

# Crime Scene: A Mystic Place

Mr. Ajay Verma<sup>1</sup>, Dr. Vijay Chaudhary<sup>2</sup>

<sup>1</sup>Research scholar, Department of Laws, Himachal Pradesh University.

<sup>2</sup>Assistant Professor, University Institute of Legal Studies, Himachal Pradesh University.

## Abstract

This document highlights the essential role of Crime Scene Investigation (CSI) in modern forensic science, emphasizing the need for systematic protocols to preserve evidence integrity. In the U.S., a request for CSI services acts as a formal agreement, requiring a thorough evaluation of the requesting agency's needs and the lab's capabilities, a process that differs significantly in India. Effective CSI involves identifying the scene, collecting and securing evidence, and reconstructing events to establish facts. Advanced forensic techniques, including DNA analysis and comprehensive documentation, enhance the credibility of evidence, transforming speculation into definitive conclusions about guilt or innocence.

The document addresses challenges such as human interference, which necessitates rigorous protocols to protect evidence and maintain scene integrity. Meticulous documentation is vital, as even small oversights can undermine investigations. It also examines the impact of technological advancements, particularly the rise of cybercrime, which introduces unique challenges due to anonymity.

Additionally, it underscores the legal obligations of investigators, focusing on the critical need to maintain a clear chain of custody. Recent court rulings emphasize evolving evidence collection standards, especially for digital data, which must be handled carefully to safeguard privacy. Ultimately, robust crime scene management and scientific analysis are essential for delivering justice in both conventional and cybercrime cases.

**Keywords:** Crime Scene, Forensics, Evidence Management

## Crime Scene : a Mystic Place

## INTRODUCTION

Managing a crime scene is a vital component of forensic investigation, rooted in legal standards and judicial principles that regulate the gathering, safeguarding, and examination of evidence. In United States of America the cornerstone of this process is the Fourth Amendment of the U.S. Constitution, which safeguards individuals from unlawful searches and seizures. This amendment underscores the requirement for law enforcement to obtain a warrant, supported by probable cause, before accessing a property to gather evidence<sup>1</sup>. In India, it is referred to fundamental rights which has been provided by the constitution of India. The jurisprudential framework emphasizes the importance of safeguarding constitutional rights while ensuring effective crime scene investigation.

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<sup>1</sup> Institute of Legal information, [https://www.law.cornell.edu/wex/fourth\\_amendment](https://www.law.cornell.edu/wex/fourth_amendment) (visited on Sep 12, 2024 at 3:23 p.m.)

The principle of "chain of custody" is crucial in crime scene management. Legal doctrine mandates that the integrity of evidence must be preserved from the time it is collected to its presentation in court. Any lapse in the chain of custody can raise doubts about the evidence's validity and admissibility. Courts demand that every individual who handles the evidence be recorded to ensure accountability<sup>2</sup>. The legal standard of "preponderance of the evidence" applies here, as the prosecution must demonstrate that the evidence is reliable and relevant to the case at hand.

Moreover, the doctrine of the "exclusionary rule" holds significant importance in crime scene management. Rooted in landmark cases such as *Mapp v. Ohio*, this rule bars the use of evidence acquired through the infringement of a suspect's constitutional rights<sup>3</sup>. If an investigator fails to adhere to proper procedures—such as entering a scene without a warrant or contaminating evidence— This can result in the exclusion of key evidence from the trial, weakening the prosecution's case.

Jurisprudence also emphasizes the need for thorough documentation at crime scenes. This includes detailed notes, photographs, and sketches, which serve as objective records of the scene's condition at the time of investigation. Courts recognize the importance of this documentation in establishing the facts surrounding the crime, supporting the credibility of the investigation, and aiding in jury understanding during trials.

In addition to constitutional principles, state laws and procedural rules further govern crime scene management. Each jurisdiction may have specific protocols for how investigations should be conducted, focusing on the training and responsibilities of the investigating officers. For example, officers are required to take measures to secure the crime scene and restrict access to unauthorized personnel to prevent evidence contamination. These procedures are based on the recognition that even slight changes can greatly impact the results of an investigation.

The role of forensic science in crime scene management is also governed by legal standards. Scientific evidence must adhere to the rules of admissibility set forth in landmark cases like *Daubert v. Merrell Dow Pharmaceuticals*, which established criteria for evaluating the reliability and relevance of expert testimony. Forensic techniques must be scientifically valid, ensuring that methods employed in evidence collection and analysis are based on sound principles and peer-reviewed research.

Moreover, recent developments in jurisprudence concerning digital evidence underscore the evolving nature of crime scene management. Courts have ruled on the necessity of obtaining warrants for digital searches and respecting privacy rights, as seen in cases like *Riley v. California*. This reflects the adaptation of legal frameworks to keep pace with technological advancements and the implications for evidence collection.

In conclusion, the legal framework for crime scene management is complex, blending constitutional safeguards, state regulations, and evidence-handling protocols. It emphasizes the need for law enforcement to conduct investigations that are thorough, respectful, and scientifically rigorous, ensuring justice while protecting individual rights. Proper application of these principles is crucial for maintaining the credibility and admissibility of evidence, thereby supporting a fair justice system. The effectiveness of criminal investigations heavily depends on methods applied at the crime scene, which can determine the success or failure of a case. Crime scenes may involve a single location or multiple sites, varying in nature and scope. It is a place which provides vital evidences to link the criminal with crime. It can be a Human body, any building, vehicle, water-body, or any other open space. Crime scene initially

<sup>2</sup> National library of Medicine, <https://www.ncbi.nlm.nih.gov/books/NBK551677/> (visited on Sep 24, 2024 at 3:12 p.m.)

<sup>3</sup> Case western reserve university, <https://case.edu/ech/articles/m/mapp-v-ohio> (visited on Sep 24, 2024 at 4:53 p.m.)

identified from presence of corpus delicti, marks of struggle, accounts of eyewitness, impressions, fluids, stains or other clues<sup>4</sup>. Even Locard principle state criminals often possess or leave clues near the crime scene. This is also known as theory of mutual exchange when two objects come into contact with each other, there is always an exchange of material. With the best efforts by police or scientific investigating officers who per se find the tangible and non tangible evidences, collecting, preserving and interpret the information so obtained. Certainly it becomes important that Investigating Officers should be trained efficiently to ensure that no one disturbs or destroy every possible clues or anything left by the offenders at the crime scene<sup>5</sup>.

Another vital role in criminal justice system is played by the Prosecution which must prove every link of the chain and complete chain-Infirmity<sup>6</sup>. Each incriminating circumstance must be firmly established through trustworthy and compelling evidence. The facts thus proven must create a sequence of events leading to the sole inevitable conclusion of the accused's guilt, leaving no room for any alternative explanation that contradicts their culpability<sup>7</sup>. The rules governing the burden of proof are essential in the administration of justice, protecting the rights of the party against whom it is imposed. Generally, the burden rests on the party affirming an issue, meaning the one asserting a claim or relying on a fact must prove it. A party is not relieved of burden of proof by the difficulty or inconvenience of satisfying it. Burden of evidence sometimes called burden of proof or going forward with, the evidence may shift from side to side during the progress of the trial<sup>8</sup>. The place from where such evidence can be trace is scene of crime. Crime scene is the place where the crime has committed, occurred or may be a place which is connected to crime where evidences may be found.

### **Crime Scene Investigations**

A request for crime scene investigation services from a criminal justice agency functions as a "contract" for service. The Division Head will evaluate the request to ensure that the Laboratory Division possesses the necessary capabilities, including proper procedures and equipment, to fulfill the requirements of the requesting agency<sup>9</sup>. Requests for crime scene examination services are assessed to ensure investigator safety and the Laboratory's capability to perform the required tasks. When needed, staff will clarify case requirements with forwarding agencies, evaluate the probative value of the crime scene, and discuss appropriate testing or investigative methods before initiating the crime scene investigation.

### **Role of Forensic at Crime Scene**

As already mentioned, Scene of crime is not limited to a single place only. It is any location associated with a crime committed. But the questions arise, "Is the alleged scene of occurrence genuine or fake?", "What is the Modus operandii?", "Who were criminals or victims?"<sup>10</sup>. Such questions are now typically addressed through forensic science. Crimes, whether indoors or outdoors, often leave behind physical

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<sup>4</sup> Sharma B.R., "Forensic science in criminal investigation & trials", 6<sup>th</sup> edition ( 2020), Universal publication , lexis nexis Gurgaon, Haryana, Reprint (2022), 173-174

<sup>5</sup> Bell S., "Forensic science: An Introduction to scientific & Investigating technique", 5th edn. Taylor & Francis group, CRC press London, New York, (2019), 54

<sup>6</sup> Owing R.J. Corpus Juris Secundum, Vol-31 A, St. Paul Mein, west publication company, (1964 ) 230

<sup>7</sup> Sharad Birdhi chand sharda v State of Maharashtra, 1984 INSC 121

<sup>8</sup>Supra-3, 262

<sup>9</sup>NIST,<https://www.nist.gov/system/files/documents/forensics/Crime-Scene-Investigation.pdf> (visited on Sep 15, 2024 at 1:15 p.m.)

<sup>10</sup> Supra -1, 175.

evidence due to the intense physical actions involved. Investigations generally start at the crime scene, where most physical evidence is commonly recovered from the scene itself, the suspect, the victim, and the offender. Court gives great credibility to facts revealed by physical evidence. Other than traditional methods and techniques to obtain evidence at crime scene and analyzing it for trial, now the evidences are usually scientifically collected, examined in laboratories by technicians with extensive training in their various fields of specialization. Increasing reliance of the courts is upon analysis of physical evidence, development of very specialized & advance technique and on instruments to perform analysis. It is presumed extremely rare to misinterpret evidence in laboratory<sup>11</sup>. The most important function of scientific evidence is to convert suspicion into a reasonable certainty of either guilt or innocence<sup>12</sup>. Forensic science is used at the crime scene to collect and preserve evidence for court use. However, if investigators fail to identify or preserve physical evidence for lab analysis, no advanced equipment or technical expertise can resolve the issue<sup>13</sup>. In the case of Pantangi Balam Venkata Ganesh v. State of Andhra Pradesh<sup>14</sup>, The deceased was shot and killed by the accused and the co-accused. A witness identified the attacker, noting that the assailant was wearing a pink shirt during the incident and confirming that the attacker was injured when the shots were fired. During the investigation, police recovered the bloodstained pink shirt, which was collected as evidence and sent for DNA testing at the forensic lab. The DNA results, combined with other evidence, led to the conclusion that the accused was guilty. This highlights the critical role forensic investigations play in supporting criminal investigations by identifying suspects and providing key evidence<sup>15</sup>. In 1956, three boys found 18-year-old Lloyd Duane Bogle's body near his car, shot in the head with his hands tied behind his back. The next day, a county worker discovered 16-year-old Patricia Kalitzke's body near Great Falls; she had been shot and sexually assaulted. The case remained unsolved until June 2021, when investigators used DNA evidence and forensic genealogy to identify the killer. This made it one of the oldest cold cases solved with these techniques. Unfortunately, the perpetrator, Kenneth Gould, had died in 2007<sup>16</sup>.

### Crime Scene Management

Other than traditional ways of investigation new scientific techniques and methods are being used by the investigators. Traditionally random search is poorest of all it follows no orderly pattern<sup>17</sup>. Crime scene processing involves key steps: surveying and documenting the scene, followed by collecting and preserving evidence. The next step is identifying the various components at the scene. Finally, the crime scene is reconstructed, and a report is prepared for presentation in court<sup>18</sup>.

### Methods Applied At Crime Scene

The process of taking notes begins with call to crime scene investigator, started with sketching the crime

<sup>11</sup> Nabar B.S., "Forensic science in crime investigation", 3<sup>rd</sup> edition (2002), Asia law house, Hyderabad, Reprint (2008), 29.

<sup>12</sup> Walls H.J., "Forensic science: An introduction to scientific crime detection", Universal law Publication, Delhi, 1<sup>st</sup> Indian Edition, Reprint, (2002), 7.

<sup>13</sup> Richard S., Criminalistics : An Introduction to forensic science, 11<sup>th</sup> global edition , Pearson education limited, England, (2015), 48.

<sup>14</sup> Pantangi Balam Venkata Ganesh v. State of Andhra Pradesh 2003 (1) ALD(CRI)789.

<sup>15</sup> Ibid

<sup>16</sup> Forensic college, <https://www.forensicscolleges.com> (visited on Oct 4, 2024 at 6:40 p.m.)

<sup>17</sup> Supra-9, 50

<sup>18</sup> Rawtani D. & Chaudhary M.H., "Technology in forensic science : Sampling, Analysis, Data & regulation", Wiley vch boschr.12, Weinheim, Germany, (2020), 30.

scene, taking photo, search, Seize, marking locations, identification, medical assistance. Notes taken may be recorded in audio and video form<sup>19</sup>. Accurate documentation of the crime scene is the most crucial aspect of the investigation. Its purpose is to permanently capture the scene's condition. From securing and sketching the crime scene to handling seized evidence, forensic methods are essential. Investigators must know how, where, and what to search for, ensuring a thorough, methodical approach with sharp attention to detail. There is no single correct pattern for conducting an individual crime scene. Search depends upon scene size, area, nature of crime, ratio of officers, facilities available. Search may be conducted clockwise or anticlockwise movement in which strip, spiral, Zonal and wheel method be applied at upper, lower, side places of crime scene tracing clues on furniture, doors, floors, ceiling, windows, articles, fabrics, stains soil, firearms, documents, prints, marks etc. After that complete documentation of the scene the investigator's notes are prepared and sent to Investigating officer (IO) as well as later to the court. For e.g. track marks often establish the scene of occurrence. Number of different marks may give no. of culprits. It indicates mode of transport, struggle at scene, and presence of persons. Law of probability has assumed or determines the chance of occurrence of particular happening in particular way out of no. of possible ways<sup>20</sup>. Taking of Photographs provide layout of the scene of occurrence. A photograph of the crime scene not only reproduces every minute detail, but also acts as an artificial memory. No matter how skilled or perceptive the investigating officer may be, it is unrealistic to expect them to recall every detail of the scene while documenting it in the case diary. Photographs serve as a clear, sharp, and undistorted record, accurately representing the objects. Photos should capture the unidentified deceased, stolen or seized items, fingerprints, footprints, post-mortem examination, questioned documents, marks of struggle, the entire crime scene, and objects discovered at the scene. The final step in crime scene management is reconstruction, which involves determining and ruling out possible sequences of events during the crime. Hypotheses are formed based on speculation and then tested. Reconstruction is achieved through reports, analysis, witness statements, and expert testimony<sup>21</sup>. Crime scene reconstruction involves determining or ruling out events and actions at the scene by analyzing crime scene patterns, the location and positioning of physical evidence, and conducting laboratory examinations of the evidence to establish the sequence of events<sup>22</sup>.

### **Preservation And Handling Of Evidence**

The search for physical evidence must be thorough and methodical. To ensure an objective and accurate reconstruction of the crime, investigators rely on their training and experience. Even when suspects are apprehended quickly, the motives and circumstances of the crime may become evident<sup>23</sup>. A wide variety of packaging materials and tools are necessary to collect and secure evidence. Unbreakable bottles with pressure lids are ideal for storing hair, glass, fibers, and other trace evidence. Charred debris should be sealed in airtight containers to prevent the evaporation of volatile petroleum residues<sup>24</sup>. There should be use of disposable tools to collect biological materials for packaging & preserving collected material. Material such as blood is to be stored in airtight container the accumulation of moisture may encourage

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<sup>19</sup> Supra-9 , 50

<sup>20</sup> Supra-7, 23

<sup>21</sup> James D.S., "Investigative methods", Reston publishing company Inc. Prentice Hall Company, Reston, Virginia USA, (1978),32

<sup>22</sup>Crime Scene reconstruction, [www.stidhamreconstruction.com](http://www.stidhamreconstruction.com) (visited on Oct 22, 2024 at 4:55 p.m.)

<sup>23</sup> Supra-9, 50

<sup>24</sup> Ibid, 60

the growth of mold which can easily destroy its evidentiary value<sup>25</sup>. Principle of exchange states criminals often possess or leave clues near the crime scene. With the best efforts by police or scientific investigating officers who Prima facie find the tangible and non tangible evidences, collecting, preserving and interpret the information so obtained. It certainly becomes important that Investigating officers or scientific investigating officers should be trained efficiently to ensure that no one disturbs or destroy every possible clues or anything left by the offenders at the crime scene. Preservation of crime scene is most important to protect material and non material evidences because it might never be restored to its original position. It is easy to destroy the value of Physical evidence by mishandling it if the special attention is not devoted to the proper methods to be used in its collection. The evidence should be handled by minimum no. of persons in chain of possession. Ideal sequence to be maintained by the investigating officer who collect evidences from the scene of crime & later produce it in the court. The legal formalities in the location, collection, dispatch and preservation must also be observed scrupulously. In democratic setup the rights of the individuals are guarded. The court may reject a piece of evidence which has not been processed according to the law of land. Such as in 2023 the Supreme court in Maghvendra pratap singh v State of Chhattisgarh<sup>26</sup>, reverses murder conviction imposed by trial court which affirmed by High court where court didn't find veracity of IO who failed to follow procedure given in Crpc and also failed in collecting direct evidence to prove the ballistic report. He even failed to examine the expert who conducted chemical analysis and the author who made the report. For maintaining maximum purity of the evidence the investigating officer should never fiddle with evidence, follow proper procedure of law, never mutilate while handling or marking it, never carry without scientific process, never use dirty containers and pack it loosely and pack it with superior quality of sealing wax in air conditions at crime scene which will protect from destroying it. Still cautions to be taken in scientific techniques as well. As in many cases formalin is used and is useful to preserve evidences taken from accused, victim or scene of crime but it is disaster if to be used in DNA sample preservation. If it is used in DNA preservation it may destroy the sample. A major concern when collecting DNA-containing specimens is contamination, which can occur if evidence is exposed to coughing or sneezing during the collection process<sup>27</sup>. In case, Vijay and Atul Hatwar v State of Maharashtra<sup>28</sup>, it is determined that if the DNA report is disputed and there is evidence of inadequate quality control, improper sampling, or tampering with the samples, it would be unreliable to use the DNA report as the basis for a conviction. So, the scientific standards must also be analyzed time to time and there must be check on standards or methods used while managing crime scene evidences. It must be correctly collected and packed so that it arrive at laboratory in uncontaminated state & ensure reliable results<sup>29</sup>.

### Evidence at Crime Scene

Just as automobiles run on gasoline, crime labs operate on physical evidence. Any item that can prove a crime has or hasn't occurred, or can connect a crime to its victim or perpetrator, qualifies as physical evidence<sup>30</sup>. Biological examination of samples taken from crime scene was earlier subject to

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<sup>25</sup> Id, 61

<sup>26</sup> Maghvendra Pratap Singh v State of Chhattisgarh (2023 INSC 415)

<sup>27</sup> Supra-9, 62

<sup>28</sup> 2017 Bombay 7765

<sup>29</sup> Ibid

<sup>30</sup> Supra-9, 48

Morphological examination but later replaced by DNA profiling. DNA of a subject varies from one person to another person. Samples collected for DNA matching from the crime scene such as semen, blood, larva, swabs etc. are useful in determining the presence of person may be accused victim or suspect of crime. DNA of every person is different except twins. Monozygotic twins are having identical DNA. It may be identical in some cases but two human body doesn't have identical body prints<sup>31</sup>. Finger prints often at crime scene are found in form of patterns formed by toes, sole, palms and fingers. These patterns form before birth and remain until body decomposes. Sketches are a desirable supplement to photographs in many investigations. Sketches are used to graphically record measurements taken at a scene and to show true relationship between objects. Still photography at crime scene offers a means of safely preserving evidence which recognized at initial crime scene processing. IO may found Gun, Gunpowder, cartridges, calibers, chemicals at crime scene which provides police with evidence related to weapon, fired bullet and cartridge casing bears certain traces of weapon used to fire. Tool mark evidence at crime scene defined as marks which offer physical proof that two objects were once in contact with each other. If body is found at the crime scene the signs of death and life shall be seen. Death caused to any person signs that death is natural or accidental and murder be investigated with proper scientific procedure at scene of occurrence<sup>32</sup>.

### Problems at Crime Scene

Introducing humans into the process brings the risk of human error. A significant issue arises from curious onlookers, such as eyewitnesses, the general public, friends, relatives of the victim, and media personnel, who can cause major disruptions for crime scene investigators. Crime scenes are often delicate, and any presence, including that of police investigators, can endanger the integrity of evidence. Only a minimal number of people should be allowed at the scene until the investigation is complete. Remote crime scenes, due to weather, distance, or other factors, can also pose challenges. When removing evidence, investigators must photograph it before moving it and coordinate with others to ensure the proper positioning and justification for its removal. Communication plays pivotal role as everyone involved in the crime scene investigation. Such as police officers, forensic scientists, coroner's or medical examiner's, investigators, detectives, crime scene investigators or medical examiner's, and actions such as paramedics' actions, the victim's actions, the suspect's actions in the case must have a two way communication with the district attorney's office which will be helpful in leading trial. Lack of communication can hamper the final disposition of a case. Another common problem encountered in crime scene investigations is neglecting hidden and potential evidence. No one checks the Places such as floor or the ground prior to entering the scene. Detectives and crime scene investigators should examine the ground using oblique or side lighting so that shoeprints and other evidence that end up on the ground can be more easily visualized and preserved<sup>33</sup>.

### Role of Investigating Officer

Under the law, investigators are tasked with uncovering the crime. The police have a duty to prevent and

<sup>31</sup>Nicoletta Lanese, Identical twins don't share 100% of their DNA, <https://www.livescience.com/identical-twins-dont-share-all-dna.html> (visited on Oct 22, 2024 at 4:55 p.m.)

<sup>32</sup> Serafettin D. and Kamil H.D., Death Scene Investigation from the Viewpoint of ForensicMedicineExpert, [https://www.researchgate.net/publication/215670416\\_Death\\_Scene\\_Investigation\\_from\\_the\\_Viewpoint\\_of\\_Forensic\\_Medicine\\_Expert](https://www.researchgate.net/publication/215670416_Death_Scene_Investigation_from_the_Viewpoint_of_Forensic_Medicine_Expert) (visited on Oct 22, 2024 at 3:46 p.m.)

<sup>33</sup> [www.epgp.inflibnet.ac.in](http://www.epgp.inflibnet.ac.in) (visited on Oct 16, 2024 at 1:13 p.m.)

detect crimes and to ensure the accused are brought to justice. The purpose of an investigation is not only to secure a conviction in court but to reveal the unembellished truth<sup>34</sup>. Thus, Investigation at crime scene in scientific way is helpful to establish whatever happened to convert suspicion into a reasonable certainty of either guilt or innocence. The potential to acknowledge and properly collect physical evidence is sometimes critical. Police Officer and Scientific investigator from centre or state forensic laboratories being an IO in a case plays important role having major responsibilities being the first person at the crime scene. The investigator must create a sketch of the crime scene, combining it with photographs as a standard procedure for an ideal presentation. The success or failure of an investigation relies on the proper handling of the scene and the training of the investigator. They must possess the skills to preserve evidence effectively. He must be fully conversant with the legal as well as the scientific requirement in the collection of evidence which will lead to solving or prosecuting crimes. The cardinal rule of investigation is to prevent any change in crime scene. Changes will destroy or camouflage evidence & will lead IO not able to recognize it. So it is vital to keep all unauthorized persons out of crime scene area. People authorized to enter at crime scene may vary to the circumstances and situation although in most of cases IO, Forensic team, and Medical assistance team allowed at a place. In certain cases changes at crime scene in attempting suicide or in accident cases or where dangerous gas turned on to asphyxiate the victim will be the foolishness of the officers at crime scene which later may change the crime theory which even not actually occurred<sup>35</sup>.

The first officer arriving at the crime scene is responsible for securing and protecting the area as much as possible. They must document their observations and maintain a log. Immediate measures should be taken to isolate the area, with boundaries extending from the crime's central location to include potential paths of entry and exit, as well as areas where evidence might have been discarded or moved. Efforts should be made to identify all potential victims, suspects, and witnesses. The crime scene must be safeguarded from curiosity seekers, the media, neighbors, and other visitors, as anyone entering could compromise the scene. Individuals present at the scene should refrain from smoking, eating, drinking, or littering, as these actions could alter the scene or its conditions, including temperature, by adjusting windows, doors, or HVAC systems<sup>36</sup>.

### **Defective Investigation**

For a defective investigation trial is not vitiated<sup>37</sup>. A defect or illegality in the investigation however serious has no direct bearing on the competence or the procedure relating to cognizance or trial<sup>38</sup>. It is necessary for the accused to show a reasonable doubt that the prosecution evidence is such that it must have been manipulated or shaped by reason of the irregularity in the matter of investigation, that he was prevented by reason of such irregularity from putting forward his defense or adducing evidence in support thereof<sup>39</sup>. In a case of defective investigation, court has to be circumspect in evaluating the evidence<sup>40</sup>. Mere failure on the part of the Investigating officer to obtain related fingerprints in the

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<sup>34</sup> Jamuna chaudhary v State of Bihar (AIR 1974 SC 1822)

<sup>35</sup> Supra-7, P. 29-35

<sup>36</sup> Supra-9, P.49

<sup>37</sup> Batna Ram v state of HP, (1981)10 ILRHP 347

<sup>38</sup> Narain singh v State (1986 (2) crimes 535.

<sup>39</sup> State of UP v Bhagwant kishore joshi, 1964 (1) Cr.I.J 140

<sup>40</sup> Ram Bali v State of UP, (AIR 2004 SC 2329)

course of his investigation would not weaken the prosecution case<sup>41</sup>. In *Vishnu v State of Maharashtra*<sup>42</sup>, The accused stated under Section 313 of the Criminal Procedure Code that his semen was forcibly obtained by the police to fabricate evidence by planting it on the clothing of the prosecutrix.

### Presumptions Drawn From Crime Scene

With the purpose to bring or unravel the truth investigation must come with unbiased results. Procedures are followed at the crime scene to maintain the integrity of evidence. Evidence collected from a crime scene is presumed untampered; however, continuity of possession must be established when presenting it in court as an exhibit. Every individual who handled or examined the evidence must be documented. Failure to verify the chain of custody can raise serious doubts about the evidence's authenticity and integrity. All items should be carefully packaged and labeled immediately upon collection at the crime scene. The chain of custody must include the collector's initials on forms and containers, the evidence's location, and the date of collection. Upon transfer, the details must be documented in notes. Records of acquisition and transfer should be maintained until the evidence is presented and testified in court<sup>43</sup>.

### Latest Challenges

The modern approach to crime is functional, focusing on the role of law in a civilized society. Advances in science, the industrial revolution, the evolution of political institutions, and increased education and awareness have reshaped the nature of crime, particularly in today's information-driven society<sup>44</sup>. Conventional criminals generally leave traces of a crime, through through either finger prints or other physical evidence. Cybercriminals operate through electronic means, eliminating the need for their physical presence to commit crimes. In contrast, traditional crimes are often solved more quickly, as offenders typically leave behind evidence like DNA, fingerprints, photos, surveillance footage, or identification documents. These evidences can be used to identify and spot the culprits. Since the cyber criminals use fake identities and work from remote locations it generally takes longer to locate and identify the cyber criminals and apprehend them. Cyber crimes may remain undetected for a very long period due to lack of evidence<sup>45</sup>.

### Cyber Crime/Digital Footprints

Societal changes have transformed crime, with cybercrime posing major challenges due to its global reach and anonymity<sup>46</sup>. Cybercrime includes activities such as data theft, ransomware, phishing, cyberbullying, piracy, and hacktivism, all reliant on networked systems like the internet. These crimes are automated, borderless, and often anonymous, complicating prevention and enforcement<sup>47</sup>.

Criminology recognizes that crime follows consistent spatial patterns, even in the digital realm. Courts have adapted to these changes, as seen in **Rakesh Shetty v. State of Karnataka**<sup>48</sup>, where it was ruled that investigative agencies cannot permanently retain usernames or passwords of digital accounts.

<sup>41</sup> *Bikash chhetri v State of Sikkim* 2007 (1) crimes 685

<sup>42</sup> AIR 2006 SC 508

<sup>43</sup> *Supra-9*, P.64

<sup>44</sup> Talat Fatima, *cyber crimes*, Eastern Book Company, 2nd edn, Lucknow, second edition (2016), 67

<sup>45</sup> Sushma A. and Raman A., *Cyber crimes & laws*, 3<sup>rd</sup> edn. 2018, taxman publication pvt. Ltd., New Delhi, (2018), 6.

<sup>46</sup> Jamie H., Pamela D., George M., *An Introduction to criminal justice*, 1<sup>st</sup> edn., Sage publication, (2017), 202

<sup>47</sup> Avi B., Eamonn C., Nigel S., *The Routledge companion to Criminological theory and concepts*, Henry ling limited, London, United Kingdom, (2017) 518.

<sup>48</sup> 2020SSC(KAR)4638.

Agencies may download necessary data but must return updated credentials to owners. For physical items like servers, cloning or sampling is required, with the original retained for investigation.

In **Virendra Khanna v. State of Karnataka**<sup>49</sup>, the Court held that providing passwords or biometric data does not constitute self-incrimination, as the data itself must be proven in trial. This ruling aligns with the **K. Puttaswamy** judgment, noting that data use in investigations falls under privacy exceptions. The court's ruling was one of the first in India on the subject, but some say it did not rigorously address the constitutional issues involved. Still these rulings reflect the balance between investigative needs and individual rights in the evolving landscape of cybercrime.

### Voice Spectroscopy

Voice spectroscopy is an innovative forensic technique used to analyze vocal characteristics for identification and authentication purposes. This method involves examining the unique acoustic features of an individual's voice, including pitch, tone, and speech patterns. By capturing and analyzing these vocal elements, forensic experts can create a voiceprint, akin to a fingerprint, which can help in identifying suspects in criminal investigations or verifying the authenticity of recorded conversations.

The process typically employs advanced software that measures various acoustic properties, allowing for precise comparison between voice samples. Voice spectroscopy is gaining traction due to its non-invasive nature and potential applications in security and law enforcement. While still evolving, this technology presents a promising tool for enhancing the accuracy of forensic analysis and may play a crucial role in the future of voice-based identification, particularly as concerns around security and verification continue to grow.<sup>50</sup>

### Conclusion

Crime Scene Investigation (CSI) is a vital component of the criminal justice system, aiding law enforcement in solving crimes through the systematic collection and analysis of evidence. The process begins with a formal request, reviewed to ensure proper resources and safety protocols. Forensic science underpins this process, using scientific methods to collect, preserve, and analyze evidence that establishes key facts about a crime.

The crime scene includes all locations tied to the incident. Forensic experts focus on verifying the scene, understanding the criminals' methods, and identifying victims and suspects. Modern investigations rely on physical evidence, collected through advanced techniques that enhance its reliability in court. This evidence transforms suspicion into solid proof, as demonstrated in numerous cold cases solved through forensic advancements.

Effective crime scene management involves clear steps: securing the scene, thorough documentation (notes, photographs, sketches), systematic evidence collection, and event reconstruction. Tailored search patterns ensure no evidence is missed, while strict protocols prevent contamination or degradation. Proper handling, such as using airtight containers for biological samples, preserves evidence integrity. Forensic evidence must meet legal standards to be admissible in court. Procedural lapses can lead to

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<sup>49</sup> AIR 2021 KAR 525

<sup>50</sup> Krishna G., Kajal B., Forensic Analysis of AI-Modulated Threatening Voices: A Praat-based Study, [https://efaidnbmnnnibpcajpcgclefindmkaj/https://ijirt.org/publishedpaper/IJIRT165285\\_PAPER.pdf](https://efaidnbmnnnibpcajpcgclefindmkaj/https://ijirt.org/publishedpaper/IJIRT165285_PAPER.pdf) (visited on Oct 16, 2024 at 1:15 p.m.)

evidence exclusion, emphasizing the need for meticulous adherence to protocols. Ongoing evaluation of forensic methods, especially in DNA analysis, ensures accuracy and reliability.

Crime Scene Investigation enhances law enforcement's ability to connect suspects, victims, and crime scenes, strengthening the justice system. As forensic science evolves, it remains essential in resolving crimes, ensuring justice through methodical, evidence-based investigations.

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