

# **CHAPTER - I**

## **INTRODUCTION**

## **PART-A: AN OVERVIEW OF INDIAN CRIMINAL JUSTICE SYSTEM**

The Part-A of introductory chapter defines and explains the evidences, forensic evidences and criminal justice system. The chapter is divided into three sections with a view to constructing the hypothetical understanding about the evidences and various stakeholders of Criminal Justice System along with entire process of Criminal trials. The definitions of evidences with a general as well as legal view are elaborated in the first section, in which a description about various forms of evidences are also given. The definitions and types of the evidences of forensic sciences are elaborated in the second section. The concept of Criminal justice system and criminal trial process in Indian Judicial system is comprehended in the third section.

### **Evidence**

The Latin word “evidere” is the root of the term “evidence”, which means to prove something, to show distinctly, to discover as clear as possible, to create a neat view sight, to determine.

According to *Sir Blackstone*, the word “Evidence” means which makes clear, detects, reveals or exhibits the reality of the viewpoints or facts with subject to one or either side. (Blackstone, 2009)

According to *Sir Taylor*, to uphold or contradict any matter of fact by the means of argumentation is the law of Evidence. The truth of which is submitted to judicial investigation. (Kumar, 2012)

### **Evidence in Terms of Legal Language**

Section 3 of The Indian Evidence Act, defines evidence in the following words.

Evidence means and includes-

(1) All the statements which the court permits or requires to be made before it by witnesses, in relation to matters of fact under enquiry; such statements are called Oral evidence;

(2) All the documents including electronic records produced for the inspection of the court; such documents are called documentary evidence. (Legal India, 2017)

### **Different Forms of Evidence**

There are many types of evidences defined in The Indian Evidence Act (IEA), 1872. Which are as follows:

**Oral evidence.** Section 60 of the Indian Evidence Act, 1872 suggests the provision of recording oral evidence. "All those statements which the court permits or expects the witnesses to make in his presence regarding the truth of the facts are called Oral Evidence." (Agarwal, 1961) It is the evidence which the witness has personally seen or heard. Verbal evidence is to be always to-the-point or positive, necessarily.

**Documentary evidence.** Section 3 of The IEA says that all those documents which are presented in the court for inspection such documents are called documentary evidences. (Stephen, 2016)

**Primary evidence.** Section 62 of IEA says "Primary evidence is classified as the supreme type of evidence. It means the document itself produced for the inspection of the court." (The Indian Evidence Act, 1872, 2011) It is the evidence which provides the crucial indication in a controversial matter and establishes through documentary proof by providing an original document for investigation by the court.

**Secondary evidence.** Section 63 of The Indian Evidence Act says Secondary Evidence is the inferior evidence. It is the evidence which holds a secondary position in the court. (Legal India, 2017) It is the evidence, after the demonstration of which, it is felt necessary to produce the supreme evidence. It is

the evidence which is produced in the absence of the primary evidence. Hence, it is known as secondary evidence.

**Real evidence.** The physical or material proof is termed as real evidence. Not by the information obtained from any person or witness, but by the examination of a substantial material, the real evidence of any case matter is brought to the knowledge of the court of law. (Legal India, 2017)

**Hearsay evidence.** These are the proofs which are neither seen nor heard personally by the witness, nor has been realized by his senses. These are those which come to his/her knowledge by some other person(s). These falls in the feeble most class of evidences. (Lawnn, 2016)

There is no provision to accept hearsay evidence except the fact that it has reasonability and accountability. It would be the most risky to take action upon the evidence, when there is no guaranteed assurance of its truthfulness.

**Judicial evidence.** Evidence received by court of justice in proof or disproof of facts before them is called judicial evidence.

The confession made by the accused in the court is also included in judicial evidence. Statements of witnesses and documentary evidence and facts for the examination by the court are also Judicial Evidence.

**Non-judicial evidence.** Any confession made by the accused outside the court in the presence of any person or the admission of a party are called Non-Judicial Evidence, if proved in the court in the form of Judicial Evidence.

**Direct evidence.** Evidence is either direct or indirect. In the judicial terminology, direct evidence is more frequently considered for describing the proof that directly supports the crime or innocence of the person during case trial. It can stand upon its own, and there is no requirement of any assumption. Audio tape recordings, Videos and various other forms of witness testimonies are to be used as direct evidence for supporting or opposing a claim.

Direct Evidence is that evidence which is very important for the decision of the matter in objection. The evidence whereby main facts and realities have proved that it is the proof of a person who had indeed, watched the criminal activity being committed and has given the description of offense. This presents the facts with sufficient back support.

**Circumstantial evidence or indirect evidence.** The circumstantial or indirect evidence are the terms used for the evidences, which try to prove the truths of the case and are able to provide the certainty of the matter by the provision of other facts.

The circumstantial evidence is the compilation of proofs, when taken into consideration together, are useful for inferring an essence about something which is unknown. It is used in the support of theory of a chain of incidents. The summation of multiple corroborative evidences, each part being circumstantial itself, constructs a proper logic for supporting the occurrence of any event. In civil and criminal investigations, corroboration is often supplied by one or more expert witnesses who provide forensic evidence. The statement before the police only is called circumstantial evidence of, complicity and not direct evidence in the strict sense. (Tahsildar Singh And Another vs The State Of Uttar Pradesh, 1959).

## **Forensic Evidence**

Forensic evidence is the evidence obtained by the scientific examination of physical items to provide inferences of other facts and to recreate events. Forensic evidence often helps to establish the guilt or innocence of possible suspects. Analysis of forensic evidence is used in the investigation and prosecution of civil as well as criminal proceedings. Forensic evidence can be used to link crimes that are thought to be related to one another. For example, DNA evidence can link one offender to several different crimes or crime scenes, in traffic accident cases tyre and skid marks may be examined to determine direction and speed of a car prior to accident. Fingerprints at a scene indicate that a particular person was present. Such linking of crimes helps the police to narrow down the list of possible suspects and to establish modus operandi to identify and prosecute suspects.

Forensic evidence, presented by expert witness, is circumstantial evidence since it is presented to establish events that were not observed by the witness.

Several forensic authorities (Fisher, 2004) (Gardner, 2004) (Lee, Palmbach, & Miller, 2004) have developed typologies for forensic evidence. These typologies cover the variety of forensic evidence collected at crime scenes: fingerprints, impression evidence, hair, fiber, firearms, biological evidence, drug evidence, and entomological evidence. Based on Fisher (2004) and Lee, Palmbach, & Miller (2004) and in conjunction with the parallel study by Peterson and Sommers, the following classification framework was employed for present study:

**Biological evidence.** The most common types of biological evidence are body fluids like blood, saliva, semen, vaginal discharges, urine etc. Blood evidence comes in the form of wet blood or swabs of bloodstains collected from crime scenes. Buccal swabs are the most common way of collecting saliva evidence, usually from a victim or suspect. Other types of biological evidence include hair, nail, bones, faecal matter, perspiration etc. DNA profiling is also carried out in some cases from biological evidence.

**Chemical evidence.** Any type of chemicals like acids/alkalis, hydrocarbons, petroleum products, Drug evidence including drugs (e.g., opium, cocaine, heroin and others) and drug paraphernalia (containers, spoons, etc.) discovered at the crime scene are classified as chemical evidence.

**Physical evidence.** Natural and synthetic materials including clothing, metal objects, plastic, paper, soil, glass, wood, general objects including vehicles, containers, ornaments, and any other objects are called physical evidences.

**Firearm (ballistic) evidence.** The artillery evidence including firearms (pistol, revolver, guns, rifles), ammunition (bullet traces, unfired bullets, empty cartridge cases, projectiles that have been fired) and the gunshot Residue (GSR) test. The main function of a GSR test is to determine if, a person was close to a firearm at the time of firing.

**Fingerprint / footprint evidence.** Fingerprint evidence are divided into complete prints (whole fingerprints) and chance prints (only partial prints of one or more fingers). These prints can be found in forms of visible prints or latent prints. Latent prints needs to be treated with powdering (or other) technique on any physical material to make it visible.

**Document evidence.** Handwritten or Electronically printed data including any kind of documents, letters, registers etc. are considered in this category.

**Toxicological evidence.** Any toxicological material like poisonous drugs, botanical material, viscera samples obtained after postmortem, gastric lavage etc. are categorized as toxicological evidences.

**Medical evidence.** All the physical examinations of victim or suspects by medical expert, post mortem examination reports, wounds and injuries etc. are considered as medical evidences.

**Trace evidence.** Trace evidence is a general term for small, sometimes microscopic, material. It covers a wide variety of evidence, including fibers, hair, building materials (asbestos, paint, etc.), cigarettes, tobacco, glass, and others.

**Other items.** Other items are a catchall category for evidence that does not fit in any of the above categories.

## **Criminal Justice System**

India is a Union of States and is governed by a written constitution which came into force on 26 November 1949. India consists of 29 states and 7 Union Territories. Due to its colonial heritage, India follows the Anglo-Saxon common law justice system. Article 246 of the Constitution provides for three lists which are enumerated in 7th Schedule of the Constitution. List-1 is the Union List which enumerates the subjects on which the Parliament of India has exclusive power to make the laws. List-2 is the State List which enumerates the subjects on which the legislature of a state has the power to make laws. The third list is the Concurrent

list which enumerates subjects on which both the Indian Parliament and the Legislatures of the state can enact laws, but if there is any conflict or inconsistency between the laws made by the Indian Parliament and the legislature of any state, the law enacted by the Union Parliament will have overriding effect. Importantly, the “Public Order” and the “Police” are enumerated in Entries 1 and 2 respectively of the State List, meaning thereby that all matters relating to the organization, structure and regulation of the police force fall within the ambit of the states. However, the ‘Criminal Laws’ and the ‘Criminal Procedure’ are enumerated in List-3, i.e., the Concurrent List. Both the Indian Parliament and state legislatures have the powers to make substantive and procedural laws in criminal matters. The states can also enact laws on local and special subjects. Thus, under the constitutional scheme, the basic criminal laws have been enacted by the Indian Parliament. (Singh, 2006)

### **Basic Criminal Laws**

The criminal law consists of the substantive law contained in the Indian Penal Code (IPC) as well as the special and local laws enacted by the central and state legislatures from time to time and the procedural law laid down mainly in the Code of Criminal Procedure, 1973 (Cr.P.C.) and the Indian Evidence Act, 1872.

These three major Acts, i.e. the IPC, Cr.P.C and the IEA were enacted by the British during the second half of the 19th century. Out of these, the only major law that has been revised since Independence is the Cr.P.C, which was revised in 1973 on the recommendations made by the Law Commission of India. The other two laws, except for some minor amendments, have remained unchanged.

**Substantive law.** The IPC defines different types of crimes and prescribes appropriate punishment for offences. Offences are classified under different categories- offences against state, armed forces, public order, public justice, public health, safety, morals, human body, property and offences relating to elections, coins, government stamps, weights and measures, religion, documents and property marks, marriage and defamation. The IPC has 511

Sections, of which 330 are about punishments. Besides IPC, the local and special laws also contain penal provisions.

**Procedural law.** Procedural law describes the procedure to be followed in a criminal case from registration, investigation and to its final disposal after a proper trial by a court of law. Code of Criminal procedure and The Indian Evidence Act are two chief procedural laws in India. The police are not empowered to take cognizance of all penal offences. Criminal law makes a distinction between two categories of offences- cognizable and non-cognizable.

The Indian Police Act has also been enacted by the Indian Parliament. The states have also enacted laws on several local and special subjects. Some states in India have also enacted their own Police Acts. The Indian Police Act, 1861, however, is the basic statutory law governing the constitution and organization of police forces in the states.

## **Components of Criminal Justice System**

The criminal justice system has four important components in India, namely, the Investigating Agency (Police), the Judiciary, the Prosecution Wing and the Prison & Correctional Services. A brief mention of their structure and their roles is made here below:

**Investigating agency.** The police forces are raised by the state under the Indian Police Act, 1861. The basic duty of the police forces is to register cases, investigate them as per the procedure laid down in the Code of Criminal Procedure (to be referred to as the Code hereinafter) and to send them up for trial. In addition to the State Police Forces, the Government of India has constituted a central investigating agency called the Central Bureau of Investigation (CBI) under the special enactment called the Delhi Special Police Establishment Act, 1946. It has parallel jurisdiction in the matters of investigation in the Union Territories. It can take up the investigation of cases falling within the jurisdiction of the state only with the prior consent of the state governments concerned. There are certain other specialized investigating agencies constituted by the central government, in various departments, namely, the Customs Department, the Income Tax

Department, the Enforcement Directorate, etc. They investigate cases falling within their jurisdictions and prosecute them in the courts of law. Thus, India has both the state police investigating agencies and central investigating agencies as mentioned above. CBI, however, is the primary investigating agency of the central government.

**The courts.** The cases instituted by the state police and the Central Investigating Agency are adjudicated by the courts. We have a four tier structure of courts in India. At the bottom level is the Court of Judicial Magistrates. It is competent to try offences punishable with imprisonment of three years or less. Above it is the Court of Chief Judicial Magistrates, which tries offences punishable with less than 7 years. At the district level, there is the Court of District and Sessions Judge, which tries offences punishable with imprisonment of more than 7 years. In fact, the Code specifically enumerates offences which are exclusively triable by the Court of Sessions. The highest court in a state is the High Court. It is an appellate court and hears appeals against the orders of conviction or acquittal passed by the lower courts, apart from having writ jurisdiction. It is also a court of record. The law laid down by the High Court is binding on all the courts subordinate to it in a state. At the apex, there is the Supreme Court of India. It is the highest court in the country. All appeals against the orders of the High Courts in criminal, civil and other matters come to the Supreme Court. This Court, however, is selective in its approach in taking up cases. The law laid down by the Supreme Court is binding on all the courts in the country.

**Prosecution wing.** It is the duty of the state to prosecute cases in the courts of law. The state governments have constituted cadres of public prosecutors to prosecute cases at various levels in the subordinate courts and the High Court.

**Prisons and correctional services.** This is the fourth important element in the criminal justice system. The prisons in India are under the control of the state governments and so are the correctional services.

## **The Process of Criminal Trial**

The procedure of criminal justice has the following key steps:

### **Step- 1: Registration of the First Information Report (FIR)**

Police organization, in any society, is said to be the chief law enforcement agency of the criminal justice administration. Crimes and offences of general nature are, therefore, registered and investigated by the police stations. Police station is the primary and basic unit of crime registration in all civilized societies. Registration of crime and recording of an FIR is thus, one of the fundamental duties of the police.

Offences of various types, as per the provisions of CrPC, are classified as cognizable and non-cognizable offences. The offences in which police can arrest without warrant are classified as cognizable offences and the other ones are known as non-cognizable offences. On receipt of a report about commission of a cognizable offence, it should be recorded in the prescribed format, and this process is called recording of FIR.

### **Step- 2: Investigation of Crime**

The concepts of Rule of Law, Due Process of Law and Natural Justice necessitate that all crimes should be registered promptly and they should be investigated impartially and competently. Police Station is the chief center of registration of crime and, accordingly, the staffs posted there have legal powers and prescribed duties to investigate the crimes and cases. Various provisions of the Cr.P.C. and other enactments empower police to register crimes and take up investigation for their legal and logical conclusion.

After registration of the offence and sending FIR, the police officer has to proceed in person or he shall depute one of his subordinate officers to proceed to the spot for investigation and also for taking measures for discovery and arrest of the offender (section 157 Cr.P.C.). This would include functions like:

- Guarding and protecting the crime scene

- Recording of the crime scene
- Searching for the evidences
- Collection and packaging
- Maintaining chain of custody

#### Step-3: Filing of Charge sheet

After completion of investigation, the officer in charge of the police station sends a report to the area magistrate. The report sent by the investigating officer is in the form of a charge sheet, if there is sufficient evidence to prosecute the accused. If sufficient evidence is not available, such a report is called the final report.

#### Step-4: Court Trial

On receiving the charge sheet, the court takes cognizance and initiates the trial of the case. Common features of the Criminal Trial are:

- Framing of charge or giving of notice
- Recording of prosecution evidence
- Statement of accused
- Defence evidence
- Final arguments
- Judgment

#### Step- 5: Dispensing verdict

If the trial ends in conviction, the court may award any of the following punishments:

- Fine
- Forfeiture of property
- Simple imprisonment
- Rigorous imprisonment
- Imprisonment for life
- Death Sentence

In arena of criminal justice, laws are continually being broadened and revised to counter the alarming increase in crime rates. In response to public concern, law enforcement agencies have to expand their patrol and investigative functions, hoping to curtail the rising tide of crime.

## **PART-B: AN OVERVIEW OF APPLICATION, SCOPE AND LIMITATION OF FORENSIC SCIENCE**

Part-B of the chapter provides the overview of general application and significance of forensic evidence in Criminal justice system. The theoretical potential of Forensic evidence is discussed under different captions. First segment deals with the definitive aspect of Forensic Science preceded by next section which shows application of Forensic Science in general. The third segment shows scope of Forensic Science and various fields of the subject. The fourth section explains the generalized rules to be followed by investigating agency or police at scene of crime. The basic concepts to take into consideration while evidence collection, packaging and preservation are pointed out. Importance of maintenance of chain of custody is also discussed. The role of Forensic Expert while conducting analysis and preparing Expert Opinion Report are stated in subsequent section. Following portion contends with admissibility of forensic evidence according to prevailing law, in Indian context. This part also focuses on generic responsibilities of prosecutors, Expert witnesses and judges to uplift such evidence towards successful verdict in court of law. Lastly, aim and objectives, Research Problem and significance of the present study are discussed.

### **Forensic Science: An Extensive Aspect**

Crime is as old as the human civilization itself. Crime in some or the other form have existed in society from the time human race has come to life. Societies define crime as the breach of one or more rules or laws. (Krishnamurthy, 2011) Societal norms were set for identifying the do's and don'ts for the people, if they were to live together. The aim was to recognize the people who go behind the laid down norms, penalize them and isolate them from the mainstream and hence keep the society clean. This gave birth to the processes of discovery and investigation of crime and administration of criminal justice, which in order, led to the establishment of institution for investigation, trial and for imparting impartiality. (Nanda & Tiwari, 2001)

The chief object of Criminal Justice System is to protect the innocent, to reveal the truth and to punish the real culprit. The Courts should ensure that justice is being done and no innocent person is convicted. But, an impression is gaining prevalence that actual culprits escape punishment. The society is peeved at this reverberation. This happens due to the failure of prosecution to produce sufficient and clinching evidence. It is possible that the courts may be convinced that the accused has committed the offence, but they are not in a position to convict him because of the dearth of reliable evidence. It becomes necessary for the law enforcement agencies to rely upon such evidence which may rule out these problems. Here prosecution agencies and judiciary look towards the scientific ways of investigation. Because of these reasons, role of 'forensic science' and 'expert witness' is increasing day by day.

Forensic science is science used for the purpose of the law and thus any branch of science used in the resolution of legal disputes is forensic science.

Certain definitions of Forensic science are as follows:

"Science as it pertains to the law" (William J. Tilstone, 2006)

"Forensic science is the application of science to criminal and civil laws, mainly - on the criminal side - during criminal investigation, as governed by the legal standards of admissible evidence and criminal procedure" (Forensic Science, 2017)

"Science relating to, used in or suitable to a court of law; any science, used for the purposes of the law is a Forensic Science" (AAFS- American Academy of Forensic Science, 2017)

In the broadest sense, forensic science is any science used in the resolution of legal conflicts. Application of complex and scientific evidence is being increased, as a component of litigation in civil and criminal cases.

## **Need of Forensic Science**

The necessity for the application of science in criminal investigation has arisen from the following factors:

### **Social Change**

Society is subject to change and the social structure changes with the changing time. India has developed from colonial rules to the democratic republic. (Sharma, 2011) Causes of social change include economic changes, modernization, industrialization, bureaucratization, conflict and competition, ideology, diffusion, acculturation and evolution. Due to such changes the crime investigation techniques have also reformed. During the British governance the role of police was quite awful. The third degree torturous methods was the supreme technique for making the suspect confess. This techniques were creating huge pressure and fear in the mind of suspect. Contradictory to this, many forensic psychological techniques are developed which can substitute such torturous investigations.

### **Increased Escaping Ease**

In present time, with the advancement of transport facilities and due to overpopulation, the crime probabilities have been increased. Criminals are getting more chances to hide themselves and escape from apprehension.

### **Technological Awareness**

In this era of advanced scientific techniques; criminals are turning cleverer and more scientific. The methods of committing crime are getting modernized, “white collar” crimes are increasing day by day. Consequently, there is a need for more innovative and scientific techniques of investigation to combat the advanced criminals.

### **Wide Field**

With the passage of time, the crime arena is expanding. In the previous era, generally the criminals were indigenous in their city or area. But with the

modernization, even the conventional crimes like theft, robbery etc. are also turning into national and international through cyber-crimes. Some of the other escalating crime areas are financial frauds, Smuggling, Drug trafficking and crimes related to social media.

### **Better Evidence**

Eyewitness testimony has been accepted as a reliable form of evidence in criminal cases for centuries. Now, the validity of testimonial evidence is being questioned because of the facts on its reliability. Ordinarily the physical evidence arbitrated by an expert is relatively unbiased in nature. For instance, Fingerprints at a scene indicate that a particular person was present. Hence, such evidence prove better than testimonial evidences at times. However, such evidences can be corroborative evidences, but always verifiable. (Duara, 2014)

### **Scope of Forensic Science**

Forensic science covers a wide array of areas such as serology, fingerprints, documents, forensic chemistry, DNA, Forensic Psychology, ballistics, toxicology etc. Answers of the following questions may be given with the help of these areas: Who was present at crime scene? Which incidence happened and who was responsible for it? Why did it happen? When did it occur?

With the use of forensic science, the accused can be linked with the scene of crime, by the means of evidences like fingerprint, blood grouping or DNA fingerprinting. It is also possible to link the object to a source, for example linking the fired bullet with the firearm, shoeprint with the shoe, tool marks with the tool etc. Other chemical and physical analysis can be used to recognize the unknown substances found suspicious from scene of crime, e.g. whether the unknown liquid or powdery material found from scene is prohibited drug or illicit substance. (Schiffer, 2009) The unidentified material recovered from crime scene is compared with the standard and control sample (for example, blooded soil compared with control soil) or with the information retrieved from data base (for example, finger print database) for the purpose of recognition. (Encarta Online Encyclopedia, 2017) The ultimate aim of the recognition process in forensic

science is individualization, specifically to say that a particular piece of evidence originates from a precise scene or person.

Fingerprint and DNA are few of the evidences which can be individualized distinctly. For the identification of other type of evidences, appropriate techniques and skills are obligatory to relate them with the specific source. For the purpose, many standard databases and advanced technologies have been created after the contribution of several years.

During the investigations of criminal cases like murder, rape, kidnapping, assault, theft, robbery and civil cases such as forgeries, forensic science is practiced. Forensic science also regulates the laws and policies related to food items, petroleum products, drug manufacturing and automobile discharge observance etc. It is used to determine whether any such laws and policies have been violated. It also deals with forensic medicine and toxicology, personal identification, ballistic and firearm identification, soil examination, identification and association of human hair, blood, serum, hair, saliva etc.

Even though forensic science has been identified intimately with the criminal justice system in the past, now the forensic scientist plays a gradually more active role in civil proceedings and in regulatory issues. There is no curb to the scope of physical evidences found during investigation by forensic expert. Physical evidences can be various types. It can be ranging in size from microscopic (for example, diatoms in water) to macroscopic (for example, car used in committing crime). It may be as outrageous as the unconscious body of an abused child, as intangible as the transient vapors of kerosene resulting from suspected arson fire, or as obscure as the composition of dyes in the ink of a disputed document. (Thornton, 1983)

There are various fields relating with forensic science like Criminalistics, Chemistry, Biology, Entomology, Odontology, Medicine & Toxicology, Anthropology, Engineering Sciences, Cyber Forensics, Questioned Documents and Psychiatry & Behavioral Science.

## **Criminalistics**

Criminalistics is a discipline that operates under forensic science. The American Board of Criminalistics defines criminalistics as the science and profession dealing with the recognition, collection, identification, individualization, and interpretation of physical evidence, and the application of the natural sciences to law-science matters. It is the application of scientific techniques in collecting and analyzing physical evidence in criminal cases. Criminalistics is often termed as an applied science. (Forensic Law, 2017)

The quote of Mr. Paul L. Kirk is important to mention, "Wherever he steps, whatever he touches, whatever he leaves, even without thinking, will serve as silent evidence against him. Not only his fingerprints or his footprints, but his hair, the fibers from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen that he deposits or collects - all these bear mute testimony against him. This is evidence that does not recall. It is not confused by the stimulation of the moment. It is not absent because human witnesses are rather is a factual evidence. Physical evidence cannot be wrong it cannot perjure itself; it cannot be wholly absent. Only its explanation can make a mistake. Only human failure to find it, study and understand it can diminish its value." (Kirk, 1974)

Criminalists use techniques learned in chemistry, molecular biology, geology, and other scientific disciplines to investigate and solve crimes. For the criminalist, crime scene investigation involves the recognition, documentation, collection, preservation, and interpretation of physical evidence which may be as big as a truck or as small as a diatom or pollen grain. Recognition of items out of place, articles improperly located or items added to the crime scene are an important part of crime scene processing. The criminalist collects, preserves, and makes interpretations about the evidence and their relation to the series of events resulting at the crime scene.

The criminalist brings evidence back to the laboratory where examinations will be conducted. Interpretations are made about the relevance of a particular

item from the crime scene by associating particular items of evidence to specific sources and reconstructing the crime scene. This means not only associating a suspect with a scene but also the telling of a story about what transpired before, during and after the crime. (Californian Association of Criminalists, 2017)

## **Chemistry**

Forensic chemistry encompasses organic and inorganic analysis of unknown substances, arson investigation, analysis of petroleum products like petrol, diesel, kerosene; alcohol, Narcotic and psychotropic substances, synthetic fibers, explosives, paint, and any unidentified material found at scene of crime. They are analyzed chemically to establish its composition. Incidents of mass death due to consumption of illicit liquors are very common in our country, such liquors are examined in forensic chemistry division for its content analysis. Illicit manufacturing, possession, trafficking and consumption of Narcotic Drugs and Psychotropic Substances are considered as economic terrorism. Such illicit drugs are also examined by analytical techniques like micro chemical tests, Thin Layer Chromatography (TLC), Gas Liquid Chromatography (GLC), High Performance Thin Layer Chromatography (HPTLC), Gas Chromatography-Mass Spectrometry (GC-MS), UV and IR Spectrometry for complete drug profiling and quantification. Explosive materials, partly burnt cloth pieces of victim in bride burning cases, kerosene containers, matchsticks, adulterated fuel samples, adulterated food items etc. are some other evidences pertaining to forensic chemistry.

## **Biology**

Blood and biological material analysis proves important in the investigation of cases of murder, assault, dacoit, rape, accident etc. The normal crime articles encountered in the above crime are body fluids such as blood, semen, saliva, urine, hair, nails, etc. the analysis of above articles are carried out in Forensic Biology and Serology division of Forensic Science Laboratory. Broadly, Forensic Biology and Serology deals with the examination of biological materials encountered in a crime against persons or property. In addition to the articles mentioned above, fibers, diatoms, plant materials like wood, leaves, seeds, pollens,

wild animal remnants in shooting, poaching etc. are also examined in this sector. DNA profiling for the individualization is also one of the biological techniques.

## **Ballistics**

The use of firearm in criminal offences is of frequent occurrence. In fact they figure prominently in most of the heinous crimes like murders, decoity, robberies, assassinations and also in police encounter. The firearm evidence, therefore, is important in criminal investigations and trials. Forensic ballistics is the examination of evidence relating to firearms at a crime scene, including the effects and behavior of projectiles and explosive devices. The assertion of the experts that no two firearms even of the same make and model, made one after the other, leave identical marks on fired ammunition are alike. A forensic ballistics expert matches bullets, fragments, and other evidence with the weapons of alleged suspects or others involved with a case on basis of above said assertion.

## **Entomology**

Forensic entomology is the branch of forensic science in which information about insects is used to draw conclusions while investigating legal cases relating to both humans and wildlife. It is the broad field where arthropods and judicial system interact. (Gennard, 2013)

Such a practice is commonly used to estimate the time of death when the circumstances surrounding the crime are unknown. After decomposition begins, insects such as blow flies are the first to infest the body. The forensic entomologist can identify the specific insect present in the body and approximate how long body has been left exposed by examining the stage of development of fly larvae. The time required for stage development is affected by environmental influences such as climate and weather conditions. Forensic entomologist must take these conditions into consideration when estimating the post-mortem interval. (Saferstein, 2001)

## **Odontology**

Forensic odontology is the subject in which examination and evaluation of dental evidence is performed, which will be then presented in the interest of justice. Practitioners of forensic odontology provide information for the identification of victims when the body is left in an unrecognizable state. Teeth are composed of enamel, the hardest substance within the body. Because of enamel's resistance, the teeth lasts longer than other tissues as decomposition begins. The characteristic of teeth, their alignment, and the overall structure of the mouth provide the individual evidence for identifying a specific person. Another application of forensic odontology to criminal investigation is bite mark analysis.

## **Medicine and Toxicology**

The field involves the investigation of sudden, unnatural, unexplained or violent deaths. Typically, medical examiners are charged with the responsibility of answering several questions like: Who is the victim? What injuries are present? When did the injury occur? Why and how were the injuries produced? The preliminary role of medical examiner is to determine the cause of death. An autopsy is normally performed to establish the cause of death. During autopsy, other factors can be observed that may indicate the time since death. (Saferstein, 2001)

Toxicology is that branch of medical science which deals with poisons with respect to their sources, characters and properties, the lethal dose and the remedial measures to counter the effect of poison and the autopsy findings. Forensic toxicologists deals with the analytical methods of detection and estimation of poisons in body. The detection of drugs and alcohol in blood and urine samples collected from the suspects in cases of drug abuse and drunken drivers are also carried out in Forensic toxicology division. (Krishnamurthy, 2011)

## **Anthropology**

Forensic anthropology is an area that is concerned primarily with the identification and examination of human skeletal remains. Skeletal bones are

remarkably durable and undergo an extremely slow breakdown process. Because of their resistance to rapid decomposition, skeletal remains can provide individual characteristics during mass disaster. An examination of bones may reveal their origin, sex, approximate age and race. This area of expertise is not limited just to identification, however. A forensic anthropologist may also be of assistance in creating facial reconstructions to aid in the identification of skeletal remains.

### **Forensic Engineering**

Forensic engineers are concerned with failure analysis, accident reconstruction, and causes and origins of fires or explosions. Forensic engineers answer questions such as, how did an accident or structure failure occur? Were the parties involved responsible? If so, how were they responsible? Accident scenes are examined, photographs are reviewed and any mechanical objects involved are inspected.

### **Cyber Forensics and Computer Crimes**

Computer crime can broadly be defined as criminal activity involving an information technology infrastructure, including unauthorized access, illegal interception, data interference, system interference and electronic fraud. Cyber-crime is the latest and perhaps the most complicated problem in the cyber world. Any criminal activity that uses a computer either as a tool or target or both comes within ambit of cyber- crime. The computer may however be target for unlawful acts in the following cases- theft of information contained in the electronic form, e-mail bombing, data dialing, logic bombs, Trojan attacks, internet thefts, etc. (Krishnamurthy, 2011)

### **Questioned Document**

Documents play important role in human life. The criminal has not been slow to realize the importance of document. He has been exploiting the potentialities of their falsification. When a question is raised about authenticity of any document, such is called questioned document. It is a term for a forensic science pertaining to document that are potentially disputed in a court of law.

Scientific detection of forgery is possible in a fairly large number of cases. Examinations and comparisons conducted by document examiners can be diverse and may involve any of the following (Questioned Document Examination, 2017):

- Handwriting and signatures
- Typewriters, photocopiers, laser printers, ink-jet printers, fax machines
- Rubber stamps, price markers, label makers
- Ink, pencil, paper
- Alterations, additions, erasures, obliterations
- Indentation detection and/or decipherment
- Sequence determination
- Physical matching

## **Psychiatry and Behavioral Sciences**

Forensic Psychiatry and Psychology is a specialized area in which the relationship between human behavior and legal proceedings is examined. Forensic Psychiatrists are retained for both civil and criminal litigations. For civil cases, they normally determine whether people are competent to make decisions about preparing wills, settling property or refusing medical treatment. For criminal cases they evaluate behavioral disorders and determine whether people are competent to stand trial. Issues in family and domestic relations may include juvenile delinquency, child custody, parental fitness, domestic abuse, adoption, and foster care. Forensic Psychologists also examine behavioral patterns of criminals as an aid in developing a suspect's behavioral profile. The Psychological tests like brain mapping and polygraph are also conducted on criminals by forensic psychologists.

## **Forensic Evidence and Crime Scene**

Crime Scene is the place where a criminal offence has occurred. As the crime is diverse in nature the crime scene differs with each crime. The only consistent about a crime scene is its inconsistency in location, nature of the crime, the person involved in a crime etc. Crime Scene can be classified as, Primary crime

scene where the main crime has occurred and secondary, where subsequent articles are found.

Every physical clue materials has link to the victim, crime scene and suspects, though every physical clue materials may not directly be associated to a specific person, place or object, it is the skill and expertise of the team to associate the physical clue material to the person, place and objects.

Physical evidence can play following role in detection of crime.  
(Krishnamurthy, 2011)

- Physical clue materials and physical evidences play a vital role in crime detection
- It scientifically proves the actual incidence that has occurred
- Directly link to the crime with the criminal and the victim
- Fix up the place of offence
- Enlighten the modus operandi
- Establishment of the fact by use of scientific analysis cannot be denied
- It is not time related
- It can establish the identity of the criminal and the victim
- It may safe guard the innocent person
- Physical evidences are proved scientifically and hence more reliable than eye witnesses who often turn hostile
- Physical evidences have legal and scientific standing in the court of laws
- Hence physical evidences are authentic tool in the hands of law agencies and judiciary

Normally when a crime occurs, it is the common man who notices it and report to the nearest police station. Thus the first responding officer is usually the police officer. As the crime scene may be of varied nature, the first responding officer has to be alert to act immediately as per the need.

## **Crime Scene Protection and Documentation**

It is prime job of first responding officer to protect the crime scene from people not directly connected to the investigation, press, curious onlookers, family members of victim etc. The crime scene should be barricaded. Anyone entering the crime scene may alter or change the crime scene and its physical evidence. Hence, access to crime scene should be restricted only to the experienced experts who will be scientifically collect the physical evidence without any contamination and tempering of the clue materials and physical evidence.

Documentation and other procedure should be done in front of two reliable witnesses mainly the locals where the crime has occurred. The documentation should detail the complete crime scene with respect to time of occurrence, place of actual event, eye witnesses account, nature of crime occurred with complete facts of the crime, the names of the officers, the different agencies who visited the crime scene to help the investigating officer to collect proper clue materials and physical evidence. The systematic process presented will maintain the organized nature of scientific crime scene investigation. Sketching, photography and videotaping are important ways of crime scene recording. Sketch of the crime scene is a document which gives the true relationship of the crime articles, locations and the distance between each other in real scale measurement. Photographing gives a true and accurate pictorial record of the crime scene and the physical evidence present. Photographs can be used later in the court proceedings as important evidence. Videotaping the crime scene is an important document which throws light on the three dimensional views of the objects in crime scene and hence is an orientation format.

## **Methodic Search**

Crime scene after being protected should be methodically served by the expert team, normally the experienced expert eye do not miss any of the physical evidence at the crime scene. The stepwise survey would isolate all the foreign material and try and see how they link with the history of the crime as given by the eye witnesses. Macroscopic nature article are normally noted by all but the

microscopic nature article are generally observed only by the scientific expert. The microscopic evidences are normally small blood stain, fibers, hairs, dust, explosive residues etc. which can link the suspects directly to victim and crime scene. Investigating officers should be trained in forensic science laboratory to handle the crime scene in a scientific way.

Different searching methods like Strip method, Spiral method, zone or quad method and wheel method should be used while searching the crime scene as per the nature and type of crime. As far as possible, outdoor crime scene search should be carried out in day time only. If this is not possible then search should be done with floodlights. In the case of outdoor search the combination of zone and spiral method is the most proffered one, whereas in indoor search spiral method is universally adopted.

### **Collection and Preservation of Evidences**

The investigating officer should be well versed in the changing case law, mainly in regard of search warrant or court order. Failure to search warrant may lead to legal complications. Separate articles should be collected from different places to fix the place of occurrence of the crime. The investigating officers after the signature of the witness seal the crime article and forward it to forensic science laboratory for scientific analysis.

### **Packaging, Labelling, Sealing and Forwarding of the Samples to the FSLs**

Forensic scientist guide the investigating officers in collecting the proper samples for scientific analysis. Each of the articles should be packed separately and labelled for identification. The packing should be done so that no damage or contamination takes place. The container should be clean. The labels should bear the signature of the forwarding officers along with forwarding number and date. Articles collected from different places should be described properly so that the article involved in the crime can be identified. Each article should be labelled separately. All the articles should be sealed in front of witness and then forwarded to the forensic science labs through special messenger along with forwarding

letter by the investigating officers mentioning the complete event details. Name of the accused, victim, CR. No., date of occurrence, IPC and other acts under which the articles are seized, description of the article etc. A list of the examination required should also be mentioned in the forwarding letter. The forwarding letter should contain a copy of the seals which are on the crime articles to maintain the chain of custody. While delivering the samples to forensic laboratory, the signatures of both, receiver and person who hand over the samples to FSL, must be taken in log book without fail.

### **Forensic Evidence and Laboratory**

First and foremost, the forensic scientist must be skilled in applying the principles and techniques of the physical and natural sciences to the analysis of many types of evidence that may be recovered during crime investigation. However, in doing this the scientist must also be aware of the demand and the constraints that are imposed by the judicial system. The procedures and techniques that are used in the laboratory must not only rest on a firm scientific foundation but also satisfy the criteria of admissibility that have been established by the courts. After scientific analysis of the evidences, the expert report is prepared. An expert's report is issued on a standard pattern, which must state essential details as follows:

- The laboratory case and the report numbers
- The case references, the FIR number and the letter number with date
- The date and mode of the receipt
- The description of the packages (with their content) their number, identification marks, seal and the signatures and whether the seals were intact or not.
- The description of the exhibits, identification marks, signatures of the initials, etc.
- The dates on which the examination is commenced and completed
- The number and the nature of the test exhibits prepared
- The experiments carried out, the observations made and the conclusions drawn

- The name of the examiner, his qualifications and his designation.
- The mode of the dispatch of the report and the exhibits

The information given in the report has necessarily to be concise but sufficient to be intelligible to prove the conclusions arrived at convincingly. As the reports are to be utilized by the non-technical layman in most of the cases, now in the absence of the experts under section 293 of the Code of Criminal Procedure, 1974, they are expressed in simple language.

The wording of the inference should be standardized. The standardization increases clarity and obviates chances of misinterpretation. The conclusion (inference) should be displayed prominently. The report should be demonstrated with the experimental data, photographs, illustrations and sketches whenever possible and necessary. \*\*\*

The report should be sent as soon as possible. The adage “justice delayed, justice denied” is literally true in some cases. All the examinations should be carried out expeditiously and the reports thereof issued promptly.

## **Forensic Evidence and Court of Law**

### **Expert Witness**

The forensic evidence after analyzed in the laboratory, be exhibited in the court by the expert. Since the work result of the expert may ultimately be a factor in determining a person’s guilt or innocence, forensic scientists may be required to testify with respect to their methods and conclusions at a trial or hearing. Trial courts have broad discretion in accepting an individual as an expert witness on any particular subject. Generally, if a witness can establish to the satisfaction of a trial judge that he or she possesses a particular skill or has knowledge in a profession that will aid the court in determining the truth of the matter at issue that individual will be accepted as an expert witness. Depending on the subject area in question, the court will more often consider that knowledge acquired through experience, training, education, or a combination is sufficient grounds for qualification as an expert witness.

## **Prosecution / Defence Counsel**

The prosecution or defence counsel who produces an expert for evidence must understand the evidence. For this purpose, if necessary, he should have a conference with the expert before putting him in the witness box. This is especially necessary in heinous cases where it is essential to determine whether the particular death was a murder, a suicide, an accident or an act of self-defence. This prior understanding will not only avoid sudden surprise in the case for him, but he shall also be able to clarify, amplify and ascertain certain points in the evidence, which may prove useful to the cause of justice. The counsel can plan the cross-examination well if he knows the expert, the expertise, the evidence and the details of the case thoroughly.

It is the counsel who co-relate the expert evidence with the rest of the evidence and present to the court a connected whole case. He can do so only if:

- He understands the expert witness
- He is able to show that there is no contradiction in the various types of evidence
- He is able to prove that the various pieces of evidence support one another and lead collectively to one and the only one conclusion that the accused is guilty/not guilty.

## **The Court**

The court is the ultimate authority to evaluate and utilize the expert evidence. The attitudes of courts towards evidence vary tremendously. It is the judge who is interested in real justice. He should, therefore, ascertain the facts, assimilate them and utilize them in the dissemination of justice. The court must see that:

- The expert, the prosecution and the defence have done their duties properly, if they have not, the court should intervene at the appropriate time.

- The expert does not use meaningless jargons or technical terminology to hide the weak points in his evidence or to mislead the court.
- The counsel do not waste time in asking hypothetical questions.
- The points left ambiguous or incomplete, either by prosecution or by the defence, are clarified through the court questions.
- The inconclusive reports are probed to ascertain their probative values and they are given due weightage accordingly.
- The expert is not forced to answer in 'yes' or 'no'. The scientific evidence often needs elaboration. 'Yes' or 'No' answers cannot do justice to the truth in some of the questions.

### **Limitation of Forensic Science**

Many people deal with forensic evidence at different stages in the criminal process. Identification, collection, testing, storage, handling, and reporting of evidence can be deliberately or accidentally mishandled at any stage:

- At the crime scene, evidence can be planted, destroyed, or mishandled.
- At the forensic lab, evidence can be contaminated, poorly tested, used up or mislabeled. (Innocence Project of Minnesota, 2017)
- In the report, results can be misrepresented or misinterpreted.
- In the court of law, the prosecution/defence counsel may fail to properly present or critically appraise the evidence, which may lead to failure of justice. The court may not understand the evidence or under-rate expert witness.

### **Aim and Objectives of the Present Study**

After reviewing the theoretical potential of forensic evidences, growth of forensic science in Indian context, Indian Criminal laws and steps of criminal trials with reference to Indian Judiciary System, it is found essential to evaluate the fidelity of forensic evidences in criminal trials in India.

By studying all the Literature related to present research and analyzing the parameters used as well as limitations in that research, this study is allocated to

the analysis of Judgment delivered by Hon'ble Gujarat high court and Hon'ble Supreme court (pertaining to rape cases) during the period from year 1951 to 2015.

The study aims at evaluating the forensic evidence and its utilization in the justice delivery system.

Following are the objectives of present study:

1. To track the judgments to discover various type of evidences used in different judgments.
2. To identify crimes in which Forensic Evidences are used utmost
3. To critically evaluate the implication and reliability of forensic evidence in court of law
4. To identify the strength and weaknesses of forensic evidence in the investigation of volume crime
5. To spot the lacuna, if exists, among investigating agency, forensic experts and judiciary system

### **Statement of Research Problem**

“A problem well-put is half solved” is an old saying. Research problem is no more or no less than a certain question or set of questions to which the research is to provide an answer. To put well a research problem, the research must look analytically at various aspects of the problem and raise questions about the same. (Kumar, 2008) The present study lay emphasis on Forensic Evidence and Indian Criminal Justice system.

Developments in science and technology have significantly expanded the role of scientific evidences in Criminal Justice System. With the worldwide development of Forensic Science, Crime Investigation and Criminal Justice system of India have also adopted the Forensic Investigation technics. However, the present scenario of criminal investigation in India is a depressing story. A huge number of the criminal trials, lastly, end in acquittals. These repeated acquittals also make the offenders confident. (Sharma, 2011) Even in dreadful crimes large

number of criminals are not prosecuted and a limited number of trials end in conviction. And so, how forensic evidences results in actual conviction at a trial is need to be studied. Very less research is carried out to examine the effects of forensic evidence on the outcomes of criminal cases. The comprehensive assessment of impact of forensic evidence on criminal trials is a strong need to improve rationality in criminal justice.

Hence, the problem under investigation is entitled as “Role played by the forensic evidence in the criminal justice processing and outcome of the criminal cases”. These effects are surveyed within a context of cases prosecuted by Hon’ble Gujarat High court and Hon’ble Supreme court of India and the following questions are raised:

- 1) Do the forensic evidences play any role in Criminal Investigation? If yes, what is the extent of Contribution?
- 2) Which are the crimes where forensic evidences play role during investigation and trial?
- 3) Which are the main types of forensic evidences that are found during investigation and sent to FSL?
- 4) How many cases pertaining to Forensic Evidence are prosecuted?
- 5) In how many cases forensic evidences could not reach beyond investigation level? What are the reasons behind that?
- 6) In how many cases forensic evidences could not reach beyond Forensic analysis level? What are the reasons behind that?
- 7) In how many cases forensic evidences could not reach beyond prosecution/defence level? What are the reasons behind that?
- 8) In how many cases forensic evidences are appreciated by court?
- 9) In how many cases forensic evidences are rejected or not appreciated by court of law?
- 10) Do appreciation/withholding of forensic evidence has any relation with rate of conviction?
- 11) Are there any lacunas among investigating agency, Forensic agencies and Court of law?

- 12) What are the coping strategies to full-fill lacuna, if any, among Investigating agency, Forensic Laboratory and court of law?

### **Significance of the Present Study**

By conducting this study it will be possible to establish the role of forensic evidence at key decision points in the trial on the basis of available evidences. Frequently encountered evidences in specific types of crimes can be categorized. The study will also aid in inferring the types of crime having maximum input/ impact of distinct kinds of forensic evidences. The difficulties with scientific evidence can be identified. The theoretical potential of forensic evidence can be checked, and if any disconnection is found with empirical reality, the reason can be criticized. If there are any loopholes/gap in the system because of which Forensic evidences get dropped at different levels, an effort to tie the loose ends and fill the gap can be suggested so that all forensic evidences in future can become inevitable, This would help in developing a strong Forensic Science Support system to aid both investigating agencies as well as courts resulting in better conviction rate. The area seeking new research in forensic technology can be identified.

The study can be helpful to the students, medical and legal expert and forensic experts to compare and contrast the theoretical potential and legal position of forensic evidence in India. It can be helpful to the students, legal and medical experts, investigating agencies, Advocates, Judicial officer to understand the legal constitutional, social and evidentiary value of scientific evidences and help them to implement the techniques in Justice delivery system. It can provide valuable recommendations to all stakeholders of Criminal Justice System to accept and implement the outcomes stated in the research study.

### **Conclusion of the Chapter**

The definitive aspect of forensic science, various types of evidences, and forensic evidence has been given in the Part-A of the chapter. Various Criminal and procedural laws in Indian context are enlightened. The detailed procedure of criminal trials right from filing of an FIR to conveyance of final verdict by court of

law is also described. Overview of scope and application of forensic science is described in part-B. At last, the objectives of the present study along with research questions are stated. Significance of the study has also been discussed. The information about the previous studies and research work relating to the present research are given the next chapter. Previous research work and its conclusions are thoroughly discussed in the second chapter 'Review of literature' of the thesis work.