**Relationship Between Forensic and Criminology- An Analysis**

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**ABSTRACT**

Analytical study on applicability of forensic science in criminal justice system, India, like in every civilized society, in India to a criminal justice system evolved. Social, profitable, and political conditions induced during different phases of the history of India affected its evolution. Consequently, the objects of the criminal justice and style of its administration changed from time to time and from one period of history to another. To suit the changing circumstances the autocrats introduced new methods and ways to implement law and administer justice. In the previous decades, the infusion of technology in crime investigation has been advance in the process of advancement of criminal justice. Police use scientific tools and methodology 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, infallible, and determine with enhanced accuracy the innocence or guilt of the offender. Forensic evidence is a regulation that functions within the boundary of the legal system. Its motive is to provide guidance to those conducting criminal investigation and to submit the concern report in the Learned Courts with accurate information upon which they can rely in resolving criminal and civil disputes. The present paper will look over the legislative framework with regard to applicability of forensic science in criminal justice. The Indian legal structure and its federated subsidiaries need to be remoulded towards the achievement of result oriented forensic investigation and trial, so that speedy remedy and justice to victims of heinous and/ or grievous crimes may be provided.

**Keywords:** Forensic Science, Criminology, Origin and History, Nature and Development, Comparison Chat, Major Points, Importance, Legal provision, Judicial decision.

**Introduction-**

Forensic science simply means the application of scientific methods of obtaining criminal evidence, principles to support, validate or proven and substantiate the articulated matter of public discussion or arguments or defences in court of law. Forensic science is defined as the application of scientific methods and technologies in criminal and civil laws as enforced by law enforcement agencies in criminal justice systems [Saferstein, 2009: 4) According to Onashile (2002), forensic science is the science used in the detection and prosecution of crime or as the application of scientific skills of examination and evaluation to the resolution of social and legal issues or the application of science to law. Therefore, forensic science is the application of scientific concepts and principles in relation to crime or a civil or criminal action, besides its relevance to a legal system [1].

The term Criminology is a combination of two Latin words Crimen [crime] and Logus or Logy [Science]. It is the science or study of crime. Thus, criminology is the scientific study of crime. Crime according to Idowu [2019] means ‘an act or default or conduct prejudicial to the community, the commission of which by-law renders the person liable to punishment by fine or imprisonment in special proceedings, instituted by officers in the service of the crown [state]’. In 1934, American criminologist Edwin Sutherland defined criminology as:

***“.....the body of knowledge regarding crime as a social phenomenon. It includes within its scope the process of making laws, of breaking laws, and of reacting towards the breaking of the laws.....”***

Criminology can be defined as encompassing the scientific study of illegal activities, offenders, their victims, criminal law and the justice system as well as societal reactions to the crime problems. Criminologists explore how social, economic and political conditions generate criminal activity. Criminological research discusses how suspects, defendants and convicts are really handled [2].

**Origin and History of Forensic and Criminology**

The word forensic has its origin from the Latin word ***“forensis”*** which stands for a forum.

In spite of the fact, it is exactly uncertain from where the concept of forensic science originated, most of the historical experts agrees it was likely in China around the 6th century or earlier. This information is based on the earliest known mention of the concept, found in a book titled “Ming Yuen Shih Lu,” printed in that period.

During the 7th century, the concept of understanding [fingerprints](https://www.crimemuseum.org/crime-library/forensic-investigation/fingerprints/) as a means of identification was first established. According to historical records, a normal merchant was able to verify the identity of his particular customer who owed him money for a product by taking his fingerprints on a bill. The Judge accepted the prints as undeniable evidence, declaring a first example of forensic science in action. In 1659, the Merriam-Webster Dictionary officially recognized and printed the word [“forensic”](https://www.crimemuseum.org/crime-library/forensic-investigation/definition-of-forensics/) [3].

Throughout the years, science become more prominent in legal system, and scientific observation were commonly used in deciding the outcome of important legal matters. By the late 1700s, forensic science was used as a major factor to determine guilt or innocence in major criminal cases, including charges of murder. One of these scientific primary functions is to study DNA, the genetic coding found on all living things. DNA samples can be taken from any human or animal and then given for test, and compared with other samples for similarities. This process and system is highly respected, and meant to be a major consideration for cases in which the identity of an individual must be established.

Forensic Science is basically used in tandem with any discipline that has associations with the legal system and in criminal investigation. In a nutshell, forensic science is the **application of scientific methods and principles in the questions of law**. In lay man’s word, Forensic Science is a discipline which helps in solving the criminal cases which is terribly tangled in nature.

Presenting the brief Evolution of forensic science over time.

[](https://ifflab.org/wp-content/uploads/2017/08/The-Evolution-of-Forensic-Science-Over-Time-1200.jpg)

**Nature**

Forensic Science embraces all branches of science and applies them to the purpose of law. Originally all the techniques were borrowed from various scientific disciplines like chemistry, medicine, surgery biology, photography. But in the past few years it has developed its own branches which are more or less exclusive domains of forensic science. More recently significant advances have been made in serology, voice analysis, and in studies relating to nose prints and ear patterns.

Criminologists utilize the social, behavioural, and physical sciences as framework for engaging in study of the underlying causes of criminal behaviour; they examine the demographics, environmental variables, socioeconomics, cognitive, and psychological precursors to the development of criminal behaviour. For an early application of these techniques see "A Comparative Study of the Intelligence of Delinquent Girls."

**Scope:**

Forensic Science is meant for “applying science in the statutes enacted in criminal justice by law making and executing body.” Forensic Science is basically concerned about the application of scientific concepts and methods of the various scientific discipline into legal matters. The proof analysis list consists of multiple areas such as sociology, physics, forensic chemistry and biology, DNA profiling, computer science, and engineering. Like for example, Physics is used to understand the blueprint of a blood dispersion; biochemistry is meant for strengthening the basis for an unverified suspect, and chemistry helps to find out the chemical composition mixed in different drugs.

Forensic scientists examine the physical evidence collected from the crime scene like for an instance, fingerprints, blood, hair, etc. to identify suspects. Forensic experts also use other necessary sources for image manipulation to find out offenders who are absconding from the law from longer period [4].

Forensic science is a concretion of almost all scientific skills and act as a critical and best qualified tool that makes the delivery of justice easier in criminal, civil, legislative, and social contexts. It helps in explanation of all scientific applications in resolving the questions of legal significance. Forensic science is now an advance research method used in criminal and civil investigations and able to address critical questions and an important part of the criminal justice system. It includes all famous techniques and methods such as the analysis of fingerprints, DNA analysis, ballistics and explosives, firearms, culture, etc.

Criminology is the study of the causes and prevention of criminal behaviour and studying crime as a social phenomenon. The scope of criminology includes perspectives on Law making, breaking laws, and societal reactions to execution of an amended laws and even on breaking of law and order make by the Legislature.

**Development**

The application of Forensic Science in the investigation of crime can be effective only if the investigating officer knows: [5]
1. The nature of physical evidence to be collected.
2. Where it is found.
3. How it is collected and packed.
4. What standard samples for comparison purposes are necessary?
5. How much sample is required?
6. How the sampling is done.
7. How the evidence will link the crime with the criminal and to what extend his labours will be rewarded by the laboratory results.

This is possible if the investigating officer is given a thorough grounding in the above aspects. He needs both theoretical and practical training.

* For example- Forensics can also be used to determine the cause of death, which may give authorities a lead on the murder weapon to look for, and subsequently, a starting point for their search for a suspect. For instance, if it was determined that the individual died as a result of a gunshot to the head, and the bullet wound was consistent with a .45 caliber handgun, the police can begin by searching the registration database for anyone with a registered .45 handgun in the area.

Primary

Application of Science.

Aim of

* + Methodology of various Regulations of science to Legal matters.

Forensic Science

* + To play an important role in Criminal Justice and the Legal System.

**Comparison between Forensic Science and Criminology:** [6]

|  |  |  |
| --- | --- | --- |
| Basis for comparison   | **Forensic Science** | **Criminology** |
| **What are they** | Forensic science is an applied natural science. | Criminology is a specialized social science, which evolves from sociology. |
| **Description** | It is a process of applying scientific methods for answering questions that arise in relation to crime or civil action and providing scientific evidence that could be used in situations. | It is the study of criminal behaviour, causes of crime, ways to prevent crime and rehabilitation/punishments for criminals. |
| **Working** | They work to serve and provide the investigatory tool. | Here the crime scene technicians and other forensic specialists work to apply scientific methods, in order to solve the specific crimes. |
| **Provides** | They provide evidences, which are used in criminology. | They provide the criminal profile by studying the crimes and nature of the criminals. |
| **Based on** | They are based in the vast and deep studies of research, mainly biology and chemistry. | They are based on the three theories which are Classical, Positive, and Chicago. |
| **Roles** | Forensic scientist does not develop theories and thesis regarding any crime. | Criminologists do develop theories and thesis from their research and experience. |
| **Types** | Types of forensic science are:1. Forensic anthropology
2. Forensic archaeology
3. Forensic entomology
4. Forensic pathology
5. Forensic botany
6. Forensic biology
7. DNA profiling
8. Bloodstain pattern analysis
9. Forensic chemistry, etc.
 | Types of criminology are:1. General Criminology
2. Criminal Sociology
3. Criminal Psychology
4. Green Criminology
 |

**Some major points:**

1. **How forensic science is used in a criminal investigation.**

Forensic science is one of the essential ingredients of any criminal investigation, which allows the concern authority to perform positively to identify a suspect in an offence to determine place and occurrence of an offence. According to the National Institute of Justice, forensic science is the application of sciences in matters of law, which is used to match DNA to an individual, helps to analyse blood spatter patterns, and observe an unidentified drug. Additionally, the results of a forensic report need to submit in the court of law to support evidence admitted at trial.

1. **How Trial Lawyers Use Forensics to Support Evidence**

In Trial both criminal defence lawyers and prosecutors, use forensics to prove and disprove the evidence they present in court. For example, if there are no witnesses to a crime, the prosecution may use the evidence found at the crime spot to collect DNA evidence that indicate the suspect at scene of the crime. Forensics may even be able to prove when a crime took place – even the exact date and time.

For instance, forensics may be used to identify the body which narrow down the list of possible murder suspects. Identification of the body can be done by testing the dental work of the remains, and even by examining the skeletal structure of the individual, i.e. a young woman of about 25 years of age, approximately five foot five inches and 125 pounds.

1. **Criminal Cases Commonly Solved with Forensic Science:**

The most common crime and/ or offences which can be solved with the help of Forensic Science are related to Narcotics and Drugs and Sexual Offences.

In case of Narcotics and Drugs, forensic can be used to analyse the kind of chemical used while in killing of an individual or for manufacturing and trafficking. Of which the report can be submitted before the Court as evidence through which the main accused shall be punished.

In Sexual Offences, [DNA may be taken from victim](https://www.baezlawfirm.com/new-dna-database-could-improve-criminal-justice/) and the results used to convict the perpetrator.

**What is the Importance of Forensic Science in Criminal Justice.**

**Forensic Science[7]** use tools and methods of natural science in criminal justice for recognition, identification, individualization, and evaluation of physical evidence in criminal cases like rape, accident-related incidents, missing person, kidnapping, murder, fraud, suicide, forgery etc.

When a crime occurs, forensic team is called upon which collects evidences. All the questions related to the crime are solved such as, a. Who Committed Crime, b. Which Crime occurred, c. When the crime occurred, d. How the crime occurred, e. Why the crime occurred.

There are many experts which need to form the forensic team. Each expert has their specialised area of work. Those officers are as follows:

1. **Field Officers:** These officers are technicians who visit the crime spot and collect the physical evidence that is related to the crime, as photographs and videos which is being placed before the Court.
2. **Lab Officers:** These are a technician who examines the evidence collected by the field officers.
3. **Crime Scene Investigator:** A crime scene investigator (CSI) is the In-Charge of extracting every possible piece of evidence from a particular crime spot.
4. **Latent Print Examiner:** This specialist examines evidence like fingerprints, Palm prints, footprints, hair and fibre.
5. **Fire arms Examiner:** Experts of Fire arms examines the collected evidence to identify kind of fire was used by comparing with bullet, shell casings and gunshot.
6. **Document Examiner:** A Forensic Domestic Examiner (FDE) is a practitioner who received proper training and analyses documentary evidence to determine origin and authenticity.
7. **Trace Evidence Examiner:** These experts examine and compare the cloth or dress, hair, fibres, glass, soil and paints collected if any from the crime spot to analyse its nature and origin whether its relevant to the instant case or not [8].

Physical evidence can be obtained from three main sources:

1. The scene of crime
2. The victim, if any and
3. The suspect and his environment

Physical evidences are collected by Investigating Officers with the help of forensic team and proved to be useful. After analysis and research, it becomes easier to identify the criminal, victim, and the missing person [9]. For an example, a crime is occurred and there is no eye witness and the criminal at the crime spot then the fingerprints, footprints, palm and sole prints, body prints, tool marks and trace marks of the criminal found at the crime spot can be examine with the help of forensic science and which makes it easy to identify the criminal.

## **Legal Provisions supporting the use of Forensic Science in Criminal Investigation.**

The provision which relates the Forensic Science with Criminal Investigation in India are:

The Code of Criminal Procedure (Cr.P.C), 1973 and the Indian Evidence Act (IEA), 1872, are the provisions regarding the procedure need to be followed in felonious cases [10]. The implementation of these statutes recognize job done by forensic science in crime/criminal discovery and give it legal validity.

The Reports and Opinions of Forensic experts and Interpreters are permissible in a court of law, as per the evidence under section 45 of the Indian Evidence Act. This section states that when the Court has to form an opinion upon a point of foreign law, science, or art, or to identify handwriting or finger impressions, the opinions of concern practitioner who are especially professed in these fields are to be considered as applicable data. Such a person is called an expert witness. An expert of the applicable branch of forensic science can be called upon to give evidence under this section. Further, it is sections 45 to 51 which talk of the applicability of opinions of experts.

Some of the case laws which need to be citation are as follows:

In **Malay Kumar Ganguly v Sukumar Mukherjee** [11], the Hon’ble Supreme Court held:

“expert opinion can be admitted or denied. Whether similar evidence could be admitted or how important 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 **State of Maharashtra v. Damu Gopinath Shinde** [12], the apex court held:

“without the examination of the expert as a witness, reliance cannot be placed on the expert evidence.”

In **Vijay v State** [13], the Delhi High Court held:

**“**FSL report is only a conformational piece of evidence and simply because it does not corroborate the evidence of the victim would not, in any manner, render the testimony of the witness, which is else dependable, as unreliable or liable to be discarded. The Draft National Policy on Criminal Justice has proposed an correction to the Evidence Act to make scientific evidence permissible as substantial evidence [14].”

Section 73 of this Act gives Courts the power to compare signatures, writing, or seal or fingerprints.

Section 53 of Criminal Procedure Code provides that an accused may be 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 Criminal Procedure Code 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.

Similarly, section 164A of Criminal Procedure Code provides for the medical examination of the victim of rape within 24 hours of receiving the information as to the commission of such an offence.

## **Judicial Decisions in India**

In **Neelam v State of Haryana** [15], the petitioner was displeased due to an improper investigation and had therefore filed this petition under section 482 of Cr.P.C. The Punjab and Haryana High Court observed that the investigation was completed, contended 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 ***Parvesh v State*** [16], two of the accused-appellants were arrested on the base of substation while the third surrendered violently. It was him who directed the police towards the murder weapon. The Delhi High Court reckoned upon the FSL report which verified that the blood set up on the murder weapon as well as the clothes of the accused was human blood with the same blood group as that of the deceased, and therefore, dismissed the prayers filed by the accused.

In **State (NCT of Delhi) v Manish** [17], the State had filed an appeal against the acquittal of accused by the trial court. In this case, the Delhi High Court set up the evidence of the Prosecutrix to be inconsistent, inflated and full advancements and concealments. The Court further set up that her evidence was also not supported by any medical evidence or FSL report. The Court, thus, dismissed the appeal.

**Conclusion**

The study concludes that criminal activities have advanced in nature and the means of crime control need to advance beyond theoretical aspects alone, rather to the scientific principles and techniques to establish facts in any criminal case, in order to substantiate or contradict defence or prosecution in the court of law [18]. The study emphasized on the necessity of the combination of the criminology (theoretical) and forensic science (applied science) to the issue of crime control at this advanced stage in life.

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