

# ● JUDICIARY AND TRUE ASSESSMENT OF SCIENTIFIC EVIDENCE: SOME ISSUES



**Dr. Anjum Parvez\***

**Prof. (Dr.) Rajesh Bahuguna\*\***

---

## Abstract

*Evidence obtained by using scientific methods are often revealed those hidden facts which cannot be traced by simple methods of traditional investigation. Yet, for judges it would not be easy task to appreciate scientific evidence in a legal dispute under adjudication because a judge usually lacks scientific expertise and, reliance on expert witness depends on his impartiality and categorical explanation of scientific facts related to such dispute. In this Article, attempt has been made to evaluate the various factors responsible for causing trouble for judges to understand the correct value of scientific evidence.*

---

## Key words

*Judges, Law, Courts, Scientific evidence*

---

## 1. Introduction

Courts cannot deliver judgments of justice unless evidence of merit adduced before them by the parties to the litigation (civil or criminal), and, much depends upon the quality of evidence so produced in terms of its admissibility. Taking the hypothesis considering the Law and Courts as Social Institutions<sup>1</sup>, both need the human agency for their effectiveness. Judges of Courts, who deliver the judgments and, Police officers, who investigate and collect evidence, and Lawyers, who present the evidence so collected before the courts, play the indispensable role in the entire process. The confusing concept of justice, which appears sometimes reasonable while unreasonable on other occasions, coupled with complicated procedure of law makes the matter more aggravated from the point of view of party who, despite of all clarity on his/her end fails to prove the relevant facts.

However, objective of each and every law in a democratic set-up, generally (but not in all cases), is to ensure justice to mankind which is, discreetly, based on foundation of truth, impartiality, independence and expertise of the persons concerned with the responsibility of maintaining the law and order and, of dispatching the justice. Any aid in ensuring the legal justice from any sector of any branch of knowledge or field has always

---

\*Associate Professor, Law College Dehradun, Uttarakhand University, Dehradun

\*\* Pro Vice Chancellor & Dean, Uttarakhand University, Law College Dehradun,, Dehradun

<sup>1</sup>Deniela Berti and Gilles Tarabout (2018) "Through the Lens of the Law: Court Cases and Social Issues in India"

17 South Asia Multi disciplinary Journal 3.

been always welcome, be it from history, literature, philosophy, anthropology, social sciences or physical or biological science including technology and engineering.

## 2. Science in the Courtrooms

Before proceeding further, one must keep in mind that law has its own rules on the parameters of which it deals with facts while science has its specific methods and techniques on the application of which it analyze the facts. When a fact in dispute acquire a legal character and comes before the Court, the same get the colour of different dimensions, i.e, vision from the angle of law and vision from the angle of science, both entirely different. It is an absolute misconception from the angle of law and legal procedure that any branch of knowledge including science, which may be of utility in terms of proving the evidence, can be regarded as perfect and unimpeachable because courts need the evidence, which cannot be always based on philosophical and meta-physical arguments. However, many believe that physical and biological sciences are un-impeachable fields of knowledge and scientific methods & techniques are, generally, accurate and perfect because they are based on actual existing physical facts in this world. Science has been in existence since time immemorial, and now science and technology go along, nevertheless, it was not true if we explore history of science which tells us that in earlier ages science and technology were almost independent activities, having no inter-link with each other.

One practical problem often arise that centuries or decades would elapse before a new scientific idea of utility could have been transformed into a useful application in the arena of legal justice of human life given the fact of its reliability in certain circumstances in every legal dispute. On historic facts, we find that engineering developed largely independent of science, and was guided by experience and tradition, yet today its doctrines are interconnected with physical sciences<sup>2</sup>. Markanday Katju (2000) claims that it is the modern age that science and technology have become closely interlinked, and the gap between them has further narrowed down<sup>3</sup> after the subsequent developments and rectified enormously with the emergence of diverse branches like chemical sciences, biological sciences, forensic sciences and many others that now, it is safe to say this modern age is indeed belongs to science and technology without any sort of skeptics. Role of forensic science, which is a combination of all branches of science, has become vital now in the process of investigation conducted by the Investigation Officer of any crime and for proving a fact.

## 3. Question of Legality of Scientific Evidence before the Court

However, as one can be convince (as usually the case of layman's belief) about the exactness of science in unearthing the truth of any matter of fact under investigation, particularly in the criminal cases, the same is neither the belief nor approach of the courts around the world as they don't rely as much upon the science and scientific methods juxtaposition from the ordinary belief of common masses and scientific community.

---

<sup>2</sup>Justice Markandey Katju, (2000) *Law in the Scientific Era: The Theory of Dynamic Positivism* 1Universal Law Publishing Co. Pvt. Ltd., Delhi.

<sup>3</sup>Ibid



In the words of C. Michael Bowers (2014) "Several of forensic science thought for many years to be of sound basis have been criticized as being based on false assumptions, poor science, inaccurate techniques, and erroneous interpretations. Unfortunately, some of these criticisms have turned out to be true as well founded"<sup>4</sup>.

Central to this is an understanding of how the scientist's findings can be properly interpreted, evaluated and communicated to the court and how the court draws appropriate inferences from the expert opinion in reaching its decision on the ultimate issue. In doing so, the court must necessarily be satisfied that the science is valid and the evidence relevant to its deliberations<sup>5</sup>.

Although, the concept of relevance has been enshrined in law across most jurisdictions for many years, in more recent times, questions have emerged around the world about wider aspects of the presentation of scientific evidence to the court and the role of the scientist as an expert witness. Many reasons including significant advances in scientific techniques, the need for investigators to deal with more complex and high profile crimes, increasing attention to these concerns and the ongoing responses of the legal profession and lawmakers to those events, are responsible for such skepticism relating to scientific findings and its status before court of law.

What is scientific knowledge and when it is reliable? Answer of this question may be simple in our simplistic life for the simplistic purposes, yet, it becomes difficult in the complex procedure of complicated problems arise before the courts in the form of disputes of civil or criminal nature. Identify of biological materials of a person may be accomplished only through medical tests i.e. Luminol Test, BCIP Test (Bromo-Chloro-Indolyl Phosphate), Phenolphthalein Test<sup>6</sup> etc. Not only this, but the common medical examination tests also play their role in determination of disputes in the form of relevant fact, if admitted by the courts. However, the question of accuracy of tests has always been the debatable as slightest error may tarnish attempt to ensure justice. These deceptively simple questions have been source of endless controversy. In the courtroom, the outcomes of criminal, paternity, environmental and medico-legal cases often turn on scientific evidence, the reliability of which may be hotly contested<sup>7</sup>. Lack of proper knowledge of science on the part of a judge may damage the case if he could not understand the facts under the light of scientific importance even it may not be the matter of *per incuriam*.

Jeroen de Ridder (2019) is of the opinion that scientific knowledge is the most reliable knowledge at least about certain subject matters<sup>8</sup>. He further acknowledged that

---

<sup>4</sup>C. Michael Bowers (2014) Forensic Science Testimony: Science, Law and Expert Evidence 23 Academic Press- An Imprint of Elsevier, New York.

<sup>5</sup>Ibid.

<sup>6</sup>Bureau of Criminal Apprehension- Minnesota Department of Public Safety (U.S.) available on [www.dps.mn.gov/bca](http://www.dps.mn.gov/bca) Last visited on 24th June, 2021.

<sup>7</sup>Kenneth R. Foster and Peter W. Huber, (1999) Judging Science: Scientific Knowledge and the Federal Courts 1 (The M.I.T. Press, Cambridge, London).

<sup>8</sup>Jeroen De Ridder (2019) How Many Scientists Does It Take To Have Knowledge , in Kevin McCain and Kostas Kampourakis (2020) What is Scientific Knowledge? A n Introduction to Contemporary Epistemology of Science 5, Routledge, New York.

science is our most reliable means for discovering non-obvious or non-superficial factual truths about the universe and about ourselves<sup>9</sup>. His observation is appreciable but the same may not be true when the same question comes before the Court of Law, especially a dispute of criminal nature. This may be our belief that science is accurate and perfect but a court needs the proof of this fact through trustworthy evidence in the cases where it is to be determined whether a scientific principle or method is reliable or not. Situation becomes worse if a judge has no or less knowledge about the science and scientific principles, although this can be cured by explaining to him (judge) the true import of scientific principle in question, and the burden of proving this shall lie on the party who asserts that principle. One of the eminent judges of Supreme Court of India, Justice Markandey Katju (2018) writes in his book that "Every institution is really the personnel manning to it, so, a High Court is not really a beautiful building or beautiful lawns but the judges who man the institution. Therefore, they should be the people of repute and integrity in conduct along with the legal knowledge they have inculcated<sup>10</sup>". It is submitted that a judge must not only be a man of higher moral integrity but also be a learned person in the field of science and technology so he may appreciate a scientific evidence in proper way. One may give argument that a judge may resort to his aid through an Expert, but, it is equally true that not all experts are unbiased as researches shown that they often lean towards the party who called them.

At the western world, it appears that the courts of America and Europe have been on the basis of their long experience and understanding are prepared enough to accept and admit the scientific evidence, if reliable in its true character, although, problems regarding their admissibility are same but judicial dynamism in understanding and acknowledging the scientific facts is the tool which can be immensely effective in the matters of application of science in the courtrooms, in relation to a dispute. While acknowledging the importance of science in the area of justice, Stephen Breyer (2011), said that "In this age of science, science should expect to find a warm welcome, perhaps a permanent home, in our courtrooms. The reason is simple one. The legal disputes before us increasingly involve the principles and tools of science. Proper resolution of those disputes matters not just to the litigants, but also to the general public—those who live in our technologically complex society and whom the law must serve. Our decisions should reflect a proper scientific and technical understanding so that the law can respond to the needs of the public<sup>11</sup>". But the probability of manipulation of facts discovered at the crime scene coupled with suspicion on accuracy of scientific method applied in the investigation, are to be sorted out first, as required by the Courts.

However, that is equally true that all the judges obviously cannot be equally well-versed in all the spheres of social life, including the science and criminal investigation. In 2013, reflecting on the controversial decision in *Bush v. Gore*<sup>12</sup> in which the U.S. Supreme Court effectively awarded the presidency to Mr. George W. Bush, former Justice Sandra Day O'Connor said "Maybe the Court should have said. "We are not going to take it,

---

<sup>9</sup>Ibid.

<sup>10</sup>Justice Markandey Katju, (2018), *Whither Indian Judiciary* 175, Bloomsbury India, New Delhi.

<sup>11</sup>Stephen Breyer, (2011) "Reference Manual on Scientific Evidence" 2 National Academic Press, Washington D.C.; Stephen Breyer has been the Associate Judge of the U.S. Supreme Court.

<sup>12</sup>531 U.S. 98 (2000).



goodbye!<sup>13</sup> But one cannot deny the importance of science and Technology even in the field of complicated social disputes, as Anjum Parvez and Prof. Rajesh Bahuguna (2020) assert as science and technology conspicuously playing important role in every sphere of day-to-day life of the human beings<sup>14</sup>.

All courts, as a matter of practical reason, require substantial and clear evidence which could assist them in arriving at the right conclusions about the facts in dispute put before them for determination, the role of expert witnesses besides lawyers become crucial in presenting and explaining the evidence in the backdrop of scientific knowledge. Judicial Tribunals all around the world usually exercise considerable caution regarding the admissibility of scientific evidence in the form of expert opinions concerning some new phase of ever increasing wealth of scientific knowledge<sup>15</sup>, because the way in which scientific evidence produced before them generally lead the case in marsh of more complications without extricating any considerable fact out of complexities.

Frequently, the amateurish and unconvincing, and in some instances the deliberately dishonest presentation of scientific testimony is responsible for a court's refusal to admit it as evidence. Likewise, the super-cautiousness, or the innate inability of a judge of the court, either due to his personal lack of scientific knowledge or because of the command of the law<sup>16</sup>, to appreciate the significance and importance of scientific evidence even when properly presented often accounts for the unduly deferred recognition as a scientific principle or its application<sup>17</sup>.

Forensic Science in criminal investigation and trials is mainly concerned with materials and indirectly through materials with men, place and time. Among men, the investigating officer is the most important person. In fact, it is he whose work determines the success or failure of the application of forensic science in the process of criminal case. If he fails to collect the relevant correct evidence, or allows to be contaminated, mutilated, switched, destroyed or does not provide correct samples for comparison in then forensic science laboratories, the findings of the forensic scientist will not only be useless; but they will be misleading and even go to the extent of helping the culprits<sup>18</sup>.

On the positive note, scientific methods and techniques, so far, proved very useful in identification and comparison of the materials involved or related or connected to an event, which may be in the form of criminal dispute before a court. They establish the

---

<sup>13</sup>Nuno Garoupa and Tom Ginsburg (2015) *Judicial Reputation: A Comparative Theory* 14 University of Chicago, Chicago.

<sup>14</sup>Anjum Parvez and Rajesh Bahuguna (2020) "Use of Engineering and Scientific Methods in Detection and Prevention of Crimes" 12(3) *Journal of Advance Research in Dynamical and Control System* 374.

<sup>15</sup>Fred E. Inbau (1933) "Scientific Evidence In Criminal Cases" 24(4) *Journal of Criminal Law and Criminology* 825 (Winter, 1933).

<sup>16</sup>See, for Example, Section 83 of the Indian Penal Code, 1860, which provides that court shall presume conclusively about the innocence of child who committed any sort of crime if he is under seven years of age.

<sup>17</sup>Supra Note 15, at 826

<sup>18</sup>Dr. B.R. Sharma (2015) *Forensic Science in Criminal Investigation & Trials* 2 Universal Law Publishing Co. Pvt. Ltd., New Delhi, 5th Edition.

presence or absence of a link between the crime and the criminal, the victim, the weapon of offence etc<sup>19</sup>.

In the Indian Judicial system, it appears that the it has an advantage over the U.S. Courts' approach because there are no parameters or standards so far laid down by the apex court, thus, it gives an additional extension of jurisdiction, so they may accept scientific evidence according to the merits of facts and circumstances of every case, but with an inevitable mist of confusion because here at the most courts can go on relying the principle of justice, equity and good conscience, not in disregard to the scientific principles and methods but in consonance with them, but one limitation of unavailability of settled parameter of knowing their validity. Nonetheless, this approach results in complete failure in those complicated cases where judge has to rely entirely on scientific facts and expert opinion.

Regarding the admissibility of scientific evidence in the court of the law, many institutional and systemic problems exist. Certification standards for crime data analysts and quality assurance programs for Forensic Science Laboratories<sup>20</sup> including the laboratories exclusively concerned with criminal data analyses are generally, *condicio sine qua non* in the Indian courts. Dr. Anjum Parvez and Prof. Rajesh Bahuguna (2021) are of the opinion that unlike biological or physical science there cannot exist common standards of admissibility of scientific evidence in different courts under different legal systems of different part of the world, nor, keeping in view of complex procedural aspect of admissibility of evidence, any possibility in near future of such standards<sup>21</sup>.

Yet, undeniably the need for the application of science in the legal procedure and in dissemination of justice is pressing. Some of the factors demanding the extensive use of science not only in the investigation process but also in the court rooms are i.e. more involvement of science and technology in day to day life of an individual, unprecedented social change in the human relations like surrogacy, need of efficient and accurate evidence in order to condemn an accused against his shield of Human Rights, reconstruction of crime scene incidents etc. Besides this, electronic Evidence gaining huge confidence in the eyes of Indian Judiciary if it is un-tampered or possibility of making it tampered eliminated. Giving due importance to CCTV recording, the Apex Court of India has in *Shafi Mohammad v. State of Himachal Pradesh*<sup>22</sup> directed to the Ministry of Home Affairs, Government of India to establish a Central Oversight Body to implement a Plan of Action to use the Videography in the crime scene during he investigation.

The Court further pressed the need of creating an oversight mechanism in every State and Union Territory in India which can study the CCTV recording including contents of videos and audios and periodically publish the report of its observations, in order to

---

<sup>19</sup>Ibid.

<sup>20</sup>Paul C. Giannelli (1997) "Criminal Discovery, Scientific Evidence, and D.N.A." 44 Vanderbilt Law Review 796.

<sup>21</sup>Dr. Anjum Parvez and Prof. (Dr.) Rajesh Bahuguna (2021) "Institutional Problems in Indian Judicial System Relating to Admissibility of Scientific Evidence: A Brief Overview" 14(1) International Journal of Grid and Distributed Computing 126.

<sup>22</sup>(2018) 5 S.C.C. 311



verify the validity of CCTV Footages<sup>23</sup>.

It's all about getting the better Evidence: Forensics evaluate physical evidence which is objective. If a fingerprint found at the scene of crime, it can belong to only one person. If this person happens to be the suspect, he must account for his presence at the scene of crime<sup>24</sup>.

#### 4. Laws and Rules of Crime Investigation in India

In Indian Constitution, human rights of accused persons have been given due protection in some provisions, and no procedure including the scientific method or techniques or test, howsoever genuine and accurate, can go against that principle. As article 20(3) provides that no person can be compelled to be a witness against himself, hence, no scientific method for extraction of evidence which may go against the person obtained by way of compulsion or coercion<sup>25</sup>. But, if that is not the case, evidence obtained by use of scientific methods has always been of credit.

Fortunately, most of the Legislations relating to Criminal Procedure and adducing the Evidence before the Courts have become science friendly by recent amendments. For instance, Section 161(3) of Code of Criminal Procedure, 1973 now allows the videography of the interrogation by Investigating Officer of any accused, victim or any other witness. Very recently, the Supreme Court becomes that much alert in utilizing the science and technology in criminal investigation with the aim of elimination of elements of coercion and torture, that it directed the Central and State Governments to install CCTV Cameras in every Police Stations including every Cell under the regular and continuous observation of Oversight Committee<sup>26</sup>. Latest directions have been issued in *Paramvir Singh Saini v. Baljit Singh*<sup>27</sup> that CCTV Cameras in every police station must be equipped with night vision device.

The laws and rules for the administration of criminal justice system have been framed basically by the Indian Parliament, in India, except few minor laws which are enacted by the State legislatures. All laws need modification from time to time in the form of amendments, which are made by parliament whenever, it requires so to do. There are three main codes which deals with the criminal investigation and trials: one, (Code of Criminal Procedure, 1973, hereinafter referred as Cr.P.C.) specifies the Procedure of trial in the Court, the second, (Indian Evidence Act, 1872) specifies the varied nature, the mode of production of the evidence in civil and criminal cases and the value of evidence produced by the prosecution for or against an accused, the third (Indian Penal Code, 1860) defines the nature of different types of offences and the punishment for them<sup>28</sup>.

After the Criminal Amendment Act, 2005, now a medical practitioner can conduct

---

<sup>23</sup>Ibid.

<sup>24</sup>Supra note 18, at 5.

<sup>25</sup>Constitution of India, 1949; Article 20(3).

<sup>26</sup>Supra note 20, at 44.

<sup>27</sup>AIR 2021 SC 64.

<sup>28</sup>Supra note 18, at 52.

medical examination of the arrested person at the request of Police Officer under Section 53 of Cr.PC.<sup>29</sup> which includes examination of semen, blood and blood stains, saliva, and swabs in case of sexual offence. It also includes hair samples, sweat, finger nail clippings, including D.N.A. profiling of that arrested person<sup>30</sup>. Similarly, Medical Examination of accused of rape can also be done and evidence so collected may be produced before the court<sup>31</sup>.

## 5. Suggestions

One may argue that judges should be concerned only with law as it is their natural and normal job. Obviously, it is true to large extent; however, we must concede that the laws do not apply in vacuum, but on persons living in society under certain social norms as recognized by the law, which indispensably import some elements of sociology to be kept in mind. Same is true about science and technology today as in our daily activities we have accustomed to electronic gadgets like Cell Phones, Computers, Electronic Watches, Closed Circuit TVs and many more. We mostly, including an ordinary person to the President of the country including Godmen, sages, saints, and judges too, have to resort to allopathic medical services which are considered most effective and feasible these days. Our house structures and bridges are based on principles of physics and gravity. As rapid means of transport, we prefer to use high speed trains, aero planes for commutation from one place to another in the world, working of which based on technology and engineering. One may conclude that science and technology have, consciously or unconsciously, become part and parcel of our life, which in turn, itself emphasized the need of having proper knowledge and understanding at least upto the primary level in every sphere of life, but more particularly in justice delivery system because its decisions affect the course of life of persons involved in litigations.

Forensic science, as mentioned before, is implicit in itself all branches of science, medical and engineering, and apply in the same in the investigation of crime, and, we cannot ignore its importance. Hence, undoubtedly it becomes need of the time for the application of forensic science in the criminal justice delivery system. The present scenario of crime investigation and prosecution of criminals, in India is rather dismal. A large percentage of the trials, even in those matters involving felony, ultimately, end in acquittals<sup>32</sup>. The official figure for acquittal is very high. Unofficial figures are even higher, above ninety percent. It is estimated that in India, investigative agency spends millions of rupees (Indian currency) on each trial, but often case culminated in acquittal of accused. Thus, not only the money stands wasted in acquittal cases but worse still a dangerous criminal goes scot-free and let loose on the society. The worst consequence of these frequent acquittals is that the citizen loses respect for law. They also embolden the criminals and escalate crime and multiply criminals<sup>33</sup>.

---

<sup>29</sup>Code of Criminal Procedure, 1973; Section 53.

<sup>30</sup>Id; Section 53, Explanation.

<sup>31</sup>Id; Section 53-A.

<sup>32</sup>Supra note, at 3-4

<sup>33</sup>Ibid.