**Scope of Scientific Investigation in Administration of Criminal Justice System**

By: -

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**ABSTRACT**

Science is rapidly changing the world around us today even as we watch it unfolding in front of our eyes. Private rockets are being launched into space, electric vehicles are replacing fossil fuel ones and 5G technology is being launched in every country across the world. In this age of rapid globalization where multi-national companies are investing billions of dollars in India, we are still lagging as a nation in many aspects. The progress of India through these international ventures where the rules and laws keep changing everyday, India needs to introspect. We need to amend a lot of obsolete and outdated systems which keep pulling the country backwards. In this era of economic surge of India in the global markets, India must not allow itself to be pulled down by a justice system that is unfair to those who seek access to it in terms of expenditure of money and time and effort and no guarantee of definite justice. All because the administration is unwilling to recognise this decades-old problem and solve it. The application of science in the administration of criminal justice is a less discussed topic. It should, in fact, be the most debated one in the entire discussion surrounding the criminal justice system. In this research paper, a sincere endeavour has been made to underline the scope of application of science in the criminal justice system, the challenges and how to overcome them. Case laws have been analysed to demonstrate how the theories surrounding the application of science are applied by the courts in criminal trials.

**Keywords**: space, 5G, globalization, fossil fuels, science, criminal justice

**INTRODUCTION**

Science is the study of facts. Science is a study of evidence. Science is unbiased and cannot be manipulated. It also cannot be exhibited falsely as what it is not. It is the discovery and study of matter energy time and space as they exist in nature; the discovery of reality. Hence, it has only one job, that is, finding the truth. The truth that can help us understand the validity of claims made by human beings. Proving those claims to be right or wrong is the work of science. These truths can radically alter the way things are perceived about a certain fact or incident. In the ancient times, people thought that the Earth is flat. They used to fear venturing too far in the oceans thinking that they might fall off the end of the Earth. The Earth was thought to be a flat bread. Shakespeare’s Merchant of Venice mentions “four corners” of the Earth. However, scientific investigations later brought to light an entirely different truth which had previously been discarded as seemingly unbelievable. The earliest scientific ventures to prove this were merely calculative and involved Mathematics by Copernicus and Galileo which were largely incomprehensible to the common public. The first remarkable experiment to prove the truth of this fact was carried out by the great explorer Ferdinand Magellan. His trip, sponsored by the King of Spain is accepted worldwide to be the first definite proof of the Earth being round in shape. Later, of course, when the age of space exploration came into existence, there was clarity regarding the exact shape of the Earth. Science went on making progress throughout the Industrial Revolution in Europe. From searching outwards, science took a turn and started searching inwards. As a result of this, biotechnology and genetic engineering were born. The structure of DNA was discovered and the genes constituting those DNA were decoded. Very soon, DNA fingerprinting came into existence. Also known by the names of DNA profiling, DNA typing, genetic fingerprinting, genotyping, or identity testing, it is arguably the best method of testing the identity of an individual in the current scenario. It is being extensively used to test paternity or as evidence in criminal investigations. Other forms of similar testing methods include handwriting expert, tracker dogs, fingerprint testing, foot printing, pathology, toxicology and the likes. All these can be brought under a single head called “forensics”. Science, therefore, has not only made supercars, skyscrapers, electronic gadgets and satellites but also completely revolutionised the way of seeking truth. There can be no greater boon in the field of law than the application of science in the administration of criminal justice. Trials in the criminal justice system is different from those in civil courts. Very often, the primary focus of civil suit is a question of the law applicable than the proof of facts. In other words, fact are usually well-established and the dispute is regarding the interpretation and application of laws. On the contrary, a criminal trial is more a question of fact than a question of law. Sometimes both maybe equally important but by and large, it is the prosecution which needs to prove that a crime has been committed. By “crime”, it is understood to be a punishable offence. Herein lies the difference between civil and criminal justice system. In the civil justice system, the degree of certainty required for a ruling in favour of the petitioner is lower for the simple reason that it is usually a monetary or any other material form of compensation that is awarded to the petitioner and there is no physical imprisonment or punishment of any kind to the defendant. Criminal proceedings, on the other hand, are different to the extent that the degree of certainty required for conviction of an accused is higher. The reason for this being that conviction of an accused will lead to punishment which can be in the form of imprisonment of different types and periods or even a death penalty. The criminal justice system, therefore, convicts an accused when his guilt is established “beyond reasonable doubt”. This explains the seemingly high requirements of evidence and proof and the long trials in the criminal courts of India.

**BACKGROUND**

The criminal justice system has long suffered the vices of being administered in a developing country like India which is a comparatively new democracy and is still groaning from the aches of colonial slavery and exploitation. It is no news that corruption is as normal as eating and breathing. India ranked 80 among 180 countries in the Corruption Perception Index prepared by Transparency International[[1]](#footnote-2). Ironically, the police is probably the most infamous department for corruption. It is, therefore, only prudent that the official submissions by the police in the Court of Law is of little importance unless backed by solid proof. Custodial violence is not a new practice in India. Forced confessions and even custodial deaths of allegedly accused criminals is very much normalised in the working of the Indian police. Many a times, cases are not even registered. There have been numerous such instances when the police turn away from registering First Information Reports (FIRs) under the excuse that the place of crime doesn’t fall under their jurisdiction. A simple bribe to the police or a personal connection with an IPS officer is often more than enough to make a registered FIR never see the light of the court. Unofficial arrests and illegal custodies make the police all the more unreliable. Then comes political influence. Cases are rarely registered in a local police station against the local political administrator. Political pressures often lead to illegal quashing of FIRs in police stations. Criminal investigation under such a system is bound to be an extremely faulty one. Even if proper procedures are followed, it is a long arduous procedure for the official machinery and paperwork to go through and oftentimes the investigation of serious offences is done without following the procedural norms for this very reason. This has a major drawback in the court of law as the defence attorneys get an upper hand when the police doesn’t follow proper procedures while investigating. Another major challenge in the administration of criminal justice system is the handling of witnesses and evidence. Witnesses are often either paid fake ones or are threatened and bribed by political influence. There are numerous cases like the Sohrabuddin encounter case where each and every witness of the CBI turned hostile in the court. The litigation in criminal cases take so much time that most of the evidence is either erased or is lost. Without proper evidence and witnesses, already delayed criminal cases hardly go forward. The police force being understaffed and overworked hardly takes any interest in investigating daily crimes until and unless there is an external political pressure or an extensive media coverage. The courts being overworked with an extremely less number of judges and a large number of pending cases hardly gets to concentrate on solving the cases brought before it. Instead, most of the criminal justice system is reeling under the pressure of an incredible workload and most of the useful time gets wasted on formalities. The focus of a criminal case often gets diverted from the verification of facts through witnesses and evidences to other trivial aspects and over the course of time the judgement probably comes when the entire crime is no longer relevant to the complainants who have probably moved on in life. The pending case is then nothing but a reminder of an incident they no longer feel like holding on to for justice. It is then nothing but an ordeal for the victims to drag themselves to the court in every hearing. The criminals often walk free with little or no punishment in the absence of proper evidence and investigation. In other words, the criminal justice system is slow, inefficient and non-functional without rapid investigation based on expert evidence collection and corroborating them with the testimonies of the witnesses who must be genuine and who have to be given proper reassurance and protection from political threats in order for them to not turn hostile. It is under these conditions that the application of science in the administration of criminal justice comes into play.

**FORENSICS IN INDIA**

The scientific analysis of evidence is categorised into a separate branch of investigation called forensics[[2]](#footnote-3). Forensics is “related to scientific methods of solving crimes, involving examining the objects or substances that are involved in the crime”[[3]](#footnote-4). From the definition itself, a fairly clear image can be perceived. However, it must first be mentioned that what are the different kinds of forensic examination carried on in India. Then, this research shall further take a deep dive into the specific legal provisions that actually accommodate the forensic investigation within the criminal justice system. Further, how much of the scientific investigation is actually in effective in the criminal justice system in India shall also be discussed in this paper. Then there are several limitations and challenges to the application of science in the criminal justice system. Case laws will be analysed for understanding the same.

Forensic science involves the collection of physical evidence usually at the scene of crime and then testing that evidence in a suitable setup or a laboratory. Toxicology, pathology, fingerprints, handwritings, footprints, ballistics, narco-analysis, voice analysis and tracker dogs[[4]](#footnote-5) are some of the most widely used forensic tools in the criminal justice system in India.

**APPLICATION AND ANALYSIS**

The opinion of forensic experts through forensic reports can be submitted as evidence to the court of law under Section 45 of the Indian Evidence Act, 1872 which states that:

45. 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.

The word “expert”, however, does not refer to a person with a mere University degree. It refers to a person with a special knowledge or skill in the particular field of study using which the evidence is analysed and the opinion of such a person will be considered as an “expert opinion”[[5]](#footnote-6). Even arts, foreign law and polygraph testing are considered to be the field of experts. The opinion of an expert is, however, largely treated as secondary evidence in the Indian courts. In most cases, they are useful only to back up primary evidence. To understand this, the expert opinion in the matter of identification of handwriting can be used as a suitable example here. In the instance of identification of handwriting, Section 47 of The Indian Evidence Act, 1872 states that:

47. Opinion as to handwriting, when relevant.—When the Court has to form an opinion as to the person by whom any document was written or signed, the opinion of any person acquainted with the handwriting of the person by whom it is supposed to be written or signed that it was or was not written or signed by that person, is a relevant fact.

This means that the expert opinion of the handwriting by a handwriting expert will not be considered a more acceptable and satisfactory opinion than the opinion of a witness who has is acquainted with the handwriting of the person in question. The Section states that the witness may have got acquainted with the handwriting either by having directly seen it being written by the person himself or by having received letters from him regularly. Either way, it will be considered more appropriate as an opinion than that of a handwriting expert. There comes the drawback of this Act. It places more confidence in the opinion of a witness who may be directly or indirectly involved in the case rather than the neutral opinion of an expert third party. Science takes a backseat in this practice. In Devi Prasad v. State[[6]](#footnote-7), the Court ruled the above stated principle in practice. It stated that the opinion of someone who is not acquainted with the handwriting of the person in question should not be considered.

The scientific evidence produced before courts has to be properly documented along with proper documentation of the scientific reasoning and by using the proper scientific methods depending on the field of enquiry. Scientific evidence differs from the deposition of witness because the witness may not be entirely honest or bribed or threatened. Even if honest, the witness will answer questions as asked by the attorneys. It is common knowledge that attorneys ask questions and make the witnesses answer them in a way that may sound different from what the actual truth of the situation is. They make the court hear what they want the court to hear in order to win the case. However, this is not so with scientific evidence. An unbiased scientific investigation will reveal exactly what the evidence reveals. There are numerous scientific methods as already stated. An expert witness usually testifies the validity of the scientific method requested to be fallen upon during the trial.

In Pritam Singh v. State of Punjab[[7]](#footnote-8), footprints in blood going towards the bathroom were found near the dead body. The footprints were compared with the footprints of the accused in printer’s ink. The expert consulted in the case gave evidence that showed that there were nine similarities with respect to the right foot and ten similarities with respect to the left foot. There were only three dissimilarities found in each case and the expert also explained how those differences arose due to the different densities of blood and ink. The court held that it was proved that the footprints in blood were those of the accused. Footprints contain unique pattern of friction and ridges which are different for every individual and can, therefore, be considered as reliable. However, the drawbacks in scientific evidence are similar to that we saw in the case of identification of handwriting. The court has often ruled on the lines of Mohd. Aman v. State of Rajasthan[[8]](#footnote-9) where the scientific evidencing of identification of footprints will not be solely relied upon as the courts hold it to be an imperfect science to some extent and such evidence will be accepted only when it is backed by some other kind of evidence from a different and more reliable source. Herein we again find another instance where the courts in India are reluctant to rely on scientific evidence and chooses to be more dependent on witnesses or other conventional evidence and not on the forensic ones.

As far as medical evidencing goes, DNA fingerprinting is the most prominent one under this category. The court can order the samples of blood to be taken for the purpose of paternity tests. According to experts, DNA fingerprinting should be an infallible test. DNA is Deoxyribonucleic Acid. It has a specific chemical composition and it contains genetic material that can be linked to the individual being tested. Conventional fingerprints might be surgically altered. But DNA is inside the cell and no intervention of any kind can alter that. Hence, when a hair strand, skin tissue, drops of blood, mucus or semen is found at the crime scene, they can be sent for DNA testing and matched with the DNA of the person whose link to the crime is in question. If the DNA matches, it links the individual to the crime scene. The Supreme Court has, however, refused to grant total access to blood tests for DNA sampling in way of routine practice. In Goutam Kundu v. State of West Bengal[[9]](#footnote-10), the court also held that individuals cannot be compelled to give blood for compulsory testing. In case of Rohit Shekhar v. Narayan Dutt Tiwari & Anr[[10]](#footnote-11), the court held that eye-witness will be given priority over medical evidence. Ocular witness being given more validity than medical evidence is the chief drawback of this procedure. DNA evidence is definitely more reliable than human testimony. Human beings can falter. Human beings can be mistaken. Human beings can be coerced to do or speak things against their will. Human beings may choose not to speak the truth. Science cannot falter. Science cannot be mistaken. Science is not a living creature that can be forced or manipulated to do things against its will. Science reveals the state of things as it is. Science is always about the truth. The discovery of truth is the sole purpose of science. It is, therefore, not in confirmation with logical or rational decision making that medical evidence, especially DNA evidence, is disregarded when there is a contrary claim by a human witness. This is a great disadvantage to the working of the criminal justice system.

Tracker dogs are also not a suitable form of evidence as held by the Ho’ble Supreme Court of India. In Abdul Razak Murtaza Dafadar v. State of Maharashtra[[11]](#footnote-12), it was observed by the Court that India is yet to reach that level of scientific development where a ground tracker construed as an acceptable evidence. Therefore, if at all acceptable, it only has secondary value as evidence. Hence, another category of forensic evidence is ruled out from being completely permissible as solid evidence.

The ruling in State v. S.J. Choudhary[[12]](#footnote-13) brought to light the changing nature of the word “science”. The court held that typewriter evidence could be construed as an expert opinion and could be counted upon as reliable. The instance of handwriting expert and typewriter expert shows that the tendency of courts is to hold any kind of art which requires expertise and can be generally produced as evidence as science. Not only medical evidence, fingerprints and the likes which are normally perceived as science, but also any kind of expert evidence is being considered under the purview of scientific investigation by the criminal justice system[[13]](#footnote-14).

Polygraph and lie detector tests also come under the scope of scientific investigation of crimes. Usually, the polygraph tests are based on biological changes in the body of an individual. For instance, it is assumes that usually when a person lies, it causes some mental stress on him[[14]](#footnote-15). This mental stress is expressed in the form of changes in the rate of breathing, heart rate and galvanic skin response. This test is not admissible as a definite evidence in the court of law. This is because the stress may or may not have been caused due to the test itself. In Selvi v. State of Karnataka[[15]](#footnote-16), the Supreme Court held that these tests violated the right to privacy of an individual. These tests interfere with the mental privacy of an individual and were therefore held unconstitutional as it encroached upon their personal liberty[[16]](#footnote-17). The Supreme Court of India clearly laid down that the forceful conduction of these tests were not permissible and could not be admitted as evidence. However, if someone volunteered to undergo these tests, then they were allowed to do so under the ‘Guidelines framed for the Administration of Polygraph Test (Lie Detector Test) on an Accused’ by the National Human Rights Commission and also observed that the same guidelines would also be applicable to ‘Narcoanalysis Technique’ and ‘Brain Electrical Activation Profile Test’.

The next kind of expert evidence admissible in a criminal trial is ballistic evidence. Unlike the other kinds of scientific evidence discussed already, the court put a lot of importance on ballistic evidence. In S.G. Gundegowda v. State[[17]](#footnote-18), it was held that the ballistic expert need not be called as witness for his report to be held admissible. In Rchhpal Singh v. State of Punjab[[18]](#footnote-19), the court observed that in cases where there are firearms involved causing injuries, the opinion of a ballistic expert is of great evidentiary value and the failure to get such opinion gravely affects the worth of the evidence produced.

**CONCLUSION**

From the above analysis, it is not difficult to construe the current state of scientific investigations in the criminal justice system in India. Firstly, the courts almost always treats the testimonies of witnesses, documents and other conventional evidence as primary evidence and the evidence which comes forward from scientific investigations including forensics and the likes as secondary evidence. This secondary evidence is only valid when there is primary evidence to strongly support the claim. In other words, secondary evidence serves only as a backing up in most cases and doesn’t has enough value without a primary evidence. In the case of corroborating handwriting by an expert evidence, we saw that the most professional opinion by an expert has lesser value than the evidence by a witness who only saw the letters written by the person in question regularly even if he didn’t see the person actually writing the letter. In the case of corroboration of scientific evidencing by footprints, the court held that the footprints are not enough to convict someone. The reason they gave was that matching of footprints was still not a perfect science and hence not suitable to be used to convict someone unless and until it was backed by a different kind of evidence. Further we see in the case of the possibly strongest form of medical evidence available, that is, DNA fingerprinting that the courts are still not satisfied with its use and gives more importance to ocular evidence to ocular evidence than definite scientific proof. Further, a lot of questions arose regarding the consent of the accused and the court ruled that DNA fingerprinting cannot be used as a routine instrument. The above are those categories of scientific investigation where the court appears to reject definite scientific evidence and instead goes with witness testimonies. Although these seem to be an anomaly, the courts might have sufficient reasoning to go with these decisions. The prime focus should be on the fact that India is a developing country. Witness tampering is something that happens on a day-to-day basis here. The forensic departments are either under Home Ministry or any other Ministry which is under direct external influence[[19]](#footnote-20). Altering test results won’t be too difficult in India. Similarly, as already mentioned before, crime investigation by the police in India is a long and arduous process that requires a lot of time and formalities. More often than not, there is a lack of proper infrastructure for testing of forensic evidence[[20]](#footnote-21). Moreover, there is a undeniable lack of forensic experts to actually carry out the investigation following proper procedures with respect to collection, storage, culturing and observation of the forensic evidence collected at the scene of crime. It of these steps has to be carried out extremely carefully ensuring that there is no alteration or damage caused to the evidence. The delays in collection of physical evidence often lead to destroying or altering of evidence. When forensic evidence like semen is not collected on time, it may undergo chemical decomposition to produce some other chemical compounds, the presence of which will radically alter the course of investigation of the crime[[21]](#footnote-22). This is because those chemicals might be an indication of something else when in reality those chemicals were not present and the facts of the case should have been completely different. Such misleading of the court could be extremely dangerous as they might may completely change the facts of the original crime. Hence, in a faulty investigation system, the courts probably had no other option than to fit the purview of scientific investigation within the current system of administration of criminal justice. It was the only justified thing to do in order to prevent miscarriage of justice. The court rightfully held polygraph tests to be unreliable. The physiological effects vary from person to person and it is an extremely uncertain and thin line to tread. In the criminal justice system, the proof of guilt has to be “beyond reasonable doubt” and therefore, the safeguards. The Court further lay down the following :

In Mahmood v. State of U.P[[22]](#footnote-23), the court ruled that the sole testimony of an expert is not enough evidence for conviction. There must be other evidence also for the corroboration of the forensic evidence.

In State of Maharashtra v. Damu Gopinath Shinde[[23]](#footnote-24), the court held that the expert evidence could not be permitted unless the expert was examined as a witness in the court.

In Malappa Sidappa Alakumar v. State of Karnataka[[24]](#footnote-25), the court held that ocular evidence will take precedence over medical evidence when there is a contradiction between the two and when the ocular evidence can be relied upon.

In Ram Swaroop v. State of Rajasthan[[25]](#footnote-26), the court rightly held that the doctor only gives his opinion about a certain finding and it cannot be grounds to discard the testimony of an eye-witness.

Keeping these in view, the most important suggestion that can be given as of present is gearing up the performance of the criminal justice administration without delay and incorporate appropriate infrastructure and trained experts to make up for the extreme incapability of the justice system to administer timely and effective justice to the citizens of this nation. Science is the only way forward to revolutionise the way the criminal justice system operates. The sooner steps are taken to correct the irregularities, the better for all.

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**BRIEF ABOUT THE AUTHOR**

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