

## ETHICAL ISSUES IN BALLISTICS AND EXPLOSIVE

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### ABSTRACT

Forensic ballistics and explosive analysis have emerged as critical components of the Indian criminal justice system, particularly in the investigation of violent crimes, terrorism, and organized criminal activity. These disciplines aid in identifying firearms, matching bullets and cartridge cases, analysing explosive residues, and reconstructing crime scenes involving blasts. In India, the increasing reliance on forensic science has underscored the need for standardized methodologies, ethical accountability, and trained personnel across forensic laboratories. However, challenges persist, including inadequate infrastructure, delays in evidence processing, and instances of compromised objectivity. This paper examines the current practices, institutional frameworks, and ethical concerns in ballistic and explosive forensics in India, highlighting relevant case laws and policy gaps. It also discusses recommendations to enhance scientific rigor, transparency, and judicial trust in forensic evidence. The integration of advanced technology, judicial oversight, and adherence to ethical norms are crucial for ensuring the credibility and effectiveness of forensic investigations in India.

**Keywords:** Forensic ballistics; explosive analysis; ethical issues; forensic science in India; crime investigation; judicial evidence; forensic laboratories; criminal justice; chain of custody; expert witness testimony.

### INTRODUCTION

Forensic ballistics, a sub-discipline of forensic science, deals with the analysis of firearms, bullets, cartridge cases, gunshot wounds, and trajectories to assist in criminal investigations. In India, this field has gained increasing prominence in the wake of rising gun-related crimes, organized violence, and terrorism. Ballistic experts contribute significantly to identifying the type of weapon used, linking bullets or shell casings to specific firearms, and reconstructing the sequence of events at a crime scene. Their findings often play a decisive role in courtrooms, where expert opinions can strongly influence judicial outcomes.

However, with this responsibility comes a range of ethical considerations. The Indian forensic framework, though evolving, continues to grapple with challenges such as lack of standardization, limited infrastructure,

understaffing, and pressures from investigative agencies. These systemic issues heighten the need for forensic experts to adhere strictly to ethical norms such as impartiality, scientific integrity, and confidentiality. Unethical practices ranging from overstatement of evidence to biases in favour of law enforcement can lead to miscarriages of justice, including wrongful convictions or acquittals.

The ethical responsibilities of ballistic experts are therefore not limited to technical proficiency alone but extend to legal accountability, human rights, and professional conduct. Forensic scientists must avoid confirmation bias, ensure transparency in methodologies, and provide balanced, scientifically defensible testimony. Upholding these ethical responsibilities is crucial in reinforcing public trust in the criminal justice system and ensuring that forensic science

serves its true purpose is delivering objective truth in the pursuit of justice.

### LEGAL PROVISION UNDER WHICH BALLISTIC EVIDENCE WHICH WAS USED / REFERRED

As a new method, ballistics has not yet been rigorously examined by the courts. Ballistics have only been adequately considered in a small number of cases. In United States v. Mouzone, and Commonwealth v. Pytou Heang, court only mentioned about the NRC<sup>1281</sup> report on ballistic imaging while taking the validity of the evidence for tool mark identification into consideration<sup>1282</sup>. The types of cases that and the legislations in which forensic ballistics played a significant role in solving crimes:

#### ➤ THE BHARATIYA NYAYA SANHITA, 2023

Murder, attempted murder, criminal conspiracy, attempts to commit robbery or dacoity while armed with a deadly weapon, actions taken by multiple people in support of a common goal, sedition, unlawful assembly, culpable homicide that does not qualify as murder, theft in a residence, dishonest misappropriation of property owned by a deceased person at the time of death, house-trespassing after preparation for harm, assault or wrongful restraint, voluntarily causing harm and grievous harm by dangerous weapons and means, rioting, aiding and abetting, mischief, criminal intimidation, war against the state, war against the state conspiracy, planning to commit dacoity, causing evidence of an offense to vanish, providing false information to screen offenders, or impeding public servants from performing their duties.

#### ➤ THE ARMS ACT, 1959:

While not directly dealing with forensic evidence, the Arms Act deals with the legality of possession and use of firearms.

Ballistic evidence is often used to prove illegal possession or use of firearms under this Act.

- Section 25: Penalties for certain offenses,
- Section 27: Penalties for the use of weapons, etc.
- Section 39: Weapons and ammunition import, transportation, and reexport licenses
- Section 3: Permit to purchase and possess guns and ammunition Section 7: Prohibition of obtaining, possessing, manufacturing, or selling banned weapons or ammunition
- Section 30: Penalties for violating a license or regulation

#### ➤ THE BHARATIYA NAGARIK SURAKSHA SANHITA, 2023

#### Section 329 – Reports of Certain Government Scientific Experts

- Allows ballistic reports from certified government experts to be admissible in court without the need for oral testimony, unless the court requires it.
- This includes ballistic experts from recognized forensic science laboratories (FSLs).

#### Section 348 – Power to summon material witness or examine person present

- The court can summon a ballistic expert at any stage of the trial to clarify their findings or offer additional insight.

#### Section 51 & 52 – Examination of accused by medical practitioner at the request of police officer

- While these mainly pertain to medical examinations, they allow for scientific examinations that can include ballistic analysis (e.g., gunshot residue tests).

<sup>1281</sup> National Research Council, Committee to Assess the Feasibility, Accuracy and Technical Capability of a National Ballistics Database, Ballistic Imaging, 93 (The National Academies Press, Washington D.C. 2008) available at: <http://www.nap.edu/catalog/12162/ballistic>

<sup>1282</sup> V.R. Dinkar, Scientific Expert Evidence 194 (Eastern Law House, Calcutta, 1st edn., 2013) at 275

➤ **THE BHARATIYA SAKSHYA  
ADHINIYAM, 2023**

**Section 39 – Opinions of Experts**

- This is the primary provision that permits the use of ballistic evidence in court.
- It states that when the court has to form an opinion on a point of science (including forensic science), the opinion of a person specially skilled in such science is considered relevant.
- A ballistic expert's opinion falls under this section.

Example: A ballistic expert's opinion on whether a bullet found at the crime scene matches a particular firearm is admissible under Section 39.

**Section 40 – Facts Bearing upon Opinions of Experts**

- Allows the court to examine facts that support or contradict the expert opinion.

**ETHICS AND FORENSIC BALLISTICS**

Forensic ballistics plays a vital role in the Indian criminal justice system, particularly in cases involving firearms. It involves the scientific examination of bullets, cartridges, guns, and related materials to establish facts in criminal investigations. While the science behind ballistics is objective, its ethical application is critical to ensuring justice.

**ETHICAL PRINCIPLES IN FORENSIC BALLISTICS**

- **Objectivity and Impartiality**
  - Forensic ballistic experts are ethically bound to provide unbiased and scientifically accurate findings. Any deviation can lead to wrongful convictions or acquittals, thus undermining public trust in the justice system.
- **Confidentiality**
  - Experts must maintain confidentiality regarding

case details, especially when investigations are ongoing. Unauthorized disclosure can jeopardize the integrity of the process

<sup>1283</sup>

- **Competency and Continuous Learning**

- Ballistics experts must remain current with evolving technologies, methodologies, and legal standards. Ethical practice demands ongoing training and adherence to best practices.<sup>1284</sup>

- **Avoiding Conflict of Interest**

- Experts must disclose any relationships or affiliations that could influence their testimony or interpretation of evidence.

- **Accurate Representation in Court**

- When presenting findings, experts must avoid exaggerating their conclusions. The principle of **"report what can be scientifically supported"** is foundational.<sup>1285</sup>

Ethics in forensic ballistics is not just about scientific accuracy but also about ensuring that justice is served in a fair and unbiased manner. Strengthening training, standardizing procedures, and promoting transparency are essential to uphold these ethical standards in India's forensic ecosystem

**ETHICAL ISSUES IN BALLISTICS AND EXPLOSIVE ANALYSIS**

Ballistics and explosive analysis are critical components of forensic science in criminal

<sup>1283</sup> National Academy of Sciences. *Strengthening Forensic Science in the United States: A Path Forward*, 2009

<sup>1284</sup> Sharma, B.R. *Forensic Science in Criminal Investigation and Trials*, Universal Law Publishing, 6th Ed., 2016.

<sup>1285</sup> Houck, M.M., and Siegel, J.A. *Fundamentals of Forensic Science*, Academic Press, 2006

investigations involving firearms, bombings, and acts of terrorism. In India, the forensic community faces several ethical challenges, particularly as forensic science intersects with the justice system. These challenges can influence not just the credibility of forensic results, but also the delivery of justice.

#### ▪ **Objectivity and Bias**

The foremost ethical obligation of any forensic expert is to remain impartial and objective. However, in India, forensic experts, particularly in government-run laboratories, often work closely with law enforcement agencies. This proximity can lead to confirmation bias, where experts unconsciously interpret data in favour of the investigating officer's theory.<sup>1286</sup> In high-profile cases or politically sensitive investigations, this pressure can be even more pronounced.

#### ▪ **Inadequate Infrastructure and Its Ethical Implications**

India faces a severe shortage of accredited forensic laboratories and qualified ballistic/explosive experts.<sup>1287</sup> Overburdened labs often result in delays, poor-quality analysis, and compromised evidence handling. From an ethical standpoint, this violates the accused's right to a fair and speedy trial and the victim's right to justice.

#### ▪ **Chain of Custody and Evidence Tampering**

Maintaining an unbroken and well-documented chain of custody is a cornerstone of forensic integrity. In India, lapses in evidence management are not uncommon, especially during transfers between police and forensic labs. Any tampering, whether accidental or deliberate, raises ethical concerns about evidence reliability and judicial fairness.<sup>1288</sup>

#### • **Confidentiality and Media Trials**

Forensic findings, including ballistic and explosive analysis, are sometimes leaked to the media before being presented in court. This raises significant ethical concerns about confidentiality, especially in high-profile cases where public perception can prejudice judicial proceedings.<sup>1289</sup>

#### ▪ **Misuse of Expert Testimony**

Experts must avoid overstating conclusions or providing speculative opinions that extend beyond scientific limits. However, in some Indian cases, forensic reports are drafted in vague or non-scientific terms, leaving them open to misuse in court.<sup>1290</sup> For example, stating that a particular gun "must have been used" without statistical or comparative backing can be ethically problematic.

#### ▪ **Lack of Uniform Ethical Guidelines and Training**

India lacks a centralized, enforceable code of ethics for forensic professionals. While some labs follow internal codes or adopt international norms, there is no standardization. This leads to inconsistent practices and raises the risk of unethical behaviour going unpunished.<sup>1291</sup>

#### ▪ **Ethical Dilemmas in Explosive Analysis**

In cases involving Improvised Explosive Devices (IEDs), forensic experts often face pressure to conclude links to terrorist groups without conclusive evidence. Misattribution can lead to wrongful detentions and political misuse. Ethically, experts must report only what is supported by physical and chemical analysis, not conjecture.<sup>1292</sup>

Ethical integrity in ballistics and explosive analysis is essential for upholding the principles of justice. India must address systemic issues

<sup>1286</sup> Saks, Michael J., and Faigman, David L. "Failed Forensics: How Forensic Science Lost Its Way and How It Might Yet Find It." *Annual Review of Law and Social Science*, Vol. 4, 2008.

<sup>1287</sup> National Crime Records Bureau (NCRB). *Crime in India 2022 – Statistical Overview of Forensic Labs and Case Pendency*.

<sup>1288</sup> Sharma, B.R. *Forensic Science in Criminal Investigation and Trials*, Universal Law Publishing, 6th Ed., 2016.

<sup>1289</sup> Singh, Yuvraj. "Media Leaks of Forensic Reports and Their Impact on Indian Judiciary." *Indian Journal of Law and Technology*, Vol. 10, 2018.

<sup>1290</sup> Kanchan, T., and Krishan, K. "Questionable Forensic Practices and Wrongful Convictions in India." *Journal of Forensic and Legal Medicine*, Vol. 30, 2015.

<sup>1291</sup> Directorate of Forensic Science Services (DFSS), Ministry of Home Affairs, Government of India – Status Report, 2021.

<sup>1292</sup> Baxi, Upendra. "Terrorism Trials and Forensic Evidence in India: Ethics, Law, and Accountability." Seminar, Issue 698, 2017.

such as lack of resources, formal training in forensic ethics, and standardization of procedures. Establishing an independent forensic regulatory authority and promoting transparency and accountability can mitigate many of these ethical challenges.

## ETHICAL RESPONSIBILITIES OF FORENSIC SCIENTIST

Forensic scientists working in the domain of ballistics which involves the analysis of firearms, ammunition, and gunshot residues play a critical role in the criminal justice system. In India, their ethical responsibilities are grounded in the principles of objectivity, accuracy, and integrity, guided by legal mandates and professional codes of conduct.

### ▪ Objectivity and Impartiality

Forensic ballistic experts must provide unbiased opinions, irrespective of the investigating agency or the accused. Their primary duty is to the truth and the court of law, not to the police or prosecution.

*"A forensic scientist is not an advocate, but an impartial expert who assists the court."<sup>1293</sup>*

### ▪ Scientific Accuracy and Competence

Ballistic experts must:

- Conduct tests using validated methods (e.g., comparison microscopy, trajectory analysis).
- Stay updated with scientific advancements and standard operating procedures (SOPs) issued by institutions such as the Directorate of Forensic Science Services (DFSS), Ministry of Home Affairs, Government of India.

*"Only competent and qualified forensic scientists should be allowed to testify in courts, as per Section 45 of the Indian Evidence Act, 1872<sup>1294</sup> or section 39 of BSA"*

### ▪ Integrity of Evidence Handling

Maintaining the chain of custody is critical. Ballistic evidence like bullets, cartridges, and firearms must be:

- Properly labelled, sealed, and documented.
- Stored securely to avoid tampering or contamination.

*"Any compromise in evidence handling can lead to miscarriage of justice"<sup>1295</sup>.*

### ▪ Confidentiality

Forensic scientists must maintain confidentiality of case details and findings. Disclosure should be made only to authorized personnel or when required by the court.

*"Unethical disclosure of forensic findings can jeopardize investigations and violate rights of individuals"<sup>1296</sup>.*

### ▪ Honest and Clear Reporting

Ballistic experts should:

- Avoid overstating the certainty of findings (e.g., claiming 100% matches without statistical support).
- Provide clear, understandable reports without technical jargon to help judges and lawyers comprehend the evidence.

*"Expert opinions must be clearly worded and based solely on facts and scientific reasoning."<sup>1297</sup>*

### ▪ Courtroom Testimony Ethics

While testifying:

- The expert must answer questions honestly, even under pressure.
- Should not align with the agenda of either prosecution or defence.

*"The role of an expert witness is to educate the court—not to support one side over the other"<sup>1298</sup>.*

<sup>1293</sup> National Institute of Criminology and Forensic Science, Government of India – Code of Ethics for Forensic Professionals.

<sup>1294</sup> Indian Evidence Act, 1872 – Section 45: Opinions of experts.

<sup>1295</sup> Directorate of Forensic Science Services, Ministry of Home Affairs – SOP on Firearms Examination.

<sup>1296</sup> Central Forensic Science Laboratory Manual – Guidelines on Data Protection and Confidentiality.

<sup>1297</sup> Forensic Science in Criminal Investigation and Trials by B.R. Sharma (2020).

### ▪ Avoiding Conflict of Interest

Forensic scientists should disclose any personal or professional interest in the case that may influence their judgment. They must not accept bribes, favours, or influence from any party.

*“Any conflict of interest must be declared to preserve the integrity of the justice system.”<sup>1299</sup>*

### ETHICAL DILEMMAS IN THE INVESTIGATION OF FIREARMS AND EXPLOSIVES

Investigating firearms and explosives presents unique challenges for forensic experts and law enforcement personnel. In India, these dilemmas often emerge at the intersection of legal boundaries, scientific limitations, and moral responsibilities. The stakes are high, as these investigations frequently involve terrorism, organized crime, or high-profile cases.

#### 1. Pressure from Investigating Agencies or Authorities

Forensic experts may face external pressure to produce results that support a specific narrative—particularly in politically sensitive or high-profile cases.

*“In certain cases, forensic scientists may be compelled to align findings with preconceived theories, compromising impartiality.”<sup>1300</sup>*

This undermines the principle of scientific objectivity and could lead to wrongful accusations or acquittals.

#### 2. Incomplete or Contaminated Evidence

In many firearm and explosive cases, evidence is not collected or preserved properly, either due to negligence or a compromised crime scene. This puts forensic experts in a dilemma: should they proceed with an analysis that might not meet scientific standards?

*“Poor evidence handling creates a conflict between the need to support investigations and the duty to uphold scientific integrity.”<sup>1301</sup>*

#### 3. Chain of Custody Concerns

Ensuring the chain of custody is maintained is essential, especially in explosive cases where materials like RDX or ammonium nitrate are highly sensitive.

*“Even a minor breach in evidence handling may raise doubts about the validity of the forensic report.”<sup>1302</sup>*

The ethical dilemma arises when experts are asked to overlook procedural lapses to preserve the case’s momentum.

#### 4. Use of Outdated or Non-Validated Techniques

In some Indian forensic labs, resource constraints may force the use of outdated instruments or methods that lack validation under current international norms.

*“Reliance on outdated techniques puts experts in a bind—follow protocol or report findings they can’t confidently support.”<sup>1303</sup>*

This becomes particularly concerning in cases involving IEDs or sophisticated firearms where precision is critical.

#### 5. Attribution of Explosives to Suspects Without Direct Evidence

In several terror-related cases, forensic reports are used to link suspects to explosive devices despite lacking direct physical evidence, such as fingerprints or DNA.

*“Experts face pressure to draw connections based on circumstantial or trace-level residues, risking overinterpretation.”<sup>1304</sup>*

<sup>1298</sup> Supreme Court of India judgment in *State of H.P. v. Jai Lal*, AIR 1999 SC 3318.

<sup>1299</sup> Ethics in Forensic Science: Professional Standards for the Practice of Criminalistics – American Academy of Forensic Sciences (adapted to Indian context).

<sup>1300</sup> Sharma, B.R. *Forensic Science in Criminal Investigation and Trials* (2020), Chapter on Ethics in Firearm Investigations

<sup>1301</sup> CFSL Delhi, Internal SOP Manual on Handling of Ballistic and Explosive Materials (2019).

<sup>1302</sup> Ministry of Home Affairs – “Manual on Chain of Custody Procedures” (2020).

<sup>1303</sup> Directorate of Forensic Science Services (DFSS), Annual Report, 2021-22.

<sup>1304</sup> National Human Rights Commission (NHRC), India – Report on Forensic Ethics and Wrongful Prosecutions (2018).

## 6. Balancing National Security with Individual Rights

Explosive and firearm cases often involve threats to national security. The urgency to solve such cases can lead to ethical shortcuts, including ignoring procedural safeguards or violating suspects' rights.

*"Experts must navigate the thin line between aiding national security and upholding constitutional rights of accused individuals<sup>1305</sup>."*

## 7. Media and Public Influence

Media sensationalism in high-profile bombings or shootings can influence forensic experts indirectly. There may be pressure to align with public expectations or to fast-track reports.

*"Trial by media can skew the ethical compass of forensic investigations, especially when public sentiment is inflamed<sup>1306</sup>."*

Ethical dilemmas in firearm and explosive investigations are not only technical but also deeply human. Forensic professionals in India must uphold the highest standards of scientific neutrality, procedural integrity, and respect for human rights, even under intense pressure from the state, media, or public.

## CHALLENGES AND ETHICAL DILEMMAS

### 1. Pressure from Investigating Agencies

Experts may sometimes face pressure to tailor findings in favour of the prosecution. Upholding scientific integrity in such cases is a significant ethical challenge.<sup>1307</sup>

### 2. Lack of Accreditation and Standardization

Many regional FSLs lack international accreditation, leading to discrepancies in methodologies and possible ethical breaches.<sup>1308</sup>

## 3. Delayed Justice

Backlogs in forensic labs can delay the analysis of ballistic evidence, potentially affecting the right to a speedy trial.

## CRIMINAL CASES IN WHICH BALLISTIC EVIDENCE WAS USED/REFERRED FOR RECORDING CONVICTION OR ACQUITTAL.

### ❖ Prem Kumar And Another v. State of Bihar (1995) 3SCC 228

#### a. Background of the case:

In accordance with section 302 read with section 34 of the IPC, the Session Judge found Accused 1 and 2 guilty of killing T and trying to kill G and R. They were found guilty under section 307 of the IPC and sentenced to seven years of harsh imprisonment in addition to a life sentence under section 302 of the IPC. The High Court upheld A1 and A-2's conviction under section 302. However, A-1 and A-2's conviction under section 307 IPC was overturned. Thus, this appeal was favoured by A-1 and A-2.

#### b. Facts of the case:

The event was caused by animosity that existed between the appellant's family and the dead family. It was claimed that the dead had killed the brothers of accused 1 and A-2. The prosecution said that on the day of the incident, T, PW1, PW2, and PW8, together with two more people, boarded a bus to return to their separate locations after attending the hearing of the murder case involving the brothers of the current accused 1 and 2. A automobile pulled up behind the bus and stopped in front of it after it had been halted for some time. Then, A-2, A-6, and their co-workers exited the vehicle. The rest of the people were equipped with rifles, but A-6 were empty-handed. A vehicle pulled up and halted in front of the bus in the meantime. He got from the vehicle A-1 with a rifle and his fellow gun-wielding buddies. The accused and other co-conspirators began announcing that T should be dismembered since he was inside the bus. As soon as they heard this, the bus's occupants were terrified and began to run. At that moment, A-1 and A-2 entered the bus via the front door. When he saw A-1 and A-2

<sup>1305</sup> Supreme Court Judgment: *PUCIL v. Union of India*, (1997) 1 SCC 301 – Balancing national security and individual freedoms.

<sup>1306</sup> Press Council of India – Guidelines on Media Reporting in Criminal Matters (2021).

<sup>1307</sup> Kanchan, T. et al. "Forensic ethics and the role of the expert witness." *Journal of Forensic and Legal Medicine*, Vol. 20, Issue 4, 2013.

<sup>1308</sup> DNA Technology Regulation Bill, 2019, and discussions on forensic regulation in Parliamentary Standing Committee Reports.

shooting indiscreetly at T, PW8, who had covered his face with the chuddar to conceal his identify, hurried to the bus's rear door. PW5 and PW6 were also hurt in the fire. By that point, PW8 had succeeded in disembarking from the bus along with several other passengers, and he hid in dense undergrowth close by. The accused and others shouted victory chants and ran away in their vehicle and jeep after learning of T's death.

#### **c. Typology of Forensic Evidence Used in the Case:**

All the injuries were caused by shots of firearms which also led to the death of T.

#### **d. Report Of The Experts Regarding The Case:**

PW4 performed T's post-mortem examination and concluded that injury 2 was the wound of exit and injuries 1 and 3 mentioned above were wounds of entrance. T's death was brought on by shock and bleeding from a gunshot wound. After the post-mortem examination, 12 to 18 hours had passed since the death. In the normal run of nature, each injury alone was enough to result in death. The post-mortem examination report was in Ext. 3. Dr. K. Singh performed PW5's medical checkup. There was one lacerated laceration on the shoulder's left side. It was unable to investigate the depth. The skin around the wound was charred. Three shots were seen on the upper left part of the back on the X-ray plate. It was a straightforward incident brought on by a gun or rifle. The damage occurred within 12 hours. The medico-legal certificate was Ext.

#### **e. Ground For Accepting The Forensic Evidence:**

Despite the appellant's attorney's argument that neither the recovered cartridges nor any ballistic expert were sent to or examined, the court in this regard cited the court's observation in this regard as well as a Supreme Court ruling in Mohinder Singh v. State. According to the court's opinion, the remark made in the aforementioned instance is relevant in situations when the victim's weapon was in the courtroom and it was unclear if the injuries were inflicted by the

weapon. The weapons used by A-1 and A-2, however, were never found in this instance. Therefore, under the circumstances, the prosecution was unable to claim that a specific, identifiable weapon was used to perpetrate the crime. In this instance, the ballistic expert had nothing to examine. As a result, the specific background mentioned above should be used to understand the remarks made in Mohinder Singh v. State. The appellant's attorney's argument lacked validity.

#### **f. Impact of Forensic Evidence (Conviction):**

The **conviction** of A-1 and A-2 was upheld as there was no merit in the case and the appeal was dismissed.<sup>1309</sup>

#### **❖ Sukhwant Singh v. State of Punjab (1995) 3 SCC 367**

In connection with the murder of the deceased, the appellant was tried for a section 302 violation. Although the firearm and ammo were removed from the accused and empty cartridges were discovered on the scene, the prosecution failed to send the confiscated weapon and the retrieved empty cartridges to the ballistic expert. prosecution based solely on the evidence provided by the deceased's brother. The court decided that the ballistic expert's opinion is essential in cases involving firearm-related injuries where both the weapon and the crime cartridge were discovered during an investigation to connect an accused individual to the crime. In certain cases, failure to deliver the expert opinion before the trial court has a substantial effect on the creditworthiness of the prosecution's case. After meticulously analyzing the circumstances in the record, the court determined that it would not be safe to uphold the appellant's conviction based only on the testimony of PW3, the deceased's brother. Because the trial court's conviction and penalty could not be maintained, the appeal was granted, and

<sup>1309</sup> Prem Kumar And Another v. State of Bihar (1995) 3 SCC 228

the appellant was declared innocent.<sup>1310</sup>

❖ **Gajadhar Soni v. State of M.P.**  
**(04.12.1996 – MPHC)**  
**MANU/MP/0786/1996**

In accordance with section 302 of the IPC, the accused was found guilty of murder. In the present instance, the FSL report unequivocally declared that the moment at which the cannon last fired could not be determined with any degree of scientific precision. The accused's gun had discharged at some point, but it was impossible to pinpoint the precise moment when the event occurred. It was normal practice to not clean the barrels of firearms after each firing, and it's possible that the gun had already fired before the accused took it. Since the prosecution witness had not backed up the case, there was no proof that the accused had shot a pistol. Even the confiscation of the accused's pistol, for which he had a legal license, did not provide any confirmation. The accused's participation in the crime was not supported by the deceased's assertion in the dying declaration. As a result, the conviction was overturned, and the accused was found not guilty. The appeal was granted.<sup>1311</sup>

❖ **Jagdish Kumar and Ors. v. State of H.P.**  
**(15.05.1996 – HPHC)**  
**MANU/HP/0140/1996**

The trial court found the appellant guilty in accordance with section 302/34 IPC. Thus, this appeal. The respondent's wife was the target of the appellant's filthy and offensive remarks. The respondent made an effort to block their use of such words. The respondent/husband died from his wounds, and an autopsy was performed on his corpse after the appellant, who felt wronged by the respondent's meddling, requested one of his friends to shoot him with the goal of killing him.

**Held:** Respondent was shot down after the appellant's friend begged him to do so in order to see the terrible outcome. The sealed package with the empty cartridge was kept and sent to a ballistic specialist. The appellant intended to murder the respondent. Additionally, the respondent's blood-stained clothing was discovered. The appeal was denied, and the conviction was maintained.<sup>1312</sup>

❖ **Raj Kumar v. State of Haryana**  
**(13.06.1996 – PNHC)**  
**MANU/PH/0916/1996**

**Meetings** The judge found the defendants guilty under the Arms Act's Sections 302 and 27. Thus, this appeal. **Held,** the doctor said throughout the trial that the deceased's wound, which was characterized as blackening in injury No. 1, required a minimum of three feet and a maximum of six feet between him and the attacker. Therefore, it is never possible to assume that a single shot fired from a 12-bore, single-barrel rifle 40 to 42 feet away caused the deceased's injuries. The ballistic expert was tasked with analyzing the gun that was found on the accused and the empty that were found on the scene. It was useless since it did not support the prosecution's case, even though it was stated that the pistol was operational and that the cartridge casings taken from the area were believed to have been shot from the gun. It was challenging to believe them as eyewitnesses to events since their additional proof was completely at odds with medical data. The testimonies of other witnesses contradicted one another, and the accused had no reason to murder the dead. As a result, the prosecution's case lacked convincing proof. As a result, the appellant's conviction was overturned, and he was exonerated of all accusations brought against him. The

<sup>1310</sup> Sukhwant Singh v. State of Punjab (1995) 3 SCC 367

<sup>1311</sup> Gajadhar Soni v. State of M.P. (04.12.1996 – MPHC)  
MANU/MP/0786/1996

<sup>1312</sup> Jagdish Kumar and Ors. v. State of H.P. (15.05.1996 – HPHC)  
MANU/HP/0140/1996

appeal was granted.<sup>1313</sup>

❖ **Bilal Ahmed Kaloo v. State of A.P.  
(1997) 7 SCC 431**

**a) Background of the case:**

Under the 1987 Terrorist and Disruptive Activities (Prevention) Act, B was a party to a prosecution. Despite being exonerated of the TADA offenses by the designated court, he was found guilty of sedition under sections 124-A of the IPC and 25 of the Arms Act and given a life sentence in prison. He was also found guilty of a number of other lesser offenses, each of which carried a three-year rigorous prison sentence. The aforementioned convicted individual had filed this appeal under section 19 of the TADA.

**b) Facts of the case:**

The appellant actively participated in Al-Jehad, a terrorist group founded with the ultimate goal of freeing Kashmir from the Indian Union. In light of this, the appellant incited inter-communal animosity among Muslim youngsters in Hyderabad's historic district, encouraged them to engage in armed militancy training, and provided them with weapons and ammunition. He personally carried deadly weapons, such as live ammunition and a homemade pistol. The police closely monitored the appellant's movements throughout the time of the several bombings that took place in Hyderabad. Following his arrest and the recording of his confession, the police confiscated a pistol and two cartridges that he had produced. Following the conclusion of the inquiry, he was charged with offenses under sections 124A, 436, 153-A, and 505(2) of the Indian Penal Code, as well as sections 3(3), 4(3), and 5 of the TADA and section 25 of the Indian Arms Act, before the Hyderabad Designated Court.

**c) Typology of Forensic Evidence Used in the Case:**

The report of the ballistic expert was used to examine the recovered weapon and the cartridges.

**d) Report of The Experts Regarding The Case:**

The ballistic expert (Assistant Director of FSL) conducted scientific test on the articles and reported that the seized articles were in perfect working condition. Particulars of the weapon given in the seizure memo tallied with the weapon on examination by the ballistic expert.

**e) Ground for Accepting the Forensic Evidence:**

Allegations of tampering with those articles were not made at any stage of the case neither there was any challenge to the seizure memo and the same tallied with the weapon on examination by the ballistic expert. The identity of the weapon thus stood established beyond any reasonable doubt. Therefore the court was in agreement that the appellant was in possession of arms and ammunitions in violation of law and he was thus liable to be convicted under section 25(1-B)(a) of the Arms Act. The sentence awarded by the trial court (RI for 3 years) in the circumstances of the cases needed no interference.

**f) Impact of Forensic Evidence (Conviction):**

The appeal was partly allowed by setting aside the conviction and sentence passes on the appellant for offences under sections 124A, 153-A and 505(2) of IPC. But the conviction and sentence passed on him under section 25(1-B)(a) of the Arms Act was confirmed.<sup>1314</sup>

**CONCLUSION**

The field of forensic ballistics in India

<sup>1313</sup> Raj Kumar v. State of Haryana (13.06.1996 – PNHC) MANU/PH/0916/1996

<sup>1314</sup> Bilal Ahmed Kaloo v. State of A.P. (1997) 7 SCC 431

plays a crucial role in criminal investigations, especially in cases involving firearms. However, it is fraught with several ethical challenges that must be addressed to ensure justice and maintain public trust in the legal system.

Firstly, the **accuracy and objectivity** of ballistic analysis are paramount. Ethical concerns arise when examiners face pressure to produce results that align with investigative or prosecutorial expectations, potentially leading to **biased interpretations**. This can severely compromise the fairness of trials and result in wrongful convictions.

Secondly, the **lack of standardized protocols** and **modern infrastructure** in many forensic labs across India raises concerns about the reliability of ballistic evidence. Ethical integrity demands that conclusions be drawn from scientifically sound and reproducible methods, which is not always the case due to underfunding and inconsistent training.

Moreover, **transparency and accountability** are often lacking. Ethical practice requires forensic experts to remain impartial and to disclose any limitations or uncertainties in their findings. However, in India, forensic testimony is sometimes seen as conclusive, and experts may not be cross-examined thoroughly, which undermines due process.

Lastly, **privacy and chain of custody issues** are critical ethical concerns. Mishandling of evidence, either intentionally or due to negligence, can taint investigations and lead to miscarriages of justice.

In conclusion, addressing the ethical issues in forensic ballistics in India requires systemic reforms. These include implementing standardized procedures, investing in advanced technology and training, ensuring transparency in forensic

reporting, and fostering a culture of accountability. Only by upholding the highest ethical standards can forensic ballistics serve as a reliable pillar of the Indian criminal justice system.

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