any offence cannot be forcedto give testimony against him. It is basically premised on the principle that "the individual is innocent until proven guilty".

The safeguard enshrined under Article 20(3) can be availed only where compulsion is inflicted.[6]"This right has been taken to ensure that a person is not bound to answer any question or produce anydocument or thing if that material would have the tendency to expose the person to conviction for a crime."[7] In contrary, under Indian Evidence Act, S.73 provides authority to the court to order for taking the finger impression of any person including the accused. Though it seems to be the violation of the Art.20 (3) but the Apex Court has ruled that compelling someone to give his/her fingerprints doesn'tcontravenethe abovementioned constitutional provision.

There were various queries that arise in relation to forensic evidences as whether these are in contradiction or violation to Art. 20(3), therefore, court in ***The State of Bombay v. KathiKaluOghad& Others***[8] has held that if the offender provides specimen signature, blood, hair, thumb impression or semen then such person will not come under the meaning of "being a witness" as mentioned in the article. Hence, the offender cannot raise objection as to the DNA examination that is being done for purpose of trial and investigation.

Further, the debate arose in relation to narco-analysis. In narco-analysis, the officer who is investigating the case tries to procure the statement from a person who is in a semi-conscious state so, that such statement can be used as evidence. Though such procedure possesses certain question involving law and ethics. This method of forensic science was also seen as a violation to Art.20 (3). Therefore, in the matter of ***Ramchandra Reddy and Ors. v.State of Maharashtra***[9]**,**theHigh Court of Bombay has upheld the authenticity for the usage of brain fingerprinting, narco-analysis or truth serum and lie detector test. The court has upheld the

[5]Prapti Kothari, *Exploring the Role of Forensic Science in Indian Criminal Justice System,* SSRN, 2-3 (20230.
[6]INDIA CONST. Article 20(3).
[7]*Ibid.*
[8]AIR 1961 SC 1808.
[9]AIR 1961 SC 307.

special court order which allowed the SIT to carry out the scientific tests on the offender as well as the main offender in case of stamp paper scam.

In ***Dinesh Dalmia v. State***[10], The Madras HC ruled that "obliging an accused person to undergo narco-analysis does not constitute forced testimony."[11]Whereas, in another case ***Selvi &Ors v. State of Karnataka &Anr***[12], the court held that any statement given in a semi-conscious state cannot be treated as conclusive one and also such method cannot become part of the investigation. Under S.53 of CrPC, 1976[13] it clearly provides that the investigating officer can ask the accused person to go through the medical examination if he thinks that such process can be useful in providing the evidence. Though amendment has been done in the year 2005 in the criminal procedure code to do examination of swabs, DNA profiling, semen test, blood stains, etc. but all such things were restricted only to rape cases. Moreover, under Criminal Procedure Code, S.164[14] provides authority to the medical expert to examine the victims of rape cases within 24 hours but the crucial issue is that whether such medical professional is proficient enough to collect the DNA samples as it is very well-known that if such samples get contaminated due to any negligence it would be of no use and hence, the evidences for case gets tarnished.

Forensic report is considered as "belief or opinion" rendered by expert under Indian Evidence Act, 1872. "An expert may be defined as a person who, by practice and observation, has become experienced in any science or in his area of expertise. He is one who has devoted time and knowledge to a special branch of learning, and is thus especially skilled in that field wherein he is called to givehis expert judgment".The expert's primary role is to present all relevant evidence to the court along with justifications for his conclusions, allowing the court to reach its judgement based on their own examination of the relevant evidence even though they are not experts.[15]. "The trustworthiness of an expert witness completely depends on the reasons stated in support of conclusion and the tools, techniques and materials, which form the basis of such conclusion.[16]Although, the court can completely disagree with the conclusions drawn by the expert and depend on other evidences for the purpose of judgment."

[10]AIR 2010 SC 1974.
[11] Santhy and Dr. K.V.K., *The Realm of Forensic Toxicology in Criminal Justice System of India* (February 18, 2023). IJLPSR, 5 (1), 42-46 (2023), Available at SSRN: https://ssrn.com/abstract=4367707
[12]AIR 2010 SC 1974.
[13]Criminal Procedure Code, 1973, Section 53.
[14] Criminal Procedure Code, 1973, Section 164.
[15]Heli Dubey and Siddhi Nigam, *Forensic Entomology in India: A Road Less Travelled*, 1(1) JLFJ 15-21 (2022)
[16]*Ibid.*

III. IMPACT OF FORENSIC SCIENCE

Forensic Science is considered as a very essential or important aspect of the criminal justice system. It includes examining the traces left at the crime scene by the perpetrator. It aids in determining the suspect of the crime, its timing, and its method. It aids in analysing the various facets of the crime and offers testimony with respect to the victims, perpetrator, and criminal acts. The impact of forensic science is constantly increasing as now the dependency upon gathering of forensic evidences are put forward in most of the Criminal investigations and prosecution proceedings as it makes it easier for the police administration and court to function at a fast pace without indulging themselves in the longer procedure to find the guilty.

As the society is evolving with a fast pace and with the technological advancement, even the way to commit crimes has undergone several changes as the criminals have changed the pattern or the manner in which they used to commit crime. So, technically it becomes very difficult for the police administration to catch the culprit as after the commission the perpetrators usually flee away from those area and even try to create such scenario that the police might end up catching an innocent person. Therefore, with the evolution of forensic science it has become quite possible to find out the perpetrator committing crimes in different manner.

IV. RESTRICTIVE USAGE OF FORENSIC EVIDENCE IN INDIAN LEGAL SYSTEM

The technological advancement, no doubt has made the functioning of judicial system in India quite easier, but there are several reasons due to which the court opts for the restrictive usage of forensic evidence and still prefers or rely upon the old procedures being followed for presenting the evidences. The main reason for such restrictive usage is that the evidence isnot properly collected, even not preserved properly which ultimately affect the reports. For instance, if sample of blood stains have been collected for DNA testing than if such sample is not properly sealed or kept in a particular chemical composition, then there are high chances of it getting contaminated and will affect the reports. Moreover, it has been seen that sometimes the police agency is unable to send the samples to forensic labs on time which ultimately leads to delay in examination of sample and possibilities increase that the samples may get decompose. As a result, it can be challenging for the court to trust the results in situations involving assessing that whether body was intoxicated or not.

Further, it has been revealed in an RTI of 2013 that there were numerous cases pending before the FSL in Rohini in New Delhi, including cases involving DNA tests, ballistics tests and forensic reports. According to the response, there were 8991 cases pending with the laboratory at the beginning of 2013. This pendency in examination is due to lack of staff as 194 seats were

left out of 337 posts.[17] Also in 2014-15 the issue was related to the reliability over the forensic test conducted by laboratories after a conflict among the CFSIL in Hyderabad and scientists resulted in the allegedly throwing away of samples of the internal organs from 12 bodies. "As of April 2019, 30,125 police cases were pending with 8 forensic laboratories and 2 mini labs. The Directorate of Forensic Sciences Laboratories disclosed in a response to an RTI that, despite a minor decrease in numbers during the second half of the year, there is still a paucity of manpower for these kinds of professions; with only 733 of the 1500 sanctioned vacancies were filled."[18]

Moreover, due to the fact that even the investigating officer lacks expertise and knowledge, the area of forensic science remains technical field that is not widely used. Until now, investigations have been conducted using archaic, non-scientific methods. The absence of scientific understanding by the I.O. (investigating officer) who is treated as the first respondent of the crime poses a significant challenge to the judicial system and its ability to be fair.

The other issue relates to the independence of forensic laboratories. The forensic labs in India usually function under the police department or within their home department. They are governed by certain departments and are unable to pursue their autonomy. The forensic laboratory must be completely independent of all other departments in order to give unbiased results.Even the most basic facilities and forensic experts are lacking in laboratories. This profession facesmajor issues such as scarcity of equipment, finance and collaboration between forensic experts& police. According to a study by the committee on the Draft national policy, they have mentioned that the framework should place emphasis on forensic science guidance, professionalism, research, and development.[19]Furthermore, it was recommended in the Malimath Committee Report that special attention must be paid towards the development of forensic labs with all required tools. Additionally, guidelines must be established to define the requirements for maintaining the sample during examination and DNA profiling.

V. LANDMARK CASES IN RELATION TO FORENSIC SCIENCE INVESTIGATION

There are certain recent or landmark judgements which shows that even the court has relied on the forensic science or evidences in order to get into the depth of the case as in absence of evidences, forensic science has helped in the conviction of accused and the victims has been

[17]Shali and Sonia Kaul, *Applicability of Forensic Science in Criminal Justice System in India With Special Emphasison Crime Scene Investigation*, SSRN (2018).
[18]*Ibid*
[19]P. A. Zapf and I. E. Dror,*Understanding and mitigating bias in forensic evaluation: Lessons from forensic science,* IJFMH 16(3) 238 (2017).

provided justice.

In another case of ***Anil v. State of Maharashtra***[20], the accused was found guilty of a brutal murder of a boy aged around 10 years after engaging in carnal intercourse with the victim before strangling him to death, and was given the death penalty and a fine by the Sessions Judges. The court relied on scientific evidence, including the victim's DNA profile and oral testimony.

The petitioner, i.e. boy's father, in case of ***Sushil Mandal v. The State Represented by CBI***[21], questioned the results of DNA profiling. The school administration warned parents of both the deceased boy and the school girl to keep an eye on them since they were on the verge of developing a mutual adolescent infatuation. A week later, a totally decomposed unidentifiable body was retrieved out of a lake after the youngster was later reported missing. The petitioner stated that his son's attire and body parts were unidentifiable.He resorted to A habeas corpus petition was filed regarding the girl's father and soughtfor ordering the CBI to conduct an investigation. The deceased's parents' genetic profiles were matched by the DNA analysis of the body's remains. The skull super imposition test also proved a connection between the body that was found and the person who had died. The dispute was finally resolved after the Supreme Court relied on scientific procedures, such as DNA profiling, for identifying humans. Moreover, in the case ofthe ***State of Gujarat v. Mohan Hamir Gohil***[22]the court observed that with the passage of time, courts all around the world, as well as in India, have also been extensively relying upon the DNA results after consulting with numerous authorities on DNA technology, using multiple testing methodologies, and scientific advances made worldwide.

Also, in ***Kalburgi Case***[23], "around 45 days after the Kalburgi murder, the CID received its first major lead in the case – a ballistics report from the forensic lab that said three cartridges found at the Pansare shooting scene in Kolhapur and two cartridges found at the Kalburgi shooting site were fired from the same gun."[24] As the authorities before receiving such reports were basically were unable to find any link related to the commission of crime and accused.

In ***Pritam Singh and Another v. State of Punjab***[25] the Court noted that "the science of identification of footprints was a rudimentary science and not much reliance could be placed on the result of such identification. However, it added that the track evidence can be relied

[20]1981 Cri.LJ Bom. 125.
[21]AIR 2014 SC 2689.
[22]Spcl. Cri. Application No. 3262 of 2020.
[23]*R.P Kalburgi v. State of Karnataka*, ILR 1986 Kar. 1954.
[24]Ibid.
[25] AIR 1956 SC 415.

upon as a circumstance which along with other circumstances could point to the identity of the culprit even though by itself it would not be enough for a conviction. In the facts of the case at hand, the Court concluded that the track evidence was a circumstance which was available to the prosecution against Pritam Singh Fatehpuri and Pritam Singh Lohara".

Further in case of ***Virendra Khanna v. State of Karnataka***[26], The judge ruled that the offender cannot be forced to share their passwords and biometric data for an inquiry by the court on its own. It can only be done if a request has been made by one of the parties. The Court determined that information obtained through a smartphone and/or email account would not automatically establish the defendant's guilt; rather, this would need to be demonstrated at trial. According to Section 311-A of CRPC, it is more than just a specimen or signature. The court further ruled that requesting the passcode, passwords, or biometric information would not amount to coercion of testimony or the taking of one's own testimony, as these are only facts that must be established by both parties at trial. Therefore, these case laws shows that how the development of forensic science has acted as a guide to the court in resolving the matters where the evidences were not enough to support the injustice that has been done upon the victim or to where the perpetrators have chance to escape from the court of law.

VI. CONCLUSION& SUGGESTIONS

The technological advancement in the field of forensic science has been a boon for the criminal justice system in India, though its lack of usage by the judiciary and also due to the influence of other factors i.e. a smaller number of forensic staff, delay in forensic reports, contamination of samplings etc. can be said to have created a disrupting effect over the whole process of justice. Due to this, even the National Crime Records Bureau in 2021 has stated in its report that the lack of evidence is a major reason because of which our nation has an appalling conviction rate of 35.5% for crimes against the human body, such as kidnapping, sexual assault, human trafficking, murder etc."In 2021, over 6 lakh cases were deemed 'true' by the police under various Indian Penal Code (IPC) sections and local laws, but could not be proved due to insufficient evidence."[27]

Therefore, it is the need of the hour that the deficiencies prevailing within system of forensic sciences must be resolved and its usage must be promoted among the public in order to make them aware of such advancements which are ultimately made for providing them justice. In order to provide acknowledgment to the forensic investigation a recent announcement made by

[26]Writ Petition No. 1983 of 2021.
[27]DECCAN HERALD, https://www.deccanherald.com/india/the-missing-piece-forensics-in-criminal-investigation-1146042.html (last visited Jun. 3, 2024).

Union Home Minister Amit Shah stated that all offences carrying a sentence of more than six years will require forensic inquiry."The target conviction rate was set at an ambitious 90%. The current conviction rate for offences under IPC sections is only 57%."[28]Hence, it has been stated that "such a methodology should embed within a framework which allows for an understanding of the contribution that a specific evidence type could meaningfully deliver in terms of sub-source, source, activity or offence-level propositions for a given set of case specific circumstances rather than restricting it to a soloed one-dimensional reactive process becomes obvious. A contextualized means of evaluative reporting of forensic science data pertinent to a particular case but held in the context of that case where alternative propositions can be attended to and challenged correctly, works to fulfil this problem-solving potential. Such an approach has been suggested by the Association of Forensic Science Providers among others."

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[28]THE WIRE, https://thewire.in/government/ncrb-data-conviction-rates (last visited Jun. 3, 2024).