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**A STUDY ON THE ROLE OF FORENSIC SCIENCE IN INVESTIGATION
OF CRIMES**- Rohit Kumar Soni¹**Abstract**

This study was conducted to examine the value of forensic science in criminal investigations. Forensic Science is a dynamic area of knowledge and skill that can be very helpful and useful for criminal investigations. Forensic science applies technical expertise to detect, identify and prosecute offenders. Forensic Science Application and Awareness Grows in Law Enforcement in India.

Key words – Examine, forensic science, criminal, technical, investigations, awareness

1. Introduction

The word forensis is a Latin word which was used by the romans to refer to the different forums like market, business or commercial transactions and public discussion. These forums played various roles like the role of criticism, scrutiny and helped in shaping the civil law as well. Its general meaning includes the evidence that are presented in the court of law to prosecute the person involved in commission of crime.

The forensic science has very broad role to play in its application and scope, forensic science helps the investigators to solve the crime by involving victim, witness and experts involved in the case. It has various identities like forensic, forensic anthropology, medical jurisprudence, forensic psychology, forensic archeology, forensic hypnosis, and Criminalistics.

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The forensic science takes help from various professionals to find out the solutions of the crime. It engages with pathologist, chemist, biologist, physicists and various medical officers. It can successfully help to find the missing person by setting up their original identity recounting and prosecuting through testimonies that have persecuted those who have produced scientific evidence.

In the crimes like rape, the hair and fibers found at the crime scene plays very important role in the process of investigation. The suspect identity can be successfully identified by carefully studying the data. The collection of fingerprints, tool marks and footwear signs can be collected technically to find out the persons who relate to the commission of the crime. There are biological fluids like urine, semen, blood, saliva and vomit these contains persons DNA, they are collected in a container called sterile container which can be further analyzed and helps to catch the real criminal.

This evidence contains minute particles left at the scene of the crime which must be packed, recognized, documented and preserved. Evidence like piece of hair generally used by the forensic investigators in the investigation of crime. In the case of heinous crime, the blood splatter pattern are considered as highly valuable as evidence.

2. Research objectives

- To study the branches of forensic science
- To study the importance of forensic science in law
- To study the legal provision in favor of the use of forensic science
- To study the landmark cases relating to Forensic science in India

3. Research questions

- What are the branches of forensic science?
- What is the importance of forensic science in Law?
- What are the legal provisions in favor of forensic science?
- What are the landmark cases relating to Forensic science in India?

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4. Review of literature

- ²**Nabi Bakhsh Narajo and Muhammad Abdullah Avais (2012)**. In this paper the authors have studied the various aspects of forensic science and how it helps in the investigation of crime. The author further explains how forensic science a dynamic field of knowledge is and how these skills are highly useful in the investigation of the crime. It deploys technical skills to identify and detect the offenders.
- ³**Shalu Bhati (2020)**. In this paper the author has discussed the importance of forensic science, various branches of forensic science legal aspects dealing with forensic science, the role of forensic science in detection of crimes with the help of various case laws. In the conclusion the author mentions it is a developing study and requires a lot of education, skill and experience, courts have often considered forensic science to be insufficient or totally reliable. However, its role in securing convictions cannot be denied.
- ⁴**Reema Bhattacharya (2019)**. Police use scientific tools and techniques to locate a crime, reconstruct the crime scene, identify the alleged perpetrator and make vital connections; the courts, on the other hand, take into account this otherwise infallible physical evidence and more precisely determine the innocence or guilt of the offender. Forensic evidence is a discipline that operates within the parameters of the legal system. Its purpose is to provide guidance to those conducting criminal investigations and to provide courts with accurate information on which they can rely to resolve criminal and civil disputes. This article will analyze the legislative framework regarding the applicability of forensic science to criminal justice. India's legal structure and its allied branches need to be reorganized with a view to achieving results-oriented forensic

² Nabi Bakhsh Narajo and Muhammad Abdullah Avais," Examining the Role of Forensic Science for the Investigative –Solution of Crimes". (SINDH UNIVERSITY RESEARCH JOURNAL, (SCIENCE SERIES, 2012).

³ Shalu Bhati," Role of Forensic Science in Crime/Criminal Detection", (law circa, 2020).

⁴ Reema Bhattacharya,"APPLICABILITY OF FORENSIC SCIENCE IN CRIMINAL JUSTICE SYSTEM , INDIA" (research gate, 2019).

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investigations and trials, so that swift remedies and justice can be provided to victims of heinous crimes.

- **⁵R. AustinHicklin and et al. (2021).** Although the evaluation of bloodstain sample proof left at crime scenes is predicated at the professional evaluations of bloodstain sample analysts, the accuracy and reproducibility of those conclusions have by no means been carefully evaluated at a big scale. We investigated conclusions made through seventy five working towards bloodstain sample analysts on 192 bloodstain styles decided on to be extensively consultant of operational casework, ensuing in 33,1/2 responses to activates and 1760 brief textual content responses. Our effects display that conclusions had been frequently misguided and frequently contradicted different analysts. On samples with regarded causes, 11.2% of responses had been misguided. The effects display confined reproducibility of conclusions: 7.8% of responses contradicted different analysts. The disagreements with admire to the that means, and utilization of BPA terminology and classifications recommend a want for progressed standards. Both semantic variations and contradictory interpretations contributed to mistakes and disagreements, which can have severe implications in the event that they happened in casework.
- **⁶Glinda S.Cooper and Vanessa Meterko (2016).** In this paper the authors have discussed the forensic science as the patchwork of discipline which primarily assist the criminal justice system of a country. The authors suggest that many solutions regarding forensic science are already there, but these solutions may or may not solve the fundamental problems. Therefore, the authors have suggested some of the important solutions through this paper which will further helps to solve the problem from the root.

⁵ R. AustinHicklin and et al.” Accuracy and reproducibility of conclusions by forensic bloodstain pattern analysts (forensic science international, 2021).

⁶ Glinda S.Cooper and Vanessa Meterko,” Cognitive bias research in forensic science: A systematic review”,(forensic science international, 2016).

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5. Branches of forensic science

There are basically 11 branches of forensic science that are

- Forensic Anthropology
- Forensic Pathology
- Forensic Odontology
- Forensic Biology
- Forensic Entomology
- Forensics Engineering
- Toxicology
- Criminalistics
- Digital Forensics
- Behavioral Sciences
- Ballistics

i. **Forensic Anthropology**

It is a branch of forensic science which primarily deals with the people whose identity is difficult to identify by using general methods. It involves the study of skeletal remains to find out the age, height, and sex of the deceased person. The deceased in this branch is basically a victim of airplane crash, train accident and bombing etc.

ii. **Forensic Pathology**

The main function of forensic pathology is to identify the reason of death of the person by undergoing the process of autopsy or postmortem. As the dead body itself depicts various clues about the person's death, forensic pathology enables the investigators to know the time of death and the reason behind the death whether it was natural or accidental or result of some criminal act.

iii. **Forensic Odontology**

Forensic odontology refers to the study of enamel of teeth, which is the hardest substance in a human body. When it isn't possible to identify such remains by other methods of forensics

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science the teeth of the deceased help to identify the persons identity. It also helps in the identification of bite marks. This method is generally used in identification of body in times of mass detection.

iv. Forensic Biology

This branch of forensic science uses evidence such as blood, semen, skin, hair, saliva etc. to establish the relation of the crime between the victim and the perpetrator.

v. Forensic Entomology

Forensic entomology uses insects that are found on the body of the deceased person to find out various things like time of death, it also uses factors like humidity, moisture, temperature, cloths to determine the exact time of death of the person.

vi. Forensics Engineering

Forensic engineering involves study of specific product, materials, and structures to identify the cause of failure, which can cause damage to the property, personal injury or death of a person. It can be used in investigation of both civil as well as criminal cases.

vii. Toxicology

Toxicology is often used in the cases of drunk and driving cases, it analyzes the body of dead or living person to determine the presence of alcohol or the cause of death was poison or any such toxic substance.

viii. Criminalistics

It analyses the evidence that are brought into existence by criminal activity, it includes weapons, blood, fingerprints, drugs etc. to trace the evidence.

ix. Digital Forensics

Digital forensic deals with digital evidence which can be found on the devices like laptop, computer, mobile phones, hard drives, servers or networks to collect the evidence.

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x. Behavioral Sciences

This science deals with the behavior of the criminals, using the psychology a profile is created to give the idea about the personality of the criminal and helps the authority to decide the matter.

xi. Ballistics

The analysis of ballistics suggests what kind of firearm was used to commit the crime.

6. Importance of forensic science in law

The word forensic formed from the Latin word called Forenses which means forum. During the Rome time forum is a public place where judicial proceedings and debates were conducted. Thus, the origin of the word itself is connected with the legal system. It involves preservation, and analysis of the evidence useful for the courts to prosecute the offender. Thus, forensic science holds special place in the criminal justice system.

In the trial of criminal offenders, the law recognizes the evidence based on forensic science and gives great weightage to it in the deciding the punishment of the criminal offenders. This is because scientific technique more trusted way of investigations and there is no place left for injustice and biasness. This is the reason why DNA profiling and a host of other forensic evidence are widely accepted in the court of law across the globe. During Chinese 650 A.D the first forensic technique involving palm and fingerprint was used.

The evidence based in forensic science is widely used to convict or exonerate the defendants. This is the reason why forensic laboratories have developed all around the world in the recent times. Countries like USA, Canada and Australia have enacted a special act to improve the forensic services to ensure that crime is dealt with greater certainty and conviction rate can improve where the accused is found guilty. Having this system in place it will have great impact on time efficiency and management of crimes.

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7. Legal provisions in favor of forensic science

Under section 45 of Indian evidence act⁷ forensic reports and opinions of forensic experts are admissible in the court of law. As per this section when the court form opinion based on forensic law, art or science to identify the writing or fingerprints of the person who are actually skilled in these field are to be taken as real facts. This person is called expert witness. Section 45 to 51 of the Indian evidence act also talks about the opinion of experts and any expert of the branch can be called to give evidence as per this section.

The code of criminal procedure, 1973 and Indian evidence act 1872 discuss about the provisions relating to the procedure of criminal cases. Both acts recognize the role played by forensic science in detection of the crime and prove it with legal validity.

In the case of *State of Maharashtra v. Damu Gopinath Shinde*⁸, the supreme court held that “without the examination of the expert as a witness, reliance cannot be placed on the expert evidence”.

*Malay Kumar Ganguly v Sukumar Mukherjee*⁹ it was held “expert opinion can be admitted or denied. Whether such evidence could be admitted or how much weight should be given thereto, lies within the domain of the court. The evidence of an expert should be interpreted like any other evidence”.

*In Vijay v State*¹⁰ the Delhi high court held that “FSL report is only a corroborative piece of evidence and merely because it does not corroborate the testimony of the victim would not, in any manner, render the testimony of the witness, which is otherwise reliable, as unreliable or liable to be discarded. The Draft National Policy on Criminal Justice has proposed an amendment to the Evidence Act to make scientific evidence admissible as substantive evidence”.

Section 73 of the Indian evidence act gives the court the power to compare the signature, seal or fingerprint or writing.

⁷ Indian evidence act 1872

⁸ State of Maharashtra v. Damu Gopinath Shinde, AIR 2000 SC 1691

⁹ Malay Kumar Ganguly v Sukumar Mukherjee, AIR 2010 SC 1162

¹⁰ Vijay v State 2009.

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Section 53 of the CrPc¹¹ provides that the accused maybe examined upon arrest if there are reasonable grounds for believing that such examination will afford evidence as to the commission of an offence. Section 53A of CrPC was inserted by the 2005 Amendment Act. It expanded the scope of examination of an arrested person. It provides for the examination of an accused upon arrest if he is arrested for committing an offence of rape or an attempt to commit rape and there are reasonable grounds that such an examination will afford evidence as to the commission of such crime. Also, the section 164A of the CrPc provides for the medical examination of the victim of rape within the 24 hours of receiving the information as to the commission of such offense.

8. Landmark cases relating to Forensic Science in India

In *Neelam v State of Haryana*, the petitioner was aggrieved due to an improper investigation and thus filed the petition under section 482 of CrPC. The Punjab & Haryana High Court observed that the investigation was completed, alleged allegations were not proved and hence, a cancellation report was also filed. The Court also observed that the FIR was registered under section 306 of IPC without considering the report of Forensic Science Laboratory. The Court held that such an investigation cannot be called fair and thereby transferred the case to SIT in the interest of justice.

In the case of *Parvesh v State* two accused appellants were arrested based on the statement made by witness and the third one surrendered violently. It was the third accused who directed the police towards the weapon of murder. The high court of Delhi relied upon the FSL report which stated that the blood found on the weapon of murder and on the shirt were the blood of human, having the same blood group as to the deceased and therefore dismissed the appeal filed by the accused.

In *State (NCT of Delhi) v Manish*¹², the state filed an appeal against the acquittal of the accused by the trial court. In this case Delhi High court found the testimony of the prosecutrix to be inconsistent, exaggerated, and full of improvement and concealment. The

¹¹ Code of Criminal Procedure 1974

¹² Mahendra @ Manish vs State (Nct Of Delhi) on 30 May, 2018

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court further found that the testimony wasn't supported by any medical evidence. The court therefore dismissed the appeal.

9. Conclusion and suggestions

The evolution of forensic science has played a major role in the legal industry. It helped many judges around the world to decide the most important cases. The way forensic science has helped the investigators and revolutionized the whole process of investigation is tremendous. Many developments have been seen around the world in the field of forensic science because technology has seen a major improvement in the past two decades.

The Report of the National Human Rights Commission, 1999 is a comprehensive report on forensic science that needs to be implemented for forensic capacity building in India. Previous and subsequent relationships can also shed light on gray areas that need to be strengthened immediately. The quality of forensic reports depends entirely on the types of samples sent by investigators for testing in laboratories. Therefore, forensic training of investigators should be made compulsory. Likewise, such training should also be essential for prosecutors and judges, who must respectively present and assess forensic evidence. There should be homogeneous technology and experience in the different forensic analysis labs in India so that the quality of the report does not suffer from lack of experience and latest technology.

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