

## APPLICABILITY OF FORENSIC SCIENCE IN CRIMINAL JUSTICE SYSTEM IN INDIA: A STUDY

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### *Abstract*

*“Physical Evidence cannot be intimidated. It does not forget. It sits there and waits to be detected, preserved, evaluated and explained”*

- **Herbert Leo MacDonnell**

*The never-ending rate of crime and its complexity emphasizes the role and importance of Forensics in the current scenario. Forensics is a systematic study of evidence found at the scene of occurrence. The principle of Forensics is purely based on the famous Locard's Principle, according to which, the perpetrator of the crime always carries or leaves behind some traces at the crime scene or the place of occurrence.*

*This Paper is a deliberation on understanding the concept of Forensic Science and investigation. Further, the analysis is aimed at identifying the problem in admissibility of scientific evidence in Indian Courts in case of doubt. An evaluation in this regard, with reference to the Daubert Guidelines is discussed to present the acceptable norm as followed in USA. Subsequently, this is followed by a study of the applicable section of the Indian Evidence Act where the Daubert Guidelines can be followed. The conclusion and the suggestions would be focusing on the quality control and standards for scientific evidence that needs to be set, to avoid discrepancies in Courts of Law. The findings of the study are to understand the legal admissibility, its use and the competence of scientific evidence before the Indian Courts.*

**Keywords:** *Scientific Evidence, Forensics Science, Legal Admissibility, Daubert Guidelines, Indian Evidence Act.*

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## INTRODUCTION

Scientific Evidence is to act as an educator and stimulator of public opinion. Scientific Evidence ought to be seen as a watch dog on behalf of the community against all hazards and abuses that may threaten. In Ancient India, the process of investigation of crime and admissibility of the evidence were based on Dharma and Science. The wicked people or the criminals of the society were considered as ‘Kantakas’ or thorns of the society. Criminal is a person who commits or omits in violation of law forbidding or commanding it. Manu and especially Kautilya have dealt in depth with Kantakas. It is a fact that, prevention is always better than cure. This idea is appropriate in the process of prevention and investigation of crime. In modern world, the investigations of such types are coming under Forensic Science.

## MEANING OF FORENSIC SCIENCE

The word ‘Forensic’ has been derived from the Latin word *Forensis*, meaning ‘belonging to the market place or forum’. In ancient Rome, the ‘forum’ or public meeting place was where legal cases were tried and pleaded. *The term Forensic Science means the application of the knowledge of science for the purposes of law and justice.* The term includes the application of all sciences such as Physics, Chemistry, and Biology. It may appear odd at the first instance, but almost all branches of science can help in the administration of justice.

Modern Forensic Science has different branches such as Forensic Psychiatry, Forensic Toxicology and Forensic Pathology. Forensic Psychiatry means where the psychiatrist examines persons suspected of a crime to determine if they are legally sane; Forensic Toxicology identifies drugs and poisons in body tissues and determines their effects. Forensic Pathologist performs autopsies on victims to know the cause of death. For instance, in a vehicular accident, glass fragments may be found at the scene of crime. Since the refractive indices of all glasses differ minutely, comparison of the refractive indices of glass pieces found at the accident site with the glass of the suspect car may offer a useful clue. This is an example of the application of Physics in the administration of justice (*Forensic Physics*). Similarly chemical analysis of an unknown poison found in the stomach of a dead person is an example of the application of Chemistry in the administration of justice (*Forensic Chemistry*). Analyses of blood stains found at the scene of crime require the application of Biology (*Forensic Biology*). Forensic Science is a very vast subject and comprises of the application of any branch of scientific knowledge for the administration of

justice.

## **ROLE OF FORENSICS IN INQUIRY AND INVESTIGATION**

In Forensic Jurisprudence, ‘inquest’<sup>1</sup> is there. So inquest is an enquiry into the cause of particular wretchedness which is apparently not due to natural cause. This inquest differs from country to country. One of the first instances when science was used for the detection of crime was when the Greek scientist Archimedes (287-212 B.C.) found out an interesting way to detect the amount of silver used as an adulterant in a gold crown. The King of Syracuse, Hieron II was suspicious about the purity of gold in his crown, and he instructed his court scientist Archimedes to find out a way to detect the adulteration without in any way destroying the crown. Archimedes while taking his bath discovered quite serendipitously that all substances on immersion displace an amount of water equal to their volume, and the weight of the immersed object consequently decreases by that amount. This is known even today as “the principle of buoyancy” or the “Archimedes’ Principle”. By cleverly applying that principle, Archimedes could show that the gold crown indeed had been adulterated with silver, and consequently the goldsmith was executed. This is perhaps the first instance when Forensic Science was used resulting in the execution of a criminal.

In ancient India too, medical opinion was frequently applied to the requirements of law. By law the minimum age for the marriage of girls was fixed at 12 years; the duration of pregnancy was recognized as being between 9 and 12 lunar months with an average of 10 months and there is evidence that doctors had to opine on such cases.

The first medico-legal autopsy in history is said to have been conducted by the ancient Roman physician Antistius, who examined the body of Julius Caesar after his assassination in 44 BC. He found twenty-three stab wounds over his body. After the post-mortem examination, he concluded that only one wound, the one in the chest between, 1st and 2nd ribs, had been fatal.

The first real evidence that a special branch of medicine, devoted to the support of judicial work, was indeed taking shape, dates from the thirteenth century AD, comes from China. A bulky book entitled Hsi Yüan Lu was published in that country in 1248. It was actually meant as a handbook for applying medical knowledge to the solving of crimes and to the

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<sup>1</sup> Etymologically in = in; quest = to seek means legal or judicial inquiry to ascertain a matter of fact.

work of the courts. In keeping with the highly speculative character of early Chinese medicine, many of the procedures were utterly fantastic. The book however, does contain valuable instructions for the examination of corpses. It deals with the various kinds of wounds delivered by different weapons of different degrees of sharpness. It tells how to ascertain whether a person had been killed by strangulation or drowning. It discusses the problem of whether dead bodies found in water have been actually drowned, or killed beforehand, as well as the question of whether a body was burned before or after death-in other words, whether a fire had been set in order to cover up a preceding murder. It stresses the need for careful examination of the scene of the crime. Its basic attitude may be summed up in the proverb: "Everything may depend on the difference between two hairs".

In contrast, in Europe a similar book appeared much later. In 1507, *Constitutio Bambergensis Criminalis* appeared which acknowledged the usefulness of physicians in legal cases involving infanticide and bodily injury. This book was published in the Diocese (the circuit or extent of a bishop's jurisdiction) of the Bishop of Bamberg. It became the model for a far more extensive penal code, the *Constitutio Criminalis Carolina*, also known as *The Criminal Jurisdiction of Emperor Charles V and the Holy Roman Empire*, issued by Charles V in 1532 for all the lands included within his mighty empire. To be sure, it made no mention of careful medical examinations or of autopsies where the cause of death was doubtful. At best, wounds were "widened" to determine their approximate depth or direction of penetration. One of the physician's principal functions was to decide whether a defendant was strong enough to be put to torture.

In the eighteenth century, the Italian anatomist Giovanni Battista Morgagni (1682-1771) had begun dissecting the bodies of the dead and comparing the alterations in their organs with the symptoms of the diseases that had caused death. In 1761 (i.e. in the eightieth year of his life!), he published a book on the 640 post-mortem dissections he had conducted. He thus was the founder of Pathology. The three great pioneers of Forensic Medicine to be born in the eighteenth century were Johann Ludwig Casper (1796-1864) born in Berlin, Mathieu Joseph Bonaventure Orfila (1787-1853) born in Minorca and Marie Guillaume Alphonse Devergie (1798-1879) born in Paris. They devoted their life to the study and development of Forensic Medicine as we understand it today, but they were all disgraced by their colleagues. Most medical professionals regarded them as intruders, exploiters of the true art of medicine, or representatives of a second-rate science tainted by crime and the ugliness of slums. In

1835, Devergie published the influential *Médecine légale, théorique et pratique*, (Legal medicine in theory and practice). Casper, who was looked down upon and driven from place to place by such influential persons of his time as Rudolf Virchow, ultimately proved his worth by publishing *Gerichtliche Leichenöffnung* (Forensic Dissection) in 1850, and *Praktisches Handbuch der gerichtlichen Medizin* (Practical Manual of Forensic Medicine) in 1856. These three books brought out a revolution of sorts in the world of Forensic Medicine. They covered a wide range of subjects, and gave details of thousands of cases, these courageous men had solved, by applying rigorous observation, accurate and detailed autopsy, and microscopic and chemical examination.

Forensic Medicine made rapid advances in the 19th and the 20th centuries. Newer discoveries were regularly being made. The latest Forensic technique to be invented is the technique of DNA profiling (commonly known as DNA fingerprinting) perfected in 1985, by a Leicester University Professor, Alec Jeffreys. It enables the Forensic Scientists to identify an individual positively among millions of suspects. The technique is very useful in solving cases of rape, disputed paternity, and putrefied bodies and so on.<sup>2</sup>

## **ROLE OF FORENSIC SCIENCE IN ADMISSIBILITY OF EVIDENCE**

It is the evidence which the trial judge finds it useful in helping the trier of fact which can be a jury, if there is a jury, or otherwise the judge. It cannot be objected to on the basis that it is irrelevant, immaterial, or violates the rules against evidence which a person tries to introduce. It has little relevant value, usually called probative value in determining some fact, or prejudice from the jury's shock at gory details may outweigh that probative value. In criminal cases, the courts tend to be more restrictive on letting the jury hear such details for fear they will result in "undue prejudice." Thus, the jury may only hear a sanitized version of the facts in prosecutions involving violence.

### ***The Daubert Guidelines***

The Daubert Guidelines were laid down in a remarkable judgment of the United States

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<sup>2</sup> Aggrawal Anil, "Introduction To Forensic Medicine And Legal Procedures Prevalent In India" - Part I. (2001); Vol. II, No. 1 (January-June 2001); Available at: [http://www.anilaggrawal.com/ij/vol\\_002\\_no\\_001/ug002\\_001\\_1.html](http://www.anilaggrawal.com/ij/vol_002_no_001/ug002_001_1.html) (Accessed on: September 21, 2014)

Supreme Court in the case *Daubert v. Merrell- Dow Pharmaceuticals, Inc.*<sup>3</sup> The court concluded that the Federal Rules of Evidence superseded the Frye Rule and that the rigid general acceptance rule should not come on the way of a reasonable minority scientific opinion in the form of new and emerging research based on reliable studies. It also laid down factors for the basis of Scientific Evidence which are also known as *The Daubert Guidelines*. These are:

- The content of the testimony can be and has been tested using the scientific method;
- The technique has been subject to peer review, preferably in the form of publication in peer review literature;
- There are consistently and reliably applied professional standards and known or potential error rates for the technique;
- Considers general acceptance within the relevant scientific community.

The United States of America amended the Federal Rules of Evidence in 2000. Rule 702 reads as : “If scientific, technical or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education may testify thereto in the form of an opinion or otherwise if; the testimony is based upon sufficient facts or data ; the test is the product of reliable principles and methods, and; the witness has applied the principles and hearsay and other objections.”<sup>4</sup>. Thus, if there are shortcomings in the tests (DNA), these do not affect the admissibility of the test result, only the weight a judge should accord it.

## **ROLE OF FORENSICS IN CRIMINAL JUSTICE SYSTEM**

The usage of Forensics has been versatile and pragmatic in the field of Criminal Justice. Initially, the traces found at the scene of occurrence are collected. Later, it is sent for analysis to detect, discover evidence that is useful in providing the following information;

- Directing towards the criminal who committed the crime;
- The reasons that led to the cause of death;

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<sup>3</sup> *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993)

<sup>4</sup> Federal Rules of Evidence.1975; 2000

- Can be used to test whether it is in corroboration with the eyewitness (if any)

## CO-RELATION BETWEEN FORENSICS, PSYCHOLOGY AND LAW

The trio relationship between Forensics, Psychology, and Law variegates the way of detecting and solving crimes. Forensics serves as a medium for analyzing, detecting from the scene of occurrence. This is done scientifically and systematically. It provides the rough roadmap as to how and in which direction the investigation may proceed.

On the other hand, Psychology is connected with reading of minds. Applying the practical usage of psychology in the Criminal Justice System, it helps us to understand in depth about the mental state of the accused or the suspect who has committed the crime. If on one hand, we say it helps in establishing Mens Rea which is one of the essential elements of committing any crime, on the other it establishes the absence of Mens Rea due to lack of cognitive instability. Under section 84 of IPC<sup>3</sup>, a person who is of unsound sound will not be punished even if he had committed crime as it comes within the general exceptions. In cases of brutal murders done by serial killers, the combination of Psychology and Forensics helps in determining the pattern or the nature of injury caused by the killer.

Law collects evidence that is required by the court to convict criminals with the help of Forensics and Psychology. Our criminal jurisprudence is based on the principle that:

*“May thousands of criminals escape but even a single innocent shouldn’t be punished.”*

With such a principle, the burden on the prosecution still increases to prove beyond a reasonable doubt to convict the accused. Henceforth, to provide solid evidence, both Forensics and Psychology play a very crucial role.

## IMPORTANCE OF FORENSICS IN INDIAN CRIMINAL JUSTICE SYSTEM

Several convictions have occurred in India where the Scientific Evidence (DNA) has been accepted under Section 45 of the Indian Evidence Act. It is the section dealing with the opinion an expert. It states, that, when the court has to form an opinion upon a point of foreign law, or science or art, or as to identity of handwriting or finger impressions, the opinions upon that point of persons specially skilled in such foreign law, science or art, or in questions as to the identity of handwriting or finger impressions are relevant facts. The Courts have opined that Medical Evidence is only an evidence of opinion and is hardly

decisive. It is not substantive evidence. But they say that that the opinion of the doctor who has held the Post-mortem examination and of the Forensic Science Laboratory is reliable. The Supreme Court of India has further stated that unless there is something inherently defective in the Medical Report, the Court cannot substitute its own opinion for that of the doctor.

*Section 293 of the Cr.P.C.* deals with reports of certain Government Scientific Experts. Section 293(2) says that the Court may, if it thinks fit, summon and examine any such expert as to the subject-matter of his report. The underlying principles of the technique cannot be questioned; legal scrutiny can only revolve around questions related to the collection, forwarding and authentication of samples.<sup>5</sup> On the other hand, there are no proper international as well as national guidelines and that each laboratory has its own control and standardization methods. But the fact remains that the court is unlikely to understand in any detail the principles of the process. The expert's opinion is taken by the Courts on trust and faith. Some Courts may still be reluctant to admit some type of Scientific Evidence (like DNA typing) as they may feel that it does not follow the Frye Rule. However, of late, it is generally held that unless there is some special circumstance, all relevant evidence is admissible.

The Supreme Court of India has held that, "A medical witness called in as an expert and the evidence given by the medical officer is really of an advisory character based on the symptoms found on examination. The expert witness is expected to put before the court all materials inclusive of the date which induced him to come to the conclusion and enlighten the Court on the technical aspects of the case by explaining the terms of science so that the Court although not an expert, may form its own judgment on these materials after giving due regard to the expert's opinion because once the expert's opinion is accepted it is not the opinion of the medical officer but that of the Court"<sup>6</sup>. Thus, it can be said that the laws and Courts in India are still not clear on the matter on the criteria of admissibility of scientific matters and confusion still prevails.

## CONCLUSIONS AND SUGGESTIONS

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<sup>5</sup> VV Pillay, "Textbook of Forensic Medicine and Toxicology". 14th ed. Hyderabad: Paras Publishing, (2004) p.89.

<sup>6</sup> *Madan Gopal Kakkad v. Naval Dubey & Another*, (1992) 3 SSC 204



The police are a disciplined force trained to uphold the law. Police powers are confined by the provisions of the Constitution, the Police Act, the Criminal Procedure Code, the Evidence Act and many other local and special laws which impose restrictions on the scope and method of exercise of that power. Forensic Scientists should inspire the Police with their scientific methods not to violate the norms. They will be accused of conspiring with them if they are a party in using the above psychological coercive methods. Though there is general acceptance of admissibility of Scientific Evidence and expert's opinion in Indian Courts, there is no special law with respect to this and enable democratic institutions to function lawfully. Section 45 of the Indian Evidence Act is insufficient in this regard. In case of doubt, the Daubert Guidelines can be adhered to. Proper National Protocol should be formulated and extensive studies carried out with respect to quality control, interpretation of results and understanding the potential error rates of Scientific Evidence matter.

It is thus imperative to understand the admissibility of findings, methods and opinion of Forensic Medicine Specialists to legal matters. Formerly, for the reason that of lack of sophistication in Chemistry, Physics, Biology and Medicine, investigation was largely subjective, this leads to great controversy and legal challenges during court trials. Hence, a special test of competence is required for Scientific Evidence. The major issues are: whether the subject matter of the expert's opinion is appropriate to the case; whether the expert is sufficiently qualified to render the opinion; the type of information on which the expert bases his opinion; the role of general consensus in the scientific community in evaluating the admissibility of expert testimony; and limitations other than the above pertaining to the type of opinion an expert can express. There are a host of criminal cases and situations where the problem can only be solved through an intelligent application of medical principles. In fact, this is what Forensic Medicine is all about. A law providing for statistical probability of evidence is essential. Thus it is for the court with the use of scientific and legal principles to decide upon the amount of reliability that should be given to the Scientific Evidence and to the expert's opinion.