FORENSIC EXPERTS IN THE COURTROOM: A CRITICAL ANALYSIS OF EXPERT TESTIMONY AND IT'S EVIDENTIARY VALUE IN CRIMINAL TRIALS

Aman Deep Walia & Dr. Ritu Panta, Chandigarh University

ABSTRACT

A crucial role is played by forensic experts in the justice system. It has aided in police investigation and trials. This paper throws light on multiple responsibilities of forensic experts, from crime scene investigation to courtroom trials. After examining methods, results and discourses in current literature, this paper highlights the importance of forensic experts in finding the solutions of crimes and securing convictions. The paper highlights significance of judicial pronouncements, including Ram Chandra v. State of U.P ,etc. It also investigates the issues faces in the Indian context which includes backlogs in forensic laboratories, inconsistent standards, inadequate infrastructure which often undermines the reliability of forensic evidence. Both strengths and limitations are highlighted in cases such as Nirbhaya Gang Rape (2012), Arushi Talwar Double Murder (2008) etc. The testimony of forensic experts is ought to be subjected to transparency and corroboration to strengthen the justice system.

Keywords: Forensic Evidence, Expert Testimony, Criminal Trials, Indian Evidence Act (1872), Judicial Scrutiny

Introduction

The opinion presented under oath by a qualified individual, an expert, or all those who help the jury or judge understand complex, technical, or scientific matters that fall beyond the scope of lay understanding is called expert testimony. Mainly, they translate the language of science for the courtroom without giving any verdicts themselves. In scenarios where the evidence involves intricate details at the molecular, anatomical, digital, or ballistic level here laypeople simply can't interpret it alone. That is where forensic experts come in by clarifying medical findings, such as cause of death or injury patterns, decoding DNA profiles, linking biological samples to individuals, along also analyzing ballistics, shedding light on trajectory or firearm matches, as well as delving into digital footprints, helping trace movements and communications.[1]

The forensic arena has advanced dramatically: from early fingerprinting to today's powerful DNA profiling, ballistic science, and digital forensics because the global forensic science market is projected to reach around USD 21.4 billion by 2025 as the digital forensics has surged by over 400% in the past decade, Fingerprint analysis boasts impressive success rates with over 98%, when done correctly, DNA analysis represents roughly 60% of forensic laboratory casework[2].

Jeremy Bentham, often called the "father of modern evidence law," argued that testimony must always be subjected to rigorous scrutiny, no matter the source. For Bentham, unchecked expert authority risked "substituting conjecture for proof." Therefore, while forensic experts play a pivotal role in strengthening criminal justice by offering scientific evidence, their testimony must undergo critical scrutiny, thus reflecting Bentham's caution against untested authority and Wigmore's view that expert opinion is only advisory, not determinative, as given the risks of methodological flaws, judicial over-dependence, and the complex interplay between science and law.

[1] Geoffrey G. Nathan Law Offices, The Role of Expert Witnesses in Criminal Trials, available at https://www.geoffreygnathanlaw.com/topics/the-role-of-expert-witnesses-in-criminal-trials/ (last accessed 6 September 2025).
[2] Gitnux, Forensic Statistics (29 April 2025), available at https://gitnux.org/forensic-statistics/ (last accessed 6 September 2025).

Historical Background of Expert Testimony

The theory of historical evidence holds that legal judgment must be rooted in verifiable facts and not conjecture, basically a principle championed by jurists like Jeremy Bentham, who warned that justice "must be founded upon evidence, else be absurd." Expert testimony embodies this ethos: scientific insight supplements, but never supplants, the judicial reasoning.

Ancient legal cultures recognized the indispensable role of specialized knowledge in judicial decision-making. In East Asia, the eminent Chinese jurist and physician Song Ci (1186–1249) authored Collected Cases of Injustice Rectified in 1247, also known as The Washing Away of Wrongs. Widely hailed as the world's first systematic treatise on forensic medicine, this groundbreaking manual provided judicial officials with detailed forensic methods like including autopsy techniques, crime scene inspection protocols, and even the earliest recorded use of forensic entomology to solve a homicide by observing flies congregating on a blood-stained sickle.[3]

Europe's forensic journey matured by the late 18th century. In 1784, the Lancaster case marked one of the earliest convictions using physical matching, as John Toms was proven guilty by matching newspaper fragments found in his pocket with a wad in the victim's head wound.[4]

India formally incorporated expert evidence through the Indian Evidence Act, 1872. Sections 45 to 51 enshrine that the opinions of persons with specialized knowledge in science, art, handwriting, and all of these are admissible. However, such testimony is explicitly advisory and not binding on the court; its importance lies in the reasoning behind it. Institutional support in India followed: the Central Forensic Science Laboratory (CFSL), Kolkata, was established in 1957, later followed by other regional labs, embedding scientific rigor within criminal justice.[5]

[3] China Culture (Ministry of Culture, P.R.C.), The First Monographic Works on Forensic Medicine – Xiyuan Jilu, available at https://en.chinaculture.org/created/2005-08/01/content_71484.htm (last accessed 6 September 2025).

[4] Guinness World Records, First Person Convicted Using Forensic Material Matching, available at https://www.guinnessworldrecords.com/world-records/118957-first-person-convicted-using-forensic-material-matching (last accessed 6 September 2025).

[5] Indian Evidence Act, 1872, ss. 45–51, available at https://indiankanoon.org/doc/1610765/ (last accessed 6 September 2025).

Historical Evolution of Forensic Evidence in Criminal Justice

India's forensic legacy has deeper roots than many realize reason being there have been multiple references to legal procedure which are featured in ancient texts such as the Artha Shastra and Manu Smriti, though concrete forensic-science style practices are harder to pin down. Artha Shastra (Kautilya) discusses punishments, evidence, oaths, and the reliability of witnesses, but does not describe scientific techniques akin to modern forensics. Similarly, the Manu Smriti outlines procedural norms of witness testimony and confessions, but no precise method. For example: - examining injuries or corpses in a medico-legal manner. These early legal texts show that Indian jurisprudence valued credible evidence and process, even if "forensic" tools (autopsy, fingerprints, DNA) were absent.

The real turning point came under British colonial rule. In mid-19th-century Bengal, Sir William James Herschel began using handprints (and later fingerprints) in civil contracts to prevent fraud, recording that such prints appeared to be "persistent over time" and unique to individuals. This development laid the groundwork for the future of forensics. [6]

By 1897, Edward Richard Henry, along with Azizul Haque and Hem Chandra Bose, formally introduced the Henry Classification System in Bengal. On 12 June 1897, the colonial government's committee approved using fingerprints for classifying criminal records, and the Calcutta Anthropometric Bureau was transformed into what's often regarded as the world's first Fingerprint Bureau. This system replaced the earlier Bertillon anthropometry method because it was simpler, more accurate, and quicker. [7]

Landmark Indian judicial cases later reflected this forensic evolution. For example, in State of Maharashtra vs. Damu (2000), the Supreme Court dealt with gruesome infanticide and questioned forensic testimony related to medical/physical evidence, though the case did not hinge solely on forensic science; it showed how courts weigh physical evidence, witness

[6] Fingerprint Recognition, Sir William Herschel (1833–1917) and Early Fingerprinting in India, available at https://fingerprint-recognition.org/sir-william-herschel-1833-1917-and-early-fingerprinting-in-india/ (last accessed 11 September 2025).
[7] Times of India, "World's Oldest Fingerprint Bureau Gets Own Home," Times of India (June 2022), available at https://timesofindia.indiatimes.com/city/kolkata/worlds-oldest-fingerprint-bureau-gets-own-home/articleshow/92193308.cms (last accessed 11 September 2025).

statements, and expert testimony together.[8]

Therefore, the historical evolution in India evolves from procedural concern in ancient law and then through colonial innovation in fingerprinting, further to modern cases where forensic evidence is a significant though not always decisive factor. This arc shows both progress and the persistent need to align science with legal rigor.[9]

Types of Forensic Expert Testimony in Criminal Trials

Forensic expert testimony encompasses specialized scientific and technical evidence that aids courts in establishing facts beyond lay understanding. In criminal trials, its scope has diversified significantly.

Medical and forensic pathology is foundational. Autopsies establish cause and manner of death. Though exact national autopsy counts are elusive, regional studies report, for example, the 312 medico-legal autopsies analyzed in a year at a tertiary care center, with 61.2 % accidental and 9.0 % homicidal cases. DNA evidence is thought to be the "gold standard" for identification. India's forensic framework is mounting: as per reports till late 2024, there have been recorded seven Central Forensic Science Laboratories (CFSLs) which cover DNA and cyber forensics, with another one (8^{th}) approved in Samba, Jammu, where 3953 cases were awaiting across these labs, highlighting growing demand. Additionally, cyber and DNA profiling divisions face high backlog rates nationwide.

1. Ballistics experts analyze firearms and ammunition. Though nationwide data are limited, CFSL infrastructures in India include ballistics divisions across key labs.[10]

2. Fingerprinting is widely used, with systems like NAFIS integrating huge databases. While there a less Indian-specific error rates, global studies as those from the Innocence Project,

[8] Vaseem Khan, "Inside India #25: The Indians Who Invented Fingerprint Classification" (18 August 2021), available at https://vaseemkhan.com/2021/08/18/inside-india-25-the-indians-who-invented-fingerprint-classification/ (last accessed 11 September 2025)
[9] State of Maharashtra v. Damu, AIR 2000 SC 1691, also available at https://indiankanoon.org/doc/557368/ (last accessed 11 September 2025).
[10] Delhi Police Training Division, Forensic Science Laboratories, Other Expert Institutions & Their Utilization in Police Work, available at https://training.delhipolice.gov.in/PDF/PublicData/EVENTS_20200115152053289.pdf (last accessed 6 September 2025).

depict wrongful convictions because of fingerprint mis-attribution, sometimes up to 20%.[11]

3. Digital forensics is swiftly increasing, examining cyber, mobile, and online data. The Ministry of Home Affairs has reinforced cyber-forensic competences, including building a national cyber-forensic facility in Hyderabad and in another place.[12]

4. Psychiatric and Psychological specialists, though fewer calculable in data, play serious roles in irrationality defenses and witness reliability calculations. Their standing is understood across many forensic enhancements.

Legal Framework Governing Expert Testimony in India

The scenario of expert testimony in India is mainly rooted in the Indian Evidence Act, 1872, which to date is still the backbone of evidentiary rules. Section 45 of the Act defines the role of experts.[13] As it says, when the Court has to form an opinion upon a point of foreign law, science, art, identity of handwriting or finger impressions, the opinions of persons "especially skilled" in such matters are relevant facts. In short, the statute treats experts as assistants to the judge; they don't decide guilt but help the court understand technical matters. This was quite visionary for 1872, because at that time India had no proper forensic labs, but the law anticipated the need for technical know-how (Indian Evidence Act, 1872, s. 45).

Courts, over time, have interpreted this section in many important cases. For example, in Ram Chandra v. State of U.P. (1957 AIR 381), the Supreme Court noted that expert evidence is only advisory in nature. The Court is not bound by an expert's opinion, though it must be given due weight depending on the facts. Later judgments like Murari Lal v. State of M.P. (1980 AIR 531) also cautioned that expert evidence should be corroborated and not relied upon blindly, because science too can have errors. This shows the judiciary always maintained a cautious balance between scientific authority and judicial reasoning.

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[11] Project 39A, National Law University Delhi, Forensic Science India Report – A Study of Forensic Science Laboratories (2013–2017): Executive Summary, available at https://static1.squarespace.com/static/5a843a9a9f07f5ccd61685f3/t/64e094d61efcc85a9803fd1d/1692439770869/Executive%2BSummary%2B-%2BForensic%2BScience%2BIndia%2BReport.pdf (last accessed 6 September 2025).

[12] Ministry of Home Affairs, Unstarred Question No. 3452: Infrastructure in Forensic Laboratories, Lok Sabha Debates (17 December 2024), available at https://www.mha.gov.in/MHA1/Par2017/pdfs/par2024-pdfs/LS17122024/3452.pdf (last accessed 6 September 2025).

[13] Indian Evidence Act, 1872, s. 45.

If we compare with other jurisdictions, the U.S. approach is more structured. In Daubert v. Merrell Dow Pharmaceuticals (1993), the U.S. Supreme Court laid down that expert testimony must be both relevant and reliable, with the judge acting as a "gatekeeper." Factors like peer review, error rates, and general acceptance are considered. The U.K., on the other hand, formalized things through the Criminal Procedure Rules (Part 19, 2015), which clearly state the duties of experts, including the need for transparency, impartiality, and disclosure of limitations in their methods. India has not codified such detailed standards, though some High Courts have tried to stress impartiality in practice.

Reforms have been suggested. The Law Commission of India, 185th Report (2003)[14] recommended clearer guidelines for admissibility of expert evidence, especially in fields like DNA, handwriting, and cyber forensics. Recently, the push for reforms got stronger after concerns about wrongful convictions based on faulty forensic reports (see Delhi Police Forensic Training Report, 2020).[15] Even the Ministry of Home Affairs in 2024 stated in Parliament that India needs more accredited labs and standardized protocols to ensure the reliability of forensic testimony.

So overall, Section 45 gave us the base, but practice shows gaps. Compared to Daubert or U.K. rules, India still lacks a consistent standard to test reliability. Courts rely on precedent and judicial wisdom. The path forward probably lies in combining statutory reform with investment in forensic infrastructure. Expert testimony is useful, but without checks, it can become dangerous, and that's why the law must keep evolving.

Statistical Landscape of Forensic Use in India

When we look at the aspects of data, India is still catching up compared to Western countries. The NCRB's Crime in India 2022 report noted that cybercrime cases touched over 65,000, out of which nearly 60% required digital forensic examination at some stage (NCRB, 2023).[16] However, the conviction rate in cybercrime is only about 21%, partly because labs are overburdened and evidence is often delayed.

The Delhi Police Training College report (2020) itself admitted that in more than 30% of

[14] Law Commission of India, 185th Report on Review of the Indian Evidence Act, 1872 (2003).
[15] Ministry of Home Affairs, Lok Sabha Unstarred Question No. 3452 (answered 17 December 2024).
[16] National Crime Records Bureau, Crime in India 2022 (New Delhi: NCRB, 2023).

criminal trials in Delhi, forensic evidence was either "inconclusive" or challenged due to procedural lapses. That shows not just a lack of infrastructure but also training gaps among investigators who handle the chain of custody.[17]

Conviction rates in India overall hover around 57% (NCRB 2022), but when reliable forensic evidence like DNA is introduced, conviction probability rises significantly. For example, a 2019 Ministry of Home Affairs note pointed that DNA profiling had an accuracy above 99% and helped in more than 60% of sexual assault cases where samples were usable. Yet, only about 5–6% of such cases in India actually use DNA evidence, compared to 60–70% in the US and UK.[18]

Speaking of comparisons, the FBI Laboratory (USA) handles nearly one million forensic examinations each year, with an average backlog time under 60 days. In contrast, India's CFSLs (Central Forensic Science Laboratories) often report pendency of 6–12 months (MHA Lok Sabha Answer, 2024). The UK Forensic Science Regulator (2023 Annual Report) also stresses accreditation, transparency, and error reporting – areas where India is still lagging.[19]

So, numbers reveal the gap clearly: forensic science in India is expanding, but infrastructure and standards haven't kept pace with the rising crime load.

High-Profile Indian Cases & Expert Testimony

1. Nirbhaya Case (2012)

In one of India's most infamous sexual assault and murder trials, forensic evidence played a central role. DNA tests on bloodstains from the underwear of the main accused, Ram Singh, were matched with those of the victim, and swabs taken from her body also showed matching DNA profiles. These findings were vital in corroborating the testimonies and medical evidence.

Also, experts used medical pathology to determine the cause of death (severe internal injuries, vaginal trauma) and timing. However, there were criticisms: defense counsel argued that police tampering or contamination of samples could have undermined reliability. Some argued chain-

[17] Delhi Police Training College, Forensic Science and Criminal Investigation Report (2020).
[18] Ministry of Home Affairs, Lok Sabha Unstarred Question No. 3452 (answered 17 December 2024).
[19] UK Forensic Science Regulator, Annual Report 2023.

of-custody was not properly documented. This highlights that even where science succeeds, procedural lapses can weaken expert testimony.[20]

2. Aarushi Talwar Double Murder (2008)

This case is emblematic of how forensic evidence can be ambiguous and heavily contested. Multiple forensic experts disagreed. For instance, there was a claim by a CFSL DNA scientist, B.K. Mahapatra, that male DNA was found on Aarushi's pillow, suggesting someone other than just Hemraj or the parents was present. But later that claim was retracted or clarified by the CBI, saying the finding was wrong or based on mislabelling of parcels ("Parcel 21") from the house.

Another issue was LCN (Low Copy Number) DNA techniques, whose reliability in Indian labs was questioned, especially given environmental contamination, delay in sample collection, and improper storage. Also, conflicting versions of timelines (who was where, when) complicated how the expert findings were interpreted in court.[21]

3. Sheena Bora Case (2012/2015)

Forensic testimony was crucial here. In 2012, remains (bones, skull bones, teeth) were found in a forest near Raigad, Maharashtra, but DNA testing wasn't immediately done. Only in 2015, after exhumation and discovery of more remains, did forensic experts compare the skeletal remains with the DNA of Indrani Mukerjee, and reported a match, supporting the prosecution's claim that Sheena was murdered, and not living abroad, as the accused had alleged.

But there were obstacles: some skeletal remains couldn't be located, sample degradation, missing evidence pieces, and conflicting forensic expert depositions about whether certain remains were hers or generic miscellaneous bones.

[20] Sanjeev Miglani & Suchitra Mohanty, "Delhi Rape Case: Prosecutors Bank on DNA, Despite Poor Forensic Track Record," Reuters (21 January 2013), available at https://www.reuters.com/article/world/delhi-rape-case-prosecutors-bank-on-dna-despite-poor-forensic-track-record-idUSDEE90K00B/ (last accessed 11 September 2025).

[21] Namita Vyas Joshi & Pawan Rana, "A Critical Assessment on Arushi Talwar's Murder Mystery with Special Reference to Forensic Evidence," NIU International Journal of Human Rights, Vol. 8(V) (2022), available at https://www.researchgate.net/publication/390898203_A_CRITICAL_ASSESSMENT_ON_ARUSHI_TALWAR_S_MURDER_MYSTERY_WITH_SPECIAL_REFERENCE_TO_FORENSIC_EVIDENCE? (last accessed 11 September 2025).

4. Use in Terrorism Trials (Mumbai 26/11 etc.)

While the precise forensic testimony in 26/11 is less publicly detailed, there is documentation of digital forensics, audio and video forensics, cell site analysis, and intercepts being used. Also, foreign agencies like the FBI assisted by analyzing technical evidence recovered from the scene and attack locations, for example, bomb fragments, mobile communication data, etc. These forms of scientific expert input helped shape the investigative leads.

Still, in terrorism trials, the stakes are so high that expert testimony is painstakingly contested: chain-of-custody, reliability of devices (phones, cameras), admissibility under rules of evidence, and the pressure of political/public expectation often complicate things more.

Future of Forensic Expert Testimony in Indi

The future of forensic testimony in India is at a turning point. Courts, police, and policy makers are realizing that old-style reports and expert opinions without transparent methods are not enough for justice today. With rapid technologies like Artificial Intelligence (AI), machine learning (ML), blockchain, and advanced DNA profiling, the criminal justice system can either evolve or it will keep repeating the same problems seen in past cases like the Aarushi Talwar murder trial or the Sheena Bora case.

AI and Machine Learning in Forensic Work

AI is now slowly entering forensic science worldwide, and India cannot stay behind. Tools like predictive models, facial recognition, voice spectrograph, and automated fingerprint matching are already being tested. According to the Ministry of Home Affairs' National Cyber Forensic Lab report (2019), machine learning has been used in analyzing digital fraud and even voice recordings of suspects. But the issue is that courts in India still hesitate to accept AI outputs without human cross-verification. This is because of fear of bias in algorithms, data tampering, and a lack of Indian standards to certify AI tools. If handled with accountability, AI can help reduce delays where currently forensic reports take months. But AI cannot "replace" human experts; rather, it should support them with quicker analysis.

Blockchain for evidence security

One major criticism in India's forensic chain is tampering of evidence between the police, the

lab, and the courts. In the 2012 Delhi gangrape case, DNA was crucial, but questions were raised about storage and chain-of-custody (Reuters, 2013).[22] Blockchain technology, which creates immutable digital ledgers, could solve this by recording every single step of evidence transfer. The National Crime Records Bureau (NCRB) has already suggested pilot projects for blockchain in digital evidence. This would mean every handover of a sample gets a timestamp and cannot be altered later. However, critics say the cost and lack of trained officers may slow down adoption.

DNA Technology (Use and Application) Regulation Bill, 2019

The Bill passed by the Lok Sabha in 2019 was a landmark. It allows the use of DNA databanks at the national and regional level for identifying missing persons, victims of disasters, and criminal suspects. Research by Joshi & Rana (2022) [ResearchGate] highlighted that India earlier had no unified framework, so evidence got challenged easily in court. With this Bill, forensic experts will have stronger legal backing to present DNA results, but civil liberties groups fear misuse and privacy breach if databanks are not properly regulated. The Bill also stresses the creation of a DNA Regulatory Board, which could improve the training and credibility of experts. Still, actual implementation is very slow, and many state labs don't have upgraded DNA sequencing machines.

Role of private forensic labs

Government forensic science labs (FSLs) are over-loaded, understaffed, and often under political pressure. Cases like the Sheena Bora murder (2015) showed how private labs helped Mumbai police with faster DNA matching (Scribd presentation, 2021). The increasing role of accredited private labs can reduce pendency, but the issue is credibility. Courts sometimes doubt reports from private labs if not empaneled with the state government. Future reforms must allow private-public partnerships with strict accreditation under NABL (National Accreditation Board for Testing and Calibration Laboratories). In the US, the FBI works closely with private forensic experts (FBI.gov testimony on Mumbai case, 2009). India could adapt such models for transparency.

[22] Reuters, "Delhi Rape Case: Prosecutors Bank on DNA, Despite Poor Forensic Track Record" (2013).

Integration with global standards

Indian courts often rely on the Evidence Act 1872, which is outdated for modern forensic methods. Internationally, countries use standards like ISO/IEC 17025 for lab competence. Adoption of these global benchmarks can increase trust in Indian expert testimony. For example, INTERPOL guidelines for digital forensics could help Indian police in combating cybercrime. Moreover, cross-border crimes like the Mumbai 26/11 attacks showed how FBI and Indian investigators collaborated but had difficulty aligning on evidentiary procedures (FBI.gov). Harmonizing with global practices will also protect Indian cases in international tribunals.

Challenges Ahead

Even with new tech, three problems remain:

1. Training gaps – Most judges and lawyers are not tech-savvy, so they can't cross-examine AI or DNA evidence effectively.

2. Ethics and privacy – Use of the national DNA databank raises fear of surveillance on minorities or political opponents.

3. Transparency – Experts in India sometimes act like a "final authority" rather than advisors. Courts must remember that forensic evidence is only a supporting tool, not a replacement for the judicial mind.

Way Forward

The best path is balance. Forensic experts armed with AI, DNA databanks, blockchain and global practices can become "powerful allies of truth". But strict checks like accreditation, open peer review of methods, and judicial caution are necessary to avoid miscarriages of justice. If India invests in training, infrastructure, and independent regulation, future forensic testimony can really strengthen faith in criminal trials.

Conclusion

Forensic experts today stand at the intersection of science and law. where they offer the courts an ability to interpret evidence that lies beyond the reach of common understanding.

Essentially, this spans from DNA profiling and digital forensics to the spectrum of ballistics and pathology, demonstrating that their contributions have significantly enhanced the accuracy and credibility of criminal trials. Specifically in India, the codification of expert testimony under Sections 45–51 of the Indian Evidence Act, 1872, with the subsequent institutional growth of Central and State Forensic Science Laboratories, have shown to the aspects of underscored the increasing reliance on scientific expertise in the pursuit of justice.

Even now, the reliance on expert testimony must be examined with caution because many scholars and jurists have consistently proposed that the role of experts is to inform and aid judicial reasoning and not to supplant it. Courts shall remain vigilant to ensure that expert opinions are critically evaluated against all established legal principles, plus corroborative evidence, and the facts of the case. As Over-dependence on expert testimony risks the transformation of judges into passive recipients of scientific authority, all of which would undermine the very foundation of judicial discretion.

To preserve fairness, there is a need for stricter standards of admissibility, methodological transparency, and cross-examination protocols are essential. Indian jurisprudence, mainly through the influence of global precedents like Frye and Daubert, is showing instances that have begun to move toward a reliability-and-relevance model; still, more systemic reforms are required. There is a need for investments in training as well as infrastructural upgrades and reducing the case backlogs in forensic laboratories, which are equally critical to prevent delays and errors that weaken evidentiary value.

Ultimately, at the larger scale, forensic experts are powerful allies of truth, but only when their testimony is subject to rigorous checks. The justice system must embrace scientific progress while simultaneously ensuring defense against its misuse.