

# **FORENSIC EVIDENCE IN CRIMINAL JUSTICE SYSTEM IN THE LIGHT OF DAUBERT STANDARDS**

Written by *Sambeeta Dabral*

*PhD research Scholar*

## **FORENSIC EVIDENCE**

The term 'evidence' has been defined under Section 3 of Indian Evidence Act, 1872 to mean and include an oral and documentary evidence. There are various kinds of evidence under the law, the most important being the 'material evidence'. It is involved as a part of crime and is usually recovered from the crime scene or from a place where the accused or victim has been present either before or after the commission of crime. Blood, hair, semen, fingerprints, shoeprint etc. are all real evidence. There are many evidences which are used in a criminal trial. One such kind of evidence is scientific or forensic evidence. These evidences are important in proving a case as they are based on the knowledge that has been developed by using scientific method. Many types of evidence are considered as scientific evidence such as DNA fingerprinting, fingerprint identification, hair analysis etc.

The term forensic evidence incorporates two distinct ideas. The 'forensic' part refers to the laboratory and observational processes utilized in the forensic science at issue from which necessary facts get generated. The manner in which DNA is extracted, tested, and subjected to population analyses is a primary example. The 'evidence' part refers to an impartial procedure of collection of information in a litigation which leads and guides a judge to reach a particular conclusion relating to a fact in issue.

Forensic science is useful in all kinds of cases, but the information provided from scientific sources must be relevant to one of the issues in the case. In criminal cases, using forensic science involves some form of scientific work which is performed to resolve factual matters relating to the case itself. All the evidences including forensic evidence are used to reconstruct and connect to every event forming part of the crime committed.<sup>1</sup>

---

<sup>1</sup> Terrence F. Kiely, *Forensic Evidence: Science and the Criminal law*, second edition

Information generated by the forensic sciences is referred to as forensic evidence simply to distinguish it from non-scientifically generated information such as witness statements in relation to the crime committed.

Forensic evidence involves application of scientific theory accompanied by laboratory techniques, some of which involves natural sciences, such as anthropology, DNA analysis, pathology, serology, geology, toxicology etc. Some disciplines associated with forensics are non-academic in nature, such as footwear impressions, fingerprints, and hair analysis which involves the use comparison microscope. All this carefully gathered scientific and non-scientific information is generated to accomplish the goal of establishing a material fact or facts at or before trial.<sup>2</sup>

## **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 a 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;

---

<sup>2</sup> Peter White, *Crime Scene to Court: The Essentials of Forensic Science*, Second Edition

- 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.<sup>3</sup>

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.

## **CLASSIFICATION OF FORENSIC EVIDENCE**

The forensic evidences are classified into various kinds, based on the variety of evidence such as fingerprints, hair, blood, semen, fibre, firearms, drugs, etc. collected at the crime scene. They are classified into:

1. **Biological Evidence:** Blood (wet blood or swabs of bloodstains) and saliva are the most common types of biological evidence. Others include seminal stains, urine, perspiration etc.
2. **Weapons Evidence:** It consists of firearms such as handguns, revolvers, rifles, assault weapons, etc.; ammunitions including used casings, fired projectiles, fragments of bullet, and unfired bullets; gunshot residue and blades including knives.
3. **Fingerprint Evidence:** It consists of fingerprints of both hands of the accused or the victim and includes latent and patent fingerprints as evidence.
4. **Drug Evidence:** It includes drugs like marijuana, cocaine, methamphetamine and others along with drug paraphernalia ie. pipes, spoons etc as accessories, found at the scene of offence.
5. **Impressions:** It means an impression made by a material on a substance and includes shoeprint impressions, tyre tracks, tool marks etc.

---

<sup>3</sup> Tom McEwen, "*The Role and Impact of Forensic Evidence in the Criminal Justice System*", National Institute of Justice, Office of Justice Programs, U.S. Department of Justice

6. **Trace Evidence:** Evidence which is very small in quantity is called as trace evidence which covers evidence such as fibres, hair, asbestos, cigarettes, tobacco, glass etc.
7. **Natural Materials:** It includes clothes, bed, bathing material, carpet cuttings, metal objects, plastic, paper etc.
8. **Generic Objects:** It includes door, wood, bicycle and concrete.
9. **Electronic/Printed Data:** Electronic and printed data include documents and electronics (computers, cell phones, etc.).
10. **Other Items:** Evidence which do not fall in any of the abovementioned categories is referred as other items.<sup>4</sup>

## FUNDAMENTAL PRINCIPLES OF FORENSIC SCIENCE

Forensic evidence plays an important in detection and investigation of crimes. However, the scientific evidence on which the criminal justice system depends is based on various sound principles which makes such evidence relevant and admissible in the court of law. They are -

- **Individuality:** Every object, natural in nature has an individuality. Neither the nature duplicates it nor the man. For example- fingerprints.
- **Locard's Principal:** Whenever two identities come in contact, there is an exchange of traces mutually. This is known as Locard's exchange principle.
- **Law of Progressive change:** Change in everything takes place with the passage of time. The crime scene, physical evidence, criminal involved in the crime undergo change as the time passes by.
- **Principles of Comparison:** Only those things which are similar in nature can be compared. This principle stresses upon the need of providing similar samples or specimen for the purpose of comparison.
- **Principles of Analysis:** For effective use of scientific evidence in trials, emphasis to be laid on correct sampling and packaging procedure.
- **Law of Probability:** It determines the change of occurrence of a particular event in a particular way out of a number of ways in which the event can take place or fail to take place with equal facility.

---

<sup>4</sup> Tom McEwen, "The Role and Impact of Forensic Evidence in the Criminal Justice System", National Institute of Justice, Office of Justice Programs, U.S. Department of Justice

- **Facts do not lie:** Material evidence is more concretely based than oral evidence and holds more value. Hence, importance of circumstantial or scientific evidence is as good as oral or direct evidence.<sup>5</sup>

The police officer (investigating officer) are on average about three times more likely to clear cases when scientific evidence is gathered and analysed. Prosecutors may not agree to enter negotiations if the forensic evidence strongly supports the association of the accused person into the commission of the crime. Therefore, with the use of forensic evidence at various stages of investigation and trial, we can analyse its need and importance in our judicial system.<sup>6</sup>

## **ADMISSIBILITY OF FORENSIC EVIDENCE IN THE COURTS**

Section 45 to Section 51 of the Indian Evidence Act, 1872 deals with relevancy of expert's opinion in a case. As per the Act, an evidence may be given of only those facts which are personally known to a witness. However, these provisions are exceptional in nature to the general rule. It is based on the principle that the court cannot form an opinion or come to a conclusion on a matter which is technically complicated and sophisticated, without the help and assistance from a person who possess special skill and knowledge on that matter. Such persons who have special knowledge and skill in the said area is called an 'Expert'. Medical, chemical, explosive, ballistic, fingerprint analysts are some of the examples of forensic experts.<sup>7</sup>

However, following conditions are there for admitting an expert's opinion by the courts -

1. that the concerned dispute cannot be resolved without expert's opinion, and
2. the person expressing opinion is fit to be called an expert.

The legal system world-wide faces many challenges when it comes to admissibility of expert evidence. The judges do not usually have special scientific knowledge and accordingly they are not expected to form independent opinion on matters of science, including the social sciences, involving complex quantitative and qualitative analyses. For that reason, the courts make use of experts who, due to their knowledge or training, can provide explanations which may be relied upon in decision making.

---

<sup>5</sup> Richard Saferstein, *Forensic Science: From the crime scene to the crime lab*, second edition

<sup>6</sup> Joseph L. Peterson, "Use of Forensic Evidence by the Police and Courts", U.S. Department of Justice National Institute of Justice October 1987

<sup>7</sup> S P Sarkar, *Commentary on The Law of Evidence*, second edition, Dwivedi Law Agency

The expert evidence and the challenges it poses in the decision making by the courts is been discussed nationally and internationally for so many decades that it has become a ‘talk of the town’ pertaining to the issue of admissibility of expert evidence.

The expert witness’s evidence should fulfil the following requirements:

- the witness must be classified as an expert;
- the expert statements or reports must meet the minimum standards of reliability;
- the expert statements are relevant and of probative value;
- the content of the expert statements falls within the accepted expertise of the expert witness.<sup>8</sup>

However, scientific evidence has to some extent proved to be problematic for judges and lawyers as both these authorities have little or no training in science and technology. Courts while entertaining scientific evidence face the difficulty in choosing the veracity of scientific explanation which is tendered by the expert witness. In order to solve this difficulty and to reduce the delay and expenses involved in getting expert opinion, examination of certain experts have been dispensed under the law. As per Section 293(2) of Criminal Procedure Code, 1973 –

The Court may, if it thinks fit, summon and examine any expert as to the subject-matter of his report, namely –

- a) Any Chemical Examiner / Asst. Chemical examiner to the Government,
- b) The Chief Controller of explosives,
- c) The Director of Fingerprint Bureau,
- d) The Director of Haffkein Institute, Bombay,
- e) The Director, Dy. Director or Asst. Director of Central and State Forensic Science Laboratory,
- f) The Serologist to the Government,
- g) Any other Govt. Scientific Experts specified by notification of the Central Govt.

The abovementioned reports which are executed by any of the abovementioned government scientific experts is admissible as evidence in any inquiry, trial or proceeding. However, he may be exempted by the court from personal appearance as an expert witness unless the court deems fit and proper to call him for testifying the material facts. He may instead depute any

---

<sup>8</sup> Artur Appazov, *Expert Evidence and International Criminal Justice*, Springer International Publishing, Switzerland, 2016

other officer in his place to attend the court but that officer must be well versed with the facts of the case and must be capable of deposing as an expert in the court.<sup>9</sup>

The advent and advancement of science and technology introduced a marked change in the criminal justice system all over the world. These scientific advancements affected the evidence which were presented in the courts which included expert evidence. Expert evidences were based on science. However, the judges faced problem in understanding whether to admit the expert evidence or not as if they excluded its admissibility, it would affect the decision of the case. In United State of America, till 1923, there were no proper standard of admissibility of expert evidence to guide the courts. But in 1923, in case of Frye v United States, a standard for evaluating testimony of the experts was laid down by the Court. Frye's judgement was considered as the first most important decision passed by an American court over the issue of admissibility and acceptance of scientific evidence in the courts.

### **FRYE AND DAUBERT'S CASE**

Before analysing Daubert's case, let us first understand the ratio of the decision which was over ruled by Daubert's Judgement. It was Fry's case<sup>10</sup>.

James Alphonso Frye claimed innocence to a charge of murder by requesting the court to engage an expert and carry on polygraph test, the 'systolic blood pressure deception test' on him. In this case, the issue was whether an expert's evidence must be accepted out rightly or a rule for its acceptance must be made. This court laid down the rule of general acceptance. It said that the expert's opinion will be admitted if it has gained general acceptance from the scientific community. As per the court, the law shall be protected by deferring to science which was already proven and accepted by the scientific world. As a result of this judgement, a standard for admissibility of expert was set. According to this standard, an expert's testimony which is based on any scientific theory shall be admissible in the court of law if the scientific principle on which it is based is accepted generally in the field to which it belongs. However, Frye's decision failed to explain the meaning of general acceptance and hence different courts

---

<sup>9</sup> The Code of Criminal Procedure, 1973, Bare Act, 2015, Professional Book publishers

<sup>10</sup> Frye v. United States 293 F. 1013 ( DC Cir. 1993 )

interpreted it as per their understanding. The Frye's decision was widely applicable in the court in spite of a lot of criticism from various community.<sup>11</sup>

In 1975, the Federal Rule of evidence was enacted by the Congress. Rule no 702 spoke of admissibility of expert testimony. As per this rule, if any party to the litigation wishes to bring an expert to testify in his case then such an expert witness shall be qualified to act as an expert because of his knowledge, training, education in the respective science. This rule explained the scope of admissibility of scientific evidence in the courts. This rule existed for the next two decades till Daubert's judgement was passed.

### ***Daubert***

This case<sup>12</sup> is an important one as it laid down the standard for admissibility of expert's evidence in legal proceeding in the United States Federal Court. In this, the plaintiff had filed a case against the defendant pharmaceutical company for manufacturing a drug named Bendectine. Because of ingestion of this drug by plaintiff's wife during pregnancy, it caused defect in the two child born out of his wife. The defendant wins this case on the basis of an expert testimony who gave an opinion that there was no risk involved in taking this medicine on human beings. However, the plaintiff presented affidavits to prove that this medicine caused birth defects in the animals. The court's decision was based on following opinion which says- Whenever an expert testifies in the court, the judge must preliminarily assess whether the method underlying the expert's testimony is scientifically valid or not. Also whether the reason or methodology used by the expert is applicable to the fact-in-issue.

In this judgement, the court laid down some general rules of acceptance of expert testimony given as follows:

- Whether the scientific method used can be effectively tested;
- Whether the scientific theory involved is subjected to peer review of the scientific community and whether it has been published thereafter;
- Is every scientific technique accepted by the community, the court should know the rate of error involved.<sup>13</sup>

---

<sup>11</sup> Bobak Razavi, J D, *Admissible Expert Testimony and Summary Judgement*, The Journal of Legal Medicine, 29:307-343, 2008 Taylor & Francis Group

<sup>12</sup> Daubert v. Merrell Dow Pharmaceuticals, Inc 509 US 579 (1993)

<sup>13</sup> The Florida Senate, Analysis of Law relating to Admissibility of Expert Testimony and Scientific Evidence, October 2008,2009-331

As per the judgement passed in Daubert's case, the trial judges were referred as the 'gatekeeper' who ensured that the expert's opinion involved in any case was reliable and relevant. As per the new standard, the scientific evidence was to be based on sound principles and accepted by the scientific community, only then the judges will consider them as reliable evidence.

From 1923 to 1993, Frye's judgement set the standard of admitting the scientific evidence in the courts based on general acceptance rule. Then came the Federal Rules in 1975 which expanded the ambit of admissibility of scientific evidence. In 1993, with the passing of Daubert's judgement, new standards and norms were set up to accept the scientific evidence.

### ***Indian Scenario - Reliability of expert's evidence***

In India, scientific evidence is taken as relevant and admissible under section 45 of Indian Evidence Act, 1872.

According to Section 45 of Indian Evidence Act, 1872, an expert's evidence is admissible as evidence in the court of law. However, expert's opinion in written form or report is considered as weak and not reliable evidence. It is observed that it is unsafe to base a conviction only on the basis of written expert opinion, unless this opinion is corroborated by an independent evidence.<sup>14</sup>

According to Bentham, witnesses are considered as eyes and ears of a justice system. Whenever an eye witness accounts for the facts perceived by him in relation to a crime, the Court place huge reliance on such a testimony. But such testimony has to carefully and independently be assessed and evaluated for credibility. In case an ocular evidence given by a witness is at variance with the medical evidence (expert's opinion), it will be erroneous on the part of Court to believe in medical evidence and exclude eye witnesses statement.<sup>15</sup>

In case an opinion is given on a fact by two different experts and both their opinions vary from each other, the court may not qualify their opinion as conclusive expert opinion and shall not rely on them.<sup>16</sup>

In *Baso Prasad & ors v. State of Bihar*<sup>17</sup>, the Hon'ble Supreme Court observed that opinions of the experts are relevant facts. The courts may consider the expert's opinion as relevant,

---

<sup>14</sup> M Durga Prasad, Spl Assistant, Syndicate Bank and etc v. The State of AP and etc. [2004 CrLJ 242]

<sup>15</sup> State of UP v. Hari Chand 2009 CrLJ 3039

<sup>16</sup> Sidharth Vashist@ Manu Sharma v. State (NCT of Delhi)

<sup>17</sup> AIR 2007 Supreme Court 1019

admissible and reliable. It is for the court to decide whether to take experts opinion as reliable or in case of contradiction between expert opinion and ocular evidence, upon whom to believe! An expert may be a medical or a ballistic expert. However, a medical officer cannot be categorised as a ballistic expert and thus he is not expected to answer whether an inquiry is caused by a bullet or not. If he makes an opinion regarding the injury to be caused by a bullet, no reliance can be placed on his opinion because he is not a ballistic expert.<sup>18</sup>

An expert in law is not a witness of fact. He gives his opinion relating to a fact-in-issue, which is advisory in nature. Such an opinion is considered credible by the court if it depends on reasons in support of his reason.<sup>19</sup>

From the above analysis it may be submitted that evidence of an expert is not a substantive piece of evidence. The courts do not consider it conclusive. Without independent and reliable corroboration, it may have no value in the eye of law. Once the court accepts an opinion of an expert, it ceases to be the opinion of the expert and becomes the opinion of the court.

## **CONCLUSION**

The Daubert decision did not change the standards for judging the relevance of expert evidence, the qualification of experts or other considerations that enter into the assessment of expert evidence but it did affirm that the judges should act as a gatekeeper while accepting a forensic evidence. After Daubert case, the judges began acting as more watchful gatekeepers. They carefully started scrutinizing not just the reliability of an evidence but all dimensions of expert evidence. The judges nowadays may feel compelled to act as a gatekeeper to evaluate the reliability of a forensic evidence but is not yet knowledgeable enough in the relevant field to make accurate determinations. An evidence could be admitted because the judge does not understand the flaw in the argument also because the evidence is reliable,

The judges usually admit a forensic evidence. However, they totally do not rely on it as a gospel truth, before passing the judgement. Expert evidence is opinion evidence and it can't take the place of substantive evidence. It is a rule of procedure that expert evidence must be corroborated either by clear direct evidence or by circumstantial evidence. Courts do not consider it as conclusive and, therefore, not safe to rely upon it without seeking independent

---

<sup>18</sup> Mahmood and anr v. State of UP AIR 2008 SC 515

<sup>19</sup> Ramesh Chandra Agrawal v. Regency Hospital Ltd & ors AIR 2010 SC 806

and reliable corroboration. It is not safe to rely upon this type of evidence without seeking independent and reliable corroboration.<sup>20</sup>

It is emphasized that judges are not obliged to consider these factors in every case. However, Daubert standard may be used by the judges as and when required in order to evaluate the reliability of scientific evidence used in a case. Due to lack of scientific knowledge, before Daubert case the Court admitted forensic evidence as reliable piece of evidence. However, Daubert decision laid down standards of accepting expert evidence in relating to a scientific evidence.

Measurement of such outcomes would perhaps be the best way to evaluate the performance of the current criminal judicial system and to determine whether changes in the methodology and procedure for screening expert evidence are necessary. The judges decide whether a particular expert evidence should be admitted or not. They may use three criteria in taking this decision:

- Relevance – Will the evidence assist the prosecution in determining a fact-in-issue?
- Reliability – Is the forensic evidence genuine and entails valid knowledge from the expert's field?
- Qualification – Whether the expert has specialized knowledge in the field related to the testimony?

Daubert's case has set a new standard for the admissibility of at least some of the expert testimonies in the Federal courts. Based on this judgement, numerous State and Appellate courts have thereafter been following its reasoning to determine the admission of expert testimony in their courts. The guidelines laid down in the Daubert judgement have proven to be very helpful and illuminating for other courts. It indicates that expert testimony has entered into a whole new world of scientific evidence.

Whether Daubert's decision acts as a guiding standard for different courts is a debatable issue. However, this judgement has triggered a new standard of admissibility of scientific evidence by various criminal courts. Also, there is a debate among the legal community as to whether Daubert criteria is stringent in application. In India, scientific evidence is taken only as opinion evidence as discussed earlier and is hardly decisive. However, the Supreme Court of India has stated that unless there is something really defective in the medical report, the Court cannot reject it. The expert's opinion is taken by courts on trust and faith.

---

<sup>20</sup> S.Gopal Reddy v. State of A.P. AIR 1996 SC 2184

It is the need of the hour that in order to strongly rely on the forensic evidence by the courts, Daubert standard needs to be implemented so that forensic evidence can form the base for conviction in the criminal matters. In India, till today there is a general acceptance of admissibility of scientific evidence and expert's opinion. There is no special law and procedure laid down for accepting such kind of evidences. However, in case of doubt, the Indian courts can follow the standard laid down in Daubert's case.

