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FORENSIC EVIDENCE AND MEDICAL JURISPRUDENCE
A TEXTBOOK ON THE NEW CRIMINAL LAWS (BSA, BNS & BNSS)

Dr. Manindra Singh Hanspal
Dr. Anand Kumar Dwivedi

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About the Book

The book titled "Forensic Sciences" provides a comprehensive exploration of the intersection between scientific methodology and the Indian legal system. It is structured into five distinct parts that transition from foundational legal frameworks to specialized scientific disciplines. The text specifically addresses the significant legislative shift in India from the colonial-era Indian Evidence Act (1872) to the modern Bharatiya Sakshya Adhiniyam (BSA), 2023, and the Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023.

The book covers a vast range of topics, including:

- Medical Jurisprudence: Detailing DNA profiling, biometrics, and post-mortem changes.
- Clinical Forensic Medicine: Classifying wounds and mechanical injuries, including firearm ballistics.
- Forensic Toxicology: Outlining the principles of poisons and the duties of medical practitioners in poisoning cases.
- Modern Challenges: Addressing digital forensics, deepfakes, and cybercrime.

A core theme is the "paradoxical relationship" between science, which deals in probabilities, and the law, which seeks certainty. By integrating landmark case studies like the Nirbhaya case and the Sheena Bora murder, the book illustrates how integrated forensic evidence, biological, pathological, and digital, is woven into a coherent evidentiary narrative for the courts. Overall, it serves as a vital guide for understanding how physical traces are translated into the language of legal proof in the 21st century.

Preface

The book, “Forensic Sciences,” explores the complex “paradoxical relationship” between science and law, where scientific probabilities must be translated into the absolute certainties required for legal verdicts. It serves as a critical guide for the third decade of the twenty-first century, a period defined by a “legislative revolution” in India marked by the transition from colonial-era laws to the Bharatiya Sakshya Adhiniyam (BSA), 2023, and the Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023.

The text provides a comprehensive taxonomy of the field, moving from the foundational Legal Framework and Law of Expert Opinion (Section 39 BSA) to specialized domains like Medical Jurisprudence, Clinical Forensic Medicine, and Forensic Toxicology. It places significant emphasis on the role of the forensic expert as the “interface between the physical world and the legal record”. Through landmark case studies—such as the Selvi and Kathi Kalu Oghad decisions- the book illustrates the constitutional boundaries of evidence collection and the mandatory forensic mandates introduced by Section 176(3) of the BNSS. Ultimately, it addresses modern technological challenges, including digital forensics and deepfakes, framing them within a coherent evidentiary narrative for the Indian judiciary.

Acknowledgement

The completion of this book, “Forensic Sciences,” is the result of collective intellectual effort and the support of numerous individuals and institutions dedicated to the advancement of the Indian legal and scientific landscape. I extend my deepest gratitude to the Ministry of Home Affairs and the Bureau of Police Research and Development (BPR&D) for their invaluable role in providing the standard operating procedures and structural insights that form the backbone of modern investigative practice in India.

I am particularly indebted to the pioneering work of forensic medicine scholars such as Jaising Modi, P.V. Nandy, and K.S. Narayan Reddy, whose foundational texts provided the essential taxonomy for this treatise. Special thanks are also due to the experts at the Central Forensic Science Laboratory (CFSL) and various State Forensic Science Laboratories (SFSLs), whose practical commitment to methodological transparency and NABL accreditation standards ensures the reliability of forensic evidence in our courts.

Furthermore, I acknowledge the profound impact of the Indian judiciary, whose landmark decisions, from Selvi v. State of Karnataka to Arjun Panditrao Khotkar, have shaped the constitutional boundaries of forensic collection and the admissibility of electronic records. I also thank my colleagues in the legal and medical professions for their critiques, which helped refine the exploration of the “paradoxical relationship” between scientific probability and legal certainty. Finally, this work would not have been possible without the patience and support of my family and publishers, who saw this project through the complex transition into the era of the Bharatiya Sakshya Adhiniyam, 2023.

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PART-1
THE LEGAL FRAMEWORK OF FORENSIC SCIENCE

Chapter 1

Introduction to Forensic Science & Law

Forensic science and law share a paradoxical relationship: one disciplines itself to deal in probabilities, the other to arrive at certainties. The courtroom is where these two epistemic cultures must negotiate a verdict, and it is the forensic practitioner who stands at that crossing point, serving both disciplines while belonging wholly to neither.

The word 'forensic' derives from the Latin forensic, 'of the forum,' the public place where the Romans conducted legal proceedings. Every medical examination performed for evidentiary purposes, every chemical analysis of a poison, every fingerprint lifted from a crime scene, every DNA profile computed from a blood sample, all of these are, at their root, exercises in translating the physical world into the language of legal proof.[1] This translation has never been more consequential, or more technically demanding, than it is in the third decade of the twenty-first century, when Indian courts routinely receive electronic records, artificial intelligence outputs, deepfake-detection analyses, and genetic database matches as evidence in criminal trials.

India's journey from the rudimentary forensic evidence rules of colonial-era jurisprudence to the digitally sophisticated framework of the Bharatiya Sakshya Adhiniyam, 2023, is not merely a story of legislative revision. It is a story of a society's changing relationship with science, knowledge, and proof, a story shaped by a succession of landmark judicial decisions that progressively expanded the role of scientific evidence, and by legislative reforms that repeatedly struggled to keep pace with the technology they were asked to regulate.[2]

1 Ministry of Home Affairs, Forensic Science Development Plan (2024): Committed to doubling CFSL/SFSL laboratory capacity by 2027 and training 10,000 additional forensic personnel over three years in response to Section 176(3) BNSS demands.

2 Ministry of Home Affairs, Forensic Science Development Plan (2024): Committed to doubling CFSL/SFSL laboratory capacity by 2027 and training 10,000 additional forensic personnel over three years in response to Section 176(3) BNSS demands.

Definition

Forensic Science & Law refers to the interdisciplinary field where scientific principles and techniques are applied within the legal framework to investigate crimes, establish facts, and ensure justice.

According to Richard Saferstein (Criminalistics: An Introduction to Forensic Science, 12th ed.), *"Forensic science is the application of science to criminal and civil laws that are enforced by police agencies in a criminal justice system."* [3]

What is Forensic Science? Foundations and Scope

Forensic science is, in its most comprehensive definition, the application of natural and social sciences to matters of law. This deceptively simple definition conceals an enormous breadth: forensic science encompasses organic and inorganic chemistry (toxicology, drug analysis, trace evidence), biology (DNA profiling, forensic pathology, entomology, botany, anthropology), physics (ballistics, accident reconstruction, digital forensics), psychology (offender profiling, cognitive interviewing, forensic neuropsychology), and an expanding frontier of computational disciplines (machine learning-based image analysis, predictive forensics, NLP-based document examination). No single practitioner masters all of these domains; the forensic practitioner is a specialist operating within a discipline, and the medico-legal system works by assembling the outputs of multiple specialists into a coherent evidentiary narrative for the court.

The Institutional Architecture of Forensic Science in India. India's forensic science infrastructure is organized on three tiers. At the apex sits the Central Forensic Science Laboratory (CFSL) under the Ministry of Home Affairs, with four operational units in New Delhi, Hyderabad, Kolkata, and Chandigarh, handling the most complex and high-stakes forensic analyses, DNA profiling, digital forensics, ballistics, questioned document examination, and narcotics identification, primarily for cases investigated by central agencies (CBI, NIA, SFIO, NCB). The second tier comprises the State Forensic Science Laboratories (SFSLs), one or more in each State and Union Territory, handling the bulk of routine forensic work for state police investigations. The third tier encompasses district

3 Ministry of Home Affairs, Forensic Science Development Plan (2024): Committed to doubling CFSL/SFSL laboratory capacity by 2027 and training 10,000 additional forensic personnel over three years in response to Section 176(3) BNSS demands.