

# ROLE OF FORENSIC EXPERT EVIDENCE IN CRIMINAL JUSTICE DISPENSATION: A CRITIQUE

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## I. INTRODUCTION

Trials in criminal and civil issues are held under the same rules of evidence as stated under the Indian Evidence Act, 1872, despite this, the actual application of those rules in both these trials is dissimilar. In other words, both the criminal and civil procedures are very different from each other. Rules overseeing prosecution and defence in criminal litigation tend to maintain a balance between justice dispensation system's requirement for accuracy and its need for convictions.<sup>1</sup>

The very first point of distinction in civil dispute and criminal proceeding with regards to rule of evidence is in terms of standard of proof, that is to say, in the former mere balance of probabilities plays the trick whereas, in the latter 'beyond reasonable doubt' is the keyword. It means, there is a requirement of stringent standard of proof in case of criminal justice administration.<sup>2</sup> Criminal justice administration has been defined as- "*The personnel, activity and structure of the justice system - courts and police - in the detection, investigation, apprehension, interviewing and trial of persons suspected of crime.*"<sup>3</sup> Role of science is important in detection of crime because of its reliance on universally accepted methods which is of assistance in identification of the offender.

Witnesses play a crucial role in trial and, as general rule of evidence, witness must only give information of the facts seen, heard, or perceived by him whereas his personal opinion or belief holds no relevance in court of law. It has been observed that, allowing a witness to state his own opinion may come across as 'delegation of judicial function'.<sup>4</sup> Sections 45-51 of the Indian Evidence Act, 1872, lay down the exceptions to this rule. Specifically, section 45<sup>5</sup> deals with the opinion of experts. The reason for this exception is that, it is impossible for the court to lead to an accurate opinion in cases of subject matter requiring technical expertise, wherein assistance of subject-matter expert becomes pertinent. Although, it has been time and again emphasised regarding the evidentiary value of expert opinion, that the same is not decisive in nature but is only an opinion, to be received with caution; the courts have been reluctant to accept it as sole basis for conviction.<sup>6</sup> Section 45 mentions five broad aspects on which an expert can give his opinion in the court, science

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<sup>1</sup> See R. Erik Lillquist, "A Comment on the Admissibility of Forensic Evidence" 33 *Seton Hall Law Review* 1191, 1196 (2003).

<sup>2</sup> The author has used the term 'justice administration' and 'justice dispensation' interchangeably throughout the paper. Meaning denoted to these terms is 'an act or process of providing justice'.

<sup>3</sup> As defined by Duhaime's Legal Dictionary, available at: <http://www.duhaime.org/LegalDictionary/A/AdministrationofJustice.aspx> (last visited on Jan. 31, 2019).

<sup>4</sup> *Mubarak Ali Ahmed v. State of Bombay*, AIR 1957 SC 857.

<sup>5</sup> "Opinions of experts. — When the Court has to form an opinion upon a point of foreign law or of 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 identity of handwriting] [or finger impressions] are relevant facts. Such persons are called experts."

<sup>6</sup> Himanshu Setia, "Evidentiary Value of Forensic Reports in Indian Courts" 4 (6) *Research Journal of Forensic Sciences* 5 (June, 2016).

being one of them. Therefore, forensic<sup>7</sup> testimony by forensic expert is covered under this section.

“The term ‘forensic expert’ is used to refer an expert witness who testifies or gives forensic related opinions at a dispute resolution trial or hearing by virtue of his/her specialized knowledge. Forensic opinions are sought from forensic experts to explain past, present, and future events.”<sup>8</sup> Forensic experts can be referred as consultants to legal system. It will not be wrong to say that in contemporary criminal proceedings, expert evidence and scientific proof can play influential role. But there are in existence many issues and challenges which refrain the Indian criminal justice dispensation system from recognizing, relying upon and utilizing the forensic evidences in the fullest possible manner.

The author in her paper has tried to highlight those issues and challenges at the same time looking into the positive aspects in admissibility of forensic evidence as relevant in criminal justice dispensation. This paper has been divided into six parts: Part I of this paper introduces the topic and gives the scheme of further discussion; Part II summarizes the history and development of forensic science in Indian jurisdiction; Part III elaborates the role of forensic expert in Indian legal system; Part IV deals with the issue and extent of admissibility of forensic expert evidence in criminal justice administration; Part V provides certain suggestions in terms of factors that can enhance effective use of forensic expert evidence in criminal justice dispensation and mentions the practices that can make the Indian system match global standards.

## II. HISTORY AND DEVELOPMENT OF FORENSIC SCIENCE IN INDIA

Forensic science is not a pure science as such, instead it involves application of various types of sciences.<sup>9</sup> Its main function lies in investigation of situations or questions which hold importance in solving of disputes. Forensic science methodology is to recover and test the trace evidence<sup>10</sup> in scientific lab to find out the wrongdoer and establish his link to the

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<sup>7</sup> Black’s Law Dictionary defines Forensic as ‘Belonging to courts of justice’ (*available at*: <https://thelawdictionary.org/forensic/>) and Forensic Evidence as ‘Evidence that can be used in a court based on science. It can be blood tests, ballistics, and DNA’ (*available at*: <https://thelawdictionary.org/forensic-evidence/>). Merriam-Webster Dictionary defines Forensic as ‘relating to or dealing with the application of scientific knowledge to legal problems’ (*available at*: <https://www.merriam-webster.com/dictionary/forensic>).

<sup>8</sup> See <https://definitions.uslegal.com/f/forensic-expert/> (last visited on Jan. 31, 2019).

<sup>9</sup> Some authors have recognised and elaborated the tension between the areas of ‘science’ and ‘forensic science’. Further providing that the issue with much of the theory of forensic science is that it is mainly inductive and has never been subjected to strict tests aimed specifically at falsifying it. Inductive in the sense for example, people generally believe that: ‘Nobody has ever observed two indistinguishable fingerprints that belong to different individuals. Hence, the generalised observation that, all fingerprints must be extraordinary or unique.’ Now, this is inductive reasoning going from specific to general. In contrast to inductive reasoning, deductive reasoning provides for sufficient opportunity to test the hypothesis. Taking the same fingerprint example, the deductive form of reasoning maybe: “The level of variance between two fingerprints coming from same person is little, and there is a high level of variance among fingerprints from various individuals. In this manner almost certainly, fingerprints from two unique individuals will be recognizably different.”

*Bowers* after highlighting this issue in his book, suggests that it’s still not correct to refer to forensic science as ‘junk science’ and of absolute null value to criminal justice system. According to him, “The problem is that many forensic science practices lack robust support for their theoretical and scientific underpinnings...the only way out is to ascertain the boundaries of what the forensic sciences can and cannot do. Fortunately, there is already a tried and tested framework available to forensic scientists on which to base this attempt: it’s called science.” [See C. Michael Bowers, *Forensic Testimony: Science, Law and Expert Evidence* 23-36 (Elsevier, San Diego, USA, 2014).

<sup>10</sup> Based on Locard’s principle, i.e., every contact leaves a trace.

crime being investigated.<sup>11</sup>Forensic examination may even help in identifying victims.

Since 1897, India is using fingerprint for classification of the records of criminals. In search of truth, judiciary has been taking into consideration forensic evidences like fingerprints, post-mortem report, serology, toxicology, odontology, ballistics, DNA profiling, etc. Recent times have witnessed a spurt in the use of modern forensic techniques for deception detection like, lie detector, brain mapping, narco-analysis for helping judiciary in reaching the truth in delivery of justice.<sup>12</sup>

The forensic science development in India can be traced through the following chart:

1849, 1853, 1864, 1870	Setting up of Chemical Examiner's Laboratories	Madras, Calcutta, Agra and Bombay
1892	Establishment of Anthropometric Bureau	Calcutta
1897	Creation of the First Fingerprint Bureau in the world	Calcutta
1898	Setting up of Department of Explosives, Headquarters	Nagpur
1904	Post created for Government Handwriting Expert	Bengal
1910	Establishment of Serology Department	Calcutta
1915	Establishment of Footprint Section	CID, Government of Bengal
1917	Setting up of Note Forgery Section	CID, Government of Bengal
1930	Ballistics Laboratory	Police Department, Calcutta
1936	With the objective of examination of bullets, cartridges, firearms, etc. found at crime scenes, scientific unit was developed.	CID, Bengal.
1952	Formation of First State Forensic Science Laboratory in India	Calcutta
1955	Establishment of Central Finger Print Bureau  (Central Finger Print Bureau first established in 1905 at Shimla; CFPB restarted functioning from 1955 in Delhi under the administrative control of Intelligence Bureau (IB). In July 1986, the administrative control of the CFPB was transferred to the National Crime Records Bureau (NCRB), Delhi.)	Shimla, Delhi.
1956	Establishment of Central Detective Training School.  Purpose was to impart training in scientific investigation of crimes like drug abuse, terrorism, explosion, crime against women, investigation of	Calcutta

<sup>11</sup> The type of forensic evidence that is typically sought to admit in a criminal case focuses on identity, i.e., tying the defendant to the crime. Its use is immense in cases where identity of the perpetrator is a contested issue.

<sup>12</sup> Gajendra K. Goswami, "Forensic Law" L ASIL 649 (2014).

	road accidents and enforcement of traffic laws, etc.	
1957	Creation of First Central Forensic Science Laboratory.;  In 1965, the second central forensic science laboratory was established.	Calcutta  Hyderabad
1960	Establishment of the Indian Academy of Forensic Sciences.  Purpose was to hold annual scientific meetings/seminars as well as assist in holding seminars in forensic science.	Calcutta
1964	Establishment of first Central Detective Training School.  In 1973, the second such school was established. Their main objective was to train the operational police personnel in modern scientific techniques of crime investigation, with a view to improve their professional standard and efficiency.	Hyderabad  Chandigarh
1968	Establishment of The Central Forensic Science Laboratory, (CBI) as a scientific department to provide scientific support and services to the investigation of crime.  It was a scientific department under the administrative control of CBI and overall control of the Ministry of Home Affairs with the Govt. of India.	Delhi
1972	Establishment of Institute of Criminology and Forensic Science (ICFS).  Main objective was to imparting training to the in-service personnel and conducting research in Criminology and Forensic Science.	Delhi
1972	Conversion of Central Forensic Science Advisory Committee into Standing Committee on Forensic Science, which is functional even today in BPR&D.	Delhi
1983	Sanctioning of the post of Chief Forensic Scientist and creation of Forensic Science Directorate in BPR&D.	
1983	Declaration by the Government of India regarding the forensic science institutions, at the Central Government level as being the Science and Technology institutions with objectives of functioning in an autonomous fashion, with complete modernization of equipment and manpower capabilities.	

1991	Renaming of Institute of Criminology and Forensic Science to National Institute of Criminology and Forensic Science (NICFS) in 1991. It was again renamed after Lok Nayak Jayaprakash Narayan in 2003.	
1997	<p>Redefining of the roles of 3 CFSL's at Calcutta, Hyderabad and Chandigarh as most of the States by that time had their own forensic science laboratories, therefore, the role of CFSL's seemed diluted.</p> <p>Designated roles were as follows:  CFSL, Calcutta----Forensic Biological Sciences  CFSL, Hyderabad----Forensic Chemical Sciences  CFSL, Chandigarh----Forensic Physical Sciences  The Neutron Activation Analysis Unit of CFSL, Calcutta, operating at the BARC, Mumbai, was brought under the administrative control of CFSL, Hyderabad.</p>	
1998	Formation of DNA typing laboratory.	CFSL, Calcutta
2002	<p>Integration of Central Forensic Science Institutions under one umbrella under the Ministry of Home Affairs.</p> <p>Creation of separate Directorate of Forensic Science in New Delhi under the direct charge of MHA, India. CFSL at Kolkata, Chandigarh and Hyderabad placed under it.</p>	
2010	Renaming of Directorate of Forensic Science to Directorate of Forensic Science Services (DFSS). Charter of duties prepared.	
<b>Sources Referred:</b> <a href="http://www.jpgmonline.com/text.asp?2000/46/4/303/250">http://www.jpgmonline.com/text.asp?2000/46/4/303/250</a> <a href="http://dfs.nic.in/pdfs/First%20resolution%20of%20DFSS.pdf">http://dfs.nic.in/pdfs/First%20resolution%20of%20DFSS.pdf</a> <a href="http://dfs.nic.in/pdfs/MHA%20resolution%20for%20DFSS.pdf">http://dfs.nic.in/pdfs/MHA%20resolution%20for%20DFSS.pdf</a> <a href="http://nicfs.gov.in/">http://nicfs.gov.in/</a>		

### III. ROLE OF FORENSIC EXPERT IN INDIAN LEGAL SYSTEM

#### A. Who Is An Expert?

It has been observed by the Supreme Court in *State of H.P. v. Jai Lal and Ors.*<sup>13</sup> 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 a special experience therein or in other words

<sup>13</sup> (1999) 7 SCC 280.

that he is skilled and has adequate knowledge of the subject.”

***(i) Definition of Expert***

Section 45 of the Indian Evidence Act, 1872, does not define ‘expert’ in clear terms. It provides that the Court may allow opinion of persons skilled in technical areas of foreign law, science, art, handwriting or finger impressions, in order to form its own opinion in such specialized fields. Such opinions, are termed as relevant facts and the person providing opinion is an expert. The section only mentions that specially skilled person is an expert who gives an opinion in court. It doesn’t mention any specific criteria for any person to come under the purview of the term expert, except for that he should be specially skilled in either of those five criteria on which experts opinion holds relevance.

If this provision be compared with Federal Rules of Evidence of the United States on point of defining the expert. Article VII, Rule 702 on Testimony by Expert Witnesses, of the Federal Rules states that: “A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise.....”. The rule makes it clear that person may be termed as an expert in his area, because of his knowledge/skill/experience/training/education; whereas, section 45 of the Indian Act, uses the term ‘skilled’ only for an expert. In other words, it maybe said that a person who does not possess academic qualification although he has professional skills as well as experience in hand is an expert. It is the responsibility of judiciary to choose whether ability of an individual pertaining to issue, on which proof of his supposition is offered, is adequate to classify him as expert.

Rule 702, Federal Rule of Evidence is comparatively clearer in terms of definition of expert and what constitutes expert opinion, unlike section 45, the Indian Evidence Act, 1872.

***(ii) Meaning of Expert Opinion and its’ scope***

A witness who is an expert in his field is perceived by the court as an individual who will put forth his opinion in a particular subject matter that is beyond comprehension of a ‘person with average intelligence’. He is supposed to give detailed explanation for his opinion as well as rule out all other probable possibilities being involved.<sup>14</sup> The experts are required to examine evidence in a logical way, to translate the outcomes unbiasedly, and to report their discoveries steadfastly.

The expert’s testimony in court needs to be convincing and effective in nature. It should come across as a scientist’s persuasion, who very systematically and logically puts forth the fact and thereby makes the listener believe in his findings.<sup>15</sup>

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<sup>14</sup> See Samuel R. Gross, “Expert Evidence” *Wisconsin Law Review* 1113-1232 (1991). The author of this paper has in one of the sections presented a short case study of a trial that depicts many problems in the methods of using expert evidence. He points in his paper that “... isn’t it, in fact, shocking-that casual observers and even interested partisans are treated by the legal profession with at least reasonable respect, but trained and experienced doctors, engineers and scientists are castigated?” (p.no. 1114).

<sup>15</sup> Donald Doud, “Elements of Effective Expert Testimony” 44(4) *The Journal of Criminal Law, Criminology, and Police Science* 522-524 (1953). In the words of the author, “Convincingness, clarity, interest-these are the elements of effective expert testimony”.

Section 45 of the Indian Evidence Act, 1872, lists five areas in which expert opinion may be given in the court.<sup>16</sup> For the purpose of this paper, author's focus is upon forensic expert giving scientific opinion. The various central and state level forensic science laboratories in India, have divisions with experts working in different areas like ballistics, toxicology, psychology, digital forensics, documents etc. The Forensic Science Laboratory, Delhi,<sup>17</sup> has five divisions, namely, chemical sciences, physical sciences, biological sciences, documents division and forensic psychology division.<sup>18</sup> The Central Forensic Science Laboratory, Delhi,<sup>19</sup> "is one of the most comprehensive laboratories in the country with 10 fully equipped divisions namely physics, chemistry, biology, serology, ballistics, documents, fingerprints, forensic psychology, photo, computer forensic science and scientific aids divisions with addition of state-of-the-art laboratories for computer forensics and DNA profiling."<sup>20</sup>

### ***B. Role of Forensic Expert***

Role of forensic expert is three-fold: at crime scene, in the laboratory and inside the court room. At crime scene, it is believed that the role of forensic expert is advisory in nature.<sup>21</sup> He assists the investigating officer in establishing *corpus delicti*, in ascertaining real or false nature of the crime, in identifying the clues, etc.<sup>22</sup> In the laboratory, his role becomes more active in nature and he works towards, "*proving the existence of a crime, the perpetrator of a crime, or a connection to a crime through the: Examination of physical evidence, administration of tests, interpretation of data and clear & concise reporting*".<sup>23</sup> Inside the court room, his role courtesy, section 45 of the Indian Evidence Act, 1872, is that of an expert giving his view based on application of universally sound scientific principles. His opinion in the court room, assists the judge to draw a reasonable conclusion. The two parameters for admissibility of an expert witness testimony are:

- i. when a dispute is such that it cannot be resolved without expert opinion, and;

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<sup>16</sup> See Article VII, Rule 702 of Federal Rules of Evidence on Expert Witnesses' Testimony. The rule is broadly phrased. The fields of knowledge which may be drawn upon are not limited merely to the "scientific" and "technical" but extend to all "specialized" knowledge. Similarly, the expert is viewed, not in a narrow sense, but as a person qualified by "knowledge, skill, experience, training or education." Thus, within the scope of the rule are not only experts in the strictest sense of the word, e.g., physicians, physicists, and architects, but also the large group sometimes called "skilled" witnesses, such as bankers or landowners testifying to land values [See [https://www.law.cornell.edu/rules/fre/rule\\_702](https://www.law.cornell.edu/rules/fre/rule_702) (last visited on Jan. 31, 2019)].

<sup>17</sup> It takes care of cases referred by Delhi Police and Court of Law.

<sup>18</sup> See [http://delhi.gov.in/wps/wcm/connect/doi\\_fsl/FSL/Home/Divisions/](http://delhi.gov.in/wps/wcm/connect/doi_fsl/FSL/Home/Divisions/) (last visited on April 26, 2019).

<sup>19</sup> It investigates cases for CBI mainly and Delhi Police, Judiciary and Vigilance Departments of Ministries & Undertakings & State/Central Govt. Departments.

<sup>20</sup> CFSL, CBI, *available at*: <http://www.cbi.gov.in/cfsl/about.htm> (last visited on Feb. 24, 2019).

<sup>21</sup> In India, First Responder, is generally a police officer who is a non-forensic personnel and therefore, providing of adequate training to such officer for handling evidence at the scene of crime becomes important for successfully carrying out fundamental recovery procedures before the crime scene investigators arrive, if there is a danger of the evidence being destroyed, lost or contaminated. [See, *A Forensic Guide for Crime Investigators: Standard Operating Procedures* (LNJN National Institute of Criminology and Forensic Science, Ministry of Home Affairs, Delhi) *available at*: [https://jhpolicer.gov.in/sites/default/files/documents-reports/jhpolicer\\_ebook\\_a\\_forensic\\_guide\\_for\\_crime\\_investigators.pdf](https://jhpolicer.gov.in/sites/default/files/documents-reports/jhpolicer_ebook_a_forensic_guide_for_crime_investigators.pdf) (last visited on April 28, 2019).

In fact it has also been pointed out by other sources that forensic expert is rarely called at crime scene; physical evidence is collected by police officer and is sent for examination in the labs.

<sup>22</sup> Dr. B.P. Maithil and Rajesh Mishra, "Crime Scene Investigation: The foundation stone of crime detection, investigation and prosecution" 34(3) *The Indian Police Journal* (July – Sep., 2007).

<sup>23</sup> Crime Scene Investigator, "What is Forensics?", *available at*: <https://www.crimesceneinvestigatoredu.org/what-is-forensic-science/> (last visited on April 28, 2019).

- ii. the expert witness expressing the opinion is actually a certified expert.<sup>24</sup>

### *C. Expert Testimony: Ethical Issues*

#### *(i) Credibility of expert's opinion*

Impartiality and truthfulness towards one's work should be the foremost virtue of an expert, and the same shall contribute towards the credibility of expert's opinion. The expert opinion although is still considered to be a weak evidence due to certain reasons. Sometimes, conformity to the societally developed expectations of their respective disciplines, create a burden on the expert while they conduct investigation and thereafter present the result. Forensic examination being done by a human being, it's not wise to rule out the chances of bias.<sup>25</sup> In fact to add on, apart from bias, the scientific errors are the ones which affect the credibility of expert opinion.<sup>26</sup>

#### *(ii) Forensic Evidence v. Ocular Evidence*

This issue in front of trial judge, when there arises a clash between forensic evidence and ocular evidence, is of great contention in the field of law and forensics. When such clash is there, court, considering the fact that ocular evidence or eyewitness's testimony is direct in nature gives it prevalence over forensic evidence.<sup>27</sup>

In case of *Ram Swaroop v. State of Rajasthan*<sup>28</sup>, it was observed that:

“A doctor is usually confronted with such questions regarding different possibilities or probabilities of causing injuries or post-mortem features which he noticed in the medical report may express his views one way or the other depending upon the manner the question was asked. But the answers given by witness to such questions need not become the last word on such possibilities. After all, he gives only his opinion regarding such questions. But

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<sup>24</sup> Redefining the Role of an Expert Witness, available at: <https://jguforensics.wordpress.com/2017/06/22/redefining-the-role-of-an-expert-witness/> (last visited on April 28, 2019).

<sup>25</sup> M. Redmayne, *Expert Evidence and Criminal Justice* 13 (Oxford University Press: Oxford, 1<sup>st</sup> edn., 2001). The author goes to an extent of stating that bias appears to be universal tendency in forensic science.

<sup>26</sup> See Mingxiao Du, “Analysis of Errors in Forensic Science” 3(3) *Journal of Forensic Science and Medicine* 139-143 (2017). The author emphasises on scientific errors being the more prevalent reason in comparison to bias which paralyses the helpful contribution of experts. He highlights three categories of errors: systematic errors, random errors and gross errors. Systematic errors consist of errors caused by defect in instrument, method, environmental defect etc.; random errors are caused due to uncontrollable reasons which can be prevented by replication; gross errors are caused by human errors, like recording of erroneous readings. He further states that bias can still be removed by replacing experts and it's indeed a tough task to eliminate scientific errors; for which he elaborates the concept of peer review.

He concludes his article by stating: “... if a scientific principle or method fails to pass peer review, it tends to be inadmissible. If it passes peer review and is published, knowledge, professional ethics of the specialists, and the confidence level of the forensic testimony's findings need to be considered by judges, especially when the results are around the thresholds.” (p.no. 143).

<sup>27</sup> See *Abdul Sayeed v. State of M.P.* (2010) 10 SCC 259; *State of U.P. v. Krishna Gopal* (1988) 4 SCC 302. One of the major differences between evidence of an expert and evidence of an ordinary witness is, court can't pass an order of conviction on the basis of expert opinion as the same is not conclusive, whereas, court may pass an order of conviction on the basis of ocular witness.

<sup>28</sup> AIR 2008 SC 1747.

to discard the testimony of an eye-witness simply on the strength of such opinion expressed by the medical witness is not conducive to the administration of criminal justice.”<sup>29</sup>

Forensic evidence must be attached with more weightage in comparison to evidence given by eyewitness as there can be chances that the onlooker has been overstating actualities and giving a twisted variant of the genuine episode. Till the late 20<sup>th</sup> century, due to lack of relevant technology, courts were inclined towards non-scientific evidences. Major issues connected with those evidences were:

- a. Eyewitness observes the occurrence for a brief period.
- b. Inter-mingling of roles carried on by various persons during the occurrence.
- c. Existence of eyewitness's bias towards either of the party (i.e., culprit or victim).
- d. Eyewitness tends to forget, rationalise, or even deal with confusion because the statement may have been recorded after substantial passage of time.
- e. The environment inside court room may frighten him.
- f. He could have discussed about the happening with others and may take into account the opinion of those others.
- g. His observation power, memory and description tend to have a significant impact.<sup>30</sup>

### ***(iii) The Ethics of Expert Testimony***

The ethics that an expert need to understand and respect can be stated as follows:<sup>31</sup>

- a. to act with integrity, honesty, and impartiality;<sup>32</sup>
- b. keeping himself abreast with latest changes in his area of specialization;
- c. providing for expert opinion in their respective area of expertise;
- d. applying universally accepted scientific standards in examination of evidence in lab and drawing conclusions;
- e. inside the courtroom, makes full-fledged and impartial disclosure of all the laboratory results irrespective of its' implications;
- f. apprise the court with any factor that may have adversely affected his findings;
- g. expert must be persuasive and not advocative about factual accuracy;
- h. expert needs to understand that he is not the witness for any specific side but is the witness for the court.

The author came across a word of caution for the experts by *C. Michael Bowers*<sup>33</sup>:  
“Forensic experts must realize that the courtroom environment is the antithesis of a scientific

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<sup>29</sup>*Ram Swaroop v. State of Rajasthan*, AIR 2008 SC 1747 (Para 9).

<sup>30</sup>B.R. Sharma, *Forensic Science in Criminal Investigation* 33-34 (Universal Law Publishing Co. Pvt. Ltd., New Delhi, 4<sup>th</sup>edn., 2003).

<sup>31</sup> See Melanie Klinkner, “Forensic science expertise for international criminal proceedings: an old problem, a new context and a pragmatic resolution” 13 *The International Journal of Evidence & Proof* 123 (2009); J. L. Peterson and J. E. Murdock, “Forensic Science Ethics: Developing an Integrated System of Support and Enforcement” 34 *Journal of Forensic Sciences* 753 (1989); Sadhna S. and K. Roja, “A Study on the Admissibility of expert evidence in Indian Evidence Act” 120(5) *International Journal of Pure and Applied Mathematics* 1130 (2018).

<sup>32</sup> Credibility of a witness in the field of law is an assemblage of multiple behaviours that the witness must possess in order to be effective.

<sup>33</sup>C. Michael Bowers, *Forensic Testimony: Science, Law and Expert Evidence* (Elsevier, San Diego, USA, 2014).

*forum due to its adversarial nature.*” Unlike any scientific forum, inside the courtroom, a judge is under no obligation to accept the findings of expert. An expert deposes and his job is not to decide. Forensic experts’ testimony is more of ethically challenging and complex in nature.<sup>34</sup>

The expert brings in the ethics of his own discipline into the legal system, the system which in itself is governed by ethics of altogether different kind. One of the inherent differences between the two fields can be highlighted during the cross-examination.

In the words of founding father of the Indian Evidence Act, 1872, *Sir James Fitzjames Stephen*, “The substance of the rules as to experts is that they are only witnesses, not judges; that their evidence, however important, is intended to be used only as materials upon which others are to form their decision.”<sup>35</sup>

#### **IV. ADMISSIBILITY & RELEVANCY OF FORENSIC EXPERT EVIDENCE IN CRIMINAL JUSTICE ADMINISTRATION**

Common Law scholars have feared the absence in legal systems of correct tools for evaluating scientific information. In the words of *Gary Edmond*, “Because the various sciences maintain different approaches, theories, canons of practice, metaphysics, status, levels of relevance, levels of abstraction and so on, it would be highly naive to suggest that we could expect some universal criteria which could be applied consistently to determine ‘reliability’.”<sup>36</sup>

The main factors that can be attributed as the reasons pertaining to doubtful acceptability of forensic expert evidence is the gap in existing law and non-clarity in definition of ‘who is an expert’. Second set of issue lies in treating the expert evidence as mere opinion and the tussle between *forensic evidence v. ocular evidence*. In other words, in case there is a contradiction between the version of unimpeachable eyewitness or a documentary evidence and expert opinion, then the latter will not prevail over the direct evidences.<sup>37</sup> The court is allowed to differ from the experts conclusion and can place reliance on other existing evidences in order to reach to a decision. There is absence of parameters to assess the cogency and dependability

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<sup>34</sup> See N.J. Schweitzer and Michael J. Saks, “THE CSI EFFECT: Popular Fiction About Forensic Science Affects The Public’s Expectations About Real Forensic Science” 47(3) *Jurimetrics* 357-364 (2007). The authors in this paper have presented results of an empirical study conducted by them on sample of 48 university students on one of the aspects of CSI effect, i.e., “do CSI viewers give forensic science more weight than it deserves?”. The results were: “CSI leads viewers to expect high-tech science and something more than the intuition of the witness, so that when in court they are presented with much lower-tech science and the witness’s subjective judgment, they are likely to find it less convincing than do non-CSI viewers”. It kind of justifies the title of their paper that indeed, ‘popular fiction about forensic science affects the public’s expectations about real forensic science’ (in other words, that is what CSI effect or CSI syndrome mean). [CSI (or, Crime Science Investigation) is an American TV show].

<sup>35</sup> Sir James Fitzjames Stephen, *The Indian Evidence Act (I. of 1872): With an Introduction on the Principles of Judicial Evidence* 121 (Macmillan and Co., London, 1872).

<sup>36</sup> Gary Edmond, “Judicial Representations of Scientific Evidence” 63(2) *The Modern Law Review* 251 (2000). See Justice Robert French, “Expert testimony, opinion argument and the rules of evidence” available at: <http://classic.austlii.edu.au/au/journals/FedJSchol/2008/3.html> (last visited on July 10, 2018); the author observes that- the wide range of issues that the courts are expected to decide upon unavoidably requires various types of experts who may guide them towards formation of their judgments. These experts can be differentiated not only on the basis of their subjects, but also on the basis of their “conceptual foundations and methodology and the nature of the intellectual or other enterprises they represent”.

<sup>37</sup> “It is the golden principle of criminal jurisprudence ocular evidence must always be given preference to the expert opinion even if the expert opinion does not support the ocular evidence.” See *Sri Dandeswar Barman v. The State Of Assam &Anr*, Gauhati High Court judgment dtd. February 23, 2017.

of forensic evidence in courtroom.

In criminal proceedings, the prosecution, and in civil cases, the plaintiff, carries the burden of proof, whereas, in case of any party bringing the expert for tendering his opinion, that party has burden of proving the scientific admissibility.

#### ***A. Real parameters or elements that constitute forensic evidence***

Forensic expert prepares a report on the basis of his findings from the examination of physical evidence procured from the crime scene. He thereafter, gives his opinion in the court based on those findings. This opinion of a forensic expert if admissible in court is referred as forensic evidence.

Forensic Science encompasses and applies all branches of science for the purpose of law. All the methods were originally borrowed from different science fields such as chemistry, surgery, medicine, etc. But it has created its own branches over the previous few years that are more or less exclusive forensic science fields. Significant progress has been made in serology, voice analysis, odor analysis and studies of nose prints and ear patterns in recent years.

The capacity to accept forensic evidence lies at discretion of presiding judge, who has to consider validity of evidence, the credibility of the science behind it, and how important each piece of evidence can prove in a particular situation.

#### ***B. Need of Forensic Expert Evidence in Criminal Justice Administration***

It is courts duty to decide: (i) whether expert evidence is needed, and; (ii) establish the expert witness' competency. The basic questions that forensic testimony is designed to address are 'who', 'what', 'when' and 'how'.<sup>38</sup> If the clues retrieved don't connect the accused to victim or crime scene, the accused's innocence will stand established.

As the popular saying in judicial system goes: "Truth must triumph is the hallmark of justice"<sup>39</sup>. The truth can be established by various scientific tests and therefore contribute to justice administration. It's been long that the police have been blamed for adopting shortcut easy methods during interrogation which have led to violation of human rights. They have been accused of using coercive methods to extract information. The scientific evidence is said to have brought about fairness during investigation as well as it assists in corroborating other evidences through the trial thereby helping judiciary in deliverance of justice.<sup>40</sup>

In recent literature on 'Expert Evidence and Scientific Proof in Criminal Trials', *Paul Roberts* in his introduction states that "forensic science as prosecution evidence, in reliably proving guilt and bringing offenders to justice, is only part of the real story". While

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<sup>38</sup>Pete Frick, "Forensic Science in Court: Challenges in the Twenty-First Century" 27 *Syracuse Journal of Science & Technology Law* 146 (Fall 2012).

"Who" committed an act is the subject of areas such as DNA, fingerprint, handwriting, hair or bite-mark analysis; "how" an incident took place can be addressed through as tool mark analysis, firearm and bullet comparisons, bloodstain pattern analysis; question of "what" can be catered through forensic toxicology and forensic pathology; "when" may be determined by forensic entomology and forensic geology.

<sup>39</sup>*Nandlal Wasudeo Badwaik v. Lata Nandlal Badwaik* (2014) 2 SCC 576.

<sup>40</sup>*Supra* note 12.

comparing forensic science to a powerful medicine which is either capable of killing or curing, he further highlights that, like a powerful medicine, forensic science depending on the dosage and skill with which it is administered can either promote administration of criminal justice or frustrate its ambitions as well as corrupt its ideals.<sup>41</sup>

Indian authors have mostly shared the view, i.e., role of forensic science and opinion of forensic expert, in administration of Criminal Justice in India is still in a rudimentary or restrictive phase.<sup>42</sup> But, there is no research as such explaining in detail the reason behind the same, citing proper data and thereafter giving suggestions for bringing the transformation. At the same time, the reason that has been attributed to infirmities in expert evidence is limited knowledge and availability of limited facilities for examination.<sup>43</sup>

### ***C. Evidentiary Value of Expert Opinion***

If there is a dearth of direct evidence and it requires affirmation for prevailing evidence, the view of the expert is required which can be utilised as an evidence. Science is said to have that capability to powerfully corroborate and settle the fact in dispute. Forensic evidence is considered to be secondary evidence that may be used to validate the primary evidence.

### ***D. Role of Cross-Examination***

One can identify basic parallels between the particular ways of legal system and forensic science dealing with knowledge creation. Law depends on testimony in court, on the other hand, science is based on noted observations. There is a similarity between testing of evidence via cross-examination and scientific methods of testing of hypothesis & falsification.<sup>44</sup>

Cross-examination of expert is a tool for checking the reliability of scientific evidence. It's a crucial requirement in adversarial system of justice that if a particular evidence is to be used against the adversary, the latter should be given chance to check the truthfulness of the same. Cross-examination may tend to put a question mark on the expert's methods or his specific finding. The cross-examiner may use other technique of calling upon another expert to counter and *rebut*.

*Gross's* paper points out that there has been much written on the aspect that experts of law (lawyers) and experts of other fields (forensic experts for our purpose) do not share very warm feelings for each other at all times. The contempt this process (calling of expert witness

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<sup>41</sup>Paul Roberts (ed.), *Expert Evidence and Scientific Proof in Criminal Trials* (Routledge, London, 2016).

<sup>42</sup>Manisha Chakraborty and Dr. Dipa Dube, "Applicability of Forensic Science in Criminal Justice System in India", available at: <http://vips.edu/wp-content/uploads/2017/07/Forensic-Science.pdf> (last visited on Feb. 20, 2019).

<sup>43</sup> Dr. T.R. Baggi (Former Director of Central Forensic Science Laboratory, Hyderabad) had in 2011 in *The Hindu*, opined that: "'forensic science' is an ornamental and cosmetic utility of the investigating agencies which completes the formality of legal process and satisfies the lay public. It is showcased and remembered only when major or sensational crimes occur to satisfy the inquisitive and demanding media and citizens. Compared to other disciplines of science and technology, forensic science is static and stunted in India. It is not being utilised in its own right with the full thrust to help the investigating law enforcement agencies and the criminal justice system."

See Dr. T.R. Baggi, "Why is forensic science stunted and static in India?" *The Hindu*, Sep. 11, 2011.

<sup>44</sup> Melanie Klinkner, *supra note* 31 at 114.

in court to testify and being cross-examined) ends up generating is not one-sided. *Gross* quotes an author *Karl Menninger*, who states: “the expert is not self-invited to these parties. He is not a trespasser. He is called, then he is questioned, criticized, disputed, attacked, suspected, disregarded and ridiculed.” Furthermore, from the perspective of experts from other fields in regards to legal experts, *Gross* furnishes that “Experts in other fields see lawyers as unprincipled manipulators of their disciplines”.<sup>45</sup>

### ***E. Constitutional and Legal Issues***

The common grounds on which the admissibility of expert evidence can be denied are as follows:

- a. professional competency and status of expert;<sup>46</sup>
- b. questionable methodology<sup>47</sup> raising objections on the reliability;
- c. jeopardising fair trial; or
- d. lacking probative value<sup>48</sup>.

In light of a legitimate concern for justice, the court must follow balanced approach between right of an individual and that of community while ordering for a forensic examination.

The Constitution of India, 1950, through Article 20, highlights two vital differences in civil and criminal court issues in form of protection against self-incrimination and double jeopardy, both being defendant favouring. However, when we consider forensic evidence, in this case as mentioned earlier, the evidence for examination is collected from crime scene investigation only and the accused is not forced to testify against himself in such case.<sup>49</sup> Moreover, as mentioned above, forensic evidence is not conclusive evidence on sole basis of which the court may decide against the accused. Article 21 mandates that the State cannot deprive any person off his right to life and personal liberty except according to a just, fair, and reasonable procedure established by law. Therefore, violation of right to privacy of the accused is justifiable only if it is done within bounds of fairness, justness and reasonableness of procedure established by law.

A question arises here, what is the fate of the evidence that is procured through unlawful, improper, or illegal means? Response to this can be that Indian courts go with balance of considerations while deciding on the issue of admissibility of evidence obtained through usage of unfair means. If the probative value of the evidence outweighs its prejudicial effect, this may lead to admissibility of such evidence.

Coming to the legal provisions under the Code of Criminal Procedure, 1973, i.e., the law laid down in sections 53 and 54.<sup>50</sup> Section 53 permits the criminal courts to use reasonable amount of force in order to conduct forensic examination. On the other hand,

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<sup>45</sup> *Supra* note 14 at 1115.

<sup>46</sup> See Gary Edmond (*supra* note 35) describing judicial skills used to evaluate scientific evidence.

<sup>47</sup> This will include collection of evidence and thereafter, its examination or scientific inquiry.

<sup>48</sup> Merely because the report is being submitted by expert doesn't ensure its' acceptability in court, unless it possesses probative value.

<sup>49</sup> Section 73 of the Indian Evidence Act, 1872, authorizes the court to guide any individual including an accused to let his finger impressions be taken. The Supreme Court has also ruled that the obligation to give fingerprints does not breach the constitutional safeguards laid down in Article 20(3) of the Indian Constitution.

<sup>50</sup> The relevant provisions under the Criminal Procedure Code, 1972, and Identification of Prisoners Act, 1920, allow for the collection of bodily samples for forensic analysis.

section 54 offers an opportunity to accused to propose medical examination for proving his innocence.<sup>51</sup>

Further, throwing some light on section 293 of CrPC, which provides for an exception to the rule stated under section 273 of the same Code, i.e., ‘all evidence received during the trial shall be received in the presence of the accused person’. Section 293 further departs from the primary rule that ‘evidence not stated on oath and tested by the party against whom it is intended to be used can’t be accepted as evidence’.<sup>52</sup> This section considers reports of the experts mentioned, as admissible evidence even without calling upon them as a witness in the case.<sup>53</sup>

### ***F. Judicial Approach***

Despite the near accuracy of scientific reports, the courts though have allowed the reports but have been reluctant to accept them as sole basis for conviction and seek corroboration.

In *Malay Kumar Ganguly v. Dr. Sukumar Mukherjee and Ors.*<sup>54</sup>, it has been observed:

“An expert is not a witness of fact and his evidence is really of an advisory character. The duty of an expert witness is to furnish the Judge with the necessary scientific criteria for testing the accuracy of the conclusions so as to enable the Judge to form his independent judgment by the application of these criteria to the facts proved by the evidence of the case. The scientific opinion evidence, if intelligible, convincing and tested becomes a factor and often an important factor for consideration along with other evidence of the case. The credibility of such a witness depends on the reasons stated in support of his conclusions and the data and material furnished which form the basis of his conclusions.”<sup>55</sup>

In *Mahmood v. State of U.P.*<sup>56</sup>, an observation was made by the Supreme Court on the lines that, “it is highly unsafe to convict a person on the sole testimony of an expert.

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<sup>51</sup> See *Halappav. State of Karnataka*, 2010 CrLJ 4341 (In this case the court observed “Drawing of the blood sample for the purpose of civil proceedings without the consent of the party is not desirable. But drawing of the blood sample for detection of the offence of rape wherein the investigating agency has to establish its case beyond reasonable doubt cannot be termed as violative of Article 20(3) of the Constitution”); consent is of importance in case of civil disputes Also see, *State of Delhi Administration v. Pali Ram*, 1973 SCR (1) 931.

<sup>52</sup> Section 293 of the Code deals exclusively with certain government scientific experts. Sub-section 1 states: “Any document purporting to be a report under the hand of a Government scientific expert to whom this section applies, upon any matter or thing duly submitted to him for examination or analysis and report in the course of any proceeding under this Code, may be used as evidence in any inquiry, trial or other proceeding under this Code.”

Sub-section 2 provides: “The Court may, if it thinks fit, summon and examine any such expert as to the subject-matter of his report.”

Sub-section 4 lists the government scientific experts to whom the section is applicable. The report of expert who is not listed in this section is not admissible in evidence without calling him as a witness.

<sup>53</sup> See <http://admis.hp.nic.in/himachal/home/Forensics/ActsandRules.htm> (last visited on Feb. 05, 2019).

<sup>54</sup> Supreme Court’s decision dated August 07, 2009.

<sup>55</sup> *Ibid.*

<sup>56</sup> AIR 1976 SC 69.

Substantial corroboration is required. Thereby, it is very evident that conviction cannot be granted only on the basis of forensic report of an expert.”

The Hon’ble Supreme Court of India in *Dharam Deo Yadav v. State of U.P.*,<sup>57</sup> stressed upon the necessity of promoting and applying scientific evidence for sake of interest of criminal justice system. It emphasised the pivotal role of forensic science specially in cases based on circumstantial evidence. The need of scientifically dealing with the crime scene without any error has been pressed upon in this case. The court observed: “In this age of science, we have to build legal foundations that are sound in science as well as in law.” It was also mentioned that traditional methods of investigating crimes and procuring evidences have become outdated looking at the increased levels of sophistication in case of new kinds of crimes.

In the case of *Mukesh and Another v. State (NCT of Delhi) and Others*,<sup>58</sup> Supreme Court considered the application of fingerprint analysis, footprint analysis and alsoodontology branch of forensic science. These forensic evidences in the case proved presence of particular accused in the bus, also bite marks on the body of prosecutrix were proved to be of the accused through the technique of forensic odontology (herein, evaluation of bite marks for identification of suspect).

At the same time Supreme Court in certain cases has criticised the negligence in improper utilisation of skills in collecting relevant evidence from scene of crime. In *Varun Chaudhary v. State of Rajasthan*,<sup>59</sup> there was no evidence to the fact of collection of tyre marks of motorcycle from the scene of occurrence in order to compare it with the tyre marks of the motorcycle alleged to have been used in the commission of the offence.<sup>60</sup>

## **V. FACTORS THAT WILL ENHANCE EFFECTIVE USE OF FORENSIC EXPERT EVIDENCE IN CRIMINAL JUSTICE DISPENSATION**

### ***A. Factors that can enhance acceptability of forensic expert evidence in courtroom***

The major lacuna that lies in Indian system pertaining to hesitation in acceptability of forensic expert evidence in courts is lack of legislative framework. A bill titled ‘Forensic Regulatory and Development Authority of India Bill, 2011’,<sup>61</sup> was introduced in the Parliament with a particular objective in mind for the favourable future of forensic science in court, but the bill never saw light of the day.

### ***B. Practices that will make the Indian System match global standards***

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<sup>57</sup> (2014) 5 SCC 509.

<sup>58</sup> (2017) 6 SCC 1.

<sup>59</sup> (2011) 12 SCC 545.

<sup>60</sup> Also See the Sessions Court judgment in the case of Arushi Talwar Murder Case, *available at*: <http://online.wsj.com/public/resources/documents/AarushiVerdict.pdf> (last visited on April 26, 2019).

<sup>61</sup> The objective of the bill as stated in the long title read as: “To establish a Forensic Sciences Development and Regulatory Authority and to provide for regulation, standardization and accreditation of forensic science services, and certification of forensic science practitioners, and for matters connected therewith or incidental thereto.”

The Bill is *available at*: <http://iafmonline.in/data/circular-notifications/FDRA-Bill-2011.pdf> (last visited on April 24, 2019).

Studies have shown that investigating agencies often avoid forensic evidence because of unreasonable delays in forensic reporting, and they end up relying back upon traditional forms of evidence only.<sup>62</sup>To put it in other words, the investigation agency as well as judge may seek the expert opinion simply after exhaustion of all other modes of obtaining evidence. This can lead to delay in court proceedings. One of the reasons for the delay in reporting can be said to be poor infrastructure of our Forensic Science Laboratories. It has been time and again reiterated by experts that the infrastructure of our FSL's doesn't match with the global standards and that acts as one of the major drawbacks as well as a challenge. There is also one issue pertaining to the independence of Central and State Forensic Science laboratories. There is lack of legislative framework for regulating functions of forensic labs in India. How much time is required for analysing evidence collected and who monitors the same and what happens in case of delay in submitting report based on analysis? These questions if satisfactorily answered, may bring the forensics assistance in Indian courts at par with other forensics assistance favouring nations.

## VI. CONCLUSION

Necessity is a major reason that the court looks out for expert opinion in order to corroborate already existing evidence to prove the guilt of the accused. This defines the role of an expert at present in the justice administration system. But on the point that, who appoints this expert for giving expert opinion in the court is not mentioned under the written law. The definition or law relating to expert opinion under the Indian Evidence Act, 1872, is not comprehensive in nature. The definition of expert under section 45 of the Act is incomplete. The court has been given complete discretion to decide upon whether to accept or reject the opinion of the expert. Out of the five areas of specialisation mentioned under the section, science is one such field which keeps on developing exponentially with new discoveries. This is evident from the fact that the types of forensic techniques that existed earlier, were lesser in number than the number of techniques that now exist. Recognition has been given to science and technology in our court rooms but due acknowledgement is still missing because of number of reasons as explained in this paper previously. In order to match the standards of application of forensic science at global level, the foremost need is the overhauling of law related to the opinion of expert and more specifically forensic expert here.

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<sup>62</sup> As pointed out by Dr. G. K. Goswami, IPS, Joint Director, CBI, Lucknow in a recently held debate (February 13, 2018 in Ahmedabad, Gujarat) on the topic: "Can India develop a passion for DNA casework even without a criminal offender database?" available at: <https://businesswireindia.com/news/fulldetails/india-leading-legal-forensic-experts-call-transforming-dna-into-courtroom-evidence-combat-rising-sexual-crimes/56986> (last visited on Jan. 31, 2019).