

# **INTRODUCTION TO FORENSIC SCIENCE**

## **DEFINITION**

Crimes were reported with the evolution of mankind. Method of commission of the crime has also been witnessing drastic changes with the development in the fields of science and technology. The pattern of committing crimes also has been more and more sophisticated. In order to tackle the crimes in every way possible, there is always a need for a scientific approach that is always one step ahead of the criminals. Obviously there is a need for an exclusive expertise for the investigation of crimes with much precision and flawlessness. Forensic science has provided the requisite solution for the comprehensive resolving of the same in every way possible.

Forensic science is the application of scientific knowledge to aid in the administration of justice. Forensics is a Latin term. It is derived from the term “forum” which means the gathering of people those are seeking justice and the same is administered by the learned elders. Otherwise in a simplest sense, it means court of law. In other words legal proceedings or is used in the court of law for the purpose of resolving the crime with the evidences those perfectly correlated among the crime scene, victim and the criminal. This is achieved through scientific proof and examination so that facts are unraveled flawlessly.

In the contemporary practice, forensic Science is being applied for resolving any type of complexities. It is useful in finding out the fact in any case of unusual happenings, in a simplest manner to find out what went wrong. Irrespective of the materialistic loss, human loss and other property losses this is applied for the fact finding. This is achieved through t

Forensic science embraces most branches of science and is applied to the purpose of law. Forensic science finds its presence in most of the irrespective of their specialty. In every ng is comprises the basic scientific disciplines such as physics, chemistry, biology and their derived subjects such as medicine, anthropology, toxicology, serology, odontology etc. In addition to all these subjects, there are some branches which have been developed exclusively for the forensic applications. They are Ballistics, Finger prints and Document examinations. There are other subjects such as serology, Voice analysis,

Psychology, or Narco analysis, DNA profiling etc which also have got much of application with forensic sciences.

Forensic science is a scientific discipline which is direct to the recognition, identification; individualization and evaluation of physical evidences related to crimes and other complex issues and are resolved by the application of the principles of natural science for the administration of justice.

### Need and Scope of Forensic Science

Time since immemorial crime has been reported in many forms. There may be evolution in the forms and methods of execution of crimes but the crime against the human being and the property are prevalent with the variations of the rates of their occurrence. There is an urgent need for the application of forensic science in the justice delivery system.

In India, there are millions of cases pending in various courts for disposal. There may be chances that they need proper evidences through which the judgment may be delivered. This may indeed needs specific proof for the resolution of the crime with the identification of the criminal and there by the justice is administered. There are a large number of trials, criminal proceedings in heinous (serious) crimes, which end in acquittals. The main reason for such acquittals may be the lack of proper evidences. In some cases the witnesses turn hostile due to varied reasons. Witnesses could be lured with finance or put under threat for life and so they either defy deposing as a witness or turn hostile. So ultimately they are incredible. An eye witness may be wrong (may be compelled to go wrong) and unreliable but scientific evidence will never go wrong. It means that the presence of physical evidences at crime scene will speak the truth and fact about the crime. It speaks for itself and there is no need to explain about anything related to the particular crime as they are the silent witnesses.

In a number of cases, criminals go scot free. In the same way, in many cases, there is a chance of innocents being falsely implicated (convicted).Till recently there was the method of using third degree treatment for extracting the truth from the suspects. In certain cases, innocents who have been brought for the examination under suspicion who did not commit the crime may also confess to the commission of crime for the fear of painful treatments. There can be thousands of criminals go

scot free but there cannot be a single innocent falsely implicated as per the Indian judicial system. The basic principle of criminal justice system is to protect the innocents from wrong convictions while making sure the culprits are punished for the crime they have committed. Even a step further the criminals may have an escape from convictions but the innocents should not be punished at any cost. In some other cases the innocents may have to confess to the commission of a crime that they did not commit because of the fear of third degree treatment.

In such circumstances, there may be foolproof evidence required for the affirmative conviction. So, there is a necessity of expert evidences for the accomplishment of proper delivery of justice. This will be achieved through the experts of forensic sciences. Existence of crime was established from the time of Adams, so to say crime started with mankind; unlike in the past the criminals in contemporary society or world used highly technical methods to execute crimes. So, to detect such criminals it is necessary to have more intellectuals, who have expertise in science and technology.

In a more contemporary perspective, not only the crime detection but also any uneventuality can be detected with the application of forensic sciences. This in a simplest sense is to say *what went wrong* could be established through the forensic sciences. Anything that is non-uniform or any unusual happenings can be analyzed for the facts about the causes or reason for the same through the scientific analysis.

It is not necessary the offences against individuals and properties are only detected or resolved but also any sort of misgivings and nonconforming things are also possibly detected.

Such skills and knowledge in forensic science is imparted through education, training and experience. This will result in emergence of more qualified and highly technical experts of forensic science. They are more needed to tackle the problem of pending cases by way of speedy delivery of justice. In other words, the forensic experts help in solving the problem of civil and criminal cases which are pending for delivery of justice.

## History and Development of Forensic Science

History dates back to the 17<sup>th</sup> century with Archimedes, who detected fraudulence of a fake golden crown through the principle of density and buoyancy. During the 19<sup>th</sup> and 20<sup>th</sup> century it became more popular with a scientific approach. Among the lot, person who initiated the practical aspect of scientific or forensic application for the criminal investigation was Sir Arthur Conan Doyle. Through his fictitious character Sherlock Holmes, he popularized the scientific method of investigation.

Later on there were many scientists who got expertise in various forensic sciences. They are as follows:

**(1). Mathews Orifila (1757-1853)**

He is considered to be the father of forensic toxicology. He did the study on the effects of poisons on animals and also the detection of them. This is the initiative for the establishment of Forensic Toxicology.

**(2). Alphonse Bertillon (1813-1914)**

He devised the scientific system of personal identification. He started to develop scientific anthropometry which is a systematic procedure of taking a series of body measurements as a means of differentiating one individual from another. This has been later replaced the Finger prints. He is considered as the father of criminal investigation through criminal identification with anthropology knowledge.

**(3). Francis Galton (1822-1911)**

He developed method of classification of Finger prints. He is responsible for the present system of identification by Finger prints. Even today it is followed.

**(4). Hans Gross (1847-1915)**

He was the first to utilize various techniques in the field of scientific criminal investigation.

**(5). Edmond Locard (1847-1915)**

He was the first to deliver the concept of exchange of particles in a crime scene. Based on these principle only the scientific evidences are analyzed.

**(6). Albert Osborn (1858-1915)**

He developed basic principle of document examination as a scientific evidence.

**(7). Leone Lattose (1887-1954)**

Dr. Karl landstainer discovered the blood groups but Dr. Leone Lattose devised a relatively simple procedure for determining blood group from a drop or from the blood stain . Even today it is in use.

**(8). Cavin Goddar (1891-1954)**

He devised the technique of comparison of a fire bullet with that of a test one. It is also possible to determine if the particular weapon has been used for firing of bullet. It would be possible to get the exact identity of the weapon and the bullet from where it was fired.

**BASIC PRINCIPLES INVOLVED IN FORENSIC SCIENCE:-**

The laws and principles of all science faculties form the basis of forensic science.

Forensic science has developed its own principle in the simplest sense, law of individuality, principle of exchange, principle of comparison, law of progressive change and principle of probability. There is another principle which states that the facts do not lie.

**[1] Principle of Individuality:-**

This law states that every object either natural or manmade has an individuality which is not duplicated in any other object. That means every object is unique and individualistic.

EX: The man made currency notes (excluding the no.), coins, typewritings etc. are certainly unique, though they have look same or alike.

Even the God's creation such as seeds, fruits, plants are also unique.

This forms the basis for scientific investigation with finger prints being unique. Of course with unique DNA pattern is also available. The DNA pattern may be alike among the uniovular twins i.e Monozygotic twins/ identical twins. Thus investigation is made easier.

**[2] Principle of Exchange:-**

“Whenever any two objects come into contact with each other, there is always an exchange of minute particles or trace evidences in between them.”

According to this principle whenever a criminal or his weapon used for the commission of crime comes into contact with the victim or his surroundings/ objects, trace evidence are left at that site. In the same way the criminal or his weapons picked up trace from the same contact.

EX: In a hit and run case of road traffic accident there is a presence of blood stains in the vehicle that has hit and run away. In the same way the tyre marks, footwear marks, paints of vehicles will be present in the victim’s surroundings. Another classical example is the blood/seminal stain present in the victim of rape, where as presence of hair seen in the body of the accused.

### **[3] Law of Progressive Change:-**

According to this law, “Everything changes with the passage of time. In other words, there is nothing permanent and invariable.”

Example: The criminals undergo progressive change as time passes on.

If the criminal is not apprehended in time, he becomes unrecognizable except for the finger prints, blood groups from stains and DNA profiling. There is also a rapid change occurring at the crime scene.

After sometime the crime scene becomes totally unrecognizable and also there is a chance of physical evidence being lost or tampered or destroyed.

### **[4] Principle of Comparison:-**

According to this principle, it is stated that, “only the likes can be compared.” or

“There is a possibility of comparison only when there are things which are similar.”

Example: A bullet from the crime scene can be compared with the firing weapon (rifle) but not with the shot gun.

When writing on the wall is to be examined, it has to be compared with the similar writing on a wall not on paper. There may be differences for any individual to write on the paper and board with the variations in size and alignment.

#### **[5] Principle of Analysis:-**

This principle states that “The analysis can be no better than the sample analysis.”  
or

“The analysis should be done with the proper sampling (correct sampling and correct packing) is necessary for the right analysis by the experts.”

Example: in the case of seminal stain analysis, the investigation officer collecting the blood stained clothes will not be of any use. When the explosive material has to be tested then it should be residual materials collected from the scene of occurrence of the explosion which has the materialistic substance of the explosion (there would be no use of testing the soil alone for the establishing the identity of the explosive.)

#### **[6] Principle of Probability:-**

This principle is based on the fact that all identification whether definite may be done on the basis of probability.

A probability is a mathematical concept. It determines the chances of occurrence of a particular event in a particular way out of a number of ways in which the event can take place.

Example: In case of identifying the dead body of a spectacled woman with nose piercing and with the tattoo mark in the right arm.

The probability of identification = The probability of spectacles x Probability of nose piercing x Probability of the presence of tattoo over the right arm

$$= 1/5000 \times 1/20,000 \times 1/1000$$

$$= 1/10^{10}$$

**Facts do not lie:**

Eye witness in a particular crime may turn hostile but physical evidences will not change. It is not possible to tamper the scientific evidences. Truth speaks for itself. The factual evidences at the crime scene or on the victim or on the criminal would never go wrong as it speaks the entire episode of what has happened. In a case of death after the surgery on an individual revealed that the patient died due to the excess bleeding occurred because of the scalpel / blade within the abdominal cavity by mistake. So the surgeon's appeal of innocence was not entertained as the blade itself proves the doctor's negligence. This is such a classical example for the explanation of the factual evidences speaks for itself.

Oral testimony of a witness is modified by external influences (threats, emotional blackmail, influence of money power, muscle power) but the material / scientific evidence will never be altered. The presence of a seminal stain over the garments of the victim of the sexual assault may reveal the episode of what would have happened. The presence of the poisonous substances in the biological tissues establishes the administration of the same.

By the application of all these principles with much perfection and precision, the resolution of the crime becomes easier with more accuracy, authenticity and accountability. The

#### Forensic Science Laboratory in India/Development

In India there were only the finger print bureau under the state Criminal Investigation Department [C.I.D] which was providing the examination of finger prints, foot prints and document analysis. Chemical test on biological evidences were also done such as with blood and other visceral tissues.

Due to slow process and lack of systematic development, Forensic Science Laboratory (FSL) were set up by various state governments. First such laboratory was set up in 1952 at Calcutta. Central Forensic Science Laboratory and central finger print bureau were established in Calcutta in 1955 and 1957.

Later with the recommendation of central advisory committee, other Forensic Laboratories were established in erstwhile Bombay, Madras, Bihar, Punjab, Rajasthan and Madhya Pradesh.

At present Bureau of Police Research and Development (BPRD) acts as nodal agency for the central government. In states like Andhra Pradesh, Gujarat, Maharashtra, Tamil Nadu and U.P regional FSL were set up. Other institutions like department of explosives, Indian security press were also set up later.



Modern biological techniques were made available in the center for DNA finger printing and diagnostics situation in Hyderabad. It carries out DNA profiling, diagnostics, genalysis and bioinformatics.

This center has data base for all the case work that were entrusted to them for the analysis. This is the primary centre for DNA testing.

### **Anthropometry Bureau:**

This was established in Calcutta in 1892. This has adopted Bertillon's method of personal identification. This center has got records of criminals such as photographs and other detail description of appearance.

### **Finger Print Bureau:**

William Herschel the collector of Hugli in West Bengal found that marking on the fingertips of an individual never changes during the life time. He applied his knowledge and skill in devising system of registration of finger and thumb impression of the entire estate employer. Edward Henry followed this principle of recording finger prints of criminals and there by a finger print bureau was established in 1897 at Calcutta.

### **Department of Explosives:**

This was established to know causes of explosions and to detect the type of explosives. Such centers were established at Nagpur, Calcutta, Bombay, Madras, Agra, Gwalior and sub division such as Shivakashi.

### **Government Examiner of Question Document (G.E.QD):-**

During the struggle independence, the government of west Bengal created this post (to identify the handwritings of secret documents, example-little of freedom fighters). It was later shifted to Shimla under the control of criminal investigation department.

### **Serologist to Government of India:-**

When the science of examining human blood in India was started, it has become possible to examine seminal stain also in criminal investigation in certain specific cases where it was felt mandatory.

Serology department was first established in Calcutta later, it was known as chemical examination laboratory of India.

### **Foot Print Section of C.I.D**

It was established in Calcutta in 1915. The main duty is to collect, preserve and analyze the foot print for identification.

### **Forgery Section of C.I.D**

In 1917 this section was set up under C.I.D by government of West Bengal.

They detect the cases of currency /coins and forgery notes/documents.

Later on government security printing press was established in Nashik.

### **Ballistic Division**

In 1930, it was established in Calcutta, later on all the other laboratories started establishing.

In addition to all this there are other institutions that provide scientific assistance for investigation those are finger print bureau government examiner of document, mobile forensic laboratories, and scientific C.I.D section and computer division.

### **Finger Prints Bureau**

Every state has got this facility in addition to this national crime records bureau under control of central government in Delhi.

The finger print record or data base at a national level has been digitized and computerized. Any police force / organization can utilize this service.

The main functions are to collect from or store the record of criminals including the fingerprints and modus operandi and other identification parameters. They are also empowered to eliminate the record of those who are dead. It also provides facility for search and locates finger prints records of a given person. They may be able to compare the finger prints found at crime scene and to give the evidences in the court of law.

### **National crime Records Bureau**

This agency is exclusively dedicated to the maintenance of records of the criminals those are apprehended or convicted. They also have the data for the missing persons for the easy accessibility and identification. The crime records contain the personal details of the convicts or suspects such as the name, residential address, affiliations, identification marks, sex religion and the section under which the person has been convicted and related information is provided in them. There is also the availability of the modus operandi of the crime that was committed by the criminal.

## **Government Examiner of Questioned Documents (G.E.Q.D.)**

Though it was established first in Shimla another zonal institution was established in Calcutta. They examine disputed or forged documents. Both central and state government has these facilities in their respective laboratories.

## **Mobile Forensic Laboratory**

Most of the states in India have got this Facility. The main function is to help police personnel in their investigation at a crime scene by helping them to locate, to collect and preserve the evidences. The team will also provide photographic facility to record crime scene and the valuable evidences. Another important duty is to guide the police to collect adequate and correct sample for comparison and also provide leads for further investigations.

## **Scientific C.I.D Section**

Some police are trained scientifically to help the department where technical photography, scientific surveillance and investigations and other technical needs are existing.

## **Computer Division**

Though the uses of computer in police organizations are limited but still they have more significance in the collection, recording and analyzing data in the electronic form. This may be available in any crimes involving either physical presence of the perpetrator or even in the absence of oneself. It would be mandatory that no crime would be possible to be committed without the communication of the information in any form (such as calls through mobile phones, email, SMS messages etc). There is a possibility of retrieving all these data through the analysis done in this division. Not only the retrieval of the data but also the possible determination of the location of the specific data that has been generated.

## **Forensic Science Laboratories**

Forensic science laboratory is the main centre of scientific investigations. It is divided into various divisions or departments. They are chemistry, Physics, Biology, Ballistics, Explosives, Toxicology, Serology, Narcotics, DNA, Voice analysis, Finger prints, Lie detection, Narco analysis and forensic psychology and Photography, Documents, Instruments, cyber forensics, and so on.

The head of institution is the Director; there will be additional Director or joint Director in large labs. Deputy Director who is specialist in the particular field will head the respective department. There will be assistant Director, scientific officers,

scientific officer, scientific assistant, lab assistant. The laboratories in India are very equipped with both modern as well as conventional equipments. Most of them are sophisticated such as Scanning electron microscopy, comparison microscope, fluorescence spectrophotometer, , mass spectrophotometer, NMR, HPLC, FT -IR, UV, X-ray diffraction analysis .

### **Main Functions of FSL:-**

The main functions of FSL are the examination of clue materials involved in crime. The physical evidences that are sent for analysis would be properly and systematically examined for the rightful and accurate results that are relevant to the crime and identification of the criminals. In addition to this the laboratories also conduct photography and examination of crime scene. In other words the entire management of the crime scene is being well taken care of by the experts of the forensic sciences.

Other functions are giving lectures , training and demonstration to police officers and judicial officers.

They carry out research in forensic sciences for the advances that are to be explored for the better results of any analytical examination. The forensic expert appears whenever they are required to explain or prove their findings.

There are various academic institutions that provide degrees in forensic such as Punjab University, Agra Univ. , Gujarat Univ. ,Sagar Univ. , Usmania univ. , Karnataka Univ. , Madras University,. National institute of criminology and Forensic sciences, Delhi too offer degree courses. There is provision for research in these institutions also.

### **Services Provided By FSL:-**

There are a number of services provided by various units of FSL. They are as follows

#### **Physics Division:**

By using modern analytical instruments they examine glass, soil, paints, also metals and trace evidence analysis are done in this division. There is a provision of testing construction of materials such as cement, concrete and iron beams etc for their strength and quality as per the standards mentioned in the protocol.

#### **Chemistry Division:**

In this unit analysis of alcohol and drugs such as narcotics and petroleum products are being done. The analysis of edible oils, petroleum products and other drugs for their standards may be done in this division.

### **Biology Division:**

There is an examination of blood stains and other body fluids such as urine, saliva, sweat etc. Apart from this, there is a possibility of examination of hair, fiber, and botanical substance being done in this division.

### **Ballistics Division:**

Examination of firearms, discharged bullets, cartridge cases are being done in this division. Range of firearm that is from where bullet is fired can be estimated in this division. Using comparison microscope bullets can be compared with original bullets.

### **Document Examination Division:**

In this division the examination of handwriting, typewriting for their authenticity and also analysis of ink and paper is done. Predominantly forgery detection is done in this division.

### **Photography Division:**

This division is totally dedicated to record the physical evidence with highly technical photographic instruments.

### **Toxicology Division:**

In this unit examination and detection of poisons from body fluids, organs are done. All qualitative and quantitative analysis is done in this division.

### **Fingerprints Division:**

In this division the examination and comparison of finger print is done. The detection is done using the automated fingerprints identification system.

### **Instruments Division:**

All the high technical instruments are available in this division to analyze the physical evidences specially trace evidences.

### **Narcotics Division:**

In this division the analysis of narcotic drug is done.

### **Narco Analysis / Psychology Division:**

In this division the examination of criminal is done by administration of specific drug to get a psychological profile. The psychological investigation is done through various methods and by doing so there is a chance of extracting the truth and fact from the criminal is possible.

### **DNA Division:**

In this division the analysis of body fluids are conducted for the identification of individual. In addition to this, the identification of paternity, maternity, child swapping are also possible.

### **Anthropology Division:**

In this division examination of skeleton remains or bones is carried for the determination of sex, race, age and other related queries.

### **Cyber Forensics / Computer Forensics:**

In this division the detection of computer related crime is carried out such as getting unauthorized access into other system (Hackers) and Fraudulence through internet.

### **Other Forensic Science Services**

Even though the service rendered by the laboratory are by and large multifarious, there are certain other services which have been provided with specialized skills such as Forensic Pathology or Forensic Medicine which is more Indian prospective, Forensic anthropology, Forensic odontology, Forensic entomology, Forensic psychiatry, Forensic engineering etc.

These services are made available outside the FSL.

#### **(1). Forensic Medicine:-**

The application of medical knowledge for resolution of crimes is carried out in this division. These experts are also able to opine about the causes of death due to accident, suicide, homicide or natural. They can also opine above the time of death with the change occur after death. This is possible by examination of body for the decomposition changes. They can also determine the age of the individual or age of the dead body by analyzing the formation of bones.

#### **(2). Forensic Anthropology:-**

It is mainly concerned with identification and examination of human skeleton remains. They can opine about age, sex, stature race by examining the bones.

### **(3). Forensic Entomology:-**

This is a study of insects and their relation to criminal investigation. This is very useful for the estimation of time of death by studying the developments of insects in a dead body

### **(4). Forensic Psychiatry:-**

This is specialty in which the relationship with human behavior and legal proceedings. Behavior pattern of person is analyzed for the possibility of the commission of crime in a given circumstances and the psychological conditions or to diagnose about the possibility of suffering from some mental illness.

### **(5). Forensic Odontology: -**

These specialists are able to opine about the identity of individual with the examination of teeth. Even in some crime scene if bite marks are available, then there is a possibility of identification of criminals.

Forensic Engineering: This is the novel introduction in the field of forensic sciences through which the accident reconstruction or any other crimes those could be reconstructed based on the physical parameters of the evidences and other related articles.

## **Function of Forensic Scientist**

Forensic scientists play an important role in the criminal justice delivery system because their opinion will be a factor in determining a person's involvement in the crime or innocence.

So, the first and foremost duty of forensic scientist will be to apply his skills and knowledge for the analysis of many evidences by using the principle and techniques of basic science.

The expert should perform the required experiment and observe and then collect necessary data.

The expert should make conclusion based on the data that were collected.

He should prepare the report without any contradictions and confusion, but it should be clear.

He should submit this report to the court through the law enforcement person who has asked for the service.

Along with that the expert must send charts, illustrations, photographs, and other supporting data.

The written report from the expert is accepted in the court , even without presence of expert himself.

But if the court insists the presence of particular expert or personal attendance of expert then he has to attend a court.

The court may have expression of concern regarding the veracity of the scientific evidence.

Such as whether the scientific technique can be tested whether the technique has been subjected to peer review, whether the technique has the error that is permissible, whether the scientific technique has been acceptable with scientific commodity.

So, the expert must be expert to give example from reference book or from book from which data has been matched or confirms.

### **Duties of a Forensic Scientist**

The expert should be thorough in the examination of various samples that are available for the analysis. He should have the thorough updated knowledge in the specific area that is under investigation.

He should prepare notes and illustrations properly of reference of literature and previous study.

He should have no bias or any specific intentions in a particular case.

He should be simple in his language and expressions.

No high sounding words or technical terms.

It should be understood easily by layman.

It is necessary that there would be diagrams, photos, sketches used.



He should have update knowledge in that field.

His conclusion should be clear definite and brief.

He should be through with degree of accuracy or probability.

### **Report:-**

An expert opinion/ report are issued on standard patterns.

It should contain the following details

- (1) The laboratory case and report no.
- (2) Case references (FIR Number. and date)
- (3) The date and mode of receipt.
- (4) Description of packages (with identification marks/ seals and their number) comments about whether seals are intake .
- (5) The description of exhibit's signature or initials etc.
- (6) The questions and answers should be very brief.
- (7) Day on which the examination was commenced and completed.
- (8) The number and nature of exhibits.
- (9) The experiments that have been carried out the observation made the conclusion drawn.
- (10) Name of examiner (his qualification and designation)
- (11) The mode and dispatch of report on exhibits

The information given in report has to be concise but sufficient to be intelligible and to prove the conclusions satisfactory.

The information given in report should have the wordings of interferences that are standardized.

The standardization so used increases the clarity and nullifies or avoids the chances of misinterpretation

The conclusion should be written prominently that it has to either written bold or should be typed in capital letters.

The reports should be illustrated with experiment data, photograph whenever necessary.

The conclusion forms the most important part of report.

It can be definite, indefinite or no conclusion at all

There is nothing wrong giving opinion without conclusions that is due to lack of adequacy / (insufficiency) , degeneration or decomposition of samples.

### **Fallacies of scientific evidence :- ( misbeliefs)**

Scientific evidence is faced with evidence of proof such as investigative, scientific and legal issues.

#### **(1) Investigative Problems:-**

It is concern with the collection of physical evidences.

If investigator is not aware of importance of physical evidences or improper handling of collected evidences or evidences are not collected in time there is a chance of mismanagement and evidences being missed out.

This may occurred due to lack of experience or knowledge on the part of investigation.

There is also the chance of destruction or mutilation of evidences.

Though unintentionally by on lookers who enter the scene with more curiosity.It may lead to destruction of evidences.

In some cases there are some chances of carpus delicti (essence of crime) being lost or tempered. Evidences may have been destructed / damaged

So, proper awareness should be created or knowledge should be imparted to investigators regarding the presentation of evidence without spoilage, contamination, addition of proper preservatives. Maintenance of chain of custody is mandatory.

#### **(2) Scientific Aspects:-**

Scientific evidences are always superior then oral evidences but there is a popular motion that is it weak one.

The reasons among them are it is a more theoretical one, the instruments used for such investigation are not standardized.

There may be chances of improper handling of samples (contamination) and tools that are used may not be uniform and consistent.

**(3) Legal Problems:-**

This involves the enacted law, case law and court convention.

In general these scientific and physical evidences are found to be rudimentary (fundamental) evidences and less reliance is given to them.

There is no legal obligation that scientific evidences may be solely considered for judgment delivery.