

USE OF FORENSIC SCIENCE IN VICTIM IDENTIFICATION: A LEGAL STUDY.

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Abstract- *The identification of the suspect who committed the crime is revealed by forensic science. The evidence makes it abundantly apparent what kind of crime was committed. The incident's timing gets clear from the circumstances in which crime gets committed. The crime scene of the offence is established by the forensic evidence. The modus operandi of the criminal is discovered during the forensic inquiry. Finally, it identifies the motive behind committing of the crime. The identities of the perpetrator and victim are reconstructed by forensic investigators. Depending on the incident, there may be a primary, secondary, or tertiary crime scene.*

In disasters, accurate identification of the deceased is crucial to providing closure to the remaining family and resolving legal questions around insurance and inheritance claims.

Forensic science is a dynamic branch of information and could track down perpetrators, identify them, and bring them to justice. A branch of forensic science that deals with dentistry is called forensic odontology. This technique is applied when removing human remains and examination of their teeth. The suspect's dental history and the bite marks on the victim's body are also compared. The study of artefacts and buried human and animal remains is known as forensic archaeology. The medico-legal analysis of human remains, particularly human osteology, is known as forensic anthropology. The identification of the deceased in routine practice, accidents, and disasters involving hundreds or thousands of victims has long been a key responsibility of the forensic. This paper undertakes the study of the use of various branches of forensics in victim identification and how far it has been helpful.

As a crime-solving sciences, forensic sciences encompass fields including criminology, criminal justice, psychology, chemistry, biology, entomology, engineering, medicine, physics, and geology.

INTRODUCTION:The Latin term "forensic" which implies appropriate or relevant to a court of law, is where the English word "forensic" originates.¹ Criminalistics, as it was formerly termed, was the application of science to both criminal and civil law.

With a history of 189 years, forensic science unites scientists and criminal investigators to impartially evaluate the evidence discovered at the site of the crime. Law enforcement is increasingly using forensic science and becoming more aware of it.

It can successfully aid in the search for missing people, reveal their genuine identities, connects and convict through testimony who victimized whom by presenting scientific proof.²

The identification of a catastrophe victim is crucial for several reasons. For starters, it helps us determine the disaster's source, the number of casualties, and their identities. DVI makes it possible for us to understand the precise amount of lost assets as well as any potential future catastrophes related to that incidence.

I. IMPORTANCE OF FORENSICS

In the modern world, forensic science is an advanced scientific method that is employed in criminal and civil investigations, is capable of providing valuable insights, and is a crucial component of the criminal justice system. As a result, forensic science is a novel idea in India.³

To ensure a fair process and see that justice is served, the fields of forensic science and law have grown increasingly complex. The identification of victims is a crucial component because it even gives investigators insight into how man-made disasters operate.

Reconstructing the scene of the incident is possible if the victim's identity is known, the injuries have been determined to be either antemortem or postmortem or to be the probable cause of death, the impact of the disaster has been established, and the intensity of an explosion, eruption, or earthquake has been determined.⁴

¹ P.J Stevens, *Investigation of mass disaster* 170-192 (London: Butterworths, 1973).

² S. Blau and T. Hill, "Disaster victim identification: a review" 35 *Minerva Medicolegale* 35-46 (2002).

³ A.K.Verma, S. Kumar and S. Rathore, "Role of dental expert in forensic odontology" 5 *Natl J Maxillofac Surg* 2-5 (2014).

⁴A. Wilder, *Locals within locals: cultural sensitivity in disaster aid* 1-3 (Anthropol Today. 2008).

By verifying the victim's personal identity and comparing the post-mortem and pre-mortem records, we can determine the victim's genuine identity and, in some situations, the most likely cause of the disaster.

The main goals are to count the number of victims and report the number of those who are still missing. Knowing the amount of the loss to the assets, especially the property, is the next area of concern. According to Mark Walport, “forensic methods are incredibly helpful in a variety of sectors outside of criminal justice.”⁵

II. DISASTER VICTIM IDENTIFICATION

The International Criminal Police Organization (INTERPOL) created particular rules and protocols for Disaster Victim Identification in response to lessons learned from earlier major catastrophes (DVI). The DVI team is made up of volunteers and subject matter experts from several fields that collaborate using protocols and techniques that have been established globally to gather and compare data from ante-mortem and post-mortem autopsies.

Using DNA, fingerprint, or odontology identification, forensic victim identification happens rather fast in many DVI instances.⁶ Yet, there are numerous circumstances that can cause the identification to be postponed or interfered with. Each major disaster, whether unintentional or on purpose, presents unique challenges for forensic experts in identifying the victims. The number of victims, type of mass destruction, degree of body fragmentation, DNA degradation, accessibility of the scene and bodies, availability for sample collection, DNA references, and finally contamination of the sample are some of the various factors, circumstances, and difficulties a forensic professional may encounter.⁷

⁵ H.G Tengrove, *Forensic odontology in disaster victim identification* 286 (London: A. Taylor, 5th edn. 2012).

⁶ Y. Schuliar, P.J.T. Knudsen, “Role of forensic pathologists in mass disasters” 8 *Forensic Sci Med Pathol.* 164–173 (2012).

⁷ S. Black, *Disaster anthropology: the 2004 Asian tsunami* 507 (London (UK): Routledge, 2nd edn. 2016).

III. STEPS INVOLVED IN IDENTIFICATION.

Accurate victim identification can take a while, especially if several persons were slain. There are four stages:⁸

- Examining the scene: Depending on the occurrence and the location, it may take days or even weeks to find all the victims and their belongings.
- Post-mortem or PM data: Experts examine the human remains to look for forensic evidence that could assist identify the victim. This may consist of:
 - a. Fingerprint- If fingerprints are accessible, they are quite reliable, but since the majority of people's fingerprints are not kept on file, their use may be limited.
 - b. Dental examination, or odontology- As teeth are extremely durable and the majority of people have dental records, teeth make for one of the most trustworthy means of identification.
 - c. DNA profiling- It allows for direct comparisons between a victim's profile and one obtained from their residence, such as a hairbrush. The DNA of the parents can also be used for indirect comparisons.
 - d. Physical signs, such as tattoos, scars, or even surgical implants that are specific to the victim.⁹
- Ante-mortem data: Often known as AM data, includes dental and medical records, fingerprints, and DNA that are found in the homes of the victims or provided by their relatives.
- Reconciliation: After the PM and AM data have been gathered, a group of experts evaluate and combine the two sets of data to determine who the victims are.

IV. TECHNOLOGY INVOLVED

1. One of the newest and most trustworthy methods of investigation in forensic science is the DNA profile. The phrase "deoxyribose nucleic acid," stands for DNA. It is an

⁸ A. Christensen, N.V. Passalacqua and E.J Bartelink, *Forensic anthropology: current methods and practice* 56 (New York, Elsevier, 2014).

⁹ Ibid.

organic component that is present in every live cell and leaves a unique imprint. Several other sources, including blood, sperm, bone, saliva, etc., can yield DNA. Homicide investigations can benefit greatly from the analysis of blood patterns.¹⁰

2. A polygraph test, sometimes known as a lie detector test, is an instrument that measures physiological reactions related to blood pressure, pulse, respiration, and temperature when the individual responds to a series of questions under the hypothesis of a false answer.¹¹ The National Human Rights Commission also released guidelines for the administration of polygraph tests linked to violations of human rights in the year 2000.
3. The process of analyzing narcotics involves putting a subject to sleep or into a drowsy state using chemical injection, and then questioning them while they are in this state of sleep. It can also involve injecting a "true" drug into a patient or suspect to induce semi-consciousness, and then questioning the patient or suspect. This procedure helped a witness's memory. The Nacro Analysis test is an effective tool for criminal investigations that would have a significant impact on both the innocent and the guilty and advance the cause of justice. Article 20 (3) and Article 21 of the Constitution are being broken.¹²
4. Forensic scientists have long utilized fingerprints as an identification tool in criminal investigations. Due to their tenacity and individuality, fingerprints are one of the most vital tools in criminal investigations. Each person has an own set of fingerprints. Fingerprints can vary even between identical twins.¹³
 - Sweat creates latent fingerprints, which are entirely on the skin's surface. The only way to see this kind of fingerprint is through extra processing; it is invisible to the naked eye. Basic powder processing methods or the use of chemicals can be used in this procedure.
 - Blood, oil, pen, or dirt can all leave behind patent fingerprints. The fingerprint type is clearly discernible to the naked eye. By pressing your fingertips onto

¹⁰ S.C. Warnasch, "Forensic archaeological recovery of a large-scale mass disaster scene: lessons learned from two complex recovery operations at the world trade center site" 6 *J Forensic Sci* 584–593 (2016).

¹¹ United Nations International Strategy for Disaster Reduction: United Nations; 2018 [14/02/18].

¹² S. Blau, C. Briggs, "The 2009 Victorian Bushfires disaster: the role of forensic anthropology in disaster victim identification" 20 *Forensic Sci Int* 29-35 (2010).

¹³ T. Anson and M. Trimble, *The role of the biological anthropologist in mass grave investigations* 55-62 (Australian Academic Press, 2008).

recent paint, war, soap, or tar, one can create plastic fingerprints, which are three-dimensional imprints.

5. Handwriting- The use of handwriting as a tool for identification research and observation A person with specialized knowledge in questions relating to the alignment of handwriting can only offer an opinion that is relevant in nature after having disclosed the facts that contain the general principles and questions pertaining to the reliability of genuineness of handwriting under Section 47 of the Indian Evidence Act.¹⁴
6. Dental- A victim's teeth may be utilized for comparison with the dental records of missing people in situations where determining the identity of a victim is challenging due to tissue decomposition or death caused by explosions or extremely deadly crashes. Dental surgery plays a major role in the uniqueness of each tooth, and coupled with developmental traits, it is the key to using teeth to identify unidentified corpses. The hardest part of the body to disintegrate, teeth are notable for remaining nearly intact after death despite the effects of thermal changes and despite, for instance, thousands of years lying in the countryside.

Because of this, teeth are crucial for identifying dead victims, whether they are found individually or as part of an accident involving a larger group of starved people. A variety of distinctive features of an individual can be measured and matched to the CAT data. The use of CAD/CAM and CAT Scan in the teeth and jaws has been extensively documented. This has improved our ability to get useful dental data.¹⁵

7. Bar coding: In the past, bar codes have been used into prosthetics like dentures. Large amounts of information about the person can be stored in these barcodes. The drawback of this method was that it was challenging to scan the actual barcode due to the thickness of the acrylic resin.

¹⁴ C. Perera and C. Briggs, "Guidelines for the effective conduct of mass burials following mass disasters: post-Asian tsunami disaster experience in retrospect" 4 *Forensic Sci Med Pathol.* 1–8 (2008).

¹⁵ Supra note 6. at 32.

V. IDENTIFICATION METHOD OF VICTIM

The techniques used to identify the victim are separated into two categories.

1. Primary identification is the process of identifying a victim using information gathered from the findings of the various participants. These findings are typically focused on how the disaster affected the victim. Primary evidence is regulated by factors including the length of time since the incident, the severity of the victim's injuries, and changes in the corpse's state during the course of the investigation. The most accurate methods are determined to be ridge analysis, dental record analysis, and Genetic fingerprinting¹⁶.
2. Alternatives to primary identification are secondary identification and the main components of secondary identification include the victim's personal items, tattoos, scars, description of the clothing and pieces of jewelry worn, and medical records.¹⁷ All of these can be supported by the other key details discovered about the victim, but they cannot be used in isolation to prove the victim's identity. Although identification by photographs can accomplish the goal, it cannot be said that it is error-free because instances, when erroneous information is gathered, do occur.

Finding significant secondary and primary data relevant to the topic of interest is important. To get a trustworthy outcome, it is important to thoroughly analyze the quality of the data obtained during the ante-mortem and post-mortem processes.¹⁸

VI. CENTERS FOR IDENTIFICATION.

- a. The victim's property is collected and documented by the identification center's property department. Basically, take pictures of each and every item you take from the victim, record it, and log it in the victim's property log book. The property

¹⁶ E.H. Kimmerle, L.W. Konigsberg and R.L. Jantz "Analysis of age-at-death estimation through the use of pubic symphyseal data" 53 *J Forensic Sci*, 558–568 (2008).

¹⁷ Ibid.

¹⁸ C.J. Bruijning-van Dongen, K. Slooten, W. Burgers, "Bayesian networks for victim identification on the basis of DNA profiles" 3 *Forensic Sci Int: Genet Suppl Ser*, 466–468 (2009).

division is also responsible for documenting, photographing, and placing the goods discovered on the victim and at the crime scene in "E" numbered bags.

- b. Based on the AM and PM data, the medical department of the identification centre is responsible for comparing the victim's physical characteristics. When mutilated victims are discovered, the basic anatomical structure is taken into account when the victim is rearranged. After general observations, the body parts should be matched to determine if they belong to the same person.
- c. The dentistry department is the next department, and its primary duties include estimating people's ages and habits as well as looking for anomalies and assisting with investigations. It will be simple to match an antemortem x-ray or dental record with both and identify the victim.¹⁹
- d. The DNA analysis division is crucial in identifying the person because it can be used to locate the victim's relatives.²⁰ Using protective gloves will prevent the need for contamination. The collection of the sample from the least damaged location should be a top priority to ensure that the investigation is unaffected.
- e. The mortuary part has a body release area. It wasn't just about releasing the body; the family of the deceased also needed to agree on where the body would be sent, whether it would be cremated locally, whether the victim's belongings should be sent to the family, and whether any of the victim's possessions would be buried with the body if local burial of the body was approved.²¹

VII. ADMISSIBILITY OF FORENSIC SCIENCE IN INDIA

The Indian Evidence Act, 1872

- Sections 45 and 46 of the Indian Evidence Act give a quick summary of the admissibility of forensic reports in courtrooms. It gives expert

¹⁹ J. Acharya, R. Shrestha and P.K. Shrestha "When protocols become fairy tales and gods remain buried under: excerpts from the diary of forensic experts at Ground Zero during the Mega Quake that hit Nepal" 38 *Am J Forensic Med Pathol.* 5-8 (2017).

²⁰ C.J. Bruijning-van Dongen, K. Slooten and W. Burgers "Bayesian networks for victim identification on the basis of DNA profiles" 2 *Forensic Sci Int: Genet Suppl Ser.* 466 (2009).

²¹ L. Olivieri, D. Bertoglio "Challenges in the identification of dead migrants in the Mediterranean: the case study of the Lampedusa shipwreck of October 3rd 2013" 28 *Forensic Sci Int.* 121 (2018).

testimony in any forensic scientific field relevance so that the court may make decisions on technically complex and sophisticated issues.

- The court will frequently judge it necessary to depend on qualified experts who have technical and in-depth knowledge of the facts addressed in the case. The official or expert who has provided a report and reached his conclusions after following several procedures in good faith will be relied upon by the court. Any evidence that appears to the court to be irrelevant but is important in the expert's opinion will be given relevance based on the expert's opinion.
- Section 47- "Handwriting Opinion," describes the conditions in which the handwriting expert must regard a handwriting as being in dispute.
- Section 67- It describes the procedures to be followed in order to verify a signature on a document.
- Section 73- It requires everyone who receives a court order to provide their fingerprints. Additionally, a violation of fundamental rights is not being committed.

VIII. FORENSIC LAW RELATING TO MEDICAL JURISPRUDENCE IN INDIA.

Criminal Procedure Code 1973

- Section 53(I) states that an accused person may be examined by a medical professional at the request of a police officer using reasonable force.
- Section 53(ii) requires that any examination of a female accused person be conducted only by or under the direction of a female registered medical practitioner.
- Section 54- A medical professional may examine a detained person upon his request in order to find evidence that will be favorable to him.

- Section 174- Inquest procedures requires police to, among other things, look into and record suicides.
- Section 176- The magistrate's investigation into the cause of death.
- Section 293- It mentions a few Government Scientific Specialists who's testimony may be used as evidence in court.

Indian Penal Code of 1860,

- Injury is defined in **Section 44** as any unlawful harm to a person's body, mind, reputation, or property.
- **Section 319** Hurt-Harm: Every person who is harmed experiences physical pain, illness, or infirmity.
- Penalty for Intentionally Causing Injury under **Section 323** is one year in prison, with or without a fine of up to Rs. 1000. The penalty for using a dangerous weapon is up to three years in prison, with or without a fine.
- Penalty for Willfully Causing Grievous Injury under **Section 325** is seven years in prison, either with or without a fine.
- **Section 326** Penalty for Voluntarily Causing Grievous Harm by a Hazardous
- **Sec. 320 & 321**- Grievous Injuries
- **Section 351 Section 328** - inflicting hurt with the intent to do so, including assault as a threat or attempt to use force. is punishable by up to ten years in prison and either a fine or both.

IX. CASE RELATING TO ROLE OF FORENSICS.

- Tandoor Case of Murder (1995) Delhi²²** – In India, forensics were used for the first time to resolve a criminal case. Shusil Sharma killed his wife Naina Sahni in this instance by shooting her three times in the residence. He killed his wife because he thought she was having an affair with a classmate and fellow lawmaker named Matloob Karim. After killing his wife, Sharma transported her body to the Bagiya restaurant, where he and Keshav Kumar, the manager, attempted to burn her in a

²² 2007 CriLJ 4008.

tandoor. Police seized Sharma's handgun and blood-stained clothing and took them to the forensic lab on Lodhi Road. They also took a blood sample from Sahni's parents, Harbhajan Singh and Jaswant Kaur, and sent it to Hyderabad for a DNA analysis. "Blood samples preserved by the doctor while conducting the post mortem and blood stains on two leads collected from the head and neck of deceased Naina's body are of the 'B' blood group," according to the lab report. The DNA report confirmed that the body was that of Sahni, who is the biological child of Mr. Harbhajan Singh and Jaswant Kaur. It stated, "The findings prove beyond any reasonable doubt that the burned body is that of Naina Sahni, who is the biological offspring of Mr. Harbhajan Singh and Jaswant Kaur. Finally, with the use of forensic evidence, Mr. Shusil Sharma was found guilty.

- b. The Supreme Court ruled in **Royo George v. Deputy Superintendent of Police**²³ that the criminal began employing extremely sophisticated and contemporary means to carry out the crime. The use of scientific methods must be used instead of the traditional methods of investigating and questioning offenders to find a solution.
- c. An expert in one who has gained specialised knowledge and a degree in any science was used in the case of **A. Nagireddy v. State of Andhra Pradesh**²⁴. His theory, which was founded on experiment observations, is pertinent in situations where forensic science-related concerns come up.
- d. **Devi Prasad and others v. State**²⁵, it was observed that as a matter of prudence and caution, the Court shouldn't be hesitant or cautious to base its findings merely on the observation or comparison of handwriting, which can have a misleading impact on outcomes.
- e. In **Pritam Singh v. State of Punjab**²⁶, it is said that the science of footprint identification is primitive and that too much trust should not be placed on the outcome of such identification.

²³ AIR 2006 (2) KLT 197.

²⁴ AIR 1992 CriLJ 1339.

²⁵ AIR 1967 CriLJ 134.

²⁶ AIR 1956 S.C. 415.

- f. In **Suntekben Shermabhal Jadeja v. State of Gujarat**²⁷, it was decided that in order to uncover the truth about criminals, all available options must be considered, necessitating the need for such a forensic test. The suspects Surinder Kohli and Mohinder Sagh Pandr underwent rapid narc analysis in the Nithart Killer Case. Under the influence of the medication, the accused made a number of confessional comments, and we even revealed the names of the people he killed.
- g. In **Vasu v. Santha**²⁸, 1975, the court set some guidelines for DNA tests and their acceptance to prove parentage.

X. CONCLUSION

Assuring the cause of death, identifying suspects, finding the whereabouts of the missing, and profiling criminals are just a few of the investigative tasks that forensic science performs in order to solve crimes. By analyzing evidence found at the scene of a crime, such as fibers, hairs, blood, fingerprints, and autopsies, they examine the fluids and tissues to ascertain the cause and manner of death. These methods are also employed to save innocent people. The forensic analysis team can be a gold standard mark to boost the investigative ability and to deliver justice to the deceased as well as the living victims in order to complete the investigation quickly and reduce the likelihood of repeat disasters in the same method by criminals.

²⁷ AIR 2008 CriLJ 68.

²⁸ AIR 1996 Ker 188.