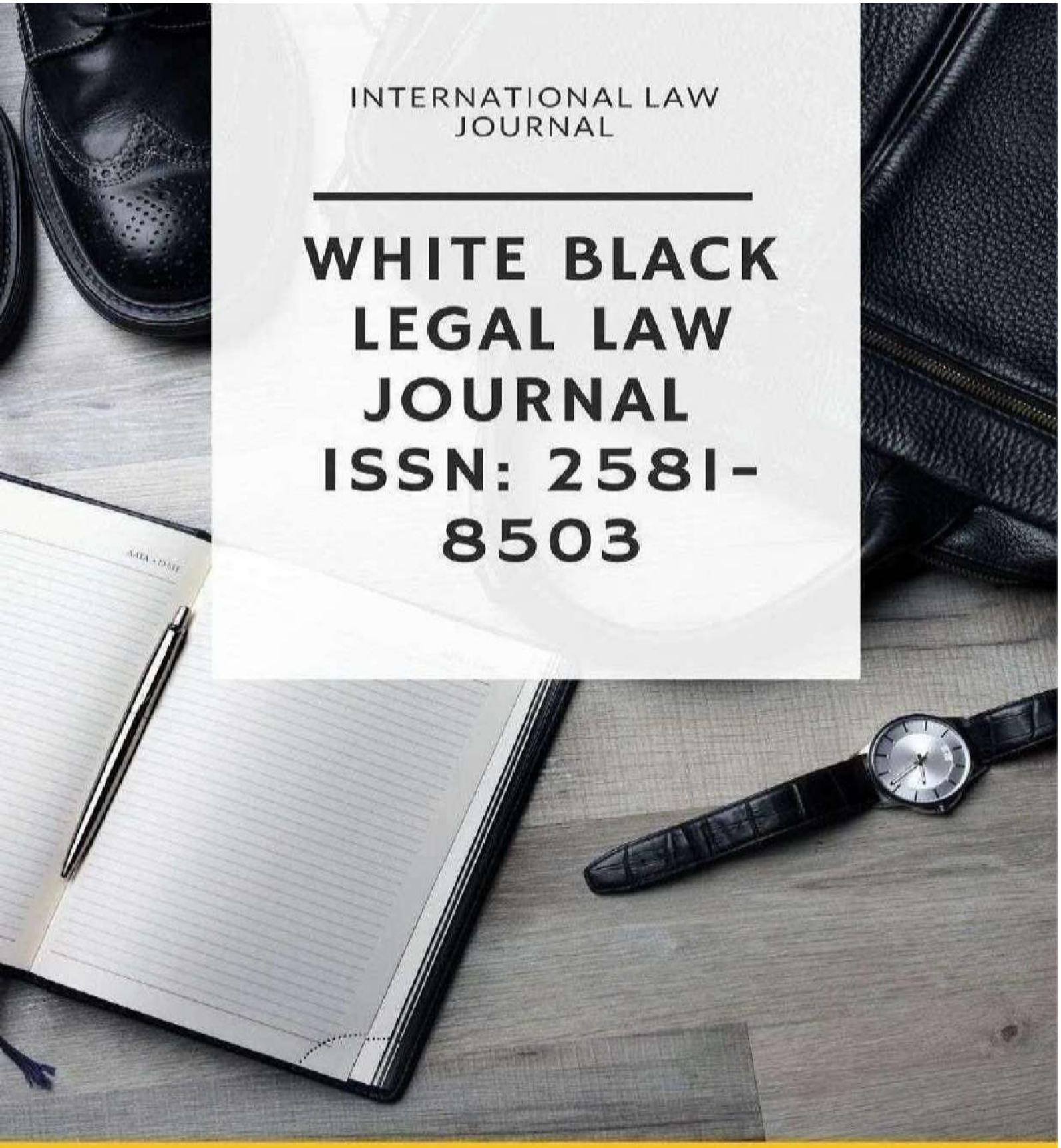

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WHITE BLACK LEGAL is an open access, peer-reviewed and refereed journal providededicated to express views on topical legal issues, thereby generating a cross current of ideas on emerging matters. This platform shall also ignite the initiative and desire of young law students to contribute in the field of law. The erudite response of legal luminaries shall be solicited to enable readers to explore challenges that lie before law makers, lawyers and the society at large, in the event of the ever changing social, economic and technological scenario.

With this thought, we hereby present to you

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EXPERT OPINION AND NEED FOR STRINGENT STANDARDS OF ADMISSIBILITY IN FORENSIC EVIDENCE

AUTHORED BY - TANVI PATIDAR & PRIYANSHU KALOSIYA

Abstract:

Forensic science has become an indispensable tool in modern litigation, particularly in criminal trials. However, the admissibility and reliability of expert opinions under Section 45 of the Indian Evidence Act, 1872 remain fraught with inconsistencies. The statute grants judge the discretion to admit expert opinions in various fields including science, handwriting, and fingerprints, but does not prescribe stringent standards for testing the reliability of such evidence. This lacuna has led to multiple instances where questionable forensic reports have influenced the course of justice. In this context, this research project evaluates the doctrinal and jurisprudential foundations of Section 45, highlights judicial interpretations, and critically assesses the existing evidentiary framework. A comparative study is drawn with jurisdictions like the United States (Daubert standard) and the United Kingdom (Criminal Practice Directions), where admissibility of expert evidence is governed by strict criteria. The paper argues that without rigorous standards, India risks undermining the role of science in the justice system. The research concludes with concrete policy recommendations for developing statutory admissibility thresholds, establishing accreditation mechanisms for forensic experts, and ensuring judicial training in scientific evaluation.

Keywords: Expert Opinion, Forensic Evidence, Daubert Standard, Evidentiary Standards

Statement of Problem:

Section 45 of the Indian Evidence Act, 1872, provides the statutory foundation for admitting expert opinions in legal proceedings, empowering the court to consider the views of individuals "Specially skilled" in areas such as foreign law, science, art, handwriting, or finger impressions. While the provision acknowledges the relevance of expert assistance in judicial decision-making, it stops short of prescribing any concrete standards for determining the scientific validity or reliability of the opinion rendered. This legislative vagueness becomes especially

problematic in the context of forensic science, which is increasingly central to criminal adjudication in India.

Forensic evidence ranging from DNA profiling, ballistics, toxicology, and digital forensics to fingerprint analysis has come to play a pivotal role in determining guilt or innocence. Despite its potential to support truth-finding, the reliability of such evidence is inherently dependent on the soundness of the underlying scientific methodology, the qualifications of the expert, the integrity of the data, and the transparency of the process. However, Indian courts currently have no statutory guidelines to evaluate whether the expert opinion presented is based on scientifically valid and widely accepted principles. This often results in courts admitting forensic evidence without adequate scrutiny, solely on the basis of the expert's credentials or institutional affiliation.

Such a practice poses several risks. Firstly, it opens the door to junk science evidence that is dressed in scientific language but lacks empirical validity or reproducibility. Secondly, it increases the possibility of confirmation bias, where experts unconsciously tailor their findings to align with the expectations of the investigating agency that employs or appoints them. Thirdly, it undermines the principle of fair trial, as the defence may not have the technical expertise or procedural access to challenge flawed or unscientific forensic reports effectively. Fourthly, it dilutes the judiciary's role as a neutral arbiter of facts, especially when judges themselves lack formal training in evaluating scientific or technical evidence.

Globally, jurisdictions like the United States, Canada, and the United Kingdom have responded to these challenges by adopting well-defined admissibility standards, such as the Daubert standard, the Mohan test, and Criminal Practice Directions, which require expert testimony to meet thresholds of scientific validity, relevance, and methodological transparency. These frameworks empower courts to act as gatekeepers who assess the reliability of forensic evidence before allowing it to influence the trial outcome.

In contrast, the Indian legal system's continued reliance on a vague and outdated evidentiary standard not only places undue weight on the persona of the expert but also leaves the system vulnerable to wrongful convictions or acquittals. This research paper seeks to interrogate this legislative gap and examines whether incorporating structured admissibility criteria, inspired by international models, can enhance the objectivity, scientific rigor, and judicial reliability of

forensic expert opinions in India. The overarching aim is to ensure that forensic science serves the ends of justice, rather than undermining them through procedural arbitrariness or unchecked assumptions.

Review of Literature:

Several jurists and scholars have expressed concerns about the superficial scrutiny of expert evidence in Indian courts. *Ratanlal & Dhirajlal's Law of Evidence* identifies that Indian courts often accept forensic reports at face value without assessing the scientific validity of the underlying method. In *State of Himachal Pradesh v. Jai Lal*, the Supreme Court emphasized that expert evidence is only advisory in nature and should be corroborated. *Selvi v. State of Karnataka* raised broader questions about the voluntariness and reliability of techniques like narco-analysis and brain mapping. The 185th Report of the Law Commission of India recommended training judges to critically examine scientific evidence, but failed to propose statutory reforms.

Internationally, the U.S. Supreme Court decision in *Daubert v. Merrell Dow Pharmaceuticals* set out key criteria testability, peer review, error rates, and general acceptance which must be satisfied for admissibility. In the UK, Criminal Procedure Rules and Practice Directions guide courts on forensic expert qualifications and methodologies. These models highlight the need for a structured framework, something India currently lacks.

Research Objectives:

1. To examine the legal framework under Section 45 of the Indian Evidence Act.
2. To analyse how Indian courts have interpreted and applied expert evidence.
3. To assess the lacunae in current admissibility standards.

Research Questions:

1. What are the existing legal standards for the admissibility of expert opinions in India?
2. How effectively are these standards implemented in judicial proceedings?
3. Are the current mechanisms adequate to ensure the reliability of forensic science?

Research Gaps:

- Absence of statutory criteria for evaluating forensic methods and expert competence.

- Lack of consistent judicial approach in admitting or rejecting expert evidence.
- Inadequate training of judges to scrutinize complex scientific claims.
- No central authority regulating forensic laboratories and their procedures.

Research Methodology:

This paper adopts a doctrinal research methodology, relying on primary sources including statutory texts (Indian Evidence Act, 1872), case law from Indian and foreign courts, Law Commission Reports, and secondary literature such as books, articles, and comparative legal analysis. It also refers to international jurisprudence to assess comparative standards of forensic admissibility.

Research Significance:

The research contributes to a pressing area of legal reform the intersection of science and law. As courts increasingly rely on forensic experts to determine guilt or innocence, the development of an objective, consistent, and legally rigorous standard becomes crucial. This paper offers a roadmap for strengthening the evidentiary regime in India and ensuring that science serves, rather than subverts, the ends of justice.

Legislative Framework of Section 45 of the Indian Evidence Act:

Section 45 of the Indian Evidence Act, 1872 governs the admissibility of expert opinions in judicial proceedings. It states:

"When the Court has to form an opinion upon a point of foreign law, science, art, or as to identity of handwriting or finger impressions, the opinions upon that point of persons especially skilled in such foreign law, science or art, or in questions as to identity of handwriting or finger impressions are relevant facts."

This provision classifies expert opinion as a “relevant fact,” thus making it admissible but not necessarily conclusive. The section permits the court to consider expert views on complex matters beyond the understanding of a layperson. However, the law does not define who qualifies as an expert or what constitutes acceptable scientific methodology. There is also no statutory requirement for peer review, reliability, or reproducibility of the expert’s conclusions. The colonial-era drafting of Section 45, though progressive at the time, now stands outdated in light of the advanced, specialized, and multi-disciplinary nature of modern forensic sciences such as DNA profiling, ballistics, toxicology, cyber forensics, and digital footprints.

The absence of a rigorous threshold results in an over-reliance on documents like FSL (Forensic Science Laboratory) reports, which may be admitted without cross-examination, especially under Section 293 of the Code of Criminal Procedure (CrPC), further diluting evidentiary safeguards.

Judicial Interpretation of Expert Evidence in India:

The Indian judiciary has offered varied interpretations of Section 45, often acknowledged its limitations while continued to rely heavily on expert opinion. The following judgments illustrate the evolving judicial stance:

(a) ***State of Himachal Pradesh v. Jai Lal*** [1] **(1999)**

The Supreme Court held that an expert's opinion is only advisory and not binding. The court observed that courts must exercise their own judgment and not blindly follow expert conclusions. It further stated that experts should provide objective, reasoned conclusions, not mere assertions.

(b) ***Ramesh Chandra Agarwal v. Regency Hospital*** [2] **(2009)**

The Court held that the credibility of an expert depends on the data on which their opinion is based and the methodology applied. The court stressed that merely labelling someone as an expert does not guarantee reliability unless their methodology is transparent and scientifically validated.

(c) ***Selvi v. State of Karnataka*** [3] **(2010)**

In a landmark judgment, the Supreme Court ruled that techniques like narco-analysis, polygraph tests, and brain mapping violate Article 20(3) and Article 21 of the Constitution if administered without consent. The court emphasized the unreliability of such techniques, noting their failure to meet international scientific standards.

(d) ***Mukesh v. State*** [4] ***(Nirbhaya Case)*** **(2017)**

In this high-profile case, DNA analysis and forensic reports played a critical role in securing convictions. However, critics argue that the defence lacked access to independent experts to challenge the findings, raising due process concerns.

While courts have occasionally stressed caution, in practice, expert opinions are often treated with excessive deference, particularly in criminal trials where they can decisively tilt the

[1] State of Himachal Pradesh v. Jai Lal and Ors., (1999) 7 SCC 280.
[2] Ramesh Chandra Agrawal v. Regency Hospital Ltd. and Ors., (2009) 9 SCC 709.
[3] Selvi and Ors. v. State of Karnataka, (2010) 7 SCC 263.
[4] Mukesh v. State of NCT of Delhi, (2017) 6 SCC 1.

verdict.

Challenges in the Current Regime:

(a) Absence of Admissibility Standards

Unlike jurisdictions that apply criteria such as relevance, reliability, and scientific validity, Indian courts lack a codified checklist or test to determine whether expert evidence is scientifically sound before admission.

(b) Poor Regulatory Oversight

Most forensic laboratories in India are not accredited to international standards such as ISO/IEC 17025. Reports from the National Human Rights Commission and investigative journalists have exposed instances of outdated equipment, underqualified personnel, and procedural lapses in evidence handling.

(c) Unqualified or Biased Experts

The term "expert" is loosely defined and often includes individuals with no formal certification or training in forensic sciences. Moreover, experts affiliated with law enforcement agencies may lack impartiality, leading to conflict of interest.

(d) Lack of Cross-Examination and Transparency

In many cases, forensic reports are accepted under Section 293 CrPC without summoning the expert for cross-examination, particularly in fast-track or summary trials. This undermines the adversarial system and limits the defense's ability to challenge the evidence.

(e) Judicial Inexperience in Scientific Evaluation

Judges, by training, are legal generalists and often lack the scientific background to critically assess forensic claims. This knowledge gap can lead to an uncritical acceptance of pseudo-scientific methods or flawed logic.

Comparative Jurisdictional Analysis:

The issue of expert opinion admissibility has been extensively debated across jurisdictions, leading to the establishment of structured legal frameworks in countries such as the United States, the United Kingdom, and Canada. Each of these jurisdictions has developed rigorous standards for determining the reliability of forensic evidence before it is presented in court. In contrast, India still follows an outdated model under Section 45 of the Indian Evidence Act, 1872, which does not provide any scientific admissibility threshold. The following comparative

analysis highlights the structured approach taken by these countries and examines how India lags behind in ensuring the reliability of forensic evidence.

In the **United States**, the *Daubert v. Merrell Dow Pharmaceuticals*[5] (1993) case revolutionized the admissibility of expert testimony under Federal Rule of Evidence 702. The U.S. Supreme Court introduced a five-pronged test requiring courts to evaluate (i) whether a scientific theory can be and has been tested, (ii) whether it has been subjected to peer review and publication, (iii) the known or potential error rate, (iv) the existence of standards controlling its operation, and (v) its general acceptance in the relevant scientific community. Under this standard, judges act as "gatekeepers," ensuring that only scientifically valid and methodologically sound expert evidence is admitted. Compared to India, where expert testimony is admitted based solely on the qualification of the expert without scrutinizing their methodology, the Daubert standard offers a much-needed safeguard against unreliable forensic practices. The absence of a mandatory scientific reliability test in India has resulted in instances where courts have admitted forensic reports without assessing their accuracy or the credibility of the expert's methodology.

Similarly, the **United Kingdom** follows a structured approach under Part 19 of the Criminal Procedure Rules and the Criminal Practice Directions. These guidelines mandate that expert witnesses must provide a statement of qualifications, a clear explanation of their methodology, an acknowledgment of limitations or uncertainties, and a declaration of their duty to the court rather than to the instructing party. This framework ensures that forensic experts maintain objectivity and methodological transparency. In contrast, Indian courts frequently rely on forensic reports submitted by state-run forensic laboratories without requiring experts to appear for cross-examination or justify their findings. The lack of a duty of impartiality and transparency in India weakens the credibility of expert testimony, making it susceptible to bias or manipulation, particularly in cases involving law enforcement agencies.

Canada, through the **Mohan Test**, has also established clear admissibility standards for expert evidence. The Supreme Court in *R v. Mohan*[6] (1994) laid down four conditions: (i) relevance, (ii) necessity in assisting the trier of fact, (iii) absence of an exclusionary rule, and (iv) a

[5] Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993).
[6] R. v. Mohan, (1994) SCC 80.

properly qualified expert. The Mohan Test ensures that forensic evidence is both legally and scientifically appropriate for a case. Over time, Canadian courts have refined this test, incorporating aspects of reliability and methodological validity in their decisions. In India, however, there is no equivalent judicial framework to systematically evaluate expert opinions before admitting them as evidence. Courts often assume the credibility of forensic reports without questioning whether they meet scientific standards, leading to potential miscarriages of justice.

Thus, while countries like the U.S., U.K., and Canada have developed robust frameworks ensuring that only reliable forensic evidence is admitted in court, India continues to rely on an outdated evidentiary model that does not subject expert testimony to scientific scrutiny. The absence of a structured admissibility test in India makes it vulnerable to errors, biases, and pseudo-scientific forensic practices. A statutory reform incorporating key elements from these international models is imperative to strengthen the reliability of forensic evidence in Indian courts.

Need for Reform and Proposed Framework

In light of the significant lacunae identified in the Indian legal framework concerning the admissibility and reliability of expert opinion under Section 45 of the Indian Evidence Act, there is an urgent need for statutory and institutional reform. The unchecked admission of forensic evidence without scientific scrutiny has had serious implications on the fairness of trials and the protection of individual rights. To bring Indian jurisprudence in line with international best practices, the following specific reforms are recommended.

First and foremost, there must be statutory guidelines for the admissibility of expert testimony. Section 45 of the Indian Evidence Act, 1872, should either be amended or supplemented with a new provision that mandates scientifically grounded admissibility standards. Drawing from the *Daubert* standard in the United States and the *Mohan* test in Canada, Indian law should require that expert opinions meet essential criteria such as the use of peer-reviewed methodologies, known and acceptable error rates, general acceptance in the relevant scientific community, transparent disclosure of data and protocols, and the reproducibility of results. Such a legislative provision would empower judges to evaluate the scientific validity of forensic evidence rather than merely relying on the qualifications of the expert or the

institutional reputation of the laboratory.

Second, India should implement a regime of mandatory accreditation for forensic laboratories and certification of expert witnesses. Currently, a significant portion of forensic evidence presented in Indian courts originates from state-run labs, many of which are neither accredited nor subject to regular audits. This compromises both the quality and credibility of the reports they generate. A comprehensive legislative framework should require that all forensic laboratories be accredited by an independent authority such as the National Accreditation Board for Testing and Calibration Laboratories (NABL). Additionally, forensic experts must undergo standardized training and certification through a centralized body, and only those with valid certifications should be allowed to provide expert testimony in court. Any lab or expert not meeting these accreditation standards must be barred from submitting reports or opinions in criminal proceedings.

Third, there should be mandatory procedural safeguards regarding disclosure and cross-examination. Forensic experts who submit reports in legal proceedings must be made available for cross-examination unless explicitly waived by both parties. In many current cases, courts admit expert reports without the presence of the expert, denying the opposing party an opportunity to question the methodology, qualifications, or impartiality of the expert. Additionally, the law must require that full laboratory records including raw data, testing procedures, and analyst notes be disclosed to the defence. This would enhance transparency and allow for an independent review of the expert's conclusions. Denial of access to such foundational materials undermines the right to a fair trial and contradicts principles of natural justice.

Fourth, the judiciary must be equipped with the knowledge necessary to evaluate scientific evidence through structured training programs in science and technology. Most judges and prosecutors lack formal education in scientific disciplines, which makes them ill-equipped to assess complex forensic claims. Periodic training modules should be introduced in collaboration with premier scientific institutions like the Indian Institutes of Technology (IITs), Indian Institute of Science (IISc), or All India Institute of Medical Sciences (AIIMS). These modules can include subjects such as forensic biology, DNA analysis, toxicology, digital forensics, and scientific reasoning. Such training will enable judicial officers to act as effective gatekeepers of admissible evidence, as envisioned in the Daubert framework.

Finally, there is a dire need for the creation of an independent National Forensic Oversight Authority. This statutory body should be tasked with formulating forensic science standards, auditing laboratories, addressing grievances related to forensic misconduct, and maintaining a national registry of accredited forensic experts. An independent oversight mechanism will ensure that forensic science in India is held to the highest standards of reliability, impartiality, and accountability. This body should also issue annual reports on the state of forensic services in the country and provide policy recommendations to the Ministry of Home Affairs and Ministry of Law and Justice.

Conclusion:

The growing integration of forensic science in the Indian judicial process demands an equally robust legal framework to ensure that such scientific evidence genuinely serves the cause of justice. While Section 45 of the Indian Evidence Act, 1872, provides the foundational basis for admitting expert opinion, its silence on the standards for evaluating such evidence has resulted in significant inconsistencies, judicial confusion, and, in some cases, miscarriages of justice. The absence of statutory benchmarks to assess the reliability, validity, and scientific merit of forensic testimony makes the system vulnerable to manipulation, bias, and the inadvertent admission of flawed or "junk" science.

Comparative jurisdictions such as the United States, Canada, and the United Kingdom have evolved comprehensive admissibility frameworks the Daubert Standard, the Mohan Test, and the Criminal Practice Directions respectively that empower judges to act as gatekeepers by evaluating expert evidence against objective scientific criteria. These models not only enhance the quality of judicial reasoning but also uphold procedural fairness and safeguard the rights of the accused.

India, by contrast, continues to rely heavily on the perceived credibility of experts without systematically scrutinizing the methods and principles underlying their opinions. This lacuna becomes particularly problematic in criminal cases where liberty and life are at stake. The lack of cross-examination of forensic experts, the absence of accreditation for laboratories, and the limited scientific training of judges exacerbate the risks of erroneous verdicts.

This paper strongly advocates for a paradigm shift in the treatment of expert evidence in Indian

courts. Legislative reform is urgently needed to codify admissibility standards that emphasize scientific reliability, transparency, and reproducibility. Accreditation of experts and laboratories, compulsory disclosure of forensic methodologies and raw data, routine cross-examination of expert witnesses, and training of judicial officers in scientific evaluation must form the pillars of this reform.

Finally, the establishment of a National Forensic Oversight Authority would serve as a watchdog to standardize practices, accredit experts, and monitor compliance, thereby ensuring that forensic science contributes positively to justice delivery. In conclusion, a stringent, structured, and scientifically grounded approach to expert opinion under Section 45 is not merely a legal necessity it is a constitutional imperative to uphold the rights to fair trial, equality before law, and due process.