

APPLICABILITY OF FORENSIC SCIENCE IN CRIMINAL JUSTICE SYSTEM IN INDIA WITH EMPHASIS ON CRIME SCENE INVESTIGATION

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Introduction

Criminal justice system comprises of a particular division or the set of processes, bodies and institutions that plan to protect or restore the mechanism of social control². It can also be defined as 'the organized or structured ways in which society responds to certain behaviours and people it regards as deviant, challenging, distressing, intimidating, troublesome and undesirable³. Primarily, the administration of criminal justice system rest on police, prosecution, courts and prisons. These four organs are engaged in the crucial role of deterrence, recognition, prosecution, arbitration and penalization or punishing of offenders 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.⁴ Speaking about the functionaries of the criminal justice, the essential role is that of the Magistrates and courts because they are wholly accountable for deciding the culpability or otherwise of the alleged offenders and determining their punishment. This process of deciding the culpability of offenders by courts is a complex one involving appreciation of facts and evidence and establishing the charge sought to be proved. In the commission, they are supported by a dedicated investigative agency, the police. The latter are assigned with the essential task of detecting and investigating crimes for the purpose of apprehending the alleged offenders and bringing them to justice. Any investigation should be supported with evidence. Truth is positioned in a Court of Law only when it is having firm and sound foundation of evidence"⁵. In the last few decades, the infusion of technology in crime investigation has been a major breakthrough in the process of advancement of criminal justice. Police utilize scientific tools and techniques to detect a crime, reconstruct the crime scene, identify the alleged offender and establish vital links; the courts, on the other, take account of these physical evidences, otherwise infallible, and determine with enhanced accuracy the innocence or guilt of the offender.

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² FRANCIS PAKES (ED), COMPARATIVE CRIMINAL JUSTICE Pg. No.1 (Routledge, Oxon, Third Edition/2015).

³ DAVID SHICHOR, THE MEANING AND NATURE OF PUNISHMENT, (Waveland Press, Inc. 2006).

⁴ Committee on Reforms of Criminal Justice System, Government of India, Ministry of Home Affairs, Volume I, 2003.

⁵ U. S. Misra, *CBI-The Role & Challenges* 13 NPAJ Vol. 57 (1) (2005).

Somewhere, the efficiency and effectiveness of the criminal justice functioning has come to be intertwined with the extent of use of technological tools in crime investigation.

Defining Forensic Science

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". Forensic Science deals with the application of the knowledge and methodology of various disciplines of science to legal matters. For evidence analysis, it involves the use of multiple disciplines such as medicine, physics, forensic chemistry and biology, DNA profiling, computer science and engineering. For example, physics is used to recognize the blueprint of a blood scatter; biology helps to establish the basis of an anonymous suspect and chemistry helps us to find out the chemical composition of various drugs. Therefore, the function of forensic science in criminal justice and the legal system is often underestimated and extremely critical in nature.

In ancient India, the idea of forensic science is not a new one as medical belief was regularly applicable to the requirements of the law. Sir William Herschel was one of the first to advocate the use of fingerprinting in the identification of criminal suspects. Fingerprint evidence was first accepted in an Argentine court in the 1890s and in an English court in 1902. Moreover, Forensic evidence is a discipline that works in accordance with the parameters of the Indian legal system. Its function is to provide direction to those conducting criminal investigation and to provide to magistrates/judges the correct information upon which they can have full trust in determining criminal and civil dispute. This is also helpful in resolving the criminal and civil cases.

Further, Forensic science is an incorporation of almost all capabilities of knowledge, a crucial and proficient resource that makes all dispensation of justice in criminal, civil, regulatory and social contexts possible. It helps in defining all the applications of science in responding questions that are of legal significance. In present times, Forensic science is a highly developed scientific procedure that is used in criminal and civil investigations, it is capable of answering important questions and forms an integrated part of criminal justice system.⁶ It comprises of all renowned techniques such as fingerprint analysis, DNA analysis, ballistics and explosives, firearms, culture etc. It facilitates to convict those guilty of crime as well as can pardon the innocent.

⁶ IshaTyagi and Nivedita Grover, *Development of Forensic Science and Criminal Prosecution-India*, , 2 IJSRP Vol.4 (2014).

Role of Forensic Science in Crime Investigation

Forensic science is one of the significant characteristics of criminal justice system. Fundamentally, it deals with exploration of scientific and physical clues gathered from the crime scene. Forensic science explains the distinctiveness (who) of the suspect who committed the crime. The evidence clearly specifies the nature (what) of the crime committed. The circumstantial evidences also speak about the time (when) of the incident. The forensic evidence proves the location of the offence (where/crime scene). The forensic investigation also observes the method (how) of the offender. Finally, comes to conclude the reason behind the crime. The forensic investigators recreate the distinctiveness of the criminal and the victim.⁷

During the whole process of criminal investigation, evidence is gathered from the location of crime or from a person who is an eye witness to the whole incident, examined in a crime laboratory and then the results are presented in the court. Every crime scene is exceptional in nature and each case presents its own challenges.⁸ Forensic science plays a crucial role in the criminal justice system by providing scientifically based information through the analysis of physical evidence, the identity of the culprit through personal clues like fingerprint, footprints, blood drops or hair, mobile phones or any other gadgets, vehicles and weapons. It associates with the criminal through objects left by him at the sight and with the victim or carried from the scene and the victim. On the other hand, if the clues recovered do not link the accused with the victim or the scene of occurrence, the innocence of the accused is established. Forensic science, thus, also saves the innocent. Due to the emergence of DNA technology as a modern method of forensic science, provides wonderful amount of information to the investigating officers that enable him to find the criminal purely on the basis of scientific evidence which he has left at the location of crime.⁹

⁷ N. B. Narejo, M. A. Avais, *Examining the Role of Forensic Science for the Investigative- Solution of Crimes*, 252 SURJ (SCIENCE SERIES) Vol. 44(2) 2012.

⁸ Forensic Sciences, National Institute of Justice, Office of Justice Programs, <http://www.nij.gov/topics/forensics/pages/welcome.aspx>, (last visited on 15.2.2016).

⁹ Jyotirmoy Adhikary, *DNA Technology in Administration of Justice*, (LexisNexis, Butterworths, 2007)

Legal Provisions Supporting Criminal Investigation

In India, the application of forensic science to crime investigation and trial has to stand the limitation of law. The predominant questions therein are: viz.

- a) How far such techniques are legitimate and supported by any authority?
- b) How far these forensic techniques helpful in crime investigation?
- c) How could we obtain evidentiary importance from the forensic experts?

As per Articles 20(3) of the Indian Constitution, no person accused of any offence shall be compelled to be a witness against himself. Article 20(3) is based upon the presumption drawn by law that the accused person is innocent till proved guilty. It defends the accused by protecting him from the probable agony/torture during investigation during detention. Criminal law believes an accused as innocent until his guilt is proved beyond reasonable doubt. The Universal Declaration of Human Rights, Article 11, "*Right to the presumption of innocence*" states that "Everyone charged with a penal Offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had all the guarantees necessary for his defence."¹⁰

Article 20 (3) of the Constitution of India guarantees fundamental right against self incrimination and guards against forcible testimony of any witness. The fundamental right guaranteed under Article 20 (3) is a protective umbrella against testimonial compulsion in respect of persons accused of an offence to be witness against themselves. The protection is available not only in respect of evidence given in a trial before Court but also at previous stage. The protection against self-incrimination envisaged in Article 20 (3) is available only when compulsion is used and not against voluntary statement, disclosure or production of document or other material.¹¹ This right has been taken to ensure that a person is not bound to answer any question or produce any document or thing if that material would have the tendency to expose the person to conviction for a crime.¹²

¹⁰ Universal Declaration of Human Rights, United Nations High Commissioner For Human Rights, http://www.icnl.org/research/library/files/Transnational/UNIVERSAL_DECLARATION_OF_HUMAN_RIGHTS.pdf (last visited on 9.2.2016).

¹¹ 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> (last visited on 8.2.2016).

¹² McDougall, Justice Robert, *The Privilege against Self-incrimination: a time for reassessment*, Paper presented at New South Wales Bar Association, 18 October 2008, http://www.supremecourt.lawlink.nsw.gov.au/agdbasev7wr/supremecourt/documents/pdf/mcdoug_all181008.pdf. (last visited on 29.05.2018) p. 2;

Sec. 73 of the Indian Evidence Act gives authority to the court to direct any person including an accused to allow his finger impressions to be taken. The Supreme Court has also held that being compelled to give fingerprints does not violate the constitutional safeguards given in Art.20(3).¹³ There are undoubtedly many queries as to whether forensic evidence violates Art. 20(3) of Indian Constitution or not? In *The State of Bombay v. KathiKaluOghad & Others*,¹⁴ the court held that giving thumb impression, specimen signature, blood, hair, semen etc. by the accused do not amount to 'being a witness' within the meaning of the said Article. The accused, therefore, has no right to object to DNA examination for the purposes of investigation and trial. The Bombay High Court in another significant verdict in the case of, *Ramchandra Reddy and Ors. v.State of Maharashtra*,¹⁵ upheld the legality of the use of P300 or Brain finger-printing, lie- detector test and the use of truth serum or narco analysis. The court upheld a special court order allowing SIT to conduct scientific tests on the accused in the fake stamp paper scam including the main accused, Abdul Karim Telgi. The verdict also maintained that the evidence procured under the effect of truth serum is also admissible. In a 2006 judgment, *Dinesh Dalmia v State*¹⁶, the Madras High Court held that subjecting an accused to narco-analysis does not tantamount to testimony by compulsion. However, in a subsequent case, i.e., *Selvi & Ors v. State of Karnataka & Anr*¹⁷, the Supreme Court questioned the legitimacy of the involuntary administration of certain scientific techniques for the purpose of improving investigation efforts in criminal cases. In the above mentioned case, the Supreme Court held that brain mapping and polygraph tests were inconclusive and thus their compulsory usage in a criminal investigation would be unconstitutional.¹⁸ The Code of Criminal Procedure, 1973 was amended in 2005 to facilitate the assortment of a host of medical details from accused persons upon their arrest. Section 53 of the Criminal Procedure Code 1976 provides that upon arrest, an accused person may be subjected to a medical examination if there are "reasonable grounds for believing" that such examination will afford evidence as to the crime. The extent of this assessment was expanded in 2005 to include "the examination of blood, blood-stains, semen, swabs in case of sexual offences, sputum and sweat, hair samples and finger nail clippings by the use of modern and scientific techniques including

¹³ Gaurav Aggarwal, *Smart Study Series Forensic Medicine & Toxicology* 73 (ELSEVIER A division of Reed Elsevier India Private Limited, Gurgaon Haryana), 2009).

¹⁴ AIR 1961 SC 1808, 1962 SCR (3) 10.

¹⁵ 2004 All MR (Cri) 1704.

¹⁶ 2006 Cri. L. J 2401

¹⁷ AIR 2010 SC 1974.

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DNA profiling and such other tests which the registered medical practitioner thinks necessary in a particular case.”¹⁹ On the other hand, the provision that was introduced through an Amendment in 2005 is restricted to the cases related to rape only. This section also does not permit a complainant to collect blood, semen, etc, for bringing criminal charges against the accused; neither does it apply to complaint cases.²⁰ In similar lines, Section 164A Code of Criminal Procedure, 1973 offers for the medical examination of a woman who is an alleged victim of rape within twenty four hours and such examination includes the DNA profiling of the woman. Both the sections allow any medical practitioner within the meaning of Sec. 2(h) Indian Medical Council Act, 1956 to collect a DNA sample. The matter lies as to whether every medical practitioner is competent enough to collect and preserve DNA evidence or not. It is a renowned fact that DNA evidence is completely dependent upon suitable collection and preservation of sample. Any simple error or negligence can contaminate the sample and contaminated sample is absolutely of no use. Under Indian Evidence Act, 1872, forensic report is regarded as a “belief” tendered by expert. 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 give his expert judgment.²¹ The real function of the expert is to put before the court all the equipments, together with explanations which induce him to come to a certain conclusion, so that the court, although not an expert, may form its own judgment by its own observation of those equipment.²² 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.²³ Although, the court can completely disagree with the conclusions drawn by the expert and depend on other evidences for the purpose of judgment. The National Draft Policy on Criminal Justice Reforms has suggested that Indian Evidence Act needs some amendments to make scientific evidences admissible as ‘substantive evidence’ rather than ‘opinion evidence’ and establish its probative value, depending on the sophistication of the concerned scientific discipline.²⁴

¹⁹ http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/India_DNA_Bill_Memo_2.0.pdf, (Accessed on 25.5.2018).

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²¹ Pragati Ghosh , Evidentiary Value of Expert Evidence under Indian Evidence Act, 1872, <http://www.shareyouressays.com/119180/evidentiary-value-of-expert-evidence-under-indian-evidenceact-1872>, (accessed on 26.05.2018).

²² S. C. Parakh, ‘Expert Witness’ 421 IJA Vol.55 (2011).

²³ Prof. (Dr.) B. P. Tiwari, *Evidentiary Value of Expert Opinion*, 23 IIRRJ Vol. IV (2012).

²⁴ Report of the Committee on Draft National Policy on Criminal Justice, Ministry of Home Affairs, Government of India,

Restrictive use of Forensic Evidence in Indian Legal Scenario

The most important function of forensic investigation is to exchange doubt into reasonable certainty of either guilt or innocence. However, till recently, the courts had to depend heavily on the non-scientific evidence because of the non-availability of proper technologies. The study conducted in 2011 by Supreme Court and High court shows only 47 cases; DNA has played an important role. Out of these, 23.4% decisions were given by Delhi High Court alone. Furthermore, DNA evidence had been used in merely 4.7% murder cases and 2.3% rape and murder.²⁵ In yet another study of rape cases over the decade, the author has indicated that there has been an increased reliance by Indian courts on forensic evidence and DNA over the years, even though the figures are abysmally low and concerted efforts are needed to include scientific evidence in all criminal matters, where applicable.²⁶

Yet, the domain of forensic science in India has not been merged. So many times, neither the arbitrator, nor the attorney nor even the police force appreciate completely, the advances or the widespread, promising potentialities of the science and the blend of new technologies together, methodologies, modalities and research. This multitasking and multi-professional approach of forensic science needs an inter-professional approach which is missing for many times.²⁷

The Committee on Reforms of Criminal Justice System also signifies that the present stage of applicability of forensic science in crime scene investigation is somewhat low in our country, with only 5-6% of the registered crime cases being referred to the FSLs and Finger Print Bureau put together.²⁸ There is critical requirement to carry forward the improvement in the prevailing conditions, more so, when the conviction rate is constantly declining over the years in the country and the forensic evidence, being clinching in nature, can overturn the trend to some extent.

The motives for such unwillingness of the courts to use forensic evidence in criminal scene investigation are diverse. Initially, the unprofessional conduct of physical evidence, including improper collection, preservation, non collection of clue evidence, non-maintenances

July, 2007.

²⁵ *The Role of DNA in Criminal Investigation- Admissibility in Indian Legal System and Future Perspectives*, 15-21 IJHSSI Vol. 2 (2013).

²⁶ Dipa Dube, 'Determining the Applicability of DNA Evidence in Rape Trials in India', Vol. 2 (1), *IJSSR*, 2014

²⁷ Justice Jitendra N. Bhatt, A Profile of Forensic Science in Juristic Journey, <http://www.ebc-india.com/lawyer/articles/2003v8a4.htm> (last visited on 28.2.2016).

²⁸ Committee on Reforms of Criminal Justice System, Government of India, Ministry of Home Affairs, Report, Volume 1, March 2003.

of chain of custody, as well as negligent and delayed dispatch of physical evidence for scientific analysis has been repeatedly noted upon by the courts. Not sending an accused for medico-legal examination, non-lifting of fingerprints by the I.O or when bloodstained mortal object had been sent for chemical examination without covering the same by a wrapper immediately after seizure of the same then it's obvious that court would reject the report.²⁹

Sometimes, scientific evidence suffers from some kind of technical lacunas such as non-mention of blood group in Serologist's report,³⁰ tests were not done meticulously,³¹ no supportive data were provided by the Expert along with report,³² delayed examination of exhibits at the laboratory etc.³³

Delayed inspection of exhibits at the laboratory can turn the advantages of a case into a negative version. The delayed inspection of biological, serological and viscera exhibit in the cases of poisoning puts a big question mark on the legitimacy of evidence. The decomposition of such exhibits can generate alcohol in the exhibits, on long standing duration and may also not permit the detection of poison and conclusive serological results; likewise, in cases of drunkenness, the blood alcohol or urine alcohol negative samples may test positive for the presence of alcohol due to self-generation of alcohol on the putrefaction of samples.³⁴ Sometimes, it is not possible for the Autopsy Surgeon to elucidate the manner of death.³⁵

The purpose of medico-legal examination is to reveal the real cause of injury or death. It can undoubtedly notify the nature of death i.e. accidental/suicidal/homicidal and injury also. Therefore, the documentation of medico-legal examination should be organized very systematically and carefully in order to arrive at scientific conclusion which in many cases is not done in an appropriate manner. A forensic record thus, is still poorly incorporated into the investigation and crime analysis process, in spite of evidence of its immense potential in various situations and learnings.³⁶

²⁹ A. Dutta, R. C.Arora, and Dr. P.C. Sarmah, *Analysis of Problems related to Forensic Examination in Offences against Human Body and Need for Auditing*, Vol.LVIII (3),IPJ& pg. no.10-11(2011).

³⁰ Kasha Beharav. State of Orissa, AIR 1987 SC 1507.

³¹ Himanashu Pahari v.State, (1986) Cri. L.J. 622.

³² Mahmood v. State of U.P., AIR 1976 SC 69.

³³ Mahavir Singh v.State, Cri. Appeal No. 498/2007, decided on 22.5.09.

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³⁵ Enamul Haque v. State of West Bengal, CRM 17348 of 2010 & AST 1114 of 2010.

³⁶ Olivier Ribaux, Simon J. Walsh and PierreMargot, *The contribution of forensic science to crime analysis and investigation: Forensic intelligence*, 171-181 FSI vol.156 (2006).

Constraints Faced By Allied Subsidiaries

Modern techniques of criminal investigation are such domains that are still unidentified to the police force because they are not skilled and trained about them. The police are blamed to be investigating crimes by using same old, conventional methods and techniques.³⁷ It has been maintained that improper scientific knowledge with the investigation officer, the first respondent to the crime coupled with inappropriate conduct of scene of crime, may either contaminate the samples required to be tested or destroy the evidentiary value, which could be obtained on proper lifting, sealing, forwarding to the Expert/Laboratory for examination. Consequently, association of Forensic Experts with the police investigating agency right from the commencement and their effective liaison with the Medico-legal Expert can contribute very considerably and sometime positively, to the resolving of the crime.³⁸

In India, a serious concern is also about the self-determination of forensic labs and its self-regulation. The state and central forensic science laboratories are under the direct administrative management of the law enforcement authorities. The State and Union Territory Forensic Science Laboratories is either directly functioning under the respective Home Department or through police establishments.³⁹ Forensic science institutions are part of police setup and therefore, cannot maintain absolute independence at all levels.⁴⁰

Forensic laboratories lack the necessary manpower and infrastructure. They are staff served. Sometimes proper infrastructure and equipments are missing. They lack proper funding also. Surprisingly, there is also a lack of co-ordination between these two wings, i.e. forensic expert and police force. The Report of the Committee on Draft National Policy on Criminal Justice highlights that guidance, accreditation, standard setting, professionalism and research and development of Forensic science should receive adequate attention in the policy framework. The Malimath Committee also recommended that more well-resourced laboratories should be established to handle DNA samples and evidence, as well as particular rule should be enacted giving guidelines to the police setting uniform standards, for attaining genetic information and generating adequate safeguards to prevent misuse of the same. Lately, Justice Verma Committee⁴¹ laid down the need for proper storage and preservation of DNA samples, especially in sexual assault cases.

³⁷ James Vadackumchery, *The Police, the Court, and Injustice*, 97 (APH Publishing Corporation, New Delhi, 1997).

³⁸ The forensic use of bio-information: ethical issues, Nuffield Council on Bioethics, <http://nuffieldbioethics.org/wp-content/uploads/The-forensic-use-of-bioinformation-ethical-issues.pdf> (last visited on 25.5.2018).

³⁹ V. R. Dinkar, 'Forensic Scientific Evidence: Problems and Pitfalls in India', 79-84, *IJFSP* Vol. 3 (2015).

⁴⁰ Peerzada Yasir Latif Handoo, *Forensic Science: A Boon to Criminal Justice, Administration with Special Reference to State of J&K*, 53 *JIARM* Vol.1 (2013).

⁴¹ Report of the Committee on Amendments to Criminal Law, 23rd January, 2013.

Latest Judicial Pronouncements: Here are some of the latest cases where court has relied on forensic evidence and given verdict by taking into consideration of this piece of evidence. In *Krishan v. State of Haryana*,⁴² the Trial Court, considering the facts and circumstances of the case, more particularly relying on the FSL report convicted the appellant under Sec. 376 and Sec. 506 of IPC.

In a recent judgment in case of *State of Gujarat v. Mohan Hamir Gohil and others*,⁴³ Division Bench of this Court after referring to various authorities on DNA technology, different methodology used for testing and the scientific advancements made world over, noticed that over a period of time the Courts across the world including in India have been placing heavy reliance on DNA results. It was observed " Over a period, the technology of DNA testing has made great strides and achieved sophistication leading to results which can often times be used either for inclusion or exclusion of the accused.

Some Landmark Judgments in Forensic Science Investigation

In criminal cases specifically based on circumstantial evidence, forensic science plays a very crucial role, which may assist in establishing the evidence of crime, identifying the suspect, ascertaining the guilt or innocence of the accused. One of the major activities of the investigating officer at the crime scene is to make thorough search for potential evidence that have probative value in the crime. Investigating Officer may be guarded against potential contamination of physical evidence which can grow at the crime scene during collection, packing and forwarding. Proper precaution has to be taken to preserve evidence and also against any attempt to tamper with the material or causing any contamination or damage."⁴⁴ In certain cases relying on scientific evidences including DNA profile and oral evidences, the accused were convicted and punished with death sentence and fine by the Sessions Judges, for gruesome murder aged about 10 years after subjecting the offender to carnal intercourse and then strangulating him to death.⁴⁵ In *Nitish Katara* murder case, the detection of the deceased victim was difficult due to availability of only a small portion of one un-burnt palm with fingers. Here also, DNA profile helped in identifying the body remains by matching DNA profile with parents of the deceased which helped the High Court of Delhi to uphold the conviction of the accused.⁴⁶

⁴² (2014) 13 SCC 574.

⁴³ R/CR.A/224/2012

⁴⁴ 2014(5) SCC 509

⁴⁵ (2014) 4 SCC 69.

⁴⁶ *Vishal Yadav v. State of Uttar Pradesh* (2014) SCC Online Del. 1373.

In *Sushil Mandal v. The State* represented by CBI, the petitioner, father of the deceased boy, challenged the findings of DNA profiling. The deceased boy fell in the adolescent cusp of mutual infatuation with a school girl and parents of both were advised by school administration for keeping check on them. Later, the boy was found reportedly missing and, after a week, a fully decomposed unidentified body was fished out from a lake.⁴⁷ The petitioner claimed of not identifying the body remains and clothes of his missing son. He preferred habeas corpus petition in the high court accusing the father of the girl and praying the high court for directing the investigation by the Central Bureau of Investigation (CBI). The DNA test of the body remains matched with the genetic profiles of the parents (the petitioner and his wife) of the deceased. The skull super imposition test also established link between the deceased and the recovered body. But petitioner refused to accept the truth revealed by these scientific tests on one pretext or the other despite the fact that DNA test was repeated for his satisfaction. The apex court placed reliance on scientific tests including DNA profiling for human identification and accordingly closed the matter.⁴⁸ The Bombay High Court in *Anmolsingh Swarnsingh Jabbal v. The State of Maharashtra*, upheld life term, relying upon DNA evidence, in addition to other evidences, for murder of a young lady engineer by her colleague in a case of one sided love.⁴⁹ In another case of brutal rape and unnatural sexual act with a four year old girl child living in a slum dwelling was investigated by Delhi police and DNA profiling was used to link the perpetrator with the ghastly act of sexual violence. The court after having examined the detailed analysis of the child's testimony and various methodologies involved therein approved the investigation findings based upon DNA reports and other evidences and held the accused guilty and set aside acquittal order passed by the trial court.⁵⁰ In another case, the use of DNA technology paved the way to prosecute and convict the culprit to death, liable for kidnapping and killing after gang rape of a 10 year old school girl by auto rickshaw driver and throwing the corpse of the victim in a running canal.⁵¹

⁴⁷ 2014 SCC Online Mad 7362 : (2014) 2 MWN (Cri) : 580 (Mad) (1B).

⁴⁸ *Inspector of Police v. John David* (2011) 5 SCC 509

⁴⁹ 2014 SCC Online Bom 397 : 2014 (2) Bom CR (Cri) 361 : MANU/MH/0352/2014

⁵⁰ *State of NCT Delhi v. Sujeet Kumar*, 2014 SCC Online Del 1952

⁵¹ *State by the Inspector of Police v. Manoharan*, 2015 Cri. LJ 1215 : MANU/TN/ 0496/2014.

Importance of Forensic Science in Law

The word "forensic" has its roots in the Latin word "forenses" which means a forum. Back in early Rome, a forum referred to a public place where judicial proceedings and debates were held. Thus, the origin and the very definition of 'forensic science' points to its close association with the legal system. Forensic Science involves the collection, preservation, and analysis of evidence suitable for prosecuting an offender in the court of law. The application of forensic science in the criminal justice system is, therefore, an apparent picture.⁵² The legal system widely recognizes the role of forensic evidence in the trial of criminal offenders. This is because when scientific techniques and methods are used, there is not much scope for bias or injustice. That is why DNA profiling and a host of other forensic evidence are widely accepted in courts across the world. Interestingly, the first forensic technique ever used involving finger and palm print identification dates back to the Chinese (650 A.D.). Forensic evidence is extensively used worldwide to both convict and exonerate defendants. Thus, forensic science laboratories have mushroomed up all over the globe in the past couple of decades. In fact, special acts have been enacted in the US, Canada, and Australia to improve the rendering of forensic services. This would ensure that crimes are detected with greater certainty and consequently conviction rates can increase. Such acts place a great emphasis on time-efficient and quality management of crime scene.⁵³

Conclusion

In Indian scenario, there has been increased emphasis on the use of such technologies in criminal investigation and trials. The Commissions appointed on reforms of criminal justice have reiterated that the infusion of technology in crime detection can help the system to function efficiently. The relevant laws have been amended from time to time to make way for use of forensic technologies in crime investigation and trial. Yet, it may be said that there are existent flaws in the laws which need to be addressed. The courts are also reluctant to rely on scientific evidence due to their restrictive approach, or certain inherent defects in the evidence as produced in courts which deter them from relying on it entirely. The main motto of criminal justice system is to provide fair justice.

⁵² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4581010/>

⁵³ <https://ifflab.org/the-importance-of-forensic-science-in-criminal-investigations-and-justice/>

Undoubtedly, forensic evidence is more authentic than ocular evidence. Forensic science being scientific evidence is a boon for criminal justice system. We have to overcome the existing flaws to step forward. We must learn from the past, disrupt our thinking, strengthen the community and change our culture. This means working together towards a resolution of the scientific deficiencies within existing forensic evidence while providing a firm basis for new innovative technologies entering into the forensic science ecosystem. At the same time, we need to ensure that the law enforcement and investigative communities once again recognize and use forensic science to its full potential as a holistic problem-solving tool (for example, through the use of the case assessment and interpretation methodology).⁵⁴ That such a methodology is embedded 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 siloed 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.⁵⁵

⁵⁴ A model for case assessment and interpretation. *Cook R, Evett IW, Jackson G, Jones PJ, Lambert JA Sci Justice. 1998 Jul-Sep; 38(3):151-6.*

⁵⁵ Standards for the formulation of evaluative forensic science expert opinion. *Association of Forensic Science Providers. Sci Justice. 2009 Sep; 49(3):161-4.*