Index

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Paper Presentation on
The Role & Admissibility of Forensic Evidence in the Indian Criminial Justice System

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The Role & Admissibility of Forensic Evidence in the Indian Criminial Justice System

INTRODUCTION :–

"Without forensic science, individuals may not be identified, charges may not be brought and convictions may not be possible."

Forensic science is the application of science and technology toinvestigate crimes and establish facts that can be presented in legal proceedings.

DEFINATION AND SCOPE OF FORENSIC EVIDENCE–

Forensic evidence encompasses any information or material obtained through scientific methods suitable for use in a court of law. It's not merely a tool for crime–solving; it's also instrumental in the broader judicial process, helping establish the occurrence of a crime, identifying the perpetrator, and exonerating the wrongfully accused. The scope of forensic evidence is vast, ranging from DNA profiles to digital footprints, each with its unique set of collection, analysis, and presentation challenges.

The objective of investigation and criminal trial is to search for truth and to prevent miscarriage of justice.3 The trilogy of "Justice, Truth, and Evidence" constitutes the bedrock for ensuring responsive governance for building a just society. "Truth" behind a fact essentially assist the court in delivery of justice. However, both justice and truth are abstract phenomenon and "evidence" as a tangible tool helps in ascertaining truth and certifying fair trial.

CATEGORIZATION OF FORENSIC EVIDENCE–

The Indian criminal justice system recognizes a variety of forensic evidence types, each with its own set of investigative techniques and legal considerations.

A. Biological Evidence or Medical Forensics

Biological evidence refers to any sample of biological material —— such as hair, tissue, bones, teeth, blood, semen, or saliva —— from which DNA can be extracted.

1. DNA Profiling: Advancements and Applications:–

DNA profiling has become a staple of forensic investigation due to its high degree of reliability. Advancements in DNA technology, such as STR (Short Tandem Repeat) analysis and mitochondrial DNA profiling, have increased the accuracy of matching samples to individuals. The DNA evidence plays a crucial role in linking the accused to the crime, setting a precedent for its admissibility.

2. Blood Typing and Serological Analysis:–

Blood typing can exclude suspects who do not match the blood type found at a crime scene. Serological analysis further examines the proteins and enzymes in bodily fluids, providing a more detailed genetic picture. Although not as definitive as DNA profiling, these methods are still valuable investigative tools.

Biological evidence like semen and hair samples can be pivotal in sexual assault cases to identify the perpetrator and establish lack of consent.

3. Postmortem Reports:–

Postmortem reports, often referred to as autopsy reports, are vital documents in forensic science. They provide a detailed account of the findings from an

examination of a deceased individual. These examinations are critical in determining the cause and manner of death, whether it be from natural causes, accidental incidents, or foul play.

An autopsy can reveal various pathologies, including those that may not have been apparent prior to death. It involves a thorough examination of the body, including the internal organs, and may also include toxicological testing to identify any chemicals, drugs, or poisons present in the body. The findings in postmortem reports are crucial for establishing timelines in criminal investigations and can provide substantial evidence in court, especially in cases of suspected homicide or unexplained death.

4. Medico–Legal Certificates (MLC) Medico:–

Legal Certificates are documents issued by medical practitioners or hospital authorities that record the examination findings of individuals who have sustained injuries under circumstances that suggest a criminal offense. An MLC includes detailed descriptions of the injuries, the possible instruments used, the time frame of the injuries relative to the examination, and any other observations that could be relevant for legal proceedings.

MLCs are often required when individuals are brought into a medical facility under conditions that suggest assault, abuse, traffic collisions, or any incident that could lead to legal action. These certificates serve as an official record that law enforcement and judicial systems rely on for evidence in cases involving bodily harm. They can help to corroborate testimonies, confirm or disprove alibis, and establish the severity and nature of the injuries sustained.

B. Physical Evidence

Physical evidence includes any material items that can be physically or chemically analyzed.

1. Fingerprinting Methods and Efficacy:–

Fingerprint analysis is one of the oldest forensic techniques. India's unique contribution to fingerprinting —– the Henry Classification System —– is still in use worldwide.

2. Trace Evidence: Fibers, Paint, and Other Materials:–

Trace evidence analysis can link a suspect to a crime by comparing materials found on them to those at the crime scene. This includes fibers, paint, glass, and soil, among others. The application of trace evidence was seen in the Nithari case (Noida serial murders), where forensic analysis of hair and clothing fibers was key to the investigation.

C. Digital Forensics

Digital forensics involves the recovery and investigation of data found in electronic devices, an area of growing importance in the digital age.

1. Cybercrime Investigations:–

With the rise of cybercrime, digital forensics has become central to identifying, collecting, and preserving evidence from computers and networks. The Pune Citibank MphasiS Call Center fraud is a case where digital forensic evidence was crucial in tracking down the perpetrators.

2. Data Recovery and Analysis:–

Data recovery can retrieve deleted, encrypted, or damaged electronic information. The analysis of this data can reveal timelines, actions, and intentions, often pivotal in both Cybercrime and cases involving digital evidence.

D. Chemical and Toxicological Evidence

This category includes the analysis of chemicals, drugs, poisons, and other substances found at a crime scene or within biological specimens.

1. Drug Analysis:–

Drug analysis not only identifies controlled substances but can also be used to trace their origin or determine the impairment of individuals. The Mumbai rave party raid in 2012, which led to multiple arrests, relied heavily on forensic toxicology reports.

2. Poison Detection:–

Detecting poisons and their metabolites in biological specimens can be the decisive factor in cases of suspected poisoning. The conviction in the Rajasthan poison tiffin box case was largely due to toxicological evidence.

E. Psychological Forensics

Psychological forensics explores the mental state of individuals, offering insights into their behavior and potential for committing crimes.

1. Profiling and Behavioral Evidence:–

Profiling involves analyzing a criminal's behavior patterns to predict their traits and future actions. This technique was notably used in the Shivani Bhatnagar murder case, where psychological profiling supported the investigation.

2. Lie Detector Techniques:–

While not conclusively indicative of deception, lie detector tests such as polygraphs are used to support investigations. The Supreme Court, in Selvi & Ors. v. State of Karnataka, has held that involuntary administration of lie detector tests violates the right against self–incrimination.

F. Ballistic Evidence

Ballistic evidence pertains to the study of firearms and ammunition used in a crime.

The Ballistic analysis includes examining bullet trajectories, firearm mechanisms, and gunshot residues to determine aspects such as the type of weapon used and the distance from which a shot was fired. This form of evidence proved to be a linchpin in the Jessica Lal murder case, helping to establish the sequence of events.

ROLE OF FORENSIC SCIENCE IN SPECIAL TYPES OF CRIME–

The three basic things through which the admissibility of an forensic evidence is calculated is its accuracy, reliability and relevancy.

Forensic science plays a distinctive role in investigating and solving various categories of crime.

A. Analysis of Violent Crimes: Homicide and Assault

Forensic evidence like DNA, blood spatter patterns, and ballistic reports are pivotal in solving homicides and assaults. These methods can reconstruct crime scenes and establish the sequence of events.

B. Forensic Science in Sexual Offences: Consent and Identification Issues

DNA evidence has become a cornerstone in adjudicating sexual offences. It's crucial for identifying perpetrators and addressing the complex issue of consent.

C. Economic Offences and Fraud: The Role of Document Examination

Document examination, including handwriting analysis and the authentication of documents, is vital in uncovering economic offences and fraud.

D. Counter–Terrorism and National Security: Forensic Intelligence In the realm of counter–terrorism, forensic intelligence—such as the analysis of explosive residues and digital footprints—is critical for national security and the prevention of future attacks.

E. class characteristic evidence– which does not refer to a particular suspect.

For example, a cartridge found at the crime scene belonging to a certain type of firearm.

F. individual characteristic evidence– which associates a particular individual with the crime. For example, the hair found on the body of victim or the fibres found on victim's clothes are consistent with the fibres found on suspect's clothes.Whenever a serious crime is committed, the police personnel devote many hours to collect and analyse forensic evidence from the scene of crime and other places, till the conclusion of the investigation. The application of forensic sciences and the collection of forensic evidence have become an important part of criminal investigations in India. Forensic evidence plays various roles in criminal investigations. It –

01. proves whether or not a crime is committed;

02. highlights the relation between the accused and the victim along with crime scene;

03. establishes the identity of people involved in the commission of the said crime;

04. exonerates the innocent person;

05. corroborates a victim's testimony;

06. assists in proving the facts which are connected to the crime.

07. establishes the element of a crime i.e., it helps in proving the commission of crime;

08. associates or dissociates the accused with the crime; and

09. helps in reconstruction of scene of crime.

ROLE OF FORENSIC EVIDENCE IN CRIMINAL JUSTICE SYSTEM–

The aim of forensic science in criminal justice system is to link the potential offender to a crime scene with the help of physical evidence obtained from the suspect along with a similar sample recovered from the crime scene. The investigating officers and the courts place heavy reliance on such forensic evidence and testimony as it helps provide information about the crime, to the investigators.

Forensic evidences are classified in two basic forms:

1. class characteristic evidence– which does not refer to a particular suspect. For example, a cartridge found at the crime scene belonging to a certain type of firearm.

2. individual characteristic evidence– which associates a particular individual with the crime. For example, the hair found on the body of victim or the fibres found on victim's clothes are consistent with the fibres found on suspect's clothes.Whenever a serious crime is committed, the police personnel devote many hours to collect and analyse forensic evidence from the scene of crime and other places, till the conclusion of the investigation. The application of forensic sciences and the collection of forensic evidence have become an important part of criminal

investigations in India. Forensic evidence plays various roles in criminal investigations. It –

- proves whether or not a crime is committed;
- highlights the relation between the accused and the victim along with crime scene;
- establishes the identity of people involved in the commission of the said crime;
- exonerates the innocent person;
- corroborates a victim's testimony;
- assists in proving the facts which are connected to the crime.

3. Forensic evidence plays three important roles in the criminal judicial process. It –

- establishes the element of a crime i.e., it helps in proving the commission of crime;
- associates or dissociates the accused with the crime; and
- helps in reconstruction of scene of crime.

The prosecutors seem to evaluate forensic evidence differently. One group finds forensic evidence always trustworthy and the second group views forensic science as corroboration for other evidence. However, their views are debatable.

PROCEDURES:–

One of the basic source of DNA testing is blood while many other sources are also there like bones, fingerprints and hair.

it is mandatory for the executives to take samples of the rape victims within 96 hours of incidents

01. GENERAL PROCEDURE TO CONDUCT SEARCH SEIZURE–

Investigation includes all the proceedings under the BNSS for collection of evidence by a police officer or by any person (other than a Magistrate) who is authorized by a Magistrate in this behalf.

02.PROCEDURE FOR PROCESSING SCENE OF CRIME–

Basics of Audio–visual Recordings

I. Preparation:

a. Verify that the audio–video recording equipment is operational.

b. Inform all parties present about the recording process.

c. Use a tripod or stabilizer to prevent shaky footage.

d. No one else other than who has to witness the statement is present in that area during the process of videography

e. For recording statement of the subject/witness setup close–up frame

f. Quality of videography/photography shall be given proper attention that may also be used for comparison purposes or to calculate precise measurements including but are not limited to latent prints, exemplars/standards, other ridge detail impressions, bloodstains,

bullet strikes, transfer patterns, tool marks, bite marks, pattern injuries, and tire or footwear impressions

II. Safety procedure:

a. Ensure that there is no immediate threat to other responders; scan area for sights, sounds, and smells that may present danger to personnel (e.g., hazardous materials such as gasoline, natural gas). If the situation involves a clandestine drug laboratory, biological weapons, or radiological or chemical threats the appropriate personnel/agency should be contacted prior to entering the scene.

b. Approach the scene in a manner designed to reduce risk of harm to officer(s) while maximizing the safety of victims, witnesses, and others in the area.

c. Survey the scene for dangerous persons and control the situation.

Notify supervisory personnel and call for assistance/backup.

III. Securing the crime scene:

a. In order to protect and prevent unwanted access to crime scene by the people with curiosity or malicious intentions, a perimeter must be established by police line tape.

b. In order to prevent contamination of the scene or any other evidence, the officer must prevent anyone from entering into the crime scene.

c. The investigating officer needs to wear gloves and protective clothing to reduce the possibility of contaminating the evidence themselves.

d. Control the flow of personnel and animals entering and leaving the scene to maintain integrity of the scene.

e. Maintain the privacy and confidentiality of scene of crime. Do not allow the media and press personnel.

IV. Preliminary Survey:

a. Do an overall survey of the crime scene

b. Evaluate and establish a path of entry / exit to the scene to be utilized by authorized personnel.

c. Evaluate initial scene boundaries.

d. Conduct scene "walk–through" and initial documentation.

e. Identify and protect fragile and / or perishable evidences.

f. Prepare preliminary documentation of the scene as observed.

g. Ensure that all evidences that may be compromised are immediately documented, photographed and collected.

h. Identify the origin of the incidence and reconstruct the sequence of events. The sequence of events should not contradict with the statement of witnesses.

IV. Contamination control:

Contamination control and preventing cross contamination at scene of crime is essential to maintain the safety of personnel and the integrity of evidence.

a. Limit scene access to people directly involved in scene processing.

b. Strictly follow established entry / exit routes at the scene.

c. Use personnel protective equipment to prevent contamination of personnel and to minimize scene contamination.

d. Disposable device should be used for the collection of biological evidence materials.

Vi. Sketching of scene of crime:

a. The crime scene sketch should generally be rough sketch, however in cases of heinous crime sketches must be to scale also, distances should be

measured accurately and nothing of important should be left out of the sketch map.

b. The exact position of one or two permanent fixture should be provided which will be helpful in ascertaining its distance to the major articles, exhibits, marks such as blood stains, track marks of vehicles etc.

c. The compass point must be indicated and the north point should be obtained by means of a compass.

d. The title, case reference, date, time, name and signature of investigation officer should be mentioned in the corner of the sketch.

e. The photographs should include dead body (if present) to show locations, injuries and condition.

f. Each piece of evidence should be photographed to illustrate where it was found to establish relationship of evidences to the victim.

g. Photographs of evidences should be taken from straight above eliminating potential distance distortions.

03. VIDEOGRAPHY PROPER DURING SEARCH SEIZURE–

a. Never talk while shooting the video and capturing the photographs on the crime scene.

b. Ensure that audio of recorder is off & also turn off mic devices available with the officials present at the crime scene.

c. Begin recording before entering the premises.

d. Include a clear introduction with the date, time, location, case details, and warrant details. As far as possible, the latitude–longitude and time of recording should be recorded along with the video. The video–recording so made shall be part of the case diary.

e. Clearly announce the commencement of the search and seizure operation.

f. Capture a 360–degree view of the area to document its initial condition.

g. Document the search process methodically, covering each room or area in sequence.

h. Focus on capturing the entire search process, including a detailed walkthrough of the area being searched.

i. Capture close–ups of seized items, showing their condition and any identifying marks.

j. Clearly narrate the discovery and seizure of items, ensuring they are visible in the recording.

k. Record the preparation and signing of the seizure list by witnesses.

l. Ensure continuous recording from start to finish without unnecessary interruptions.

m. End the recording with a summary of the search seizure operation.

Post–Recording

a. Review the recording for accuracy and completeness.

b. Securely store and backup the recording.

c. Label the recording with date, time, location, case details, and a brief description of the content.

04. TECHNOLOGICAL PROCEDURES OF STORAGE & TRANSPORTATION–

1. At the conclusion of the officer's tour of duty, the officer shall:

a. Turn in the camera's memory card to the appropriate officer or unit in headquarters by placing the memory card in an evidence envelope with

identifying case information and sealed. This sealed envelope will then be delivered to the evidence specialist.

b. Download the unaltered images into a computer file which has limited access. The writing software approved by the department should not permit re–writing or alteration of recorded images.

2. The evidence specialist, or the designated officer, will copy, without opening, the digital images/ Video onto a Hard Disk or Pen drive or storage devices which will become the "master negative."

3. The hashing should be done at this stage, while transferring data from mobile/ audio–video recorder to dedicated computer/hard disk or storage device, using various tools and softwares (mentioned ahead) of primary & negative/mirror image and documented. Transfers should be depicted in chain of custody forms with responder & evidence expert signing duly. Following tools are available for hashing (only indicative, not exhaustive):

a. Hash Check: Open–source, cross–platform tool with support for various hash algorithms and file formats.

b. Hash Tab: Windows tool that integrates with the Explorer context menu to easily hash files.

c. Hash My Files: Multi–platform tool with advanced features like batch hashing, comparing hash values, and generating reports.

d. MD5 Hash Generator: Generates various hash values for online text input.

e. SHA–256 Online: Simple web tool for hashing files uploaded from your device.

f. Cyber Chef: Multi–purpose online toolset with a hashing module for various algorithms and encodings.

PROCEDURE OF AUDIO/ VIDEOGRAPHY OF SOC ALONG WITH SEIZURE OF DIGITAL EVIDENCE

Common electronic devices that generate digital evidence may include

Device	Types of Potential Evidence
Digital/Video Camera/CCTV	• Pictures • Videos • Files stored locally or on media card
Cell Phone/ Smart phones	• Social media accounts • Text Messages or chats • Call Logs • Contacts • Applications used • Cloud based storage accounts. • App based information. • E–commerce and banking information. • Hidden or Encrypted data. • Videos, audio recordings, pictures. • Location Sharing • Google profiles and timelines • Crypto currency related details
Computer/Laptop	• Social Media accounts • Internet Search History • Documents • Email (Non–web–based) • Encrypted or hidden files. • Deleted files • Network connections

	• Crypto currency related details.
Game consoles and Toys	• Pictures • Videos • Documents • Microphone recordings
File Storage (Hard drive, thumb drive, optical media)	• Documents • Video/Audio files • Excel Sheets of Balance Statements, sales and financial data
Internet of Things (IoT)	• Usage logs • Network logs • AV Recordings • Even motor vehicles may carry considerable digital evidence.
Wearable Devices, Biometric Devices.	• Location • Apps used • Usage Logs • Biometric Data

Ram Ramaswamy v Union of India is pending before the Supreme Court urging the Court to pass guidelines regulating seizure of electronic devices. Since the Government has formed a committee on this issue, which will be coming up with revised guidelines, Hon'ble' Supreme Court has directed in the interim order that: **"...for the time being at least the CBI manual will be followed by all the Central Government agencies."**

The police officer will, as per procedure below, without delay, but not later than 48 hours, send to the Magistrate copy of the list of seized items with the signature of the witnesses and video– recording of the search and seizure process.

i. On completion of the search and seizure operation, the police officer will bring the audio–video electronic device which was used for recording to the Police Station.

ii. At the Police Station, the AV recording will be transferred to the local designated desktop – either directly through device insertion or via Cable or Bluetooth. Mention of this will be made in chain of custody form & Hashing will be done.

iii. The AV recording will be scanned for any virus before any further processing.

iv. The following day, the designated data manager of the police station will transfer all such recordings of the last 24 hours on a portable storage devise and proceed to download all the recordings on the storage device of the Magistrate.

CHAIN OF CUSTODY:

"Proper custody" means the record was maintained in a secure and reliable system with appropriate access controls and audit trails. (Kindly refer Sec. 81 with explanation, Sec. 93 of the BSA)

BSA Explanation to Sec 80 & 81

Documents/Electronic Records are said to be in proper custody if they are in the place which, and looked after by the person with whom such document is required to be kept; but no custody is improper if it is proved to have had a legitimate origin, or if the circumstances of the particular case are such as to render such an origin probable.

Chain of custody of electronic evidence is imperative. Hashing of digital evidence collected should be ensured to ascertain integrity of digital evidence seized. Once packed and sealed in front of the witnesses, a clear record of chain of

custody should be kept in writing for each package till it is handed over to the CFSL for forensic examination. The package should normally be sent for forensic examination to the CFSL without undue delays.

Document the chain of custody

a. Name and signature of each person, including internal staff, who take possession or transport the evidence.

b. Date of transfer.

c. Evidence's label or serial number.

PROCEDURES UNDER BNSS :–

The BNSS, which replaces the erstwhile Code of Criminal Procedure, has been brought in to "use technology and forensic sciences" and "reform" the criminal justice system.

Section 176 of the BNSS provides the broad procedure that investigating agencies should follow after a crime, including how a police officer receives information on a crime and acts on it. Sub–section 3 mandates that forensic experts collect forensic evidence from the crime scene for every offence that carries a punishment of more than seven years. The forensic experts will visit the crime scene after the police get information about the crime and collect the forensic samples, which will then be used by the police for their investigation.

Receipt of information relating to the commission of an offence, which is made punishable for seven years or more, the officer in charge of a police station shall… cause the forensics expert to visit the crime scene to collect forensic evidence in the offence and also for videography of the process on a mobile phone or any other electronic device," Section 176 (3) of the BNSS reads.

This sub–section will only be applicable and operational once the relevant state government decides a date for the implementation of the section. Once the state government decides the date, it has to notify this in the gazette, after which the section will take effect, making its provision operational.

Offences such as rape, child trafficking, murder, and dowry death, all of which carry terms of more than seven years, fall within the purview of the additional requirement to collect forensic evidence from the crime scene.

If a state does not have a forensic facility to conduct such tests, the law allows a forensic testing facility in another state to do it. The now outdated criminal law framework had no defined legal requirements for forensic evidence collection from crime scenes. Whether or not such evidence was required was left to the state police.

The law has raised several concerns, including the broad scope of forensic data collection extending to private persons, the expanded scope of personal data collection, and the exemptions restricting judicial interference with forensic reports.

To meet the infrastructure requirements brought in by the new law, the Centre has set up the National Forensic Science University to expand the pool of forensic science experts and scientists qualifying every year.

Laboratories such as the Central Forensic Sciences Laboratories (CFSL) in Delhi are also undertaking steps, with training and special workshops to prepare their personnel, considering the massive resources and infrastructure required for effectively implementing the new law at scale.

ADMISSIBILITY OF FORENSIC EVIDENCE IN THE COURT OF LAW–

Judicial precedents shape the practical application of forensic evidence in India. The courts, through various judgments, have provided clarity on the nuances of forensic evidence.

The apex court has issued directives to standardize the treatment of forensic evidence. For instance, in Selvi & Ors. v. State of Karnataka, the Supreme Court addressed the admissibility of narco–analysis, brain mapping, and polygraph tests, framing guidelines for their use.

High courts across India have also contributed to the jurisprudence on forensic evidence. Their observations often involve the interpretation of the Evidence Act in light of emerging scientific advancements.

Categorization of Forensic Evidence:–

Some of the most famous criminal cases in India where forensic science played a significant role in solving the crime include: the Jessica Lal murder case, the Neeraj Grover murder case, the Arushi Talwar double murder case (Noida double murder case), and the Satyam scam, where forensic accounting was used to uncover financial irregularities.

Tandoor Murder Case (1995) Delhi, 38 this was the first criminal case in India solved by the help of forensics. In this case Shusil Sharma murdered his wife by firing bullets in to her body because of the misunderstanding that she had illicit relationship with her classmate and fellow congress worker Matloob Karim.

The Indian Evidence act doesn't mentions anything about the essential conditions that has to be followed by the court while examining a forensic evidence.The only thing which the act mentions is in its section 45 where it says

that if a person becomes a expert an expert in a particular field than his evidence should be considered relevant as per the law.Onthe similar note, section 51 of the Evidence Act says that an evidence will become relevant if it is issued by an expert in the subject.

The essential elements of the above provisions can be summed are as:

1. The people who have the required knowledge about the facts and in their respective fields should be considered relevant by the court of law.
2. On relying upon the forensic reports provided by the experts of the respective fields should be considered as a relevant document by the court of law.
3. If any forensic evidence should be projected as irrelevant before the court then it should be considered as a relevant document if they are with respect to the experts

The court has to first evaluate the validity of an evidence in depth in the trial then only that evidence will be considered by the court.

In the landmark case of **Magan Bhiarilal v. State of Punjab** in which the apex court of our country has upheld the conviction set forth by the High court of Punjab and Haryana. The court has observed that the opinion of the expert will only be taken with great caution. The conviction should not be made only on the basis of forensic evidences and it is also against the rule of law which is universally enacted across the countries.

In the matter of **Forest Range Officer v. P. Mohhamad Ali**, the apex court of our country held thatthe admissibility of an forensic evidence should only be undertaken when assistance of expert will be taken.

Forensic evidences will only become admissible before the court of law when they are put forward with the relevant facts of the case. When an evidence is considered as relevant its authenticity, transparency and accuracy has been

checked by the court of law. The evidences should meet the standards set forth by the court and should maintain the integrity.

Accuracy is the basic essential element that has to be fulfilled by an forensic evidence to become admissible in the court. The courts usually prefers the opinion of an expert in an matter of conflict regarding the forensic evidences and not the reliability of the evidence. It doesn't considers various theories that are made regarding the forensic evidences. Usually it doesn't matter what specific guidelines has been issued regarding the reliability of an forensic evidence, at last it is the discretion power of the judges whether they have to rely upon the forensic or scientific evidences or not. It usually depends upon the mere facts of the case.

LANDMARK JUDGMENTS:–

Judiciary has been vigilant and somewhat cautious in granting excess evidentiary value to forensic experts or the reports, as the report or the expert can be believed to fall victim to 'human error' and only presence of Forensic report without any sufficient corroboratory evidence, to back up the report. As was held by the Supreme Court of India in ***Magan Bihari Lal vs State Of Punjab*** on 15 February, 1977 – 1977 AIR 1091, 1977 SCR (2)1007 , "It is unsafe to base a conviction solely on expert's opinion without substantial corroboration. In the instant case, it would be extremely hazardous to condemn the appellant merely on the strength of opinion 'evidence of a handwriting' expert."

With the landmark judgement above, the forensic reports and their evidentiary value witnessed a setback, as it lost the value of a 'primary evidence' and it alone, couldn't result in a conviction. Further, Section 45 of the Indian Evidence Act, left out much of the power to determine the 'evidentiary value' of

the report to the court, due to words used as 'form an opinion', establishing the expert reports, as more of suggestive in nature, rather than strong evidence.

Further in the case of *Dayal Singh vs State of Uttranchal 2012* SCC OnLine SC 580 , the court reiterated that the entire bjective of the forensic report or expert testimony is to provide the trier of the fact with relevant information as well as to guide the court to reach at a final understanding of the 'facts' of the case. On the other hand, court held that such report won't be binding upon the court, but would amount to have some evidentiary value, which will be decided by the court after careful examination. Court is supposed to read and comprehend the report, and then decide if the same can be relied upon or not.

The simple reasoning behind this treatment of 'Forensic Report' by Criminal Justice system of Judiciary, can be attributed to the fact that the objective of the forensic report is to provide relevant fact, as to what happened, which formulates only one part of essentials of criminal act, that is actus reas. Forensic science can tell us what happened, but not about why it happened. For ex. Forensic report can tell us if A had his fingerprint on the gun, but the fact that A had his/her hands of the gun for either murder or self–defense, is still unknown. Hence, forensic reports face lesser evidentiary value, until and unless backed up strongly by other corroborative evidence(s). As was held in case of *Senthil v. State* 2010 SCC OnLine Mad 5914 , where the forensic report failed to be backed up by corroborative evidence, the court held that, "The discrepancies noticed in the evidence, the recovery witness, and also the Investigator and the contents of the recovery mahazar would also cast a doubt on the said recovery. Under such circumstances, the reports received from the Forensic Sciences Department, cannot be attached with any evidentiary value"

Evidentiary value of a forensic expert report is tied directly with the evidence or nature of evidence put forth in the court, as was held by Supreme Court in case of ***Madan Gopal Kakkad v. Naval Dubej*** 1992 SCC (3) 204 , where it held that "A medical witness called in as an expert to assist the Court is not a witness of fact and the evidence given by the medical officer is really of an advisory character given on the basis of the symptoms found on examination" It was held that the expert opinion once examined and corroborated by the court with necessary evidence, the expert opinion becomes the opinion of the court itself.

The above opinion of the court was reiterated in case of ***State of Himachal Pradesh vs Jai Chand*** (2013) 10 SCC 298 , where it was held that post mortem report, in itself is not substantive piece of evidence, but the evidence or opinion of such doctor cannot be insignificant. The opinion of proper judicial examination before admissing the forensic report was reiterated by Madhya Pradesh High Court, in the case of ***Bhura v. State of Madhya Pradesh*** 2014 SCC OnLine MP 8697 , it was held that "when there is insufficient quantity of the sample, it could not be examined to conclude that it was a human blood. Under such circumstances, when no human blood was found on the clothing of the appellant, its seizure has no evidentiary value."

In another case of ***Jiya Ram v. State of Rajasthan*** 1996 SCC OnLine Raj 136 , the blood was found on the clothes of the accused, and accused challenged the forensic reports, stating that the blood stains have deteriorated and forensic report failed to identify the blood group, hence it should not have any evidentiary value, but the court held that "The circumstance that the blood group could not

be determined because the blood has disintegrated does not reduce the evidentiary value of the report of the Forensic Science Laboratory"

The admissibility of expert evidence was challenged under Articles 20(3) and 21 of the Indian Constitution. The basic argument was that by compelling a person to provide a sample of his handwriting or signature, or forcing him to undergo Narco–analysis, Polygraph Testing, and Brain Mapping, the Court was compelling a person to self–incriminate, which is a violation of Article 20(3) of the Constitution. This entire process also violated a person's right to life and liberty as guaranteed by Article 21 of the Constitution. As a result, the constitutionality of the entire process was repeatedly questioned. An eleven–judge bench of the Supreme Court addressed these questions in the case of ***State of Bombay v. Kathi Kalu Oghad.*** 1962 SCR (3) 10, The Court held that requiring the accused to give fingerprint and handwriting samples for expert opinion under Section 73 did notviolate Article 20(3), and hence was lawful. Giving samples was not equated to being a witness against themselves in this case, as the samples were not evidences per se. Instead, the expert's report would be utilised as evidence in this instance, and the expert would testify against the accused. Furthermore, this case narrowed the scope of protection under Article 20(3) by stating that "to be a witness" means imparting knowledge about facts about which the person has personal knowledge through oral or written statements, whereas giving specimens of fingerprints or handwriting do not fall under this because they have an intrinsic and unchangeable nature that can be verified. As a result, the distinction between "physical" and "testimonial" evidence was preserved in thiscase.It has previously been observed that expert opinions have been limited to medical opinions. However, with the advancement of forensic

science and technology, expert evidence is no longer restricted to medical perspectives, but increasingly includes specialists from other domains as well. In terms of criminal law, ballistic experts, forensic experts, scientists, chemical examiners, psychologists, radiologists, and even track–dogs all play important roles in criminal investigations, and their evidence is acceptable in court.In addition to the provisions of the Indian Evidence Act and the Code of Criminal Procedure, the Supreme Court and the High Courts have passed some decisions regarding the value of expert testimony.

B. CORROBORATION OF EXPERT OPINION

The prime question that arises is who can be called an Expert, what is the function of opinion given by expert in a matter before Court and further what is the character of opinion/advice adduced by an expert in forming opinion by the Court? . Hon'ble Supreme Court in ***Ramesh Chandra Agarwal v. Regency Hospital Ltd.*** AIR 2010 SUPREME COURT 806 has broadly dealt and interpreted the scenario and held that, an expert is a person who devotes his time and study to a special branch of learning. However, he might have acquired such knowledge by practice, observation or careful study. The expert is not acting as a judge or jury. It was further held that in order to bring the evidence of a witness, as that of an expert, it has to be shown that he has made a special study of the subject or acquired aspecial experience therein or in other words that he is skilled and has adequate knowledge of the subject. The real function of the expert is to put before the Court all the materials, together with reasons which induce him to come to the conclusion, so that the Court, although not an expert, may form its own judgment by its own observation of those materials. An expert is not a witness of fact (like other witnesses) and his evidence is really of an advisory

character. The duty of the expert witness is to furnish the Judge with the necessary scientific criteria fortesting the accuracy of the conclusions so as to enable the Judge to form his independent judgment by the application of these criteria. No expert can claim that he could be absolutely sure that his opinion was correct.

Another important issue under consideration is that whether the Courts are bound by the opinion given by an expert on a particular fact in a case. Hon'ble Supreme Court has answered this question in ***Malay Kumar Ganguly v.Dr. Sukumar Mukherjee***, AIR 2010 SUPREME COURT 1162 wherein it has been held that, "A Court is not bound by the evidence of the experts which is to a large extent advisory in nature. The Courts have full powers to derive its own conclusion upon considering the opinion of the experts which may be adduced by both sides, cautiously, and upon taking into consideration the authorities on the point on which he deposes. The opinion could be admitted or denied. Whether such evidence could be admitted or how much weightage should be given thereto, lies within the domain and discretion of the Court. The evidence of an expert should, however, be interpreted like any other evidence."

In ***State of U.P. v. Krishna Gopal***, 1988 (4) SCC 302 the eye–witnesses were found credible and trustworthy. Therefore, the medical opinion pointing to alternative possibilities was not accepted as conclusive. The Apex Court pointed out that witnesses, as Bantham said, were the eyes and ears of justice. Hence the importance and primacy of the orality of the trial process. Eyewitnesses' account would require a careful independent assessment and evaluation for their credibility, which should not be adversely prejudged making any otherevidence, including medical evidence as the sole touchstone for the test of such credibility.

The evidence must be tested forits inherent consistency and the inherent improbabilities. Expert opinion is a rather weak type of evidence, and courts normally do not regard it as providing conclusive proof, thus they do not rely solely on it without getting independent and trustworthy corroboration. For instance, in ***Siddheswar Prasad Singh v. Baba Sundari Pramanick,*** AIR 1978 CALCUTTA 4 it is well settled precedent that a handwriting expert's opinion cannot be regarded conclusive proof unless it is supported by corroborating evidence.

In ***Ram Chandra v. State of U.P.***, AIR 1957 SC 381, the Supreme Court ruled that it would be unsafe to consider the handwriting expert's view as a sufficient ground for conviction, but it can be relied on when corroborated by additional pieces of internal and external evidence. In the case of ***Baso Prasad and Othersv. State of Bihar,*** AIR 2007 SUPREME COURT 1019 it was held that, while expert opinion is relevant, evidence appraisal is the Court's responsibility, and so it is up to the Court to select which expert opinion to consider in situations of contradictory medical and ballistic opinion.

- **Polygraph, Brain–Mapping and Lie Detection**

In general, courts may refuse to accept the results of a polygraph test as evidence. While being questioned, a polygraph test examines a person's unconscious physiological reactions, such as breathing, heart rate, and galvanic skin response. It basically means that when someone lies, they experience stress, which is assessed by changes in their physiological responses. These tests are regarded as unsatisfactory since it is impossible to determine whether or not the stress detected during the test is induced by the test itself.

In ***Selvi Vs. State of Karnataka,*** the Hon'ble Supreme Court, had clarified as under:

The Hon'ble Court, however, left the option of voluntary submission to such techniques open and held that the National Human Rights Commission's "Guidelines framed for the Administration of Polygraph Test (Lie Detector Test) on an Accused" should be strictly followed, and the same guidelines should be adopted for "Narcoanalysis Technique" and "Brain Electrical Activation Profile Test," which are mentioned below:

a.)Lie Detector Tests should only be conducted if the accused gives his or her consent. The accused should be offered the choice of whether or not to take such a test.

b.)If the accused agrees to a Lie Detector Test, he should be granted access to a lawyer and the police and his lawyer should explain the physical, emotional, and legal consequences of the test to him.

c.)The consent should be recorded before a judicial magistrate.

d.)During the hearing before the magistrate, the person alleged to have agreed should be duly represented by a lawyer.

e.)At the hearing, the person in question should also be told in clear terms that the statement that is made shall not be a 'confessional' statement to the magistrate but will have the status of a statement made to the police.

f.)The magistrate must take into account all relevant considerations, such as the length of imprisonment and the nature of the interrogation.

g.)The lie detector test must be conducted by an independent institution (such as a hospital) and performed in the presence of a lawyer.

h.) A thorough medical and factual account of how the information was received must be recorded.

- **Foot Printing**

In ***Pritam Singh v. State of Punjab*** AIR 1956 SUPREME COURT 415 disputed footprints in blood near a dead body and going towards the bathroom, were compared with those of the accused taken in printer's ink. The expert gave evidence giving points of nine similarities in respect of the right foot and ten in respect of the left foot and three dissimilarities only in each case and explained the dissimilarities with reference to the different densities of blood and ink. It was held that the comparison stood the test well and under the circumstances these foot impressions in blood near the place of the incident, were proved to be those of the accused. The Footprint identification is reliable as the bare feet contain friction ridge patterns which are unique to each individual. Hence, the finger prints and footprints found at the scene of offence can be used to help identify the offender and also the victim. As far as science of identification of foot prints are concerned, the court has held that it is not a well–established fully developed science, if in any given case evidence is found satisfactory, it may be used only to reinforce the conclusions as to identify the culprit already arrived on the basis of other evidence. Reference may be given to the case of ***Mohd. Amanv. State of Rajasthan***.

- **Graphology**

A forensic graphologist analyzes all the physical characteristics of the handwriting and frames an opinion to facilitate criminal justice in the court of law.Forensic investigators use graphology to determine the personality traits of an individual. To do so, forensic experts have to study and analyse a large number of handwriting samples, control samples, unknown and suspected samples to frame an opinion. Graphologists use different tools such as magnifying lens to observe the handwriting and specific features. Manual/ Physical analysis involves the

study of various handwriting features such a slant, margins, word spacing, connections, pen pressure, line spacing, movements, formations, 'i' dots, t bars etc. Apart from manual/ physical examination, there are many technological methods for behavioural analysis that can analyse personality traits through the help of the computer. Automated handwriting analysis overcomes the prone and errors of manual analysis and assists the graphologists. Computer–Aided Graphology (CAG) is one such method used by graphologist to predict personality traits. It's an error–free and time saver method for graphologists.

In the case of ***Ishawari Prasad v. Mohd. Isa*** AIR 1963 SUPREME COURT 1728 the court held that the testimony of an expert is usually considered to be of light value. Since, they are proverbially biased in favour of the side which calls them. So evidence of an expert should be approached with considerable caution specially where much depends upon this evidence. The opinion of experts are not binding upon the Judge. The weights due to their testimony is a matter to be determined by the Judge and it will be proportionate to the soundness of the reasons. A Tribunal should not accept the mere untested opinions of experts in preference to direct and positive evidence as to facts. Evidence given by handwriting expert can never be conclusive because it is after all opinion evidence.Thus, in light of the aforesaid judgments it is clear the expert opinion in case of handwriting analysis can only be considered of corroborative value.

In the case of ***Godavarthy, In re*** It was held that when the court has to form an opinion as to writing, the opinion of writing expert is admissible but it should be borne in mind that the opinion of the expert is the weakest and least reliable evidence. It isthus not safe to base the conviction solely on the opinion of the expert.

- **Medical Forensics**

In the case of **Gautam Kundu v. State of West Bengal** 1993 SCR (3) 917, it has been laid down that courts in India cannot order blood test as a matter of course and such prayers cannot be granted to have roving inquiry; there must be strong prima facie case and the court must carefully examine as to what would be the consequence of ordering the blood test.

The court stated in **Amarjit Kaur v. Har Bhajan Singh** 2003(1)AWC344(SC), that section 112 of the Evidence Act was enacted at a time when modern scientific developments with deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) tests were not done. A true DNA test is believed to be scientifically reliable. Even yet, it is not enough to avoid the conclusiveness of the legal presumption regarding the legitimacy of the child. For example, under Section 112 of the Act, if a husband and wife were living together at the time ofconception but a DNA test indicated that the child was not born to the husband, the conclusiveness in law would be irrebutable.

In the case of **Rohit Shekhar v. Narayan Dutt Tiwari &Anr,** 2012(12) SCC 554 the Apex Court laid down that–

"53. We may highlight that as per the dicta of the Supreme Court noticed by the learned Single Judge also, a direction for DNA Testing can be issued onlyafter the test of eminent need is satisfied. The orderdated 23.12.2010 directed DNA testing of respondent1 only after holding the said test to be satisfied in thefacts of the present case. The impugned judgmentthough also holding that the test of eminent need issatisfied has declined to enforce the order. It is thusnot as if the order for DNA testing is made or hasbeen made in the present case on the asking or in aroutine manner for the consequence only of adverseinference to flow from

non–compliance thereof. Wefind inherent contradiction in the court on the onehand holding eminent need for such a test and in thesame breath allowing the need to remain unsatiated."

In **Atami Laxman –Vs– State of Chhattisgarh, 2007 CRI.L.J.** 1036, summarizing the issue of such discrepancies, the **Hon'ble High Court of Chhattisgarh** held inPara–14 that:]

"14 Therefore, it is clear that the eye witness testimony may contain inaccuracies and exaggerations; there may be errors or omissions on account of lapse of memory or poor power of observations or inability to recount and recite accurately. Sometimes, doctors also may not bestow sufficient care while performing examination or preparing records and their opinion may be based on inadequate or incomplete or defective examination or lack of complete knowledge. It is indeed not fair to expect a total correspondence between these two items of evidence. Court must carefully examine the discrepancies and if it is reasonably possible to arrive at the substantial and true version. Court should not throw out the prosecution case on the basis of such discrepancies. Accuracy of medical witnesses and ocular witnesses depends upon several factors.

" If eye witnesses are credible and trustworthy, medical opinion suggesting alternative possibility may not be accepted as conclusive. Primacy should be given to oral evidence."

Relying on the above the Hon'ble High Court of Chhattisgarh held in **Bedu Singh & Anr. Vs. State of M.P (Now Chhattisgarh)** Cr.A. No. 1271 of 1997 held that–

"Therefore, it is clear that if the version of the eye–witnesses are found credible, the medical opinion pointing to some other possibility is not to be

accepted as conclusive and the primacy has to be given to the eye–witness account, however, a careful independent assessment and evaluation of their evidence is required and the medical evidence is not to be treated as final check for the test of their credibility. Their evidence has to be tested for its inherent consistency taking into account the evidence of other reliable witnesses on record."

In **Kishan Lal @ Champa Yadav vs State Of Chhattisgarh,** CRA–565–2022 the Hon'ble High Court of Chhattisgarh has opined that:

"In view of aforesaid legal position qua DNA profiling report and its probative value, the prosecution is duty bound to prove the guilt of the accused beyond reasonable doubt and burden is always upon the prosecution to lead evidence by taking all the precautions for proving DNA evidence. It is necessary for the prosecution as the entire process of collecting the blood samples for DNA profiling is controlled and done by the human agencies i.e. doctors and the investigating officers. Every step to preserve the sample from manipulation/contamination has to be proved, as absence of those steps may cause prejudice to the accused. The prosecution is required to put all the positive evidence regarding the fact that all the precautions have been taken by the doctors as well as by the police officials regarding the preservation of the DNA samples. As held in the matter of Pattu Rajan (supra) DNA report is "an opinion" and its probative value varies from case to case. The science of DNA is at a developing stage, as such, it will be risky to solely rely upon the DNA report in absence of any substantive piece of evidence."

- **Digital Forensics**

In **Buddhu Krishani vs Union of India,** Criminal Appeal No.1028 of 2023, Judgment dt. 26/06/2024 The forensic analysis of Nokia mobile phone alleged to have been recovered from appellant–Baldev Prasad Gupta was carried out and extraction reports of data extraction were generated. After the charges were framed, Call Log details from extraction report of Model – Samsumg J700F/DD phone allegedly recovered from appellant–Baldev Prasad Gupta (IMEI – 356273/07/651748/4, IMEI 356274/07/651748/2) were generated. As per panchnama dated 16.12.2019 (Ex.P–7) and panchnama dated 29.10.2018 (Ex.P–23), K.V.L. Narsimhan (PW–9) carried the mobile phones to Mumbai for forensic analysis of the mobile phones. None of the independent witnesses of the panchnama have been examined and significantly neither the alleged forensic experts have been examined by the respondent during the course of trial.

Problem:–

One of the basic problems that law faces about the admissibility of the forensic evidences is that the Indian Evidence act doesn't mentions anything about the essential conditions that has to be followed by the court while examining forensic evidence. The only thing which the act mentions is in its section 39 where it says that if a person becomes a expert an expert in a particular field than his evidence should be considered relevant as per the law. On the similar note, section 53 of The Bhartiya Sakshya Adhiniyam, 2023 says that evidence will become relevant if it is issued by an expert in the subject. Other than this, none rule has been established by the legislature to address the admissibility of an forensic evidence and to check its reliability.

Suggestions:–

01. Legal Training in Forensic Science: Judges and lawyers require better training in forensic science to make informed decisions.

02. Forensic scientists must also understand the legal implications of their work to provide clearer, more relevant testimony.

03. Specific guidelines has to be issued regarding the usage of these type of forensic technologies and to examine their accuracy and reliability before the court the law.

CONCLUSION:–

Forensic evidences are presented before the court of law for its assistance.

forensic evidences plays an important role in the criminal justice system but on the other hand they raises hurdles before the court of law about its interpretations and reliability in the legal perspective. There is a growing demand by the victims of the case about the forensic evidences as they provides transparent and accurate results.

In view of the above, I would conclude by citing the relevant observations' of the Hon'ble Supreme Court of India, wherein the Hon'ble Court has opined the necessity to strengthen the Forensic Science for detection of crimes; in the case of **Dharam Deo Yadav v. State of U.P.**