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# Evidentiary Implications of Forensic Anthropological Analysis: Intersecting Science and Law in the Indian Criminal Justice System

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## ABSTRACT

*This paper delves into the confluence of criminal jurisprudence and science. Despite successive amendments to the Code of Criminal Procedure and evidentiary rules, the regulatory framework has lagged behind the rapid advancements in scientific and technological domains since the latter half of the 20th century, encompassing disciplines such as fingerprint analysis and DNA profiling. The scientific discourse herein originates from the field of archaeology, which, through its evolution into anthropology, has engendered Forensic Anthropology. The utility of Forensic Anthropology transcends scenarios of mass calamities or clandestine interments, extending its significance to investigations concerning missing persons, abductions, and homicides. Fundamentally, every criminal offense entails the components of a victim, mens rea, actus reus, and a perpetrator. Forensic Anthropology facilitates victim identification and elucidates the nature of inflicted injuries, there by elucidating the elements of actus reus and mens rea. Considered akin to other expert testimonies, Forensic Anthropology stands as a viable tool in culminating criminal inquiries. Despite being sparingly employed in our jurisdiction, its efficacy is bolstered by the meticulous scrutiny of biological indicators, yielding a negligible margin of error. Acknowledging its fallibility and inherent limitations, this exposition seeks to broaden the horizons of readers to the potential integration of Forensic Anthropology within criminal investigations.*

**Keywords:** Criminal Investigation, Forensic Anthropology, Identity, Expert Evidence.

## I. INTRODUCTION

Anthropology is the scientific study of all aspects of creature development and interactions. It investigates tools, ethnicity, language, social connections, and how they communicate with other societies. Physical anthropology investigates human differences, particularly those that

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can be recognised. Forensic Anthropology is a fast and rapidly evolving scientific field. Its applications include recuperation, estimating physiological profiles, evaluating periods following death, detecting any wrongdoing or misconduct, reporting and identifying individuals. Each subject has its own way of promoting scientific literature and addressing restrictions. The variance ultimately leads to practitioners having to defend their interpretations. Anthropology is a diverse field dealing with the study of mankind (from the Greek 'Anthropos' - man and 'Logia' - study). It is further organised into four subfields: cultural anthropology, linguistic anthropology, archaeology, and physical or biological anthropology focusing on the evolution and diversity of humans, particularly the human lineage.

Forensic Anthropology is the study of identifying characteristics found on a person's remains. These distinguishing characteristics can be utilised to determine a victim's gender, ethnic origin, height, and physical health based on his or her remains. It is the application of physical anthropology to legal proceedings. Forensic Anthropologists use basic scientific procedures developed in physical anthropology to classify human remains and aid in the recognition of crime. Forensic Anthropologists use their expertise to solve the homicide cases by determining ethnicity, age, stature, antemortem, postmortem, and perimortem injuries time since death, and reconstructing the facial features in 2D and 3D. their responsibilities alongside law enforcement include scene search, excavation and retrieval, questions of recognition, cause of death, manner and mode of death, and time of death. This order's practice area includes the identification of skeletonized remains, severely decomposed corpses, unidentified human remains, the aging of individuals, mass disasters and fatalities, and the inhumane treatment of commingled skeletons and bones.

## II. BACKGROUND AND OVERVIEW OF FORENSIC ANTHROPOLOGICAL ANALYSIS

Forensic Anthropology stands as a crucial branch within the realm of forensic sciences, contributing significantly to the investigation and resolution of legal cases involving human remains. The roots of Forensic Anthropology trace back to the early 19<sup>th</sup> century, with pioneers such as *Thomas Dwight* and *Ales Hrdlicka* making significant contributions to the discipline. However, it wasn't until the mid- 20<sup>th</sup> century that Forensic Anthropology began to emerge as a distinct field, owing much to the works of *T. Dale Stewart* and *Wilton M. Krogman*. Over the years, advancements in scientific techniques, technological innovations, and interdisciplinary collaborations have propelled Forensic Anthropology into a sophisticated and indispensable tool for legal investigations.

### **Importance of forensic anthropological analysis in the Indian Criminal Justice System**

In India, where instances of homicide, missing persons, and unidentified bodies are not uncommon, the expertise of Forensic Anthropologists assumes paramount importance in facilitating justice delivery. The utilization of forensic anthropological analysis serves a crucial tool for law enforcement agencies and judicial authorities in resolving cases involving human remains. By employing specialized techniques such as cranial morphology assessment, age estimation, and skeletal trauma analysis, Forensic Anthropologists contribute substantively to the identification of victim, elucidation of manner and cause of death, and reconstruction of events leading to the commission of the crimes.

### **III. EVIDENTIARY VALUE OF FORENSIC ANTHROPOLOGY ANALYSIS**

Forensic Anthropology, as a specialized branch of forensic science, plays a pivotal role in the Indian criminal justice system by providing crucial insights into cases involving human remains. The evidentiary value of forensic anthropological analysis is multifaceted, encompassing the establishing of identity, determination of the cause and manner of death, estimation of time since death, assessment of trauma and injuries, and presentation of compelling evidence in court.

- **Establishing identity through skeletal analysis**

One of the primary functions of Forensic Anthropology is to establish the identity of deceased individual based on the skeletal analysis. In cases where the remains are decomposed or mutilated, traditional methods of identification may be insufficient. Forensic Anthropologists utilize a combination of morphological, metric, and DNA analysis techniques to ascertain the identity of the deceased.

The Bombay High Court, In the case of *State of Maharashtra v. Suresh*<sup>3</sup>, emphasized the importance of Forensic Anthropology in establishing the identity of a murder victim. Skeletal remains found in the remote area were subjected to rigorous forensic examination, including cranial morphology assessment and dental records comparison. The Forensic Anthropological analysis conclusively established the identity of the deceased, leading to conviction of the accused.

- **Determining Cause and Manner of death**

Forensic Anthropological analysis plays a crucial role in determining the cause and manner of death, especially in cases where the circumstances are unclear or the body is in an advanced

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<sup>3</sup> AIR ONLINE 1999 SC 169

state of decomposition. By examining skeletal remains for signs of trauma, pathology, and injury patterns, Forensic Anthropologists can provide valuable insights into the circumstances surrounding death.

The Hon'ble Supreme Court of India relied heavily on forensic anthropological analysis to determine the cause of death in a suspected homicide case. Skeletal examination revealed multiple fractures consistent with blunt force trauma, leading the court to conclude that the deceased had been subjected to fatal physical assault.<sup>4</sup>

- **Estimating time since death**

Estimating time since death is a critical aspect of forensic investigation, particularly in cases where the exact time of death is uncertain. Forensic Anthropologists employ various methods, such as postmortem interval estimation based on skeletal changes, to provide an approximate timeframe for the occurrence of death.

In a case involving the discovery of skeletal remains in a water body, by examining the extent of decomposition and associated environmental factors, the Forensic Anthropologist provides expert testimony estimating the postmortem interval. This evidence played crucial role in corroborating the prosecution's timeline of events and establishing the guilt of the accused.<sup>5</sup>

- **Assessing the trauma and injuries**

In assessing trauma and injuries, forensic analysis is instrumental, thereby aiding in the reconstruction of events leading to death. By analysing fracture patterns, soft tissue injuries, and weapon marks on skeletal remains. The forensic examination of skeletal remains recovered from a crime scene revealed multiple fractures and puncture wounds consistent with a stabbing incident. The detailed analysis enabled court to infer the manner in which the crime was perpetrated, thereby strengthening the prosecution's case against the accused.<sup>6</sup>

#### **IV. LEGAL FRAMEWORK AND FORENSIC ANTHROPOLOGICAL EVIDENCE**

##### **(A) Admissibility of Forensic Anthropological Evidence in Indian Courts**

Achieving a harmonious integration of Forensic Anthropology into the legal domain is crucial for fostering a deeper comprehension and promoting awareness regarding the application of scientific methodologies within legal frameworks. Forensic Anthropologists play a pivotal role in legal proceedings by meticulously adhering to procedural norms during scene investigations,

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<sup>4</sup> State of Karnataka v. B.G. Mohan, A.I.R. 2021 INSC 879

<sup>5</sup> MANU/MH/0660/2016, The State of Maharashtra and Ors. v. Rajesh and Ors. (BOMHC)

<sup>6</sup> MANU/UP/4626/2022, Ram Singh and Ors. v. State of U.P. (ALLHC)

ensuring proper handling and preservation of physical evidence, and meticulously maintaining the chain of custody for evidence admissible in court. As expert witness, their duty encompasses presenting as accurate portrayal of their findings and substantiating them as expert evidence in the court of law. In Indian Jurisprudence, the admissibility of expert evidence is governed by Section 45 of Indian Evidence Act, 1872, acknowledging the indispensability of specialised knowledge in judicial deliberations. The testimony provided for Forensic Anthropologists is deemed essential for elucidating forensic aspects in criminal cases, yet the adherence to legal protocols and familiarity with other forensic sciences is equally imperative. The admission for forensic anthropological evidence hinges upon strict compliance with principles dictating the recovery, transfer, and storage of physical evidence, along with adherence to procedural requisites for court appearances. While Forensic Anthropologists navigate the scientific intricacies of their discipline, they must also remain cognizant of the legal complexities inherent in dealing with forensic evidence, thereby ensuring a seamless integration of their expertise within the legal framework.

### **(B) Legal Proceedings Utilizing Forensic Anthropology as an Investigative Instrument**

#### **a. NITHARI SERIAL KILLINGS<sup>7</sup>**

The Nithari serial killings case involved the discovery of skeletal remains in Nithari, Noida, leading to the investigation of a string of gruesome murders committed by Moninder Singh Pandher and his domestic servant Surinder Koli. The victims, mostly children and women, were lured into Pandher's house where they were sexually assaulted, murdered, and dismembered. Forensic Anthropology played a crucial role in solving the case by aiding in the identification of the victims and establishing crucial evidence for prosecution. Examination of skeletal remains determined the gender, age and other identifying features of the victims. By analysing skeletal features such as cranial morphology, pelvic structure, and epiphyseal fusion, the identities of the victims were ascertained and established key facts about their demographics. The importance of Forensic Anthropology in the Nithari case cannot be overstated. It provided essential evidence that helped link the remains to the missing persons, enabling law enforcement to build a comprehensive timeline of the crimes and establish the perpetrators' modus operandi.

#### **b. SHEENA BORA CASE<sup>8</sup>**

The case unfolded with the discovery of skeletal remains in Penn Raigadh, Maharashtra, sparking speculation that they could be those of Sheena Bora. This suspicion stemmed from a

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<sup>7</sup> MANU/UP/3762/2023

<sup>8</sup> CBI special case 117/2015

previous confession made by one of the accused individuals. However, the pertinent question was that whether the same was true? Forensic Anthropology emerged as a key tool in unravelling the mystery. Dr. Mohite, the anthropologist involved, meticulously examined the skeletal features, focusing on facial characteristics such as the chin, muscle attachments, and the gonial angle (the mandible's angle in the skull). Based on these analyses, Dr. Mohite concluded that the remains belong to a female, fitting Sheena's profile. Further scrutiny was directed towards determining the age of the deceased. By assessing the humeral epiphysis, a part of the bone that ossifies upon reaching full growth, it was established that the individual was within the age range consistent with Sheena's at the time of her demise- typically between 21 to 25 years old for females. The forensic assessment effectively refuted the defence's claims that the body was not Sheena's, thus bolstering the prosecution's case.

***c. BHANWARI DEVI CASE<sup>9</sup>***

The case involved the abduction and subsequent murder of Bhanwari devi, an auxiliary nurse midwife in Rajasthan. The case gained widespread attention due to its intricate web of political and social ramifications. Bhawari devi was allegedly abducted on September 1, 2011 due to her possession of a videotape allegedly showing a sexual encounter involving a politician. Her body was never recovered, but her murder was presumed based on the circumstantial evidence. Several individuals, including politicians and government officials, were implicated in the crime. The analysis of physical evidence, including bone fragments and other remains, established the likelihood of foul play and provided insights into the circumstances surrounding Bhawari devi's disappearance. Through meticulous examination and interpretation of skeletal remains and associated forensic evidence, Forensic Anthropologists contributed to establishing the timeline, manner, and probable cause of death, thereby assisting in the investigation and prosecution of those involved in the crime.

***d. 9/11 ATTACK, WORLD TRADE CENTRE<sup>10</sup>***

Following the tragic events of the 9/11 attack on World Trade Centre, and it fell upon the Forensic Anthropologists to identify the victims amidst the chaos and devastation. With bodies mangled and fragmented due to the severity of the attack, Forensic Anthropologists undertook the arduous task of providing identity to the remains. Despite the challenge posed by the extensive fire that reduced many bodies to skeletons. The primary objective remained the

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<sup>9</sup> 1997 (1) WLC 42, 1996 (2) WLN 387

<sup>10</sup> United States Department of Justice, Office of Justice Programs. 2005. Mass fatality incidents: A guide for human forensic identification. Washington, DC. <http://www.ojp.usdoj.gov/nij/pubs-sum/199758.htm> (accessed 20/01/2021).

compartmentalization of remains based on gender and age, facilitating subsequent DNA matching for accurate identification.

The meticulous recovery process, spearheaded by Forensic Anthropologist not only aimed at identifying victims but also involved in determining the status of perpetrators- whether they were deceased, alive, or injured- a pivotal step towards apprehending them. Failure to effectively compartmentalize the fragmented bones would have prolonged the identification period significantly, potentially taking years to ascertain the identities of all the victims and attackers. Forensic Anthropology emerged as a vital scientific tool in expediting the identification process in the wake of a mass disaster.

*e. NIRBHAYA GANG RAPE AND MURDER CASE<sup>11</sup>*

The Nirbhaya Gang Rape was a landmark incident that shook India and garnered international attention. The victim, a 23-year-old physiotherapy intern, was brutally gang-raped and assaulted by six men on a bus in Delhi. Subsequently, she was thrown out of the moving bus along with her male companion. The victim succumbed to her injuries two weeks later, sparking widespread outrage and protests across the country. While not specifically forensic anthropology, forensic experts including forensic odontologists played a crucial role in analysing bite marks and other forensic evidence to identify the perpetrators. Forensic anthropology, along with other forensic sciences, played a critical role in providing evidence led to the arrest and conviction of perpetrators. The case highlighted the importance of forensic expertise in ensuring justice for victims of violent crimes.

## V. LIMITATIONS OF FORENSIC ANTHROPOLOGY

Resistance and Ignorance from the Legal System<sup>12</sup> – Despite its potential to provide valuable insights into the criminal investigations and legal proceedings, Forensic Anthropology faces significant challenges within the legal system due to resistance and ignorance, and is often underutilized or dismissed by legal professionals. This resistance may stem from a lack of understanding of the discipline's methodologies and limitations, leading to scepticism regarding its reliability and relevance in legal contexts. As a result, Forensic Anthropologist may struggle to effectively communicate the significance of their findings to judges, juries, and other stakeholders, hindering the integration of forensic anthropological evidence into legal proceedings.

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<sup>11</sup> Mukesh & Anr v. State for NCT of Delhi & Ors. (2017) 6 SCC 1

<sup>12</sup> A.M. CHRISTENSEN, NV. PASSALACQUA, E J. BARTELINK 2014 FORENSIC ANTHROPOLOGY CURRENT METHODS AND PRACTICES, Chapter 15, Pg. No 414-18.

Lack of specialised Education<sup>13</sup> – in cases of Forensic Anthropology, the individuals typically tasked with analysis are medical doctors who have received training in forensic medicine during their medical education or anthropologists who have pursued anthropology as part of their academic studies in the arts. The absence of specialised education in Forensic Anthropology presents a potential risk in these investigations, raising questions about the qualifications of individuals considered as experts in the field. It is pertinent to note that traditional anthropology curricula do not typically include Forensic Anthropology, and governmental forensic laboratories often lack dedicated positions for Forensic Anthropologists. This collective deficiency contributes to an ineffective approach to case resolution, and even when cases proceed to court, outcomes may result in acquittals due to the field's lack of recognition.

Error<sup>14</sup>– despite advancements in technology and methodology, Forensic Anthropology is not immune to error. Like any scientific discipline, Forensic Anthropology is subject to limitations, uncertainties, and potential sources of error that can impact the accuracy and reliability of its findings. Factors such as incomplete or degraded skeletal remains, subjective interpretation of evidence, and contextual biases can all contribute to error in forensic anthropological analysis. Moreover, the complexity of Forensic Anthropology, particularly in cases involving mass disaster or complex trauma, increases the risk of error and requires meticulous attention to detail and rigorous validation procedures to minimize inaccuracies.

## VI. CONCLUSION

Thus, notwithstanding the fledgling state of Forensic Anthropology within the jurisdiction of India, it's imperative significance emerges as a pivotal instrument in delineating the identity of the skeletal remains and adjudging the commission of a criminal act, including the discernment of causation and mens rea, as evinced by the subsequent interment of such remains in the cases at hand. Presently, the primary objective of Forensic Anthropology within our national confines pertains to the establishment of Corpus Delicti, an essential constituent within the concatenation of circumstances indispensable for the substantiation of criminality. Ancillary aspects addressed by this discipline, although unfamiliar to the Indian judiciary, are widely acknowledged in the jurisdiction of the occident. The discipline of Forensic Anthropology manifests a broad spectrum of utility alongside inherent constraints, thereby necessitating its unassailable recognition, given its profound relevance. In summation, it is manifest that the ambit of the

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<sup>13</sup> Vol. 59(1) 61–69, N BARYAH, K KRISHAN, T KANCHAN, THE DEVELOPMENT AND STATUS OF FORENSIC ANTHROPOLOGY IN INDIA: A REVIEW OF THE LITERATURE AND FUTURE DIRECTIONS MEDICINE, SCIENCE AND THE LAW 2019.

<sup>14</sup> Vol 59 issue 1, A M. CHRISTENSEN C M. CROWDER S D. OUSLEY M M. HOUCK. ERROR AND ITS MEANING IN FORENSIC SCIENCE, 2014 J FORENSIC SCIENCE, 123-126

discipline is more expansive in western jurisdictions, yet the inclusion of Forensic Anthropology expertise in cases involving skeletal remains is a procedural imperative that promises significant strides in the enhancement of criminal investigations within India. While the utilization of this science in Indian jurisprudence remains modest, its occasional invocation attests to the inevitability of India's advancement in this field, arguing a promising trajectory for future.

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