

Crime Scene Investigation of Burnt Remains Underneath the Sewage Pit: A Case Study

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Abstract: *Crime scene investigation is essential to any inquiry. It is the convergence of science, logic, and law. One of the byzantine cases forensic experts have to deal with is burnt human remains. Criminals habitually attempt to hide the evidence and destroy the identification of the victim by exposing it to fire. Fire is a weapon that is mostly used to conceal a homicidal death and also to sabotage the physical evidences. The case study is an example to understand the crime scene investigation for forensic professionals and law enforcement personnel, especially where the body burned after death. The case study involves a 57-year-old victim whose burnt remains were found beneath the sewage pit. The examination of the scene revealed critical findings such presence of charred bones with flesh attached to them in the advanced stage of decomposition, a jerry can containing bluish liquid with a distinctive smell like kerosene, suggesting a potential fire ignition source, and several electrical wires in charred condition were also recovered from the scene. This case study underscores the importance of a multi-dimensional approach to forensic investigation and detailed crime scene analysis in determining the mystery of the burnt remains. On requisition by the deputy commissioner of police, a forensic team under the leadership of the author (T. K. Mukherjee) visited and examined the scene of the crime and uncovered the actual truth.*

Keywords: Crime scene Investigation, fire, burnt remains, homicidal death, physical evidence

1. Introduction

Fire and death have a strong connection. Fire can be a deadly weapon and can be used to conceal homicides and destroy evidence without leaving identifiable traces (Schmidt, 2015). In forensic casework, cases involving burnt bones for identification are common. The properties of bone undergo significant changes during burning, presenting challenges for forensic identification tests. Deformation and fragmentation due to heat-induced shrinkage alter critical morphological indicators for species, sex, age, and stature estimation. Additionally, heat in the burning process induces chemical modification through combustion and pyrolysis, with higher temperatures leading to DNA degradation. Understanding these influences and considering the level of heat exposure is essential for accurate interpretation of test results obtained from burnt bones. This knowledge will empower forensic scientists to navigate the complexities associated with burnt bone analysis more effectively.

A variety of cases involving burnt bones are presented to forensic laboratories, including those from vehicle accidents, mass disasters, and residential fires. Beyond accidental incidents, there are homicides where the perpetrator deliberately cremates the victim's body to hinder the investigation. The heat-induced fragmentation of burnt bones, compounded by artificial crushing, poses significant challenges to meaningful anthropological analysis.

Furthermore, DNA analysis of severely burnt bones is essential to establish the identification.

Crime scene investigation is a very crucial aspect of any criminal investigation procedure. It is the intersection of science, logic, and law (Singh, 2021) Crime scene

investigation is a time-consuming procedure that includes meaningful recording, photography, videography of the scenario or condition at the site, as well as the location of the evidence. The collecting of any tangible evidence that may perhaps dispel the darkness and light, what had happened, who executed it and pointing to how.

The investigation begins at the scene of crime, with the identification and retrieval of tangible evidence. Following the investigation and evolution of the acquired physical evidence, all findings are presented to the Court. All individuals from the First responders to the final users of the material, should have a thorough grasp of the forensic knowledge. Investigation of scene of the crime is a procedure that aims to document the scene (Norris, 2020) Since it is the initial contact, as well as identify and gather all tangible evidence essential to the case's resolution.

Due to a lack of scientific knowledge and improper methodology of the investigator regarding the crime scene investigation, it fails to obtain appropriate results and diminished its value before the Court of law.

In this case study, burnt remains were discovered from the sewage pit with a critical finding of charred and decomposed stage of bones, jerry can contain kerosene like liquid and numerous burnt wires.

2. Case History

The victim returned to his flat at about 14:30 hrs. from court where he was practicing. Quarrelling made up with his wife and the victim tried to throttle his wife. On hearing the sound, the father-in-law of the victim came to the room where the incident was happening. He saw that his daughter

was assaulted by his son-in-law and he slapped his son-in-law resulting in the victim falling on the floor. Thereafter he randomly kicked on victim's ear and its peripheral zone. After a few times, they saw the victim had no sign of life. Then he called one hired vehicle and asked him to go to his residential house located about 15 km. away from the flat. They packed the body into a gunny bag with several utensils to hide the fact from the driver of the vehicle. In furtherance, he sold petrol for Rs/- 350 from a fuel centre. After reaching his drawing house he bought the bag with the help of the driver and his daughter. The wife of the victim returned to his flat. On the next day morning, he burnt the dead body to remove the evidence. The burnt bones were collected and thrown off inside a nearby canal.

Police collected C.C.T.V. footage from the vicinity and confirmed that the victim returned from court at about 14:30 hrs. but he didn't go out after 14:30 hrs. It was also observed from footage that one vehicle went out from the flat at about 23:00 hrs. and returned at about 1:40 hrs. Police also collected the C.C.T.V. footage from the fuel centre from where the petrol was bought and poured into a polythene-made jerrycan. They also searched the canal where the burnt

bones were thrown off by the father-in-law but no significant evidence could be found. In this surfing tension, the superior authority of police requested to send a team from the Regional Forensic Science Laboratory, Durgapur to establish the fact in interest of the investigation of the case.

3. Forensic Science Investigation

3.1 Description of the P.O. (Place of Occurrence)

At first, the team examined the residential flat of the victim. The said flat consisted of two bedrooms with an attached toilet, one kitchen, one giant drawing room, and one room which was used by the victim as a practicing chamber. The practicing chamber room has a dimension of 10 feet 4 inches x 10 feet 4 inches located on the eastern side of the flat adjacent to the drawing room where the victim was reportedly murdered; however, no significant evidence could be found on the said room. Thereafter the team visited the house of one of the accused i.e., the father-in-law of the victim. A rough sketch of the house is presented below in Figure-1

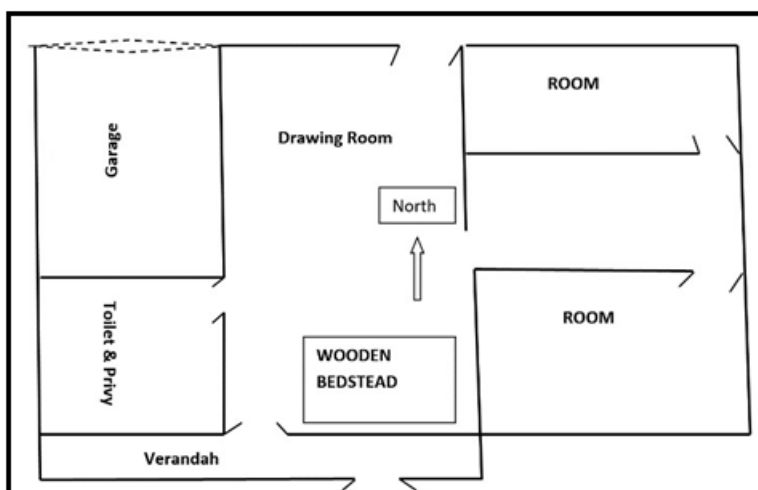


Figure 1: Rough Sketch of house of father-in-law of the victim (not to scale)

The brick-made temporary shaded (asbestos) house (actually ECL quarter) consisted of two entry/exit doors located at the northern side and southern side. The premises were found to be surrounded by a brick wall (at the southern side of the house) and further protected by barbed wire at its upper surface. On the western side of the said house, there is a garden. A rough sketch of the garden is shown in figure-2. On the northern side (frontal side) of the house, there is a garage. The team examined the house which was locked from the outside by a padlock and was open with proper key provided by the police personnel. On the western side of the house, there was a drawing room consisting of one bedstead. One red-colored polymer jerry can be found standing on the upper surface of said bedstead. A quantity of bluish liquid with the smell of kerosene oil was observed in the said jerry can. Traces of absorption of some oil-like substance was observed on the floor of the verandah located on the southern side of the house. Traces of such absorbed material extended westward from the said verandah and ended at a crater located at the southwest side of the garden shown in Figure-2

From the western side of the house, a continuous ditch is found to be cut which ends with the said crater, from which it can be assumed that the crater was probably made as a drainage system of the house. The diameter of the pit was measured to be 4 feet 6 inches (major) and 4 feet 1 inch (minor). The apparent depth of the crater was measured to be 3.2 feet (there was a huge number of dried leaves on the surface of the crater- measured up to that depth). The earth materials around the crater (inside the crater) were found to be completely blackened. The scorching signature of the leaves of the plants around the crater was observed.

Freshly excavated soil was observed on the south and western sides of the garden. The undersigned entered the crater and manually removed the dry leaves. After removing the dry leaves, a lot of burnt and thin wires were observed on the western side of the crater. The earth materials were found to be wet at that site of the crater. After removing the wires, some pieces of thin bone-like materials along with a piece of burnt and re-solidified polymer materials were recovered.

Thereafter, it was instructed to the I.O. of the case for arrangements to excavate the crater with instruments. A similar type of pit was excavated beside the sand pit. After

excavation chunks of flesh attached to the burnt bone in the advanced stage of decomposition were unearthed.

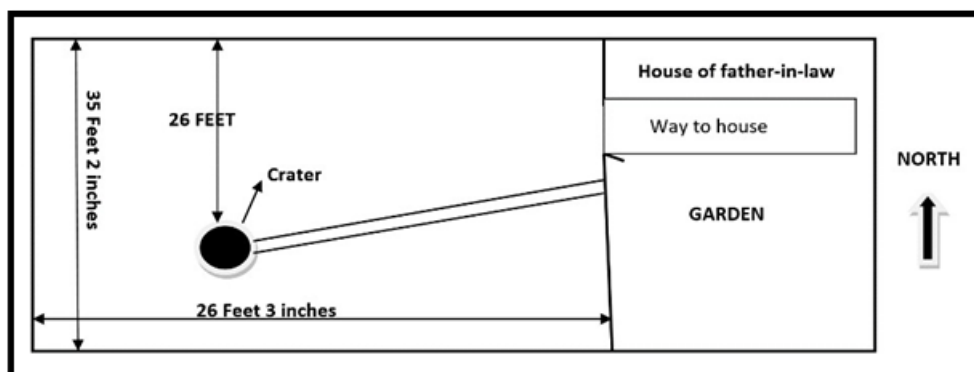


Figure 2: Rough sketch of the garden (not to scale)

3.2 Collection of exhibits

During the examination of the P.O, the following

articles/exhibits were collected shown in Table-1 and handed over to the I.O. of the case for safe custody and further necessary examination –

Table 1: List of Exhibits collected from the Crime scene

Sl. No.	Name of article/exhibit	Collected from
01	Chunks of charred bones with decomposed flesh	The pit in the garden
02	Earth sample	The pit in the garden
03	Earth sample	Superficial surface of the garden
04	One red colored polymer made jerry can containing some bluish liquid having kerosene oil like smell	The upper surface of bedstead of the drawing room
05	Small pieces of bone like substances	The pit in the garden
06	Control earth sample	The garden
07	Several burnt wires	The pit in the garden
08	One burnt and re-solidified polymer materials	The pit in the garden

3.3 Revealed from the scene of crime:

- a) Absorption of oil-like material observed from the verandah of the house which was found stretched up to the pit in the garden located at the western side of the house suggesting that the oil-like material was carried from inside the house.
- b) Freshly excavated soil was observed on the south and western sides of the garden, which indicated that the pit was dug recently which suggesting that the pit may have been dug for concealing the evidence of the incident or the depth of the pit had been increased (Figure-3).
- c) The presence of huge dried leaves over the pit clearly indicated that the culprit(s) of the case had spread dry leaves over the pit with the intention of concealing the evidence and tried to misguide the investigating agency (Figure-4)
- d) Any material(s) inside the pit has been burnt for a long time; otherwise, the depth of burnt earth materials around the pit (which was found to be at least 1 inch) should not be too rooted. The scorching signature of the leaves of the plants around the crater (suggesting a high degree of flame) was corroborating the aforesaid fact (Figure-5).
- e) Considering the recovered items (thin bone-like substances and burnt Chunks of charred and decomposed-smelling flesh with charred bones) inside the sewage, it can be opined that any living being was cremated inside the sewage pit(Figure-6)

3.4 Photography of the crime Scene



Figure 3: Side elevation of the pit



Figure 4: Top view of the pit



Figure 5: Scorching sign of leaves over the pit.



Figure 6: After recovering the bone fragments

4. The Real Fact

The real facts of the incident came out after the recovery of the burnt remains by the forensic team. The real fact is that—after returning from court the wife of the victim quarreled with the victim and physically assaulted her. Hearing the sound of aquarrel the father-in-law of the victim came into the room and slapped the victim. The victim fell on the floor. Thereafter the wife of the victim manually strangulated him. They took the body to his own house and the wife of the victim returned to his flat. The next day early in the morning, the father-in-law of the victim took the body inside a sewerage pit located at the western side of his room

inside his garden. He further excavated the pit and dropped down the body. After that, he poured some kerosene oil on the dead body. Some dried stems and broken wooden furniture were also kept inside the pit. An old tire was used as fuel and petrol was also poured into the pit. The whole process had taken almost 6 hours. After complete burning, some soil is thrown from outside into the pit. Then some dry leaves from the garden are thrown into the pit and a small fire is started. No bones or body parts were dumped elsewhere.

The I.O. of the case was instructed to send the above-noted articles along with other seized articles (if any) at the earliest to Forensic Science Laboratory, Kolkata to forwarding authority along with proper documentation and packing for necessary examinations. The I.O. of the case was also suggested to conduct a DNA examination of the biological samples collected from the P.O. The I.O. of the case sent the sample for DNA examination at the State Forensic Science Laboratory, Kolkata where the examination revealed a positive outcome.

5. Conclusion

When evaluating fire damage to human remains, it's crucial to consider the relationship between the remains and the fire. The bone composition can vary, so thorough documentation of the crime scene and remains before and during recovery is essential. The remains should be examined in the fire debris as found. The investigation determined, based on evidence from the crime scene, witness statements, CCTV footage, autopsy and DNA examination, that the cause of death was homicide. The case study underscores the significance of careful observation at the crime scene, where the victim's body was burned and concealed in a pit.

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Ethical Standards

All data/information utilized in this study were acquired by all legal requirements, and the crime scene investigation procedure was employed by the criteria established by the Directorate of Forensic Science Services (DFSS)-India. This case study did not reveal the identity of anybody by any means.

Conflict of Interest: None

Source of Funding: None

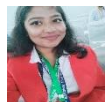
References

- [1] Schmidt, C. W., & Symes, S. A. (Eds.). (2015). *The analysis of burned human remains*. Academic Press.
- [2] Singh, H. N. (2021). Crime scene investigation. *International Journal of Science and Research (IJSR)*, 10(11), 642-648.
- [3] Norris, P. (2020). Crime scene investigation. In *Veterinary Forensic Medicine and Forensic Sciences* (pp. 1-19). CRC Press.

Author Profile



Tanmoy Kumar Mukherjee – Tanmoy Kumar Mukherjee holds a bachelor's degree. He started his career in Forensic Science at the State Forensic Laboratory Kolkata in 1994. Presently he has been posted at the Regional Forensic Science Laboratory, Durgapur as a Scientific officer. So far, he has attended more than 1000 crime scenes of various types of crimes and given significant opinions to facilitate justice.



Annwasha Mazumdar- She holds a first-class master's degree in Forensic Science from National Forensic Sciences University. She has participated, and presented in various international and national conferences, seminars, and workshops. She has undergone training at the State Forensic Science Laboratory, Tripura, India and presently interning at Regional Forensic Science Laboratory, Durgapur, West Bengal India.



Sabyasachi Khan- He holds a bachelor's degree and a postgraduate diploma in biotechnology. He has been working as a Laboratory Assistant at the Regional Forensic Science laboratory, in Durgapur, West Bengal since 2023. He has been well-versed in laboratory techniques for examining scientific Evidence of diverse nature.