

“FORENSIC EVIDENCE IN CRIMINAL JUSTICE”

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degree of Master of**

Laws.



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DECLARATION

This dissertation on “Forensic Evidence in Criminal Justice” embodies and is imperative with the result of my own research work pursued under the supervision of ASST. PROFESSOR VIKAS SHARMA. I declare that no part of this dissertation has been published or submitted to any other institution for any other purposes. My indebtedness to other works and publications have been duly acknowledged at relevant places.

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This is to certify that this Dissertation titled “Forensic Evidence in Criminal Justice” is written by **Himat Singh** bearing enrolment no. MUIT0224054060. He is a candidate of Masters of Law Program here at the Maharishi University of Technology, Noida, School of Law. He has conducted all the research work under my supervision and submitted original and bona fide work to our utmost satisfaction, in the final semester for the partial fulfilment of the requirements for the award of the degree of Master of Laws.

SUPERVISOR: ASST. PROFESSOR VIKAS SHARMA

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17. Patangi Balrama Venkata Ganesh v. State of Andhra Pradesh;
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20. Mohammed Ajmal Mohammed Abu Majahid v State of Maharashtra;
21. Sahib Hussain Alias Sahib Janv. State of Rajasthan;
22. Dharam Deo Yadav v. State of Uttar Pradesh

LIST OF ABBREVIATIONS

A. — Atlantic Reporter

A.2d — Atlantic Reporter, 2nd Series

a/a/o — as assignee of

AAS — Acta Apostolicae Sedis

ABA — American Bar Association

AC — Appeal Cases (United Kingdom law report)

ACC — Association of Corporate Counsel

AD - South African Law Reports, Appellate Division

ad., ads., adsm. — ad sectam (Latin), at the suit of. Used in colonial and Federal Era American cases when the defendant is listed first; e.g., "John Doe v. Richard Roe" is labeled "Richard Roe ads. John Doe." The long script "S" of the period often makes this appear as "adj."

adj. — see "ad." above.

Aff'd - affirmed

AG or A-G - Advocate general (European Union)

AG - Attorney General for England and Wales

Art. – Article

Artt. – Articles

Ass'n — Association

A.S.S. — Acta Sanctae Sedis

ATS — At the suit of

Atty — Attorney

HC — Hypothetical Client

HDC — Holder in due cours

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Chapter 1

Introduction

1.1 Research Background

1.1.1 Understanding the concept of Criminalistics/Forensic Science

The realm of crime is very old, and it has developed with human consciousness. Generally speaking, when humans began to live in societies, needs were created as humanity evolved. In order to uphold social honour and equal rights, a list of dos and don'ts was established for the populace. Within the confines of these established guidelines, it was noted and assessed that every member of the society complied with them, and in the event that they did not, they were disciplined and punished to preserve the community free from evil. As a result, this idea developed into the process of looking into crimes and discovering their administration, which eventually established the framework for several institutions for trial and inquiry to provide justice to impartially throughout.

There are numerous delivery methods that rely heavily on assessing the facts and determining if the victim is expressing the truth or is only making false accusations out of malice. Generally speaking, the eyewitness's testimony was crucial before any criminals were sentenced to prison time. However, it was found that in many instances, the eyewitnesses were ineffective when they were coerced into making false statements or denying anything in response to threats to their lives or the promise of money. As a result, the eyewitness credibility was called into question and could not be fully trusted before judging a person guilty. Furthermore, in an attempt to get the truth from the criminals, the crime detectives subsequently turned to "third degree methods." However, because of shifting cultural norms and values, it was viewed as harsh, and innocent individuals frequently had to deal with unintentional repercussions and irreversible losses. Due to significant scientific research and technical advancements over time, criminal investigations have also begun to use contemporary scientific procedures that assisted in finding quick and trustworthy solutions to the issues, a process known as "Forensic Science."¹

¹ D.C.Dirkmaat, L.L.Cabo, et al.,—New perspectives in forensic anthropology|137(S47)American Journal of

Forensics is the scientific field of law that is used to settle a legal dispute. For such cases, any scientific field that is used is referred to as forensic science.

In 287 – 212 BC, the founder of forensic science, Archimedes, exclaimed ‘Eureka’ when he discovered that the crown of the king wasn’t made of gold, as was widely believed at the time, based on buoyancy and densities. Since then, the word ‘forensics’ has been used and is derived from the Latin word ‘forensic,’ which means ‘connection to court’. In the legal terminology, ‘forensic’ means the science that works on the practices and principles of different branches of science, helping to settle doubtful questions in the court of law, so that the true justice can be achieved. It is a science that has a combination of scientist and lawyer, which makes it simple and efficient in the legal sense. As a result, forensic science developed the practice and studied to implement physical sciences to produce accurate evaluation of legal and social issues. Over the years, forensic science developed a strong and proactive role in regulatory and civil. To put it another way, forensic has become an integral part of any investigation. From the microscopic evidence of a diesel truck to the microscopic evidence of a pollen grain, from the physical evidence of a battered child's autopsy to the intangible vapors of gasoline; forensic actively participates in and covers all criminal prosecution. In the broad sense, forensic acts as a protector for the victim and extracts the facts and evidence to charge the perpetrator of the crime. In simple terms, forensic can be defined as the use of science to enforce law. Since its inception, forensic science has helped in the investigation and identification of various cases involving victims of civil cases (fraud, forgery, negligence, etc.) and criminal cases (robbery, rape, homicide, assault, kidnapping, etc.). To identify any type of evidence that necessitates scientific testing to ensure proper recognition of crime or substance used during the crime, forensic science may include blood stains, drugs, bodily fluids, dead body fluids, accelerants, various unidentified substances and other chemicals. The item is then subjected to standards, a database, and established information criteria. To determine the examination, all minute details are examined and assessed based on factors such as type, colour, appropriate composition, species or anatomical origins, class characteristics, etc. This process is known as scientific identification, and it denotes the precise statement that a specific, painstakingly crafted piece of evidence originated from a scene, a specific location, or a single person. Certain sorts of

evidence require the reliability of a certain location, resource, or person, whilst others, like fingerprint and DNA evidence, can clearly identify the criminal relationship of the offender.²

The increase in criminal activity and the need for in-depth investigations of these instances led to the development of forensic science as a crucial component of crime, law, and justice. The current state of criminals and their criminal investigations is quite disheartening due to the high percentage of murder cases that result in heavy acquittals. The prosecution agency likely spends over Rs. 10,000 per trial, which is a significant amount of public funds that are being squandered. Trials pertaining to criminal incidents are primarily based on material evidence, with additional information derived indirectly from places, persons, and time. Even though the investigating officer is essential in gathering all relevant evidence quickly, the outcome of the forensic science investigation will determine whether it is successful or unsuccessful. This only occurs throughout the course of a criminal case when pertinent evidence is not properly and promptly gathered, exhibits become contaminated, or samples are not supplied appropriately for comparison, all of which can lead to inaccurate or even meaningless results. Forensic science must identify the best means of removing its constraints due to a number of factors:

1. SOCIAL CHANGES- Technology is advancing to the point where even forensic science must keep up with the demands of modern research and technology. Due to the continually shifting demands of society, society is changing at an incredibly fast pace. A large number of people are moving from rural to urban areas in search of better employment opportunities and higher living standards. People increasingly desire to get easy money quickly, which drives them to commit crimes utilising a variety of cutting-edge, novel techniques. Comparably, in order to keep up with the speed of the criminal mindset, evaluation and identification techniques must be updated on a frequent basis. This will set a strong example for society by discouraging illegal activity.

2. HIDING FACILITIES- The transport infrastructure has undergone a full transformation as a result of industrialization and globalisation. It is quite simple for a criminal to flee to another city and conceal because of the highly populated cities and quick transportation networks throughout the nations. Furthermore, it is frequently noted that criminals exploit the legal frameworks of other nations and

² E. Nissan, Computer applications for handling legal evidence, police investigation and case argumentation

relocate there in order to evade detection and prosecution.

3. TECHNICAL KNOWLEDGE- Although technology has numerous benefits, whether one views it as a blessing or a curse relies entirely on how they choose to utilise it. Now that knowledge and information can be accessed with only a click, some with a malicious mindset take advantage of this and use it to undermine public safety. In these circumstances, when a criminal employs highly skilled criminal tactics, both the investigating officers and the forensic investigators must possess advanced skills and keen observation to identify the perpetrator and establish a direct connection between them and the crime.

4. EXTENSIVE FIELD- Given the rise in crime rates, criminal activity has spread around the world and is no longer confined to a single country or area. Numerous crimes, including drug trafficking, financial fraud, smuggling, child trafficking, and forgeries, provide rich and constantly growing opportunities for criminals to operate across national and international borders, making it difficult to find and apprehend them.³

5. LACK OF APPROPRIATE EVIDENCE- In the community and jurisdiction, the word "corruption" is widely used to describe a societal evil, and forensic investigation is not exempt from this evil. Due to improper political or superior pressure, evidence is frequently purposefully falsified or tainted in order to aid criminals in escaping punishment.

The focus of the thesis is on the application of forensic science, namely in the fields of forensic entomology, forensic DNA analysis, forensic chemistry, bloodstain pattern analysis, and forensic art. It does not address computational forensics or cyber forensics.

1.1.2 Role of forensic evidence in the criminal justice delivery system

Over the past 25 years, the forensic sciences have significantly advanced science by developing new instruments, databases of tangible evidence, DNA typing, and other methods for evaluating the handling of criminal cases. In 2006, the National Institute of Justice funded a project that aimed to improve forensic science by addressing four main goals: characterizing and cataloguing the different types of evidence that were collected at crime scenes; maintaining a system that can track the use and attrition of forensic evidence, including laboratory analysis, justice processes, etc.; assessing and

³ B.Ghosh,—Trafficking in women and children in India: nature, dimensions and strategies for prevention|13(5) The International Journal of Human Rights 716-738 (2009).

estimating the percentage of crime scenes where one or more forensic evidences get collected; and classifying and categorizing frequently used forensic evidence that contributed to the case's favorable resolution. In the end, this will assist in building a suitable database bank, which will be useful in subsequent situations.

The forensics team plays a variety of duties and responsibilities to solve cases and provide further support in securing just and timely justice.

Criminal investigations are thought to be incomplete without forensic evidence, which is why forensics is regarded as one of the key pieces of a puzzle.⁴ In the absence of an alibi or eyewitness, it would be challenging to obtain proper justice if forensic science had no place in the legal system. In addition to the several agencies and detectives who are always gathering physical or digital evidence of crimes, the forensic department helps them analyses this material so that it can be used as evidence in court. Therefore, it would be evident that all of the criminals, thieves, drug dealers, rapists, and murders would be at large and unpunished if forensic science didn't operate as it should. It is imperative that forensic scientists carry out their meticulous examinations without allowing any evidence to be tampered with or tainted. They use a variety of procedures and methods to conduct this kind of assessment and produce relevant results. A few of these occurrences are covered in the following:

1. SCENE OF OCCURRENCE- The location where all of the criminals were present for a specific cause is known as the "Scene of Occurrence." In addition, throughout this meeting, they left behind traces of one another in addition to the scene, like hand and foot prints, marks, and oddities and tools or clothing that they were wearing. This kind of information is highly helpful in determining the corpus deictic, establishing links between the offender, victim, and place of the incident, and assessing if the pattern of events corresponds with any prior occurrences. The scene requires the right amount of attention, diligence, and planning because it is crucial to the case's success or failure. The site of the crime must primarily be located and assessed as soon as possible after it is committed because it is a dynamic place that cannot be retained indefinitely. A few pieces of evidence fade or change quickly after the event, while others become tainted or changed over time. The biggest challenge facing forensic scientists at crime scenes is that they only have one chance to investigate the scene; if they don't do it thoroughly and attentively, a lot of important

⁴ G.S.Morrison,—Forensic voice comparison and the paradigm shift149(4) Science & Justice 298-308 (2009).

information may be permanently lost.

CASE STUDY

1) In the case, *Raghunandan v State Of U.P.*, 1974 Cri. L. J. 453 (S.C) The complaint that the blood recovered had been forgotten by both the trial court and the High Court. It was not sent for a drug analysis from the scene of the incident. The police's displeasure in not sending the blood for compound assessment is a real case of homicide; the one that came before us, for instance, should be taken less seriously. In these situations, the location of the incident is frequently questioned.

2) *Marachalil Chandra Tukaram Talekar v State of Gujrat*. 1980 Cri. L.J.5 (Guj) The scene's identification was crucial in demonstrating the fairness. Just as in the court of sessions, it was fiercely debated before the High Court regarding the possible course of blood from the front entrance of the Vakil's location into the passageway rooms compared with H and H-1 in the arrangement supported the safety theory that the deceased Kannan received his cut wounds some distance away from the house in question rather than in the house itself. The High Court held that it was inexplicable for Kannan to have entered the room under the circumstances if he had sustained his injuries somewhere outside the home medical evidence. Based on the information provided in the record and the forensic evidence, it was determined that there was no way to dispute that Kannan sustained his wounds inside the room rather than outside, which would have caused him to pass away or lose consciousness while being carried or dragged to the room. Additionally, the severe wounds and severed arteries would have caused continuous bleeding from the body during the trip.

2. UNIQUE IDENTIFICATION OF A CRIMINAL- The identification of criminals by fingerprints has proven to be an exclusive advance in forensic research. It took some time for people to accept that fingerprints could be used as a scientific tool, but eventually they were indispensable for identifying and recognizing the offender.

CASE STUDY

A homicide case with a similar incident was recorded; the victim's body was partially burned and hidden. This was discovered many days after the murder. The body was completely disfigured and unrecognizable. Through the use of a specialist, the research official removed the remaining portions of skin from the tips of the fingers. Along with one authentic fingerprint of the expired, available in his will, he delivered them to the fingerprint marking bureau. The agency confirmed that the victim had

expired. After being recovered, the digitalized skin fragments were forwarded to the fingerprint bureau. The convict's fingerprints, which were available in the records, matched those of the deceased. The durability of fingerprints permits identifying documentation of a person even after many years, since his distinct mark records were available. Through the use of finger print analysis, several of the perpetrators have been identified even after years of evasion.

3. DRUG OR POISON- In suicide deaths and murders, a variety of deadly weapons and solutions are employed. One common fatal method for killing a human, animal, or plant is poison. Poison identification is very simple in the forensics department, however it can often be difficult to determine exactly which sort or category of poison was used in the crime.

CASE STUDY

The fundamental remedies due to injury are no longer in doubt. A series of rulings by the Supreme Court closed the case. *Anant Chintaman Lagu vs. State of Bombay* (AIR. 1960 S.C. 500) states that the lordships stated that the indictment established three suggestions for a harmful situation: i) The poisoning caused the death; ii) The accused owned the toxin; and iii) The accused had the opportunity to allow the toxic material to kill them. Another case that is comparable is *Emperor v. Shetya Timma* (AIR 1926 Bom. 518), when Dhatura poisoning caused the death. After evaluating the opposing views on this matter, the lordships concluded that in the case where the accused gave Dhatura, the poisonous material, to five males in order to attempt to commit a burglary, and as a result, three men passed away. It is necessary to try to gather evidence that their demonstration was dangerous enough to be considered a criminal act. *Emperor v. Chattarpal* (AIR 1930 Oudh 502) took a similar stance.

1.1.3 Importance of forensic evidence in criminal trials in India

All of India's states and jurisdiction bodies adhere to the Evidence Act, which was introduced by the ruling body. It contains standard guidelines for both criminal and civil matters. While the standard of proof in criminal and civil trials may vary, the same decisions apply to both. India follows the *onus probandi* principle while emphasising criminal jurisdiction. It states that unless the accused's guilt is proven beyond a reasonable doubt, they must be considered innocent. The Evidence Act's adoption of the *onus probandi* concept has resulted in a decrease in the use of

forensic evidence in criminal proceedings.⁵

The Criminal Procedure Code and the Indian Evidence Act 1872 are the two key procedural laws that are mostly used to decide or make decisions on criminal proceedings in India. According to the Criminal Procedure Code, decisions must be made regarding everything from the crime's original scene to its final acquaintance or accusation. Based on the evidence given throughout the trials, the judicial Magistrates consider all relevant aspects of the case before rendering a final conclusion. As a result, it can be said that the Indian Evidence Act only permits the use of evidence that the prosecution or the defendant produces. The Act also establishes guidelines for what types of evidence are admissible in civil and criminal proceedings as relevant and convincing proof. For instance, Section 45 states that expert opinions are to be treated as evidence, whereas Section 46 proposes that pertinent facts that either confirm or refute expert judgements should be taken into account. Furthermore, Section 47 states that the veracity of information pertaining to the accused's erroneous handwriting or signature can be confirmed by contrasting it with the real handwriting of the individual who is supposed to sign or write the document.⁶

Certain procedures, like forensic pathology, forensic entomology, forensic odontology, and forensic toxicology, are used in criminal cases whereas forensic science is the main focus. The restriction fragment length polymorphism (RFLP) approach, which analyses the sample's DNA, is one of the forensic identification (DNA test) methods. But as current technology has advanced, the RFLP analysis method has become antiquated and is now only infrequently utilised. The process of creating a million copies of DNA from a biological material is known as polymerase chain reaction, or PCR. It aids in safeguarding the evidence gathered from the scene of the crime. A technique called short tandem repeats (STR) is employed to examine particular DNA regions. It facilitates determining how different DNA profiles are from one another. Analysis of mitochondrial DNA (mtDNA) examines the DNA profiles found in biological evidence, including teeth, bones, and hair. Y chromosome analysis is used to trace the links between the many male contributors or find genetic markers.⁷ In death investigations, forensic entomology is used to determine the cause of death.

⁵ A. Dhabarde,—Forensic Evidences in Criminal Trial: Need of the Hour! SSRN Electronic Journal(2012).

⁶ J. H.Bøndergaard, Forensic Memory 113-166 (Palgrave Macmillan, Cham, 2017).

⁷ E. Weizman, Forensic architecture: Violence at the threshold of detectability (MIT Press, 2017)

It establishes the incident's location, looks for the presence of poison or drugs, and measures how long a person disregarded health risks before dying. Dentistry, or forensic odontology, is connected to the analysis of dental evidence. It aids in determining a person's age and profile. In cases when the assailant left bite marks or left an object at the crime scene, it is also utilized as evidence. Forensic odontology, for instance, is crucial in identifying the culprit based on bite marks in child abuse instances. The examination of the deceased and the determination of the cause of death are related to forensic pathology. It pinpoints the causes of unexpected or sudden death and is connected to the medical-legal system. Forensic toxicology employs several methods and approaches to acquire the results. It is used on various sample types and aids in criminal investigations by determining the cause of death. Consequently, it might be outlined the various forensic investigative techniques that can be used to find human remains, determine age, find bite mark injuries, abuse, malpractice, and mass mortality.⁸

Numerous criminal cases, including *Dinesh Dalmia v. C.B.I.* (2007), *Tandoor Murder Case* (1995) in Delhi, *Sister Abhaya Murder Case* (1995) in Kerala, and *Vasu v. Santha* (1975) in Kerala, have made use of forensic evidence. A blood test of the accused was done in order to confirm the children's validity in the *Vasu v. Santha* 1975 (Kerala) case. Special protection has been granted in India for the verification of validity status. The judges are particularly stringent when it comes to the proof presented in cases involving a child's authenticity. The evidence of a mother's infidelity is insufficient to establish a child's legitimacy. Strong presuppositions underlie decisions pertaining to a child's legitimacy held in the *Morris v. Davies* (1837) 5 CL & Fin 163 decision, which was decisive. The standard of proof must be considered while determining the child's authenticity. Because it was established through science that Vasu was the biological father of the Santha family, the results of the blood test in the Vasu case were accepted. The blood test verification led the court to order Vasu to reimburse his wife for the children's maintenance and upbringing.⁹

Shushil Sharma, the accused in the *Tandoor Murder Case* (1995) in Delhi, killed his wife Naina Sahni by shooting her three times in the head and chest. Suspecting she was having an affair with Matloob Karim, Sushil killed her. Sushil wrapped Naina's

⁸ A.K.Singh and A. Singh, —The Legal Aspects of Forensic Science with Reference to Crime Scene Investigation 9(1) IUP Law Review (2019).

⁹ S.M.Cretney, *Family law in the twentieth century: A history* (Oxford University Press, USA, 2003).

body and carried it to the Bagiya restaurant after killing her. The body was cut into small pieces by the accused, who then burned them in the restaurant's open-air tandoor. But because of the smoke and vapours, a warning was provided by the local constable, and the burning possession was stopped in the midst. Following an investigation, the police found Sushil's pistol and blood-stained clothing. Furthermore, bloodstains extracted from the deceased body's neck and skull were matched with samples of Sahni's parents' blood. Based on the results of the DNA study, clothes with bloodstains, and Sahni's parents, it was determined that Naina Sahni was the deceased person. Thus, Sushil was found guilty and given the death penalty by the court based on the DNA results and the verification that the bloodstains on Sahni's parents' corpse, clothing, and sample matched Naina. But after many appeals, the death penalty was modified to life imprisonment.¹⁰

Sh. Dinesh Dalmia was charged with engaging in fraudulent actions, including deceitful activities, breach of trust, counterfeiting, and the use of false documents, in the 2007 case *Dinesh Dalmia v. C.B.I.* By creating three companies, including New Vision Investment Ltd., United Kingdom, Dinesh Dalmia Technology Trust, and Dr. Suryanil Ghosh, Trustee - Softechh Corporation, and selling the assets to M/s. DSQ Holdings Ltd., M/s. Hulda Properties and Trade Ltd., and M/s. Power flow Holding and Trading Pvt. Ltd., the accused amassed INR 5,94,88,37,999 after misappropriating assets and deceiving the investors.

In light of this, a case was brought against Dalima using the information reported in the initial report to the Central Bureau of Investigation (CBI). But in the meanwhile, Dalmia travelled to the US and was questioned to be placed under arrest by a non-bailable warrant issued by the governing body. In order to determine the primary cause of the crime, the CBI developed the narco analysis test following Dalima's arrest. In accordance with Dalmia's verbal admissions, the CBI gathered information on self-incrimination and the crime's motivation. Finally, Dalima was accused of forgery and infringement in a case filed against him under Sub-section (2) of Section 173 of the Code. As a result, it can be said that forensic evidence was crucial in deciding the case because Dalmia's confessions were the primary source of evidence used in the narco test analysis.

The body of Sister Abhaya was discovered outside the kitchen compound of the church where she resided, as reported in the Sister Abhaya murder case in Kerala in

¹⁰ P. Kapila and R. Aulakh, —Domestic violence: An appraisal of initiatives in India8(4) International Journal of Research in Social Sciences 512-521 (2018).

1995. Sister Abhaya, a 19-year-old member of the Knanaya Catholic diocese of Kottayam, was affiliated with St. Joseph's Congregation for women. She used to get up early, about four in the morning, in order to study for her exam for research. She had gotten up early for studies on the day of the unfortunate incident, as was customary, but she stopped at the hostel for a drink of water. Her body was later discovered in a well outside the kitchen enclosure after she was reported missing. It was discovered after investigations using forensic techniques including brain fingerprinting, polygraph testing, and narco-analysis that the girl had been struck to death with an axe. Thus, two dads were charged with Abhaya's murder under Sections 302, 201, and 34 of the Indian Penal Code.¹¹ After examining the instances, it is clear that forensic evidence is crucial and helps to resolve the issues in a way that makes sense and is more relevant. Consequently, the growing use of forensic evidence in judicial proceedings is required. The time lag between the crime and the investigation procedure will be shortened with the utilisation of medico-legal services. In a shorter amount of time, it will aid in case resolution and culprit identification.

1.1.4 Restrictive use of Forensic Evidence in the Indian Legal Scenario

The research area of forensic science is the application of scientific methods to legitimate endeavours. It is the tangible proof that was discovered at the scene of the crime. By utilising scientific methods including DNA analysis, fingerprint analysis, post-mortem examinations, and blood blueprinting, forensic investigations aid in case resolution. To determine the cause of a crime or the reason behind a death, forensic science investigations can make appropriate use of several areas, including medicine, biology, pharmacy, chemistry, and physics. Even However, there are still few uses for forensic science investigations in Indian legal contexts, despite the many advantages they offer. The primary cause of this is that Article 20(3) of the Indian Constitution stipulates that any person who is found guilty is not required to provide self-incriminating testimony against themselves. The purpose of the article is to shield the person from any mental abuse that may occur during the police trial. It was also implemented to end police misconduct, which involved assaulting and intimidating the accused in order to coerce them into testifying against their will and end the case. Therefore, the validity of the rules outlined in Article 20 (3) is called

¹¹ Judge C. Index of Cases.

into question when forensic investigation techniques like DNA analysis and fingerprint testing are used.¹² It is counterfeiting the terms of Article 20(3) to force the accused to furnish fingerprints or undergo DNA analysis, since it gives the impression that the accused is presenting evidence against him. But in *State of Bombay v. Kathi Kalu Oghad and others*, On August 4, 1961, the court called others and ruled that requesting samples of any person's evidence, including fingerprints, semen, blood, or hair, did not violate the rules outlined in Article 20 (3).¹³ Furthermore, the aforementioned instructions are delineated in Section 73 of the Indian Evidence Act and were employed in the 9 April 1987 case of *Kumaran Nair versus Bhargavi and Anr.* According to Section 73 of the Indian Evidence Act, the accused's writing, seal, or signature may be compared with those of the real authorizers or experts in the matter. The application of narco-analysis forensic science investigation technique was the subject of a heated discussion. Although the narcotics test is one of the best advancements in forensic science, the Indian Court of Law continues to dispute the test results' acceptability. The investigating officer attempts to get pertinent information from the subject when they are in a subconscious state of mind throughout the narcotics analysis procedure. The procedure's method of obtaining evidence is being questioned since it appears to go against the limitations on self- incrimination outlined in Article 20(3) of the Constitution. Because of this, it is unclear whether or not to accept narco tests as genuine forensic evidence because, while in certain situations they are acknowledged as essential evidence, in others they are not. It is thrown away or ignored. For instance, the court regarded the results of the narco test as a significant source of evidence in the case of *Ramchandra Reddy and Ors v. the state of Maharashtra*, but did not take the results into consideration in the case of *Selvi and Ors. Vs. State of Karnataka and Anr.*¹⁴ The results of the narco test were rejected since the evidence was gathered when the accused was only partially conscious, making it inadmissible as crucial evidence because it cannot be deemed decisive. According to Section 53 of the Criminal Procedure Code of 1976, an investigating officer may send a person for a medical examination if they believe it is necessary to

¹² J.L. Mnookin, —Fingerprint evidence in an age of DNA profiling 67 *Brooklyn Law Review* 13 (2001).

¹³ A. Sekhri, —The right against self-incrimination in India: the compelling case of *Kathi Kalu Oghad* 3(2) *Indian Law Review* 180-211 (2019).

¹⁴ H. Kaur, —Evolution and Application of Scientific and Forensic Evidence at Courts: Are the Stakeholders Keeping Up? 2 *GLC Law and Policy Review* 2(2018).

gather evidence for the case. To address this, the Criminal Procedure was amended to contain specifics stating that scientific testing of the accused, including blood, swab, and semen tests, can be performed and submitted as evidence. But scientific investigation is limited to rape situations. Section 164A of the Criminal Procedure stipulates that the victim's scientific assessment must be completed within 24 hours after the offence in situations of rape. Additional restrictions concern the way in which the revisions because a large number of officers are incompetent in obtaining DNA samples, which leads to the contamination of a large amount of evidence gathered from the crime scene.¹⁵

Although the use of forensic evidence in the Indian legal system has increased, the majority of cases that are tried and decided rely more on non-scientific evidence than on scientific evidence. According to a Supreme Court survey, of the numerous cases that are tried and resolved in the Delhi Courts, only 60–65 cases include forensic evidence as a prominent proof for making the judgement; only 5% of murder cases and 3% of rape cases are resolved using DNA evidence. The courts in the Indian legal system do not want to use forensic proofs for criminal investigation purposes because there is no standard for gathering, examining, or recording forensic evidence. The samples used to gather evidence. The court discovered that in numerous instances, the samples gathered by the investigating officers were improperly kept and tainted, resulting in the analysis's incorrect conclusions. Delays in transferring the collected sample to the testing laboratory and carrying out investigative tasks are the main causes of the contamination of the sample. Consequently, there is the disintegration of evidence that does not yield genuine results due to the delay in the study. For instance, a sample is taken in order to assess an individual's intensity of alcohol use. Nevertheless, the sample's alcohol content will naturally decrease if it is not analysed right away. As an Therefore, if the sample is examined later than intended, the results of the sample of an alcoholic person may be negative. Therefore, the Indian courts do not rely on the forensic science evidence because of these circumstances surrounding forensic science testing and the use of nonstandard forensic science investigative processes.¹⁶

The use of forensic evidence in the Indian legal system is adversely affected by

¹⁵ E.S.Andrew, —Enhanced Rights for Detained Persons: Application of the Remedy of Habeas Corpus under the Cameroon Criminal Procedure Code¶4 Strathmore Law Journal89 (2020).

¹⁶ S.K. Shali, Applicability of Forensic Science in Criminal Justice System in India With Special Emphasis on Crime Scene Investigation (Medico-Legal Desire Media and Publications, Medico-Legal Reporter, Inaugural Issue. 2018).

additional variables as well, such as an inadequate number of qualified officers and ignorant investigators. Since the investigating officer is typically the first to respond to a crime, using forensic evidence is severely hampered by their ignorance of how to conduct a scientific investigation. The legitimacy and reliability of forensic evidence is another problem. independence of forensic labs. The authorization of the laboratories functioning in India is attributed to either the home department or the police department, raising concerns about the organization's sovereignty. It becomes challenging for the Court to take into account the forensic evidence because of the governance of several departments in the testing system and the purchase of outcomes by the laboratories. Therefore, the governance of laboratories must be transferred to independent authorities that adhere to established standards and regulations surrounding the investigation, sample collection, testing, and outcome procurement in order to avoid such a confusing situation about the authenticity of forensic proofs. The Malimath Committee has emphasised the same recommendation, which states that independent authorising organisations should oversee laboratories in India. The committee also recommends that guidelines be established for investigators' use of samples for DNA profiling, handling, and storage.¹⁷

According to a poll by the Committee on Reforms of the Criminal Justice System, just 5% to 6% of criminal cases involve the utilisation of forensic evidence in the investigation process. The Finger Print Bureau and Forensic Systems Laboratory (FSLs) have also reported similar findings, indicating that forensic evidence is not frequently used in the Indian court system. According to the organisations, faulty evidence assortment and proof misdirection are the reasons for the inadequate utilisation of forensic evidence. The incompetent investigating officer's inappropriate lifting of fingerprints and lack of a medico-legal examination cause problems for the investigation process and the acquisition of genuine evidence against the offender. It follows that because of inadequate There is little use of forensic proofs in the Indian legal system due to a number of factors, including the investigative process, inexperienced investigating officers, evidence contamination, non-standard laboratory testing, limitations imposed by Article 20(3) of the Indian Constitution, and the court's little participation with forensic evidence. Therefore, appropriate constitutional practice adjustments must be made in order to increase the utility of

¹⁷ M. Chakraborty and D. Dube,—Operational Constraints of Forensic Evidence in India: Time to Rethink||4 Indian Internet Journal of Forensic Medicine & Toxicology21-27 (2016).

forensic evidence in the Indian legal system. It entails designating laboratories as approved testing facilities and educating the investigating officers on how to appropriately gather, handle, and analyse samples from crime scenes. It will contribute to the forensic evidence's increased legitimacy and aid in the more suitable resolution of criminal cases.

1.1.5 Legal Provisions Supporting Forensic evidence in Criminal Investigation

The Indian Evidence Act 1872 contains the legislative rules that allow forensic evidence to be used in a criminal inquiry in India. The Indian Evidence Act of 1872, Section 45, details decisions on the use of experts in investigations. It entails taking into account the opinions of specialists in handwriting analysis, international legislation, and fingerprinting. In contrast to opinion evidence, the Indian judicial system placed greater weight on data evidence. Expert opinion and judgement are not given greater weight than direct evidence.¹⁸ Nonetheless, an expert's analysis and opinion aid in the judge's decision-making process by generating an opinion; they are not, however, regarded as definitive evidence.¹⁹ However, Section 46 of the Indian Evidence Act of 1872 states that, in the event that an expert opinion is provided, irrelevant information may be considered significant. Sections 45 and 46, which provide the Court the authority to base decisions on forensic evidence and expert analysis, mandate the same thing.²⁰

In addition, the Criminal Procedure Code (CrPc) 1973 has provisions that highlight the need for forensic evidence to be included in criminal investigation cases under Sections 53A, 54 A, 292, and 293.²¹ Focusing on Section 53A of the CrPc 1973, it states that samples of blood, bloodstains, semen, swabs, sputum, perspiration, hair samples, and fingernail clippings can be taken from the crime scene and from the primary suspects in order to carry out the investigation of criminal cases. The samples from the registered laboratory testing units may be utilised for scientific research, including DNA profiling and other procedures. The medical professional's recommended tests may also be a part of the inquiry procedure. All of these clauses,

¹⁸ S. Sadhna and K. Roja, —A Study on the Admissibility of expert evidence in Indian Evidence Act 120(5) International Journal of Pure and Applied Mathematics 1123-28(2018)

¹⁹ Debaditya Roy, Experts Opinion and its admissibility and relevancy – Law of Evidence (Legal Services India, 1983).

²⁰ M.M. Houck and J.A. Siegel, Separation Methods: Fundamentals of Forensic Science (Academic Press, 2009)

²¹ Arindam Datta, Forensic Evidence: The Legal Scenario (Legal Service India)

nonetheless, are limited to situations involving sexual offences.²² According to Section 54 A of the Criminal Procedure Code of 1973, if someone is apprehended for a crime and a third party needs to identify them, the court may order the police officer to present himself as an identifiable person in a way that the court deems appropriate.²³ According to Section 292 of the CrPc 1973, any document recognised as official by the India Security Press as belonging to the Central Government or a gazetted Mint officer will be regarded as evidence in a court action. However, Section 293 of the CrPc 1973 stipulated that the records must be submitted by the particular scientific experts who have been registered with the Indian government. It is important to remember that the analysis and findings offered by the certified experts must be used as evidence in the case; the expert itself cannot be used as evidence. According to Section 53 of the CrPc 1973, the investigating officer may request that the accused be examined by a medical practitioner if it is thought that significant evidence will be obtained through the accused's medical examination.²⁴ However, Section 54 of the Criminal Procedure Code of 1973 stipulates that an accused individual may only be examined by a certified medical practitioner if the arresting officer is certain that the analysis would yield positive results in the form of evidence. The 37th report of the India Law Commission mentions the same regulations, stating that the investigating officer must work with a certified medical practitioner to carry out any forensic examination that may aid in solving the case. According to Section 27 (1) of the POTA, the investigating officer may also ask the court in writing for a sample of an accused person's handwriting, fingerprints, footprints, photos, blood, saliva, semen, hair, or voice. In such a scenario, With the assistance of a licenced medical practitioner, the Court is required to give the investigating officer with the samples from the accused that they want. Therefore, it can be concluded that the Indian judicial system has supporting rules and regulations that facilitate in the use of forensic procedures in case investigation.

Because of laws governing the use of forensic techniques in investigations, there have been various instances involving this, including *Kalua v. State of Uttar Pradesh*

²² Nivedita Grover and Isha Tyagi, —Development of Forensic Science and Criminal Prosecution-India 4(12)International Journal of Scientific and Research Publications 1-7 (2014).

²³ W. Schwabe, L.M. Davis, B.A.Jackson, Challenges and Choices for Crime-Fighting Technology Federal Support of State and Local Law Enforcement(Rand Corporation, 2001)

²⁴ Gowsia Farooq Khan and Sheeba Ahad, —Role of Forensic Science in Criminal Investigation: Admissibility in Indian Legal System and Future Perspectives17International Journal of Advance Research in Science and Engineering 220-234 (2018).

(1956), Bhagaban Barik v. State (1960), and the Sheena Bora Murder Case (2012). The Court considered evidence and forensic investigation in Kalua v. State of Uttar Pradesh before rendering a decision. Due to the appellant's use of an unauthorised firearm to kill Daya Ram, they were found guilty.

The forensic analysis demonstrated that the pistol owned by the appellant fired the bullet that was recovered from Daya Ram's corpse. The Court considered the analysis of the Ballistic expert, who presented the evidence. As a result, the appellant was accused of murder and sent in jail. The appellant and his father were accused of torturing someone to death in Bhagaban Barik v. The State, 1960, for harassing the appellant's wife when she was picking up a bell-metal utensil close to the village pond. But the forensic examination revealed that the dead had been intentionally struck in the head with a lathi to induce death. Additionally, the witnesses reported that after hearing Bhagbat at the residence of PW-2 went to retrieve bell-metal kitchenware from the pond. While keeping an eye out, the appellant struck the dead firmly with a stick. According to the medical evidence and the villagers' testimony, the appellant was thus found guilty of the deceased's murder and sentenced under Section 307 of the Indian Penal Code.

The dead was discovered to have been absent from her residence since April 24, 2012, in the Sheena Bora Murder Case of 2012. The mother, stepfather, and mother's driver were the main suspects in the case; they were all charged with kidnapping the dead and killing her thereafter. Despite the suspects' claims that the dead was still alive, her body was found in the Pen Tehsil of Raigad. The forensic examinations verified that the corpse found in Pen Tehsil, Raigad, belonged to the departed individual. The information of the deleted emails and text messages from the deceased PC and mobile device were also retrieved by the forensic investigators. The Court rendered its decision based on the evidence that the forensic team was able to gather. Consequently, it can be claimed that using forensic investigation techniques aids in case resolution by producing genuine and trustworthy evidence.²⁵

1.1.6 Comparative studies with other countries concerning the criminal justice system

It is well recognised that forensic evidence plays a significant role in the criminal justice system's investigation of crimes and suspects, assisting in the reasonable

²⁵ Manish Yadav and Anindhya Tiwari, —Forensic toxicology and its relevance with criminal justice delivery system in India, *Forensic Research & Criminology International Journal* 122, 122(2017).

resolution of cases. With an emphasis on India, the Indian Forensic Organisation (IFO) is in charge of overseeing forensic evidence within the criminal justice delivery system. It is the organization's duty to provide guidelines for conducting forensic investigations in criminal cases. IFO makes sure that the forensic investigations are carried out without violating any of the clauses stipulated in Article 20(3) of the Indian Constitution. When contrasting Comparing the criminal justice system in India to those of other nations, it was discovered that forensic evidence was also a part of those systems. Peterson et al. carried out a research (2011) ²⁶ by taking into account 4250 criminal instances from various nations. Sample cases from several nations, including Los Angeles County, Indianapolis, IN, and three rural sites in Indiana, were included in the research in 2013. The study's incidents were divided into many categories, including rapes (602), killings (400), aggravated assaults (859), robberies (1081), and burglaries (1263). Police investigations, laboratory results, and prosecutor case files were the sources of the case-related data. According to the investigation, forensic evidence in the form of DNA typing and the CODIS database was used in the majority of criminal cases in Los Angeles County, Indianapolis, Indiana, as well as three rural Indiana sites. The procedure of forensic inquiry assisted the investigators in foreseeing the case results, provide victim summaries, and verify victim testimonies. Consequently, there was an increase in the case resolution rate in the designated areas through the use of the forensic investigation procedure.

In American criminal cases, the forensic investigative procedure is also a part of the proceedings. In order to enhance the forensic investigation process in the United States, the Federal Bureau of Investigation (FBI) and the governing body implemented the Automated Fingerprint Identification System (AFIS). In order to preserve the integrity and calibre of the inquiry procedure, it involves the use of a 10- print card code. The FBI established the Integrated Automated Fingerprint Identification System (IAFIS), which is in charge of keeping track of the nation's criminal history and various fingerprint types. Recently, the FBI's investigation method has included the Combined DNA Index System (CODIS) to maintain criminal and forensic data at the local, state, and federal levels.²⁷

²⁶ J. Peterson, I. Sommers, et al., The role and impact of forensic evidence in the criminal justice process(Washington, DC: National Institute of Justice, 2011)

²⁷ T. McEwen, The role and impact of forensic evidence in the criminal justice system Executive summary(National Institute of Justice, 2010).

Fisher (2004) conducted a study which revealed that forensic evidence gathered from the crime scene and other suspects is utilised by investigators to establish guilt beyond a reasonable doubt, identify the primary suspects, and determine the full scope of the crime. Evidence types that may be used include biological, weapon, fingerprint, drug, imprint, trail, general items, electronic, or written data as well as other objects that may be chosen and examined in order to prove a crime. Furthermore, in Canada, forensic evidence is also employed in criminal case investigations.

Establishing the Citizen Lab is one of the steps in order to examine and evaluate the samples that are taken from the crime scene. The regulatory body has also formed a Child Sexual Exploitation Unit to handle the offensive matters related to child abuse situations. In order to improve the forensic investigation process, other nations including the US and the UK have also adopted the Citizen Lab model. GeoDASH, a machine learning system from the Vancouver Police Department (VPD), has been launched to assist in storing the historical data of the various offences. In order to identify high-risk crime zones and discourage criminal behaviour, it also anticipates the frequency of crimes in six specific places every two hours.

In Australia, the criminal justice system now includes the forensic investigative process. The nation has well-established forensic labs that, by properly analysing the materials, assisted the investigators in obtaining correct results. Australian forensic investigators are specially trained and referred to as crime scene examiners (CSS) in order to boost the effectiveness of their work. To ensure that criminal cases are thoroughly investigated, CCS are taught in seven key areas: cognitive ability, knowledge base, experience, job orientation, communication, professional demeanour, and approach to life. Because CSS has received excellent training and education, their performance exceeds that of investigating officers in a related profession.²⁸ Therefore, it can be claimed that several nations have incorporated forensic investigations into their criminal justice systems using various approaches. The use of forensic evidence facilitates the logical resolution of criminal cases and advances humanism and scientific understanding in the criminal justice system's pursuit of justice.

²⁸ S. Kelty, R. Julian, et al., —The effectiveness of forensic science in the criminal justice system: The seven key attributes of top-performing crime scene examiners| 2(4) Forensic Science Policy & Management: An International Journal 175-186 (2012).

1.2 RESEARCH PROBLEM

The criminal justice system is a collection of laws designed to protect people's rights and the interests of social groups. The governing body framed it with the intention of ensuring that justice is supplied to the communities via the upholding of law and order in the social and economic spheres. A scientific investigation into the case is known as forensic evidence, and gathering proof against the defendant. In order to solve the criminal cases, it uses a variety of scientific and technological approaches, including DNA profiling, computer science, and engineering. However, the forensic evidence is rarely employed extensively in the criminal justice system because of constraints in the Indian legal system. The primary concern with the application of evidence from forensic investigations is the veracity of the information. The majority of the samples that the investigating officer takes from the scene of the crime are tainted and yield unreliable results. Second, the detectives who are gathering samples from the crime scene lack expertise and don't gather the samples correctly. It eliminates the crucial evidence and lessens its relevance when the case is tried in court.²⁹ Thirdly, the investigating officer took too long to transmit the material to the labs, whereupon it is destroyed before any valuable information can be gleaned from it. Fourthly, there is uncertainty over the administration and standardisation of laboratories in India, which makes it difficult to include the findings submitted to them in the jurisdiction process. Since police departments oversee the majority of laboratories, the reports supplied by the laboratories are not verified by Indian courts. The use of forensic evidence in court processes and trial procedures is adversely affected by all of these. As a result, changes must be made to the criminal justice system to improve the court's capacity to use forensic evidence. It also entails forming an independent organisation.³⁰

1.3 RESEARCH QUESTIONS

- What does the term "criminalistics" mean?
- What is forensic evidence's function and significance?

²⁹ S.K. Verma and A. Verma, —Admissibility of Forensic Evidence in Indian Courts|9(4) Indian Internet Journal of Forensic Medicine & Toxicology86-91 (2011).

³⁰ S.K.Shali, Applicability of Forensic Science in Criminal Justice System in India With Special Emphasis on Crime Scene Investigation (Medico-Legal Desire Media and Publications, 2018).

- How may the Legal Provisions Supporting Criminal Investigations be brought into focus?
- How can we investigate the limited application of forensic evidence in Indian legal contexts?

1.4 AIM AND OBJECTIVES OF STUDY

- To comprehend the idea of forensic science and criminalistics.
- To assess the function and significance of forensic evidence.
- To draw attention to the legal provisions that aid in conducting criminal investigations.
- To investigate the limited use of forensic evidence in Indian legal contexts.

1.5 SIGNIFICANCE OF STUDY

A technology-based investigation approach called forensic science aids in the logical and reasonable resolution of complex situations. To get crucial evidence against the accused, it involves a variety of procedures such as DNA profiling, narco testing, fingerprint testing, blood testing, and hair testing. The study covered information on forensic science and criminalistics as well as the function of forensic evidence in the administration of criminal justice. The study looked at how forensic evidence aids in the investigation of criminal cases involving rape, murder, drug use, and civil disputes. The study has also included the information on the significance of forensic evidence in criminal cases in India. Using forensic evidence in criminal proceedings facilitates the rational and efficient resolution of complex situations. sensibly. However, due to limitations imposed by Article 20(3) of the Indian Constitution, forensic evidence is not used as frequently in the Indian court system. It lengthens the case's trial and decreases the use of forensic evidence in judicial processes in India. To ensure uniformity in the forensic investigation process, the regulatory body established organisations like the Indian Forensic Organisation (IFO). It will improve the investigative process and the utilisation of forensic evidence in India's criminal proceedings.

1.6 SCOPE OF STUDY

The study will be helpful later on as it offers insightful knowledge about forensic science and criminalistics and how they relate to the criminal justice system. The research offers comprehensive insights on the significance of forensic evidence in criminal trials inside India, as well as the limitations imposed on its application in Indian judicial proceedings. The research has also covered the facts surrounding the legal provisions that support the criminal investigation and comparative analyses of the criminal justice systems of other nations. The academics and researchers working on related subjects will find the current research useful. The primary justification for this is that they will be able to use trustworthy references from the study to carry out their own research. The present Policymakers, law enforcement officials, and attorneys would also benefit from study as it will provide them with pertinent knowledge on the limits of forensic science in Indian courts framework. Additionally, the study will offer pertinent details regarding the forensic examination procedure that other nations employ as well as suggestions for enhancing Indian forensic investigation methods.

1.7 PURPOSE OF STUDY

Conducting the study is necessary in order to obtain pertinent data on the influence of forensic evidence on the criminal justice delivery system in India. The study examined information on forensic science's function in the administration of criminal justice in India and determined the factors limiting its application in the country's legal system. The use of forensic science in Indian criminal justice was found to be limited, despite the country's enormous technical advancements throughout the scientific age. Only 47 examples are presented in the 2011 research by the Supreme Court and High Court; DNA has been a significant factor in these decisions. Delhi High Court issued rulings on 23.4% of these cases. by themselves. Moreover, just 4.7% of murder cases and 2.3% of rape and murder cases have utilised DNA evidence. Despite proof of its enormous potential in a variety of scenarios and lessons learned, a forensic record is still not well integrated into the investigation and crime analysis process. As a result, the current study addressed information on the limited application of forensic evidence in Indian judicial proceedings and suggested

improvements.

1.8 Research Hypothesis

In order to achieve the study's goals, the following hypothesis has been developed:

H1: When judging criminal cases, scientific inquiries into crimes conducted with the assistance of forensic science have greater probative value than direct evidence.

H2: A more accurate and scientific assessment of the accused's guilt can be reached through the proper application of forensic science instruments and trial procedures.

H3: Since the beginning of time, forensic science has been used in criminal trials across the globe to assess the guilt of the accused culprit.

H4: The application of forensic science will cease other unlawful tactics, such as torturing prisoners to get confessions, and open the door for fair trials for the accused.

1.9 Research Methodology

The research for this project will be qualitative in nature. The literature review will be built using an overview. Therefore, primary sources like statutory legislation will serve as the foundation for this research study in addition to the data obtained for qualitative analysis. Secondary sources will also be consulted, including books, websites, reports on news and research, and articles from both domestic and foreign publications.

This study adopted a critical stance towards all extant literature on forensic evidence and its relationship to judicial decision-making, as well as the laws of the India, and their ancestors. The primary theoretical focus of this thesis was to examine how courts in industrialised nations handle criminal cases and how those approaches contrast and overlap with those in India.

Chapter 2

LITERATURE REVIEW AND COMPARATIVE STUDIES WITH OTHER COURTIERERS IN RESPECT TO THE CRIMINAL JUSTICE AND ITS SYSTEM

2.1 OVERVIEW OF CRIMINAL JUSTICE SYSTEM AND COMPARATIVE STUDIES WITH OTHER COURTIERERS IN RESPECT TO THE CRIMINAL JUSTICE AND ITS SYSTEM

2.1.1 CRIMINAL JUSTICE SYSTEM

The criminal justice system's goals are to arrange for criminals' rehabilitation through law enforcement and to bring justice to victims. The criminal justice system's objectives are to deter crime by providing moral support to offenders. The jail, court, prosecution, police, and legal system are the main institutions that make up the criminal justice system. Various government organisations and institutions operate as a series in the criminal justice system.³¹ A wide range of criminal justice professions work in the criminal justice system, in addition to law enforcement officers, judges, attorneys, correctional personnel, paramedics, and other professionals. Every position in the criminal justice system department is a reputable one.

Around the world, the criminal justice system includes offending behaviour, punishment, and rehabilitation. The objectives of the criminal justice systems in every nation are the same, notwithstanding the differences throughout the globe. In India, police play a significant role in enforcing the law. The police agency acts quickly to protect victims, mostly from illegal activity. Police use preventative measures to stop violent crimes or offenders. Police in India are able to apprehend suspects by following the warrant and utilising the criminal law authority. In order to uphold Indian law and order and the justice system, police are required to conduct impartial investigations and gather all available evidence from crime scenes. Since police investigations form the core of the criminal justice system, they are extremely significant. In order to maintain a fair investigation process and ultimate justice, police play a significant role. The Indian police force The department's devotion is causing the investigating system to exhibit weaknesses. For the Indian Law and Order system to continue, reforms must be made to the police force. Law enforcement includes the use of the judiciary, prosecution divisions, jail system, and

³¹ R. A. Ezejiofor, N. P. Nwakoby, et.al., —Impact of forensic accounting on combating fraud in Nigerian banking industry||1(1) International Journal of Academic Research in Management and Business1-19 (2016).

correctional services.

The court has declared the final outcome for justice and plays a significant part in upholding the Indian legal system. In India, the High Court is the highest court within a state, while the Supreme Court is the highest court nationwide. Anyone can appeal a high court decision to the Supreme Court. As a result, the nation's levelling judicial system provides justice to all. The criminal justice system depends heavily on the court's backing, and victims hope that the court's rulings will bring about justice. The police department is responsible for gathering the evidence or proof that the court requests, which is proof of a crime. Judges are becoming amiable with the people who are victims of court. To uphold the legal system's law and order, judges are also viewed as law enforcement.

An additional crucial component of India's criminal justice system is the prison and correctional services sector. It aids in offenders' rehabilitation, which is criminals' ultimate goal in India. The Indian state government runs the jail system, where inmates not only provide moral activities for themselves but also care for other offenders. Indian law forbids harsh punishment since the Indian legal system values corrections. In fact, Indian basic law forbids double punishment.

Forensic evidence is necessary in criminal justice cases to establish the commission of crimes and the extent of criminal activity. Numerous methods for analysing the evidence and its specifics are offered by forensic science. Advanced forensic procedures are employed by forensic science to ascertain crime information and identify the perpetrators. In forensic labs, fingerprinting and DNA testing are the most sophisticated tests available. Through professional analysis, the tools properly identify the offenders. These precise methods can identify personal information. In rape cases, serological testing is a highly effective method of identifying the perpetrators.³² The victim's clothing, skin, and the scene of the crime are used to gather evidence in rape trials. A serological test is useful for investigating rape cases as it may analyse various bodily fluids such as blood, saliva, semen, and vaginal fluid. In order to identify the real occurrence, forensic science techniques are employed in India to link perpetrators and crimes. Forensic evidence analysis is a long procedure in this country due to limited advancements and constraints.

³² P. A. Zapf and I. E. Dror, —Understanding and mitigating bias in forensic evaluation: Lessons from forensic science 16(3) International Journal of Forensic Mental Health 227-238 (2017).

Additionally, patterns of bite marks can be identified in offenders and The forensic team removes the mark from the victim's body. In rape cases, offenders leave biological evidence behind them that is gathered to identify the offender through scientific means. Physical evidence is gathered at crime sites, which is crucial for providing solid evidence. The specifics of the rape case determine the physical evidence. The nation's forensic test procedure and judicial system are negatively impacted by the extremely low number of research studies carried out in India.

The examination of forensic evidence is recognised by all nations worldwide. There are still a few areas where forensic research has to be improved. The criminal justice system is improving relatively, and the United States, United Kingdom, France, and Russia are all making rapid progress in this area.³³ Enhancements in forensic science research have proliferated across the legal system and contribute to the preservation of law and order. Justice requires clarity, and instantaneous proof is required to establish a crime as quickly as feasible. The Indian legal system takes a very long time to provide victims with justice. Because of the general law enforcement's lack of discipline, forensic evidence is not given much weight. Due to a lack of components throughout the inquiry, courts are unable to administer impartial justice. The whole Indian legal system is hampered by the inadequate training of police officers. The shortcomings or inadequacies in the criminal justice system are lessened by advancements in forensic science and research. A recent development in the UK and other nations is the field of digital forensics.³⁴ Digital forensics can also handle documentation, identification, and extraction. A subfield of forensic science, digital forensics is now included in the criminal justice system. Since mobile phones can control it, more sophisticated methods are entering the market to expedite the legal system as a whole. The criminal justice system has several obstacles to overcome, including threats from offenders and difficult circumstances. The forensic evidence provides the legal system with a clear path to delivering justice to the victim, and India must alter certain laws and orders to improve the clarity of the legal system and expedite the resolution of cases.

2.1.2 CRIMINAL JUSTICE SYSTEM IN INDIA

³³ G. Edmond, B. Found, et.al., —Model forensic science 48(5) Australian Journal of Forensic Sciences 496-537(2016).

³⁴ R.Montasari, —Formal two stage triage process model (ftstpm) for digital forensic practice 10 International Journal on Computer Science Security 69-87 (2016).

The Indian Evidence Act of 1872 is a valuable piece of law in India that encourages the use of forensic evidence to prosecute offenders. Even though criminals may lie, the evidence is always truthful. The thought process is followed by the investigations. The Imperial Legislative Council approved the Indian Evidence Act in 1872.³⁵ The Act of India states that, in order to prove someone guilty of a crime, physical proof is not always required; instead, circumstantial evidence is crucial in ensuring victims receive justice.

The forensic evidence is not traced in an inquiry unless the Indian Evidence Act of 1872 is utilised. A case that is handled in accordance with Indian law will either be resolved or closed. This deed aids in comprehending the importance of forensic evidence in legal proceedings. The Gujarat court in India rendered decisions on 373 rape cases between 2011 and 2015. This led to the discovery of 37 judgements in all, and forensic evidence supported the criminal over the course of the inquiry. The Gujarat rape case's overall judgement rate is around 9.92% of all rape judgements.³⁶ The Indian Evidence Act of 1872 has unquestionably backed a certain number of Gujarati cases, and this Indian Law has also supported forensic evidence. India applies the Act inadequately in small instances, which lessens the Act's significance. People are unaware of the function of forensics and its significance in both criminal and civil matters.

Tests for forensic evidence come in a variety of forms, including toxicological, fingerprint, medical, physical, and biological evidence. Biological evidence is the primary sort of evidence used in forensic science and is particularly useful in cases of sexual assault. In an Indian rape case, bodily fluids such as blood, swabs, semen, and vaginal secretions can all be used as biological evidence. Body injuries are seen as medical evidence that helps bring criminal cases to justice, and the post mortem procedure functions as medical evidence in death situations. 20–25% of cases have critical forensic evidence when they get to court.³⁷ Rejecting forensic evidence has an influence primarily on rape cases in India's justice delivery system.

In India, the number of criminal cases has increased over the past few years, and the past few months have seen record numbers of cases in the country. The value of

³⁵ A. P. Kumar, —Criminal Laws and Civil Rights!53(42) Economic & Political Weekly 10 (2018).

³⁶ A. Patel and S. L. Vaya, —Influence of forensic evidence on sexual assault case trials!5(1) South -Asian Journal of Multidisciplinary Studies106-112 (2017).

³⁷ M. D. Miranda and M. H. Maras, —Sexual violence perpetrated against women in India: the role of forensic evidence!41(1-2) International journal of comparative and applied criminal justice 95-107 (2017).

forensic evidence is further increased by the improvement of rape cases. The restrictions and advancements in law and science in this country make it difficult to conduct trials, and forensic evidence has not received much attention because to the test reports' postponement. A forensic report can help identify the real offender in a crime.

In order to administer justice in court, the justice department refers to the numerous test reports that may offer the actual incident notion. The forensic laboratory receives evidence from the police department that was collected from the crime scene. The culprits are identified or recognised in the laboratory report. Forensic testing is necessary in rape cases in order to identify the offender, and section 375 of the Indian penal code punishes them upon identification. This particular section has the authority to punish the offenders in rape cases across the country and ensure that victims receive legal justice. Forensic evidence is required by law to produce or provide justice to victims. Experts in the scientific field can perform forensic analysis. The entire process of gathering, preserving, and analysing forensic evidence is governed by forensic science. The analysis of forensic evidence is used in the investigation of civil and criminal cases, meaning that forensic evidence is important in the case of the justice delivery system entirely. Researchers in the fields of physics, chemistry, biology, and engineering can help collect all evidence from the crime. A gap is being revealed by forensic evidence in national courts as a result of subpar investigative procedures. The Indian justice delivery system is negatively impacted by the gap or loop in the forensic evidence analysis process. The real cause of the forensic report's delay is that rape victims might not receive justice.

Forensic evidence was neglected while the court trials dragged on for a while. Forensic reports are crucial in ensuring victims receive justice. There is a good reason to reject forensic evidence in court. The real cause of the forensic report's rejection in an Indian court is the tardiness in sending the biological and medical evidence to forensic laboratories. Because there is no structure in place for the inquiry process, forensic reports or evidence might be helpful to the justice delivery system. Inappropriate forensic expert functioning results in report gaps, which have an effect on India's judicial justice delivery system.³⁸ During the rape case inquiry, the witness's animosity renders the criminal evidence ineffectual.

³⁸ Z. E. Lawton, A. Traub, et.al., —Analytical validation of a portable mass spectrometer featuring interchangeable, ambient ionization sources for high throughput forensic evidence screening|28(6) Journal of the American Society for Mass Spectrometry 1048-1059 (2016).

Because forensic reports are not processed in a systematic manner, victims are not given the certainty that forensic evidence will result in justice being served. Forensic science is error-free, consistently accurate, and maybe even able to bring about justice. India's mechanism for using forensic evidence in the administration of justice is deficient. The deployment of police technicians might make things better in India. Because of the new worry, the Indian may be reassured by the justice of the court and will also ensure about the forensic evidence. Trained police technicians will recognise the significance of forensic evidence and may send the evidence in a timely manner. Forensic research in India need further investigation and advancement. Police technicians and forensic scientists further require appropriate, scientific knowledge in order to comprehend the significance of forensic evidence in legal cases. The value of forensic reports might be increased by using R&D findings, and India needs to improve every facet.

India's judicial system as a whole performs mediocrely, and the Indian Evidence Act of 1872 encourages the use of all available evidence in the administration of justice. Indians are promised under the statute to concentrate on spotting evidence in both civil and criminal trials.

2.2 UNDERSTANDING THE CONCEPT OF FORENSIC SCIENCE

2.2.1 CONCEPT OF CRIMINALITIES/FORENSIC SCIENCE

When forensic science is used in a law and order situation, it indicates that the field has identified and examined legal problems. Forensic science serves legal purposes, primarily resolving legal problems. The investigative team employs forensic science to preserve proofs or evidence of criminal activity. The Latin word "forensics" is where the term "forensics" originates. According to dictionaries, the word "forensic" really refers to courts and justice. Maximum science courses, including physics, chemistry, biology, psychology, and so forth, are included in forensic science. Medical and biological evidence are defined by tangible evidence.³⁹ Science and law are used in forensic science to assist victims receive justice. There is never a time when criminals can run away from the law or orders. The best way to identify the

³⁹ A. Sood, —Administration of Criminal Justice and Role of Forensics in India: A Study 15(4) International Journal of Innovative Research and Advanced Studies 69-78 (2018).

perpetrators from physical evidence is to use more sophisticated techniques like DNA fingerprinting, blood testing, fibre, hair, bodily fluid testing, drug testing, etc.⁴⁰

Physical evidence is categorised based on the nature of the crime and the victims' physical conditions. The categorization of tangible proof presents theoretical concepts and useful methods. The investigator has to understand the significance of the evidence in relation to the crime. Fair action must be taken by investigators while gathering tangible evidence from crime scenes. Investigators employ their senses to determine the significance of the tangible evidence (Bhatt). The crime claims that investors gather tangible proof from locations where crimes have occurred. Evidence of physical harm or blood pressure is evident at crime scenes. Certain evidence is tiny, thus an investigator must use the right techniques to gather the microscopic physical evidence from a crime scene. The act of gathering and preserving tangible proof can be challenging. is the most crucial element affecting the way the judicial system operates. India employs techniques of physical proof, but its processing is not as strong as its need.

The most often used test in forensic labs is the DNA fingerprinting test, which offers accuracy in the examination of forensic evidence. A correct procedure is used in this instance to match the DNA sample with a link. The investigator gathers tiny DNA samples from the scene of the crime and brings them to the forensic lab. The DNA sample is then preserved by the lab professionals using appropriate scientific techniques. The DNA sample is tested using the criminal's sample, based on the requirements of the legal system at the time. Following testing, the samples' matching is noted. The identity of the individual recognised as a criminal is confirmed if those samples match. Therefore, the entire procedure requires specialists to identify the individual through DNA sample analysis. That is the true techniques. of fingerprinting using DNA. The forensic section views the biological process as tangible proof. Each person's fingerprint is unique and does not coincide with the prints of other people. One of the greatest procedures used by forensic science labs is the evidence, which offers precise proof of any crime. One popular technique for testing the samples is the laboratory approach of DNA matching. Otherwise, there are other ways to analyse the DNA samples used in DNA fingerprinting. The forensic division then gathers samples and compares them to the accused individual's

⁴⁰ S. Bell, S. Sah, et.al.,—A call for more science in forensic science115(18) Proceedings of the National Academy of Sciences of the United States of America4541-4544 (2018).

DNA.

Blood samples taken from crime scenes are seen to be the most crucial evidence in the administration of justice. The most popular method for gathering criminal evidence for forensic reports is blood sample. The first step in this procedure is the collection and storage of blood strains. One of the most important ways to get blood pressure from crime scenes is via communication. improved correspondence between forensic laboratory scientists and investigators or For the analysis to be effective, specialists are required. Poor research or inexperienced scientists might compromise the entire blood sample procedure or use of the sample as forensic evidence. In India, there is a communication gap between laboratory professionals and police or investigators, which hinders the judicial system.⁴¹ Occasionally, there is an additional reason why an analysis is rejected. The blood sample is misused by the inexperienced and less motivated laboratory professionals. To process the full approach, experts require the right sensibility and expertise. As for blood sample evidence, the real technique is determining blood types from the victim's marker. For this procedure, the forensic laboratories use the ABO blood group type. Blood samples are necessary to gather and store in order to adhere to the scientific procedure in forensic labs as they offer a person's DNA profile. The blood sample functions as a genetic marker and demonstrates individuality for each individual. That makes it easier to accurately locate the offender.⁴²

The identification of bodily fluids is the most crucial aspect of any forensic investigation. Body fluid might include swabs, blood, semen, and vaginal fluid. In criminal situations, testing bodily fluid is a chemical procedure that is regarded as tangible evidence.⁴³ Sometimes the tests do not specify the report of this kind of evidence; still the method is important to trace the criminals. The body fluid test is provided best supports in rape cases. Most advanced technologies have come into the market for body fluid analysis. Use of mRNA and miRNA, spectroscopic techniques, epigenetic techniques are the most advanced and useful techniques for forensic tests. Raman spectroscopy, biosensors, and immune chromatographic methods have been

⁴¹ A. Moez, B. Jean-François, et.al., —Phonetic content impact on forensic voice comparison||14 IEEE Spoken Language Technology Workshop (SLT) 210-217 (2016).

⁴² K. J. Strom and M. J. Hickman, —Untested sexual assault kits: Searching for an empirical foundation to guide forensic case processing decisions||6 Criminology & Public Policy 593 (2016).

⁴³ G. Ribeiro, J. M. Tangen, et.al., —Beliefs about error rates and human judgment in forensic science||297 Forensic Science International 138-147 (2019).

used in forensic laboratories by scientists recently. Identification of cells also can be detected by these processes of body fluid testing. Investigators have a major role to collect the body fluid as soon as possible from the crime area. Delay in communication, hampers the collection of this kind of physical evidence so body fluid collection is necessary to collect very soon. Body fluids must be collected as quickly as possible.

Forensic evidence is essential to the criminal justice system's ability to administer impartial justice. The investigative team has to be aware of the importance of tangible evidence, such as bodily fluid tests, blood tests, and DNA fingerprinting. India's legal system is also implementing the most cutting-edge laboratory forensic science procedure. Evidence is required in criminal cases. In civil lawsuits, as well as the tangible evidence, are effective in some criminal cases. Forensic science and research provide the information necessary for gathering and preserving forensic evidence.

2.2.2 HISTORY OF CRIMINALITIES/FORENSIC SCIENCE

Forensic science is mostly used in investigations pertaining to crimes. An intriguing past informs the assessment of forensic science. The Latin word *Forensis*, which meaning Forum, is the source of the English term "forensic." Because forensic science uses scientific ideas and procedures to investigate crimes, it is intimately tied to the legal system.⁴⁴ Though it originated in the ancient Greek and Roman cultures, forensic science is one of the most significant phases of contemporary criminal justice. This science has made a substantial contribution to the branch of medicine known as pharmacology. The investigation into the use of manufacturing and symptoms associated with toxins aided in the identification of potential murder cases in the past. In forensic science, an autopsy is the examination procedure used to determine the cause of death.⁴⁵ The Roman physician Antistus carried out this procedure for the first time back in 44 BC. His investigation led to the discovery of Rome's political leader Julius Caesar's cause of death. Despite having been stabbed about 23 times, the wound from the one chest stabbing ultimately proved to be the cause of his death. Quintilian, a Roman lawyer and orator, is credited with advancing

⁴⁴ Exploring the History of Forensic Science through the ages, India, available at: <https://ifflab.org/history-offorensic-science/> (last visited on February 29, 2021).

⁴⁵ All About Forensic & Investigative Sciences, India, available at: <https://www.forensicscienceexpert.com/> (last visited on February 29, 2021).

forensic science during its early stages. In the first century AD, forensic science was applied to investigate crimes. Song Ci wrote a testimonial in the 13th century called *Xi Yuan Lu*, which was based on the use of entomology and medicine to settle inquiries pertaining to crimes.⁴⁶ This book was very helpful in providing guidance on the fundamental strategies for solving murder cases. The word "pathology" dates back to the 13th century. Pathological testing has been used to determine the cause of death, including whether a death was the result of suicide or homicide.⁴⁷ The polygraph and lie detector tests were the previous methods used to identify suspects. The accused person's saliva and tongue are examined as part of the polygraph test. For instance, during India's prehistoric era, the accused had a mouth full of rice. According to the approach, rice will stick to the mouth since the suspect will generate less saliva if they are guilty. The Italian doctors Fortuneto Fidelisw and Paolo Zachhia created modern pathology in the sixteenth century, and in the seventeenth century, the assessment of advances in forensic science began to take shape. In 1880, Edward Henry and Francis Galton developed the technique of fingerprint analysis. This method had fundamentally altered the way that crimes are investigated. Edward Henry, the Metropolitan Police in London, developed the Henry Classification System, a unique method of fingerprint analysis. Henry Goddard investigates the bullet as a murder weapon in 1835. in a homicide investigation. Forensic ballistics is the term for the bullet analysis used in criminal investigations. By employing a comparison microscope, the bullet examination method was more accurate in 1920. The important details of the bullet and its shell were assessed using the microscope. Subsequently, researchers from California Aero Scope Corporation unveiled a novel method for analysing gunshot residue. Toxicology is a method used in forensic science to identify poisons, such as arsenic detections. Scottish chemist James Marsh was the first to use this method. Later, the method was refined by categorising the blood vessels, and further tests were created using testing on the saliva and perspiration. The 20th century saw the introduction of several new techniques and advances in forensic science. inside the technology. DNA profiling has significantly changed the way that real crimes are found in the globe, and cyber forensics has also been introduced to help lower

⁴⁶ Exploring the History of Forensic Science through the ages, India, available at:<https://ifflab.org/history-offorensic-science/> (last visited on February 29, 2021).

⁴⁷ Zachary M. Burcham and Heather R. Jordan, —History, current, and future use of microorganisms as physical evidence||Forensic microbiology25-55 (2017)

cybercrime in the modern day. Since previous times, forensic science has undergone significant transformation. New, exact approaches are evolved from the earlier ones. Anthropometry is the process of quantifying the skeleton and body dimensions of humans. This method has been employed since prehistoric times. It is currently being built using new methods. The method assessed the nutritional structure of the brain as well as the bone fragments. The Uhlenhuth test determines whether or not a deceased person has received foreign blood. This assessment is the most significant development in the 20th century for forensic science improvement. A new approach was added to the procedure in 1960 by scientist Maurice Mollar. The development of this procedure has been assessed throughout the history of forensic science to have had a notable impact on criminal investigation. Constant advancement of methods and procedures made possible a significant breakthrough in the investigation of criminal activity.⁴⁸ Previous studies were not conducted correctly because due to the forensic procedure's poor accuracy. However, the ongoing advancements in DNA testing, fingerprint analysis, and ballistics provide a record in identifying the genuine offender. The advancement of forensic science not only made criminals fearful before committing a crime, but it also significantly reduced crime. But greater progress in forensic science is needed if high-tech technology is to eradicate crime globally. The current crime rate in India is rising daily as a result of the absence of technology employed in the investigation. Therefore, the development of forensic science requires the use of strong procedures. Compared to earlier eras, ballistics research has advanced considerably. Criminals utilise lethal bullets and powerful technologies to cause harm to society. Consequently Forensic science must modernise its technologies in order to improve bullet examination. The only way to end the crime is to conduct a thorough investigation and ensure that those found guilty receive the just penalty. Nonetheless, the crime must be eliminated at its source, and this can only be accomplished by utilising innovative technologies in criminal investigations. It is a fact that forensic science has advanced significantly, but further advancements are needed to create a country free of crime.

2.2.3 CONTROVERSIES OF CRIMINALITIES/FORENSIC SCIENCE

A variety of forensic procedures are assessed in order to investigate crimes;

⁴⁸ G. S. Cooper and V. Meterko, —Cognitive bias research in forensic science: a systematic review|297Forensic Science International 35-46 (2019).

nevertheless, legal knowledge is also involved in certain disputes.⁴⁹ According to legal experts, certain forensic procedures are not useful throughout the course of investigating criminal activity. For instance, the findings of DNA testing might occasionally have substantial mistake rates. This problem might have a serious effect on the investigation, and at that point, the investigators are unable to identify the right criminal (washin). Numerous further forensic examinations, including bite mark analysis Furthermore, hair analysis is not reliable for the appropriate examination. Occasionally, investigations are conducted using traditional procedures, which leads to inaccurate results and a failure to identify errors. In many instances, this leads to the release of the true offenders. Investigators are frequently cognitively biased in favour of the suspect and heedlessly focut to demonstrate that the major offender is the suspect. Forensic science has come a long way, but in order to properly investigate crimes, more scientific tools and factual information are required. While a more effective way of questioning known as the Peace method was recently adopted in forensics, the suspects are nonetheless subjected to an enforcement legislation. science. Nonetheless, most individuals adhere to the established legal enforcement procedure. It could lead to false assumptions and convictions regarding the culprit. Every day, there is an upsurge in crime in India. Approximately one-fifth of all crimes committed worldwide occur in India. India's criminal justice system needs to be enhanced by utilising more advanced technologies. A well-run criminal justice system can contribute to the complete eradication of crime. A number of causes are causing inaccuracies in forensic science to have an impact on the criminal justice system. The Indian Department of Forensics is not doing its job seriously. There are occasions when they put off filing the murder case's medical report, which can extend the deadline for submitting the chargesheets. In India, the failure of the inquiry results in 40% of cases being lost. When questioning suspects, investigators abide by the law enforcement protocol. It may introduce biases and lead to incorrect conclusions and forecasts during the inquiry. Scientific techniques, like the DNA test procedure, which occasionally yields inaccurate results and which forensic investigators fail to take into consideration, need to be improved. Consequently, the true offender is not accurately recognised. The majority of cases in India are handled

⁴⁹ Forensic Science Controversies, India, available at: <https://library.cqpress.com/cqresearcher/document.php?id=cqresrre2017021000> (last visited on February 29, 2021).

using conventional forensic science techniques.⁵⁰ As a result, false convictions are used to identify offenders. In India, the crime rate has significantly climbed. It must be put an end to right now. There is no denying that forensic science has improved since the ancient times. Nonetheless, there are disputes around some forensic techniques as well. Since humans invented technology, it is their responsibility to make them better. Occasionally, errors are disregarded by forensic investigators, which may result in more criminal activity. As a result, in order to stop crimes from happening, detectives must exercise greater caution in their thorough investigations. India and the rest of the globe need a crime-free environment. This significant issue, which has a significant impact on criminal justice, is being assessed by legal experts. If the appropriate If an inquiry is not completed, there will be a rise in crime. Both society as a whole and its members in general may be impacted by that.

The correctness of the forensic results has been the subject of disputes. Proper and reliable data could not be provided by the Forensic team. Proper and precise test findings are crucial since they aid in the identification of the culprit hiding behind a crime scene. Sometimes the precision of the forensics is not up to par since the equipment and tools available to them are not accurate enough to determine the true outcome. In this manner, the real culprit does not be recognised, and the offender escapes punishment. Since forensics depends on so many other factors, its accuracy is crucial. The new technologies need to be thoroughly understood by the forensic psychiatrist. There will be repercussions for everyone who stays behind on the latest technological developments. Additionally, they must maintain a restricted rapport with patients and refrain from developing an emotional bond with them. It's critical to experience sympathy rather than pity. This will support correct analysis of the test outcomes. If the exams are not administered with empathy, the findings will be unfair and inaccurate. A forensic psychiatrist has to be knowledgeable in both theory and practice. Any lack of expertise with these abilities might lead to unethical test findings among the forensics. There have been several cases where the real offender could not be apprehended because of inaccurate test findings.

On occasion, forensics has overstated some similarities between crime scenes. In this approach, they have also assumed that certain individuals are criminals based on

⁵⁰ Most forensic science isn't real science. Try telling that to the criminal justice system, India, available at: <https://www.washingtonpost.com/news/monkey-cage/wp/2017/04/13/most-criminal-forensic-science-isnt-realscience-jeff-sessions-just-shut-down-efforts-to-change-that/> (last visited on February 29, 2021).

unhelpful evidence. For instance, it is occasionally imprecise and unreliable to compare bite marks. Research has indicated that forensic techniques are inadequate in yielding accurate outcomes. There isn't another way to use these techniques. No study has been conducted to verify the validity of the various approaches. This leads to a feeling of unfairness and inadequate resources for delivering precise data outcomes. The accuracy of the forensics' findings is crucial. In order to get the right outcomes, this is not only ethically right but also required. Numerous additional factors rely on appropriate outcomes. As such, it is crucial to deliver accurate findings in addition to outcomes that are provided.

2.3 THE ROLE AND IMPACT OF FORENSIC EVIDENCE

2.3.1 ROLE OF FORENSIC EVIDENCE

The process of investigating crimes using scientific tools and procedures is known as forensic science. In forensic science, a variety of procedures are used to look into the circumstances around a crime. Pathology testing, DNA testing, ballistics, fingerprint analysis, and many more are available. Using this scientific approach, investigational processes can yield precise results.⁵¹ Each individual has a unique set of fingerprints in addition to unique DNA types. Investigators can identify the suspect using fingerprints and DNA samples, identifying a person who is not well known. The suspect may also be removed using this technique from the list of accused.

Odontology is an additional technique that forensic scientists might use to identify the deceased corpse of an unidentified person. In odontology, a scientist can identify a corpse by looking at the teeth and the mouth's overall shape. An orthodontist uses filling scanning to build the anatomy of the teeth.

By examining the bullets in a deceased corpse, the ballistics approach assists with the criminal investigation. Additionally, the motion, angular movement, and dynamics of bombs, rockets, and missiles may be identified by scientific technology. The firearms from which the bullet is fired can be identified using this method. One may obtain a great deal of information from the ballistics reports. Another crucial method for determining the reason of death, such as homicide, suicide, or accident, is forensic pathology. Medical science is used to conduct pathological testing. It is able to

⁵¹ O. Ribaux, C.Roux,et.al.,—Expressing the value of forensic science in policing49(5) Australian journal of forensic sciences 489-501 (2017).

identify the weapon used in a homicide. Pollen, wood, foil, and gunshot residue can all be identified by trace evidence found at the crime scene.

A technique for scanning a skeleton and the remaining portion of a human body is called forensic anthropology. This special method can assist in providing details on the height, gender, and age of a certain human body. It can also establish whether the deceased corpse had any prior injuries. It might aid in giving the investigator a strong lead for their research. Without forensic science, a crime investigation cannot be fully completed as it provides reliable information for the inquiry. The forensic specialists are qualified to review the medical records and evidence. As quickly as possible, this report aids in the criminal's identification. The identification of tangible evidence, such as DNA, hair, and blood samples, was aided by forensic experts. can go over the residue that has been gathered from the site of the crime. Examining evidence and determining the truth about a crime is one of the main purposes of forensic science in criminal investigation. The application of cutting- edge technology in the process of reviewing the evidence has greatly advanced the field of forensic science. Nonetheless, given the rising crime rate every day, forensic science must advance. to outlaw the offence that it is.

2.3.2 IMPACT OF PHYSICAL AND FORENSIC EVIDENCE

Over the past 25 years, forensic evidence has become more important to criminal justice. Typically, the specialists are reviewing the police victim report, and then they utilised to determine the relationship between the offender and the victim. The relationship between the victim and the offence is made possible in part by the forensic evidence. If the forensic unit departing from the State Police Crime laboratory discovers any form of evidence, it will be easier to apprehend the offender and the victim will receive justice. Conversely, the forensic professionals gather physical evidence in the form of hair, fibres, blood, various body markings, and much more in order to get the physical evidence. This evidence aids in the analysis of the crime's actuality, motivation, and many other factors. The judge receives the forensic evidence that was provided in court to support the victim.⁵² In addition, tangible proof aids in identifying the real offender, the motive behind the crime, and several other issues. However, the evidence really serves as a guide to

⁵² S. H. Belshaw, (2019). —Next generation of evidence collecting: The need for digital forensics in criminal justice education¶3(1) Journal of Cybersecurity Education, Research and Practice 1-14 (2019).

comprehending the crime scene. The investigative team gathers tangible and forensic evidence in the current day using cutting-edge technology and the scientific technique. The forensic professionals gather data from the DNA evidence once it has been inspected by the library. Based on the report, the investigating team determines who committed the crime and it also plays a significant part in preparing the crime report.⁵³ Medical examinations aid in understanding the victim's experience with sexual harassment. The biological evidence is gathered and the victim's damage history is often examined by the forensic evidence to assist identify the real offender. However, the forensic evidence aids in the perpetrators' apprehension for their illegal actions. However, police have the ability to decide whether or not to initiate an arrest based on the evidence of injuries. The police can act once they have the tangible proof. DNA evidence is really a very reliable predictor and is useful in both identifying and apprehending suspects.⁵⁴ Since the early 1970s, forensic laboratories have employed a number of methods to gather evidence, including a fourfold approach. The evidence that is often gathered by the forensic library includes evidence related to drug misuse, sexual crimes, and many other topics. Identification of the offender and the sequences of forensic evidence used to strengthen the criminal case are aided by the physical evidence that is recognised and then compared with the control specimen to analyse the source.

2.3.3 SCIENTIFIC LABORATORY TECHNIQUE AND TYPES OF INFORMATION

Experts often employ a variety of methods to gather evidence, including bloodstain procedures, which include the presence of blood for analysis. Using this method, blood must be collected on a sterile, clean cotton towel before being allowed to air dry at room temperature. Following this, the fabric is chilled before being brought inside the laboratory to gather as much information as possible. The blood sample might not yield the anticipated outcome if the blood collection takes more than 48 hours.⁵⁵ As soon as the material is delivered into the lab, the professionals collect it and begin their examination. Most experts avoid leaving the bloodstain in the sun

⁵³ R. Granja and H. Machado, —Forensic DNA phenotyping and its politics of legitimation and contestation: Views of forensic geneticists in Europe|Social Studies of Science|1-19 (2020).

⁵⁴ E. K. Cheng and G. A. Nunn, —Beyond the witness: Bringing a process perspective to modern evidence law|97Texas Law Review|1077(2018).

⁵⁵ C. A. Streeting, J. Chaseling, et.al., —A comparison of ABACard® Hematrace and RSID™-Blood tests on dried, diluted bloodstains treated with leucocrystal violet or luminol|23Australian Journal of Forensic Sciences|1-11(2020).

when collecting the sample.

In addition, a blood sample collected from cloths can yield better results than one collected from clean paper when it comes to gathering dried blood stain evidence. Once the sample is received, it is placed in a box and labelled to seal it. The laboratory professionals begin their information-gathering tests, including spectroscopy, fingerprint development techniques, and many more, as soon as they get the material. Using presumptive and confirmatory test procedures in the lab, field investigators typically discover human blood at the crime scene. The field investigator gathers the sample if the other samples are located. Following sample collection, it is sent to the confirmatory test to get details regarding in addition to identifying the offender and victim.⁵⁶ Confirming the victim also helps. Presumptive tests are typically performed in the laboratory examination for semen, urine, blood, saliva, and many other substances. Furthermore, the investigators employ UV (ultraviolet lamps) to figure out those items. When conducting investigations in challenging circumstances, investigators typically employ other light sources to ascertain the presence of strain in the body. In addition, the forensic scientist could occasionally do presumptive tests to determine the type of bodily fluid involved. Occasionally, the enzyme that is present in other fluids aids in determining when the crime occurred.⁵⁷ In addition, the presumptive test is typically used to check for acid phosphate. The confirmatory testing technique analysis procedure in the crime lab is typically completed. The investigators use the microscope to observe the fluids. Additionally, the investigators are employing DNA testing techniques for reasons of confirmation.⁵⁸ Many criminal investigators employ presumptive testing procedures to save costs associated with sample collection. However, a lot of researchers also employ confirmatory testing for different objectives. One of the most crucial instruments for confirming the evidence in criminal investigations is a microscope.

Numerous criminal investigators have employed the chromatographic technique for their investigations. The mixes of the various components can be formed through this procedure.

⁵⁶ V. Stewart, P. Deacon et al., —The effect of mark enhancement techniques on the presumptive and confirmatory tests for blood 58(6) Science & Justice 386-396(2018).

⁵⁷ A. Illiano, V. Arpino, et al., —Multiple reaction monitoring tandem mass spectrometry approach for the identification of biological fluids at crime scene investigations 90(9) Analytical chemistry 5627-5636(2018).

⁵⁸ J. Yang, D. W. Messenger, et al., —Bloodstain detection and discrimination impacted by spectral shift when using an interference filter-based visible and near-infrared multispectral crime scene imaging system 157(3) Optical Engineering 1-9(2018).

Chromatography aids in the separation of the components that mix. A tiny amount of liquid mixture is added to the bottom of the paper chromatography. The paper's bottom is submerged in a liquid solvent during this operation. Because the paper does not move up, it is referred to as the stationary phase, and as a result, the solvent, also known as the mobile phase, travels up. Generally, various parts of the mixture stick to different surfaces as the liquid solvent rises. This procedure is employed in forensic science throughout the investigative phase to analyse dyes in fibres, explosives tests, and several other things. Identification of the victim's bodily fluids aids in the investigating procedure. Aside from this, the majority of chromatography involves collecting liquids and collecting expert samples after the liquid or gas has passed through a tube or column. Numerous chromatography techniques, including thin-layer chromatography, high-performance liquid chromatography, gas chromatography, and many more, have been employed to gather the evidence.

In addition, the best method for gathering criminal evidence via inquiry is electromagnetic radiation. A wide range of objects, including radio waves, visible light, X-rays, microwaves, and many more, are affected by electromagnetic radiation. Using this technique, the forensic investigators were able to identify the latent fingerprints of victims, suspects, and other individuals connected to the crime.

Furthermore, spectroscopy is one of the best ways to gather evidence of criminal activity since it produces light. It is able to identify accelerant and explosive residue. In order to take pictures, it typically measures the wavelength of the light. In the scene of the crime, this method aids in identifying paint or dirt. In addition, the use of UV spectroscopy aids in the identification of drug presence in urine or blood. This method also aids in the analysis of various food ingredients, colours, and the quality of the water, air, and numerous more.

The majority of the investigative team employs fingerprint development procedures to gather evidence. The detective team initially discovers the items and surfaces that contain the criminal's left thumb. In most cases, the investigators discover the latent fingerprint as a visual aid. The criminal investigation team finds the fingerprints using high-intensity UV lamps, and at the crime investigation laboratory, they also locate the other fingerprints, including those of the suspects. In order to improve fingerprint procedures, the majority of investigations conducted in the present have made use of evidence fingerprint technology, also known as dusting for fingerprints.

Experts in forensic labs typically use a soft brush and powdered powder to locate fingerprints. Usually, the powder adheres. It makes the print visible on the fingerprint. The fingerprint may be seen through the powder, and if another individual was engaged, that information can also be seen.

DNA analysis is one of the most useful tools for investigating the process and may be used to ascertain whether or not other people are participating. It is a component of chromatography in which gel electrophoresis methods play a role.

2.3.4 ROLE AND IMPACT OF THE FORENSIC EVIDENCE

When it comes to the resolution of criminal cases, forensic evidence is crucial. In order to identify suspects, forensic experts examine physical evidence from the site of the crime, including fingerprints, blood, hair, and many other details. Experts in the forensic division additionally make use of instruments for alteration used on criminal suspects. In order to comprehend the criminal incidence, forensic scientists gather, preserve, and examine the scientific evidence during a specific inquiry. To examine the forensic elements, the scientists employ labs. To gather and assess the evidence, a few forensic scientists visit the crime site. Forensic science evidence is an essential component for law enforcement, prosecution, and courts. Without forensic testing, cases involving sexual assault and homicide cannot be solved.⁵⁹ Cases are resolved with a variety of forensic evidence kinds. Forensic evidence is presented in court as the first precedence within the legal system. When fresh scientific data is presented as proof, the problem becomes more serious. From a theoretical standpoint, the forensic evidence is appropriately significant. The technology used in scientific laboratories conceals potential information from a physical hint, which remained at the scene of the crime. Many times, a case cannot progress very effectively without forensic testing and supporting documentation. There are a lot of legal studies that deal with testing and forensic evidence. The majority of individuals in the UK and the USA adhere to legal studies that are connected to forensic evidence. The physical evidence that resulted from the police inquiry between 1970 and 1980 was initially viewed in the UK. This occurrence marked the forensic science's debut in relevance proof. The majority of instances that are discovered during police investigations require forensic evidence

⁵⁹ T. A. Menaker, B. A. Campbell, et.al., —The use of forensic evidence in sexual assault investigations: Perceptions of sex crimes investigators|23(4) Violence against women399-425(2017).

from the crime scenes.

By using sophisticated fingerprint procedures, the physical evidence may be obtained through the forensic evidence. Furthermore, based on the evidence, an arrest might be made using the fingerprint and trace evidence. One might refer to the function of forensic evidence as Talk about and list the four different functions that evidence plays in criminal investigations³². Real evidence, documented evidence, demonstrative evidence, and testimonial evidence are the four categories of evidence. The outcome of the crime that was committed is the actual evidence. Direct items that are indirectly generated in relation to a crime or perpetrator are considered demonstrative evidence. Evidence that comes in the form of a document is referred to as documentary evidence. One way to gather testimony is through the words of someone who has taken an oath in a legal setting. A witness or an expert witness, for instance. On the other side, the physical harassment can also be quantified based on the medical data.

2.4 LEGAL PROVISIONS SUPPORTING CRIMINAL INVESTIGATION

2.4.1 APPLICABILITY OF FORENSIC SCIENCE IN CRIMINAL JUSTICE SYSTEM IN INDIA WITH EMPHASIS ON CRIME SCENE INVESTIGATION

The criminal justice system is made up of distinct departments, procedures, organisations, and bodies that work to safeguard or reestablish social control mechanisms. It may also be seen of as an ordered or planned manner in which society reacts to particular actions and individuals such that it is viewed as abnormal, difficult, obnoxious, frightening, bothersome, and undesirable. Essentially, the administration of the criminal justice system is dependent upon the police, the prosecution, the jails and the courts. These four areas are crucial to the prevention, identification, prosecution, arbitration, sentencing, and punishment of offenders in society. When it comes to the operation of criminal justice, magistrates and courts play a crucial role.⁶⁰ This is due to the fact that they alone have the authority to judge whether convicted offenders are guilty and to

⁶⁰ P. Kacker and A. Pandya, —Forensic Psychology for Prevention of Crime and Rehabilitation of Offenders: Public Health Perspectives‖ 1(1) Gap Indian Journal of Forensics and Behavioural Sciences 5-6 (2020).

decide how to punish them. A court must consider a variety of factors while determining whether to convict the offenders, including the significance of the facts and the available evidence. the validation of claims. They are a committed investigative organisation at the commission, with police backup. In order to apprehend the suspected criminals and prosecute them, the latter have been given the essential duties of crime detection and investigation. The police have employed scientific methods and instruments to detect crimes, reconstruct crime scenes, identify the suspected offender, and create crucial connections. However, the courts view this tangible evidence as being reliable otherwise. can more precisely assess the offender's guilt or innocence.

The scientific application of civil and criminal laws by a police agency within a criminal justice system is known as forensic science. The use of forensic science to legal matters involves the application of scientific knowledge and techniques from several fields. To ensure that When analysing the evidence, a variety of academic fields are used, including computer science, engineering, biology, forensic chemistry, physics, and medicine. DNA profiling is also one of these fields. Physics is utilised to identify a bloodstained blueprint, while biology contributes to the development of an unidentified suspect. Chemistry is done there to determine the chemical makeup of various medications. As a result, forensic science's contribution to the criminal justice system is severely undervalued and criticised. In essence, it operates by searching for scientific as well as tangible indicators gathered at the crime site. The type of crime committed is identified by the information gathered, and the timing of the crime is indicated by the situational evidence.⁶¹ Evidence is gathered at the scene of the crime or from an eyewitness throughout the criminal investigation process. at addition, the evidence is examined at a crime lab. The evidence is shown in court once the testing is completed. There are several in India legislative clauses supporting the conduct of criminal investigations. The Indian Constitution's Article 20(3) states that no one accused of a crime may be forced to testify against himself. Legally, an accused person is presumed innocent until and until they are proven guilty. It upholds the avoid being subjected to torture while the inquiry was underway. Furthermore, the court may immediately collect the fingerprints of any person, including the accused, pursuant to Section 73 of the Indian Evidence Act.

⁶¹ S. Basu, —Forensic Science and Scientific Measures of Criminal Identification in British India 54 *Indian Journal of History of Science* 189-201 (2019).

The criminal justice system is divided into tiers and wings. Investigators are crucial in gathering forensic evidence from crime scenes, and the court needs this evidence to provide victims with justice.⁶² Analysis of the facts and evidence is a major function of forensic science. To evaluate the significance of the evidence, forensic science incorporates a number of scientific disciplines. The proof strengthens the validity of the claim. Criminal justice requires very strenuous physical evidence, which might be minuscule. The field of forensic science makes sense when it comes to gathering microscopic evidence, such as DNA fingerprints. Forensic science is being used by the Indian court system to gather evidence, although in the case of criminal justice, greater advancement and reliance are required.⁶³ In India, forensic science undoubtedly contributes to societal control. Forensic science is useful in protecting society. The criminal justice system in India includes the police, prosecution, courts, and prisons. To ensure justice, forensic science was essential in every aspect.

The primary means of identifying criminals or offenders is physical evidence, and gathering physical evidence requires specialised skill and is not always simple. The team of Indian investigators must be trained and equipped with Special Forces to aid in the gathering of evidence. Science of forensics imparts information about evidence preservation, which is important for achieving ultimate justice. Another crucial technique for identifying forensic evidence is the serological test. In the context of forensic science, a serological test can primarily demonstrate the consistency of evidence with the bodily fluids of the offender.⁶⁴ Forensic science application is most interesting to recognize the offenders in the criminal justice system. The recognition and identification advantages provide strength to Indian criminal justice system and the victims get assurance about their justice. Law and order always wants authentic proof in detail so forensic science can give authentic proof from collected evidence. The government investigators and private investigators have to collect the evidence with loyalty and then justice may be possible in India. So many cases in India are

⁶² G. Baigorrotegui, —Destabilization of Energy Regimes and Liminal Transition through Collective Action in Chile 55 *Energy Research & Social Science* 198-207 (2019).

⁶³ J. M. Arnold, B. Javorcik, et.al., —Services reform and manufacturing performance: Evidence from India 126(590) *The Economic Journal* 1-39 (2016).

⁶⁴ A. Biedermann, C. Champod, et.al., —Development of European standards for evaluative reporting in forensic science: the gap between intentions and perceptions 21(1-2) *The International Journal of Evidence & Proof* 14- 29 (2017).

unsolved still now due to the lack.⁶⁵ The primary use of forensic science in criminal justice cases is in the duties of specialists and investigators in forensic laboratories.

The best method for DNA fingerprinting is serological analysis. Forensic science offers both techniques for examining the tangible evidence. Physical and psychological evidence is revealing to be quite important in the Indian criminal justice system. The use of DNA fingerprinting is improving the judicial system in India, and the country is adopting more sophisticated applications as well. Digital forensic systems, for example, assist preserve all forensic data digitally.⁶⁶ Advanced features and expertise are being provided by forensic science to enhance the legal system as a whole. The goal of forensic research is to prevent the forensic report from being rejected. There are a plethora of ways that forensic science research might strengthen justice. The country is getting ready for the criminal justice system to advance. Additional forensic research is enhancing body fluid tests. With more study, the use of forensic science will help the Indian criminal justice system become stronger.⁶⁷

⁶⁵ L. Cao, Y. Du, et.al., —Foreign institutional investors and dividend policy: Evidence from China 26(5) *International Business Review* 816-827 (2017).

⁶⁶ G. Cardoza, G. Fornes, et.al., —Barriers and public policies affecting the international expansion of Latin American SMEs: Evidence from Brazil, Colombia, and Peru 69(6) *Journal of Business Research* 2030-2039 (2016)

⁶⁷ J. M. Chin, G. Ribeiro, et.al., —Open forensic science 226(1) *Journal of Law and the Biosciences* 255-288

CHAPTER-3

UNDERSTANDING THE IMPORTANT CONCEPTS OF LAW AND STATUTES

3.1 OVERVIEW OF THE POISON ACT 1919

enacting new laws prohibiting the importation, distribution, and possession of poison. ASS In light of the aforementioned, it is decided to combine and modify the laws controlling the importation, possession, and sale of poisons. This act may be known as the Poisons Act, 1919. The Act forbids the introduction of any designated poison into India, and Jammu & Kashmir is not an exception. This rule applies to all of India.

Poisons are sold, used, and distributed under state regulations. For instance, state governments have the authority to prohibit the possession or sale of a certain poison in all or a portion of their borders. Here is a list of potential regulations: first, the maximum amount of any given poison; second, the classes of people to whom such licences may only be issued; third, the class or classes of people to whom such licences may only be sold; and fourth, the licencing of specific poisons and the cost of such licences. Act 14 of 1955 ended its application in Bellary District. The phrase "across British India" is found in A. O. 1948, according to the A. O. website. Act 47 of 1958, Section 2,⁶⁸ the power to forbid the entry of any poison into India without a licence. The Central Government may prohibit the importation of a particular poison into India in two ways: by publishing a notice in the Official Gazette and by enacting regulations controlling licence issuance. via a Central Government-established customs border. Having the capacity to limit access to certain toxins in specific areas. The State Government may, by regulation, forbid the possession of a particular poison in any area where its use appears to be so widespread as to need restrictions on the ownership of such a weapon, in cases where the poisoning of animals is used to commit murder or other mischievous acts.

If the State Government makes a rule that violates subclause (1), it may state that anyone found in possession of the poison or the containers, packages, or covers that

⁶⁸ R. Gupta, —Hookah/Sheesha Water Pipes Smoking: Why it Should be Completely Prohibited?| 9EC Pulmonology and Respiratory Medicine112-114 (2020).

contained it could face up to a year in jail, a fine of up to one thousand rupees, or both, along with the confiscation of both.⁶⁹

It is assumed that some toxins are present based on this information. A material is considered poisonous if it has been designated as such in a formal regulation or notification published under this Act.

Penalties and/or jail terms for unauthorised imports Anybody who—(a) violates the guidelines in Section 2; (b) imports something they shouldn't, The following penalties will apply to anybody who (a) imports a poison that is forbidden by Section 3 or (c) violates any requirement of a licence granted under Section 3 for the importation of a specific poison: If found guilty for the first offence, you will go to jail; if found guilty twice, you will also suffer consequences.

Warrants for searches may be granted. If there is cause to believe or suspect that any poison is being held or concealed in violation of this Act or any rule made thereunder, or that any poison that may be confiscated under this Act is being held or concealed, District Magistrates, Sub-divisional Magistrates, and, in presidential towns, the Commissioner of the Police, may issue a warrant.

A person may enter and carry out an inquiry as allowed by the warrant, and the Code of Criminal Procedure (Chapter 5 of 1898), which addresses search warrants, is construed to apply to the execution of the warrant to the greatest extent feasible.⁷⁰

Rules The State Government may additionally adopt rules that are compliant with this Act 2*[apart from section 3] in order to further the goals and purposes of this Act.

Publications included in paragraph (2) are required to publish regulations adopted in accordance with this Act in advance.

Regulations enacted under this Act by the federal or state governments shall become effective upon publication, just as if this Act had approved them first.

A rule made by the Central Government under this Act has to be presented as soon as possible to each House of Parliament while it is in session, whether it is done in one

⁶⁹ V. Venkatraman and D. Rajendran, —Why Woman Want Vote?: Writings of Sri Dharma on Woman's Suffrage in Madras Presidency, 1922–1936| SSRN Electronic Journal(2021).

⁷⁰ M. T. Myaing, —Laws Relating to Environmental Conservation in Myanmar|, in James H. (eds.), Population, Development, and the Environment 297-315 (Palgrave Macmillan, Singapore, 2019).

session or across several sessions. If both Houses concur before the end of the current session or any of the aforementioned sessions, the rule must be changed.⁷¹

Savings: Nothing done in good faith by a doctor or veterinarian while practicing their respective professions, as defined above, may be subject to this Act or any licence issued under it.

The State Government may proclaim this Act 2*[apart from section 3] to be in full force and effect despite anything to the contrary mentioned in the paragraphs before it.

3.2 OVERVIEW OF THE DRUGS AND COSMETICS ACT 1940

The Indian Parliament established a law that controls the manufacture, importation, and distribution of medicines inside the nation. The primary objective of the Act is to guarantee the safety, efficacy, and compliance with state quality criteria of medicines and cosmetics marketed in India. The Pharmaceuticals and Cosmetics Rules, which date back to 1945, regulate the prescription, sale, display, and storage of medications based on schedules. This legislation was originally known as the Drug Act when it was passed in 1940. The 1930-founded Chopra Committee offered recommendations for the creation of the initial legislation. The relevant Drugs Act was passed in 1945. The legislation is known as the Drugs and Cosmetics Act, 1940.

The concept of "drug" as defined under the act encompasses a wide range of chemicals as well as medical equipment and diagnostic tools. The legislation defines "cosmetic" as anything applied to the skin that improves its appearance or feel. Soaps are not covered under this definition, though. Following an amendment to the original legislation, Ayurvedic and Unani drugs were included to the act in 1964. The legislation's Section 16 defines the standards of quality for pharmaceuticals. In Section 17, the word "misbranding" is defined. A medication is considered misbranded if its therapeutic effect is overstated. The manufacturer of a medicine may be ordered to stop manufacturing under Section 18. Section 27 deals with contaminated and counterfeit medications.

⁷¹ M. Hopkins, L. Neville, et.al., —Preventing Acid Attacks and Corrosive Substance Crime, in *Acid Crime* pp. 137-170 (Palgrave Macmillan, Cham, 2021).

The new rule requires the label to include a greater number of the drug's ingredients. While Section 23 specifies the precise actions that inspectors must follow in the case of a raid, Section 22 describes the power afforded to narcotics inspectors.

A measure proposed in the Central Legislative Assembly in 1937 enacted the recommendations of the Medicines Enquiry Committee regarding the supervision of drug imports, manufacturing, distribution, and sales in British India. The Select Committee was encouraged to take a more comprehensive strategy to controlling medication manufacture, distribution, and imports in order to stop medicines from being sold illegally. About legislation pertaining to drug control, the Central Government asked the Provincial Governments to ask their legislatures to pass resolutions giving the Central Legislature the power to pass laws. Provincial governments voted in favour of a proposed law that would limit the import, manufacture, sale, and distribution of medications and cosmetics. The federal government was then notified of the decisions. Consequently The Drug and Cosmetics Bill was therefore brought to the Central Legislative Assembly.

There have been several changes made to the Act. The modifications are as follows:

- Modification of the Drugs Act of 1960 (35 of 1960)
- The 1962 Drugs Amendment Act. Act of 1962 (21 of 1962) modifying the 1960 Controlled Substances Act (13 of 1964)
- The 1972 Drug and Cosmetic Amendment Act (19 of 1972) was adopted.
- The 1982 Drugs and Cosmetics Act Amendments (68 of 1982)
- It was approved in 1986 as a part of the Control of Substances Mishandled by the Pharmaceutical Industry Amendments to the Drugs and Cosmetics Amendments Act Pharmaceuticals (Amendment) Act 1995 (71 of 1995) (26 of 2008)
- The most current amendments are found in the Drugs and Cosmetics (Amendment) Act of 2017.

A legislation issued by India's legislative body governs the importation, manufacture, and distribution of pharmaceuticals in the country. The main objective of the Act is to ensure that all drugs and cosmetics sold in India are safe, effective, and adhere to

required quality standards.

norms. The Indian government established the Chopra Committee in 1930, and it was through their recommendations that the Drugs Act of 1940 came to be. The Drug and Cosmetic Act covers all types of drugs, diagnostics, and medical equipment. According to the Act, a cosmetic is any material that may be applied to the human body in order to enhance or change one's look, as well as cleanse and beautify the body. In this definition, soap is not included. The Drugs (Amendment) Act 1964 (13 of 1964) now covers Ayurvedic and Unani remedies.

The Drug Control Act was ratified in December 1945, and it went into effect in 1947. Because of this, the regulations have been updated often to reflect current events and address any issues that arose during implementation. The various Acts must be enforced by the federal government as well as the state/union territory (UT) administrations. The Drugs and Cosmetics Act establishes regulations for the storage, display, sale, distribution, levelling, and prescription of medications. These regulations are divided into schedules.

Anything (including talismans and mantras) that professes to be able to cure illness in humans or animals is classified as a "magic remedy" under the statute. A technique that promises to change an organ's shape or function in both humans and animals is also featured. The law forbids the following: menstrual disorders, miscarriage, treatment of miscarriage, augmentation or maintenance of a woman's sexual delight, prevention of conception, and other illnesses and conditions specified in an integrated schedule.

The Indian Medical Degrees Act of 1916 or the Indian Medical Councils Act of 1956 (which covers additional state laws as well) define diseases for which there is no recognised treatment and for which an Indian medical practitioner must be consulted as soon as possible. These diseases may be added to the list at any time. If the legislation is to be followed, Ayurvedic and Unani practitioners, the Central Government, and the Drugs Technical Advisory Board must all be consulted. If found guilty for the first offence, the maximum sentence is six months in prison, either with or without a fine. The sentence may be enhanced by up to a year if the offender is found guilty again. The law prohibits becoming an if found guilty, a corporate employee.

The general public has easy access to these items since the legislation is not strictly enforced. The list does not include more recent illnesses like AIDS since they are incurable. Consequently, the legislation is considered outdated. There have also been instances of cable television stations airing advertising in these areas with little to no controversy. Some have questioned the legitimacy of ancient medical systems such as Ayurveda and Yoga due to suggested amendments to this law.

3.3 THE NARCOTIC DRUGS AND PSYCHIATRIC SUBSTANCES ACT, 1985

The production, cultivation, manufacturing, and sale of narcotics and psychotropic substances are prohibited in India. The NDP Act of 1985, also known as the NDPS Act in Indian law, is a legislation that controls the distribution and use of psychoactive drugs. A draft of the bill was brought before the Lok Sabha on August 23, 1985. After clearing both chambers of Parliament, the Act became operative on November 14, 1985, with the assent of then President Zail Singh on September 16, 1985. Since 1988, this statute has had four revisions, the most recent being in 2001. The NDPS Act Apart from Indian nationals residing abroad, the regulation also encompasses all occupants of vessels and aeroplanes flying the Indian flag. In March, the Narcotics Control Bureau was founded 1986 as a direct consequence of the Act. The UN Convention on the Illicit Trafficking in Narcotic Drugs and the Single Convention on Narcotics compel India to execute the Act's provisions in order to fulfil its commitments under the treaties.

In India, there had been no drug bans until 1985. The Atharvaveda is the first record to reference cannabis use in India, dating back at least 2000 BC. The 1893 Indian Hemp Drugs Commission declared that "moderate" use of hemp remedies produced "no moral loss at all" and had no "harmful effects on the mind," but an Indo-British probe into cannabis usage in India concluded otherwise. There is little doubt that using the drug at "excessive" amounts is hazardous. It appears that many "severe users" are unaffected, as per the Commission. For the 3,281-page report of the Commission, testimony was given by over 1,200 witnesses, including "doctors, bhang peasants," "fakirs, chiefs of mental asylums," and "tax-gatherers, army commanders, hemp smugglers, and the clergy." In India, using Up until 1985, it was permitted to use bhang, hashish/charas, and marijuana. Cannabis use was associated with alcohol use rather than being seen as a social sin. Even when upper-class

Indians drank bhang at Holi, they saw ganja and charas as the intoxicants of the poor. The United States signed the Single Convention on Narcotics in 1961 as a first step in the war on drugs in general. Nonetheless, India withstood American pressure to make marijuana illegal for more than 25 years. Ultimately, the Rajiv Gandhi government gave in to Under American pressure in the 1980s, the NDPS Act was established, making all drugs illegal in India.⁷²

Depending on how much of the illegal substance was discovered on their person or property, anyone found in breach of the NDPS Act will face consequences.

- For small violations, there may be a year in prison, an extra \$10,000 in fines (about \$130), or both.
- A fine of up to 1 lakh (US\$1,300) and a term of up to 10 years in prison may be imposed if the amount involved is higher than small but less than commercial.
- When a commercial quantity of the infringement is involved, a fine of not less than 1 lakh (US\$1,300) but not more than 2 lakh (US\$2,700) is required, along with a period of imprisonment of not less than 10 years but not more than 20 years.

The NDPS Act, in their opinion, is severe, and the bail requirements it imposes on defendants amount to a "virtual rejection and guarantee years of jail." Some have criticised the NDPS statute for putting the onus of proof entirely on the accused to prove their innocence, while others contend that the bail requirements are excessively onerous and resemble those found in the Prevention of Terrorism Amendment Act of 2002 and the Terrorist and Disruptive Activities Prevention Act of 1987.⁷³

Furthermore, some opponents point out that under the assumption of "culpable mental condition" in this act, the court would infer "intent to commit a crime." They contend that, generally speaking, people accused of a crime are assumed innocent unless and until they are proven guilty. The Act establishes more stringent guidelines for bail in cases involving serious crimes. "Commercial quantities" in the context of hashish refer to amounts greater than one kilogramme. If the judge has a "reasonable

⁷² M. Khanna and S. Garg, —Narcotic Drugs and Psychotropic Substances Act (Ndps 1985): A Critical Analysis|3(1) Nimitmai Review Journal 28-32(2020).

⁷³ S. Sharma, K.Kumar, et.al., —An Overview on Narcotic Drugs and Psychotropic Substances Act, 1985|4(3)Journal of Forensic Sciences & Criminal Investigation555644 (2017).

belief" that the accused person is innocent and unlikely to commit another crime while out on bond, the court may give bail to the accused person. The bill was opposed by a number of Congressmen since it treated soft and hard narcotics equally. Nonetheless, the Rajiv Gandhi government thought that the The usage of harsher medications can result from the use of milder ones.

President Ramaswamy Venkataraman signed the Narcotic Drugs and Psychotropic Substances (Amendment) Act, 1988 (Act No. 2 of 1989) into law on January 8, 1989.

Act No. 9 of 2001, the Narcotic Drugs and Psychotropic Substances (Amendment) Act, 2001, was enacted on May 9, 2001, by then-President K. R. Narayanan.

Thanks to the 2014 Amendment Act (Act No. 16 of 2014), individuals in need of pain management and palliative care can now more easily obtain opioid medications such as morphine and fentanyl.

In order to alter the Narcotic Drugs and Psychotropic Substances Act, then-Finance Minister Pranab Mukherjee introduced Bill No. 78 of 2011 on September 8, 2011. On September 13, Yashwant Sinha presided over the Standing Committee on Finance. Even though the Committee was supposed to present its findings within three months, it wasn't until March 21st. The Bill was adopted by the Rajya Sabha the following day after it was passed by the Lok Sabha on February 20, 2014. It was published in the Indian Gazette on March 10 and signed into law by Pranab Mukherjee on March 7.⁷⁴

Minor amounts of drugs for personal use are illegal under Section 27 of the NDPS Act, and offenders may face fines of \$10,000, jail time of six months, or both. The Union Ministry of Social Justice and Empowerment is supposed to legalise drug possession for individual use, according to the government. The administration believes that changes should be made to the NDPS Act to treat drug users as victims rather than as criminals deserving of prison sentences.

A meeting of all main parties was held on November 10, 2021, to discuss amending Section 27 of the NDPS Act to remove prison sentences and fines for personal drug use. An agreement was reached to propose 30-day drug rehabilitation and de-

⁷⁴ Y. P. S. Balhara and S. Mathur, —Bhang-beyond the purview of the narcotic drugs and psychotropic substances actl 31(4) Lung India: Official Organ of Indian Chest Society 431 (2014)

addiction programmes.⁷⁵

It is recommended to substitute "other than personal consumption (in tiny amounts)" for "consumption" and "addict" for "person with the drug misuse issue." This reform resulted in reduced sentences for those found in possession of small amounts of drugs and increased clarity for the courts on the difference between personal and commercial use of narcotics. Research and public health come first in a reasonable drug policy, not punishment. and prison, claim those who support the decriminalisation strategy. In addition, anyone found to have used or possessed drugs would be subject to 30 days of mandatory rehabilitation for de-addiction.

3.4 THE PHARMACY ACT, 1948

This statute may be known as the Pharmacy Act of 1948. It encompasses all of India, with the exception of Jammu and Kashmir. Within the context of this Act, "agreement" means an agreement entered into pursuant to section 20, and "agreement" means "agreement."

As per either Section 12 or Section 14 of the Constitution, the phrase "approved" denotes the approval granted by the Central Council.

Sections 3 and 15A of the Pharmacy Council of India constitution specify the Central Council and Central Register. The Executive Committee is defined in Section 3 and 15A of the Pharmacy Council of India's constitution, whereas Sections 3 and 15A define the Central Register.

"Indian University" is defined by the University Grants Commission Act, 1956 (the "University Grants Commission Act") as a university founded by or under a Central Act, as published in the Official Gazette by the Central Government.

Members and composition of the Central Council--

The Central Government will appoint members of the Central Council as soon as feasible after the University Grants Commission selects faculty members from Indian universities or colleges connected to those institutions that provide degrees or diplomas: (a) Six members, including the Director of the Central Drugs Laboratory ex officio; at least one of them must be a pharmaceutical chemist, chemist,

⁷⁵ A. A. Kumar, (2018). The Narcotics Drugs and Psychotropic Substances Act, 1985.

pharmacologist, or pharmacognosist.

The advantages of the Pharmacy Council of India's incorporation under section 3 include perpetual succession, a common seal, the power to acquire and keep the property, and the capacity to sue and be sued under its name.⁷⁶

Central Council President and Vice-President.—

For both positions, the Central Council members will select a president and vice-president. Members of the Central Council who have been elected to the positions of President or Vice-President may run for reelection if their current term on the council ends before their tenure as President or Vice-President ends.

Elections conducted in accordance with this chapter must follow the prescribed processes; objections over these procedures will be brought to the Central Government, whose decision is final.

End-of-term and unexpected vacancies.—

A member 10* who is elected or nominated under the terms of this section serves for five years, or until a legitimately elected successor is nominated or elected. Anytime they choose, members may resign from their posts by submitting a signed letter to the president. A member is deemed to have resigned from office if they miss three consecutive Central Council meetings or if they are elected in accordance with clauses a, c, or g of section 3.

Any vacancy in the Central Council must be filled by election or nomination, and the chosen official may not remain in office for longer than it takes to choose a replacement.⁷⁷

The Committee of the Executives

An Executive Committee should be established as quickly as feasible by the Central Council, consisting of the ex officio President and Vice-President of the Central Council and five other members selected by the Central Council from among its members. If an Executive Committee member's tenure ends while he is still a

⁷⁶ D. B. Thorat, —A Review on Role of Pharmacist in Current Healthcare Scenario|11(4) Asian Journal of Pharmaceutical Analysis281-284 (2021).

⁷⁷ S. B. Math, N. Manjunatha, et.al.,(2019). —Sale of medicines by Registered Medical Practitioners at their clinics: Legal and ethical issues|61(4) Indian Journal of Psychiatry S786.

member, he may run for election to the Central Council again.

The Executive Committee shall have the authority and responsibility to assume any additional duties imposed by this Act or any other law.

Regulations for the education of children.—

In order to be eligible to become a chemist under this provision, the Central Council and the Central Government must make reference to the education laws as such and provide the minimal level of education.

For instance, but not restricted to: (a) the kind and duration of preparatory study; (b) the facilities and equipment that must be provided for students enrolled in approved courses; (c) the exam themes and the required standards; and (d) any extra requirements for examination entrance.⁷⁸

Affectation of state education laws.—

Statewide education laws may be implemented at any point following Chapter III's creation of a state council and consultation with it. Regulations pertaining to education, if any, must go into effect three years after the State Council is established.

Courses and exams that have been approved for use.—

A course of study won't be recognised as an approved course of study for admission to an approved pharmacist examination until the Central Council has decided that it complies with the Education Regulations.

Upon application by any authority in a State that conducts a pharmacy examination, this examination will be recognised as an approved examination to qualify a person to be registered as a pharmacist under this Act. Before announcing an examination as authorised, the Central Council must be satisfied that it complies with the Education Regulations.

States are required to provide the Central Council with information about all required educational programmes and exams, including the minimum age requirements for completion as well as the specifics of the requirements themselves.

⁷⁸ L. Voora, S. K. Sah, et.al., —Doctor of pharmacy: boon for the healthcare system|| 14(1) Drug invention today 153-158 (2020)

When a study or test is approved by the Central Council, it should be notified to the relevant authorities and the possibility of having the licence revoked taken into account. If a test or course of study is not completed by a deadline, the Council may state that it is only allowed if the State Government and the appropriate authority have informed the Council of their opinions.

Examining - The Executive Committee may designate as many Inspectors for this Chapter as it deems appropriate. An Inspector may conduct an inspection of any institution that provides a recognised course of study or examination, and an Inspector may also attend any examinations held by those institutions that have been authorised by this Chapter. An Inspector present at an exam under sub-section (2) is not permitted to interfere with the test under subsection(3), but he is required to report to the Executive Committee on the exam's sufficiency and any other matter the Executive Committee may desire.⁷⁹

Every such report that the Executive Committee forwards to the relevant authority or institution, along with any comments made by said authority or institution, shall be copied. The report and any remarks made by that authority or institution will also be sent to the Central and State governments in copy.

3.5 THE DRUGS CONTROL ACT, 1950

The Drugs Control Act of 1950 was passed by Indian lawmakers, imposing pharmaceutical price regulations. The maximum price of any drug may be determined by the government using this technique. Customers must receive cash memorandums for transactions over five, as well as memos. The Act stipulates that for purchases under 5, must be sent to customers. A violation of the Act has a maximum term of three years in prison, with or without a fine. Any director, manager, secretary, agent, or other official or anyone involved in management may face penalties in cases of corporate violations if the infringement happened without their knowledge. It is the duty of police inspectors to look into offences.

"Drug" refers to any substance that falls under the definition of a drug under Section 3 of the Drugs and Cosmetics Act, 1940 (23 of 1940), about which a declaration has been made; "offer for sale" is the expression of a person's pricing. The governments of these states are currently known as the "State Government" under this Act, which

⁷⁹ Subhash C. Mandal (ed.), Drug Information Bulletin (Indian Pharmaceutical Association, 2018)

became operative on November 1, 1956.⁸⁰

A drug is said to be in someone's possession if: (i) that person possesses it on that person's behalf; or (ii) that person possesses it on that person's behalf. The contract specifies the highest prices and volumes that must be maintained or sold. There might be a maximum amount that a drug dealer or producer can possess at any given time, a maximum price or rate that they can charge, and a maximum quantity that they can sell to any one person in a single transaction.

This section states that prices and quantities could fluctuate depending on the area or the kinds of dealers and manufacturers involved. There is a maximum amount of things that can be sold, as stated in Section 5. (a) hold more medication than is permitted as indicated by notification pursuant to Section 4 Clause (b); (c) make any drug available for sale; or (b) sell, propose to sell, or otherwise make any drug accessible for sale.⁸¹

There is a maximum amount of money that can be owed at any given time. Under this regulation, no person may carry more medication on them at any given moment than is permitted. Unless the Chief Commissioner specifies differently in a directive that is released in the Official Gazette: A dealer or producer is exempt from this rule with regard to any materials they provide or create. Disclosure of surplus inventories is required. The Chief Commissioner or another person designated by the Chief Commissioner shall be notified of any excess medicine and take appropriate action.

Refusing to sell is not unusual among sellers. If a manufacturer or dealer declines to sell any medication within the allotted amounts under this Act without the Chief Commissioner's approval, they must give a suitable justification. Memoranda in cash will be included. specific sales. Any drug dealer or manufacturer selling drugs for cash is required to provide the buyer with a cash memorandum including the details of the transaction, even if the transaction is worth less than five rupees. A cash memo may be prescribed by the Chief Commissioner and published in the Official Gazette.⁸²

⁸⁰ C. J. Landmark and U. Brandl, —Pharmacology and drug interactions of cannabinoids| 22 Epileptic DisordersS16-S22 (2020)

⁸¹ E. Perucca, —Antiepileptic drugs: evolution of our knowledge and changes in drug trials|21(4) Epileptic Disorders 319-329(2019).

⁸² K. Wailoo, —The FDA's proposed ban on menthol cigarettes|380 The New England Journal of Medicine 995- 997(2019).

The Chief Commissioner reserves the right to omit specific areas, categories of traffickers or makers, or types of drugs from the official Gazette. There are price lists and stock quotes displayed. Each dealer or manufacturer may display a list of medicine prices kept and their quantities on the property for sale, or the Chief Commissioner may provide orders to all makers and dealers to mark any material that is exposed or meant for sale along with the price at which it is being sold. Dealers are not permitted to alter, erase, or destroy any labels on medications that expresses the retail price from the manufacturer.

The pricing for composite offers needs to be specified separately. The price that dealers and producers assign to any drug they are proposing for sale must be stated in writing, and when they do so, it is considered an offer to sell that drug for the purposes of this Act. payment in full for the sale of such medication as well as another item. The disposal of pharmaceuticals may result in their prohibition or regulation. The Chief Commissioner's proposal may lead to the issuance of an order that forbids the disposal of any medication until certain conditions are met, or it may restrict the sale of any medication to a particular class of dealers or any other directives the Chief Commissioner deems necessary to uphold the ban or conduct this kind of drug sales.⁸³

Individuals who violate legal regulations or disobey orders issued under statutory authority may be subject to fines equal to or greater than three times their maximum sentence, or both. Upon a person's conviction for an offence under this Act, a judge may rule that the federal government will receive all or portion of their narcotics supply as forfeiture. A person accused of violating any of the provisions of this section must demonstrate, in order to prove his innocence, that his actions were permitted by his employer or any other specified individual when he was serving as that person's servant or agent.

3.6 THE INDIAN LUNACY ACT, 1912

This statute may be referred to as the Indian Lunacy Act, 1912. Anything in Part II will effect the property of the lunatic, the High Courts of the Indian subcontinent, and the rights of individuals appointed by the Court to act as guardians or estate administrators. Unless otherwise defined, the term "asylum"

⁸³ P. Das, M. D. Delost, et.al., —A survey of the structures of US FDA-approved combination drugs|62(9) Journal of medicinal chemistry4265-4311(2018).

under this Act has nothing repugnant about it.

The following sections 8 through 16 and 98 specify the exceptions that apply to admission or detention of criminal crazy or lunatics only, as determined by inquisition: If two visitors agree, anyone seeking refuge at such a sanctuary may be admitted and accommodated there grant their consent only upon official request from the intended border.

After applying for a reception order in the required format, a person who is admitted under the proviso of a paragraph and notifies the facility in writing that they intend to leave cannot be held for longer than twenty-four hours. Perused and bolstered by a pair of medical certificates, it needs to come from a medical officer. When a partner, assistant, or relative of a lunatic or petitioner signs one of the medical certifications, it must be made clear exactly how they are related to the lunatic or petitioner—and, in the case of a relative, how specifically. If a previous application for an inquiry has been made, a copy of the court order must be included with the petition for an investigation into mental competency. Moreover, state if the alleged insane person has ever requested an investigation.⁸⁴

Reception orders are not authorised outside of metropolitan regions unless the State Government designates the area in the Official Gazette as an authorised location for the issuance of such orders.

In the event that the spouse or spouses are unable to file the petition due to insanity, absence from India, or any other reason, a relative of the alleged lunatic should do so. There ought to be a justification for the petition's submitted in a different manner than those listed above, unless it is submitted by the husband of the alleged madman or, in the event that there is no spouse or wife, by a close family member.

Upon presentation of the petition to be heard, the magistrate may, in his discretion, order the imprisonment of the suspected lunatic until the conclusion of the investigation. Together with the petitioner and the alleged insane, other persons listed by or on behalf of the alleged crazy will be permitted to hear the petition in secret (barring any orders from the magistrate)

The Magistrate has the authority to accept or reject the petition, to adjourn it in order

⁸⁴ V. V. Prashanth and P. Dey, —Western colonial wave in Indian psychiatry-An overview|20(2) Archives of Mental Health 61(2019).

to gather further information or conduct an investigation, and to order the party making the request to reimburse the investigation's costs, or to do so from the estate of the claimed insane person if he feels that doing so would be appropriate found to be mentally unsound.⁸⁵

When the petition is denied, the magistrate must give the petitioner a copy of the ruling and give a written explanation of why the petition was denied. Insane people who are dangerous, roam around, have had harsh treatment, or have not obtained adequate attention and supervision from the police.

The officer in charge has the right to hold or arrest anyone who is found wandering around the police station grounds if he feels that person is insane and in a dangerous state of mind. This applies even if the person is not seen wandering around openly. In the event that someone is held in this way, the magistrate has to be informed right away.

If an employee at a police station has reason to believe that a person in their care is mentally ill and is being mistreated or neglected by a family member or another responsible party, they have an obligation to notify the magistrate as soon as possible.⁸⁶

When dealing with a dangerous and nomadic lunatic:

Any individual who is taken before the magistrate for examination must have a medical officer examine him in accordance with Section 13(1); if the magistrate determines that the person is mad and has to be placed in custody, the medical officer might carry out. If the magistrate is confident that the person you know and trust will take good care of you and won't hurt themselves or anyone else, they may be allowed to take care of you. Your designee must execute a bond for the sum the magistrate deems suitable, either with or without sureties.

The accused schizophrenic has been placed in jail; a medical report is yet awaited.

Section 13 of the Mental Health Act gives magistrates the power to detain a person suspected of being insane for a maximum of 10 days while a medical officer

⁸⁵ A.Sharma, —Mental Health Services in the Northeastern Province of British India: Tezpur Lunatic Asylum, 1876–1947|42(1) South Asia Research93-108(2022).

⁸⁶ D. Sethi, —Indian Mental Healthcare Act, 2017: CBR Matrix for Inclusive Implementation|42(1) Statute Law Review 88-100(2021).

determines whether or not the person is fit to get a medical certificate.⁸⁷

A suspected lunatic may be detained for a maximum of 10 days at a time; but, unless the magistrate expressly permits it, no one may be detained for longer than 30 days after the day they were initially brought to the magistrate's attention.

The person in charge of asylum must give the magistrate their approval before they can issue a section 7 or section 10 order for the imprisonment of a dangerous or unfit lunatic. Additionally, the petitioner's or another person's written promise to cover the lunatic's maintenance must fulfil the Magistrate for the issuance of that directive.

Within seven days of the petition's submission date, a doctor who has personally examined the alleged lunatic must sign a medical certificate. The doctor who signs the certificate cannot issue a reception order that is not backed by a physician's certificate if it takes two certificates.⁸⁸

Second, before a reception order is granted, the alleged lunatic must have an individual examination by each physician if two medical certifications are required.

The Indian Navy Discipline Act of 1934 (34), which amended the 8 [Army Act (44 & 45 Vict., c58)], Military [naval], and Air Naval Discipline Act, applies to any European subject to the lunatic's declaration of insanity. An administrative medical professional may request a break. officer if he thinks that people who are insane ought to be placed in a facility.⁸⁹

3.7 THE MENTAL HEALTH ACT

India's Mental Health Act became a legislation on May 22, 1987. The measure is described as "A bill to strengthen the protection of the property and affairs of people suffering from mental illness by consolidating and revising existing laws" in the first sentence of the introduction. The first law in the nation addressing issues related to mental health was the Indian Lunacy Act of 1912. In place of the Mental Health Care Reform Act of 1987, which became effective on April 7, 2017, a new law was passed on May 2, 2017, which aims to protect, promote, and uphold the rights of individuals

⁸⁷ Kaustav Chakraborty (ed.), West Bengal: Its Contribution to Indian Psychiatry (Jaypee Brothers Medical Publishers, 2019).

⁸⁸ R. M. Duffy and B. D. Kelly, —History of Mental Health Legislation in India, in India's Mental Healthcare Act, 2017 51-59 (Springer, Singapore, 2020).

⁸⁹ M. E. Karim and S. Shaikh, —Newly enacted mental health law in Bangladesh 18(4) BJ Psych International 85-87(2021).

with mental illness while providing mental healthcare and services. Mentally ill individuals are more prone than the general public to experience abuse or have their rights infringed. If they are not protected, anyone in the community could take advantage of them. In India, mental health services are undervalued in terms of public health. Mental health laws will be very beneficial to those who are struggling with mental health concerns. Its main objective is to enact legislation that will enhance the mental and general well-being of city dwellers.

Mental health regulations were originally designed to isolate dangerous people from the general public for their own protection. Because of the WHO's definition of "health," human rights advocacy, and strategies for promoting health and aiding in the healing process or injury, there has been a shift in care delivery from 74authorized74d74n7474d settings to community-based settings. These four causes have all contributed to this transformation. This paradigm shift has led to a reevaluation of mental health laws around the world. Stigma can harm a person's capacity to receive the necessary care and treatment in addition to having a negative effect on health care. These limitations may cause people to feel more alone, This could result in mental health problems.⁹⁰

Amendments to the Mental Health Act (1987; MHA 1987) are necessary because, in light of two noteworthy occurrences, the 1987 MHA modification is deemed essential at this time. Due to modifications made to the 1993 The definitions of "international covenants" and "human rights" are found in the Protection of Human Rights Act. The 2007 ratification of the Convention on the Rights of Persons with Disabilities reinforced the 1987 MHA changes.

The Indian Lunacy Act, 1912, was in effect until 1993. MHA (1987) is divided into ten chapters, each of which consists of 98 pieces. Here are some of the problems and possible fixes for you to think about.

To protect their rights, the MHA's preamble should mention the rights of people with mental illness (1987). Families provide the majority of care in India, thus it's important to find a balance between their rights and the family's. The Indian Inadequate mental health resources require taking patients' and carers' perspectives into account.

⁹⁰ A. Mishra and A. Galhotra, —Mental healthcare Act 2017: Need to wait and watch 8(2) International Journal of Applied and Basic Medical Research 67(2018).

People with mental diseases have the right to high-quality, readily available mental health treatments as part of their human right to health. The only method to do this is through the National Mental Health Programme. Therefore, the emphasis needs to shift from respect to a more ‘fulfillment-oriented’ methodology.⁹¹

Mental retardation should no longer be included in the definition of “mental illness,” as many individuals with this condition require psychiatric care.

The 1987 MHA does not provide significant review or appeal procedures for individuals with mental illnesses. Thus, it is possible to draw the arbitrary and erroneous conclusion that the MHA (1987) mechanism for involuntary 75authorized75d75n75 and treatment is flawed. The Act contains a serious defect in this sense. This makes it important to 75authorized the appeals and reviews procedure in a way that is clear-cut, equitable, rational, and just so that patients in mental health facilities can easily access it.

Families dealing with mental illness are unable to receive the necessary emergency assistance because of the Mental Health Act of 1987 (MHA). The Indian Supreme Court has ruled that physicians employed by private practices or government hospitals are entitled to a professional duty to provide a patient in risk with life- saving medical attention. The United Nations has also 75authorized the fundamental right to health. If they are expected to report minor offences like theft, property damage, or violence, family members of the mentally ill must do so with the police. A person with a mental disorder is brought into custody and held in court custody for years after a small offence is reported and a formal complaint is filed without getting medical attention. It is very difficult to acquire a reception order in the current MHA 1987. To expedite the process of obtaining an order of protection, the judiciary’s role must be diminished by the establishment of tribunals, hospital boards, or committees of review, such the Child Welfare Committee (CWC) established under the Juvenile Justice Act. The procedure for accepting patients with wandering mental diseases must also be expedited, and the Act requires police officers to be held accountable for and informed about facilitating these people’s admission to hospitals.⁹²

When a very ill patient refuses proven treatments such as medication or modified

⁹¹ C.Lahariya, —Strengthen mental health services for universal health coverage in India 64(1) Journal of postgraduate medicine 7(2018).

⁹² M. M. Hossain and N. Purohit, —Improving child and adolescent mental health in India: Status, services, policies, and way forward 61(4) Indian Journal of Psychiatry 415 (2019).

electroconvulsive therapy, MHA (1987) makes no mention of whether or not a treatment is permitted. (ECT) In cases where a patient is unable to give permission, a few Organisations have set uniform guidelines. An RMO or superintendent of an institution serves as a trustee or surrogate guardian on behalf of two independent psychiatrists. It is time to end the argument about modified vs unmodified ECT since it is becoming increasingly important that the treatment be accepted in terms of human rights. Modified ECTs are therefore need to be included in the updated MHA. Clinical trials involving people with mental illnesses should closely conform to the ethical standards set forth by the ICMR. Admittance without consent shouldn't be mistaken for coercive intervention. It's important to authorize and outline the forced therapy technique.⁹³

Mental health laws require quick revision in order for the state to authorize its obligations both domestically and internationally to its citizens. The rights of those who are mentally ill must be protected. It's crucial to keep in mind that families in India provide the majority of care, hence these rights must be compared with those of families. The existing status of resources must be considered before making planned modifications, and baselines must be set. The financing of mental health authorities is essential to their capacity to perform their duties.

⁹³ S. B. Math, G. S. Gowda, et.al., —Cost estimation for the implementation of the Mental Healthcare Act 2017|61(4) Indian Journal of Psychiatry S650 (2019)

CHAPTER-4

UNDERSTANDING THE FORENSIC TESTING AND SCREENING PROCESSES

4.1 CLASSIFICATION OF SUBSTANCES

Legal science encompasses far more than just DNA testing and fingerprint analysis. In order to consolidate the various claims to fame in the field, eleven specific scientific science fields are officially authorized by the American Academy of Forensic Sciences (AAFS).

The Master of Forensic Sciences programme at Public University provides both theoretical background and hands-on training in criminology and crime scene investigation techniques. When you first begin working as a quantifiable researcher, you most likely won't have a not yet characterised forte. You could develop competence in one of these types of quantifiable sciences as you continue to learn and acquire insight at work or via additional coursework.

The application of the study of physical or natural humanities to the proper cycle is how the American Board of Forensic Anthropology (ABFA) defines its field. The following sub-disciplines make up the Measurable Human Sciences: Social Humanities,

Semantics, antiquarianism, and the physical sciences of human nature. When combined, these speciality areas might "authorize to reproduce however much as could reasonably be expected with regards to an individual's life and demise," according to the AAFS in its profession guide. In order to accomplish this, forensic anthropologists examine the skeletal remains to note characteristics, cause of death, injuries or illnesses, time elapsed since death, and other findings that might lead to investigating a crime, identifying a mysterious victim, or in any case supporting excavated stays on a prehistoric research burrow.

Most legal anthropologists hold a Ph.D., and they typically don't have full-time jobs in the legal sciences. Instead, they may work for a university, a historical site, the military, or a clinical association and provide the kinds of support that they provide to local investigative labs as needed. Although a postgraduate degree is required to hold this designation, specialists may also collaborate with experts in the

criminological humanities to collect, prepare, examine, and record examples as part of a legal examination.

When people think about what a criminological researcher does on a daily basis, they most likely envision criminalistics-related tasks, such as quantifiable ballistics. Many items are taken from the scene of a crime, but not all of them are useful. That's the location where criminals enter.

These specialists, who are usually located in a legal lab, have two main goals:

- 1) To identify evidence, link individuals and articles, and discern via that evidence.
- 2) There are times when criminalists possess specific knowledge in areas of real evidence, such of which further planning is necessary, such as:

- Guns (legal ballistics).
- Toolmarks.
- DNA.
- Fire and blast trash.
- Controlled substances.
- Follow proof.
- Natural life.

Professionals in criminalistics have the opportunity to work for a variety of organisations, such as state and felony labs, police departments, government agencies (such as the FBI, DEA, or ATF), clinical inspectors' offices, and, rather unexpectedly, the U.S. Postal Service.

A criminologicalistics 78authorized78d78n is available in the Master of Forensic Sciences programme at National University. This programme includes courses in follow proof, advanced measurable toxicology, advanced criminological serology, and scientific human studies. A lot of years ago, regulatory permission and labs were nonexistent. Today, they are handling breaches (and, consequently, proof). This suggests that the field of 78authorized78d and mixed media sciences is one of those fields that is constantly evolving, and that the field of crime scene investigation will continue to improve as long as innovation changes.

In order to locate and evaluate evidence, legal professionals in this field, according to

AAFS, examine apparatuses, programming programmes, and 79authorized79d documents (sound, text, picture, video, and so on). “Find” is a buzzword here because terabytes are frequently found.

Of data, lengthy segments of video (from security or traffic cameras, for example) to analyse before discovering anything noteworthy or relevant. Here are just a few examples of the responsibilities of a high-level scientific researcher:

determining if a digital image has been altered. Examining a recording’s acoustics. Identifying the devices connected to a system. Determining if data has been removed from a device or drive. Locating a distant client or framework. Following up with a victim or suspect after receiving information. This is when preparation from a good scientific science programme will come in handy. For example, the Digital Evidence course at National University offers a variety of 79authorized79d testing techniques and protocols related to crimes like fraud, extortion, and following.

The International Association of Computer Investigative Specialists is an expert association for highly qualified experts, much as many branches of scientific inquiry. According to the AAFS, this field is home to the most evolved collection of legal experts: problem Someone having a background in one of the numerous scientific or physical science subfields within the field of design. These experts are asked to look at items in both common and criminal instances, like as-

- Car accidents.
- Building breakdowns.
- Train crashes.
- Blasts.
- Item disappointments.
- Ecological pollution.

Someone with a solid background in science and a passion for crime scene investigation might excel in this area. In actuality, a lot of people pursue an online certificate programme in legal sciences after earning a bachelor’s degree in science.

Chemistry of organic matter, or design. It also helps to understand physics, math, and topography. Experts, practitioners, and other social scientists can contribute to the area of criminology by conducting surveys or providing testimony in criminal or civil proceedings.

Experts are medical professionals with additional training on the legal ramifications of their expertise. In fact, some choose clinical residency programmes specifically designed for this kind of training. They could assist in determining a person's suitability for standing preliminary or assessment problematic conduct associated with a transgression. Scientific therapists can also assist with issues involving child abuse, maltreatment at home, reception, child care, and care.

The concept of criminal profiling may come to mind when thinking about scientific brain science. Although this is undoubtedly one area where therapists can assist regulation authorization specialists, they can do much more with their particular training.

Social scientists such as therapists and analysts can contribute to the field of criminology by conducting surveys or providing testimony in criminal or civil trials.

Therapists are clinical experts who have most likely received further training regarding the relationship between their profession and the law. In fact, some choose clinical residency programmes specifically designed for this kind of training. They could assist in determining a person's suitability for standing preliminary or assessment psychological instability in relation to misconduct. Measurable specialists can also assist in issues involving child abuse, reception, child care, violent 80uthoriz at home, and authority.

When you think about scientific brain science, criminal profiling might come to mind. Though they can use their specific training for much more, this is undoubtedly one area in which therapists can assist regulation authorization specialists.

4.2 APPLICATION OF FORENSIC LAWS RELATED TO TOXICITY INVESTIGATION AND SAMPLING

According to the National Crime Records Bureau (NCRB/Ministry of Home Affairs) annual report, 20,587 people died as a result of poisoning in 2014. This is a rate of about 4.6% of all reported accidental deaths, which is fortunately a high number.

not quite the numbers from the previous few years. Even still, the worrying increase in cases consistently causes public authorities to become stressed.

As is evident, Medico-Legal aspects of the harmful effects of synthetic chemicals on humans are managed by forensic toxicology. 'Lawful' is a phrase that aptly describes the overt intrusion of law into the field of toxicology. Numerous legal measures that regulate and restrict the manufacture, distribution, transportation, and ownership of drugs and poisons have been passed. As ancient as human society appears to be, poisoning has always existed. According to all accounts, Lex Cornelia (c. 82 BC) was the first law pertaining to toxic chemicals. It eventually became an administrative rule that addressed careless pharmaceutical packaging. Some major solutions pertaining to toxic substances and their handling or misuse are essentially in place in India and have been investigated in this section.

The Indian Penal Code's corresponding Sections handle offences that cause injury. Section 272: Adulteration of food or beverage items that are anticipated to be sold It says, "Anyone who contaminates food or drink in order to render it harmful as food or drink, suggesting to sell such an item as such, or authorize that it is likely that something similar will be sold as such, will be met with a penalty that could amount to a half-year in detention for all intents and purposes, a fine that could amount to one thousand rupees, or both.

Food adulteration is a risk associated with modern guilts. Synthetic chemicals are used in consumable materials for various goals, such as early maturing and artificial taste, in order to profit financially. Most of these artificial Even drugs have inherent dangers. Subsection 273: Hazardous food and beverage sales Anybody who sells, manufactures, or makes available for purchase any item that has been delivered, turned poisonous, or is in a condition unfit for food or drink, knowing or having incentive to accept that the equivalent is poisonous as food or drink, will be met with rejection and may be detained for up to six months, or with a fine of up to one thousand rupees, or with both.

Subsection 274: Medication adulteration

Anyone who taints pharmaceutical or therapeutic arrangements in a way that reduces their viability, modifies their action, or makes them more difficult to use poisonous, intending to sell it or use it for any clinical purpose, or authorize that it

will typically be reasonable to do so for any clinical reason, as though it had not gone through such a contamination, will be rejected with detention of one or both for a term that could last up to six months, with a fine that could last up to one thousand rupees, or with both.

Section 275: Disposal of contaminated pharmaceuticals

Whoever is aware that a drug or clinical plan has been tainted in such a way as to reduce its potency, alter its effects, or cause harm, sells it, or uncovers it and makes it available for purchase, or distributes it from any dispensary for medicinal purposes as pure, or allows it to be used for therapeutic purposes by anyone unaware of the corruption, will be met with either or both of the following consequences: detention of one or both of the products for a period that could last up to six months, a fine of up to 1,000 rupees, or both.

Section 276: Selling drugs as a substitute drug or combination

Anybody who intentionally distributes, manufactures, makes available for purchase, or issues from a dispensary any drug or clinical arrangement for restorative objectives, as a substitute drug or clinical preparedness, will be met with a fine of up to 1,000 rupees, or both, or with the imprisonment of one or more of the offenders for a period that might last up to a half year.

Subsection 277: Polluting public spring or supply water

Anyone who knowingly tampers with or pollutes the water of any open spring or supply, making it less suitable for the purpose for which it is typically used, faces punishment that could include up to 90 days in jail, a fine of up to 500 rupees, or both.

Section 278: Poisoning the environment for human health

Anybody who knowingly destroys the environment in any location to make it hazardous to people's health is either a local resident, a company owner, or someone who passes along a public road, will be authorized with a fine that could reach 500 rupees.

Section 284: Incompetent handling of toxic substances

This Section addresses negligent authorization related to toxic substances. It says,

Anyone who uses a harmful substance in a way that is so reckless or careless as to endanger human life or likely cause harm to any individual, or who intentionally or carelessly refuses to use any toxic substance that he owns in a way that is sufficient to prevent Any reasonable threat to human life posed by such a poisonous material will be met with up to half a year in jail, a fine of up to Rs. 1000, or both. This offense's primary component is culpable negligence when it comes to dangerous chemicals. The fact that someone is in charge of any dangerous substance forces him to exercise caution simply by being the reality.

Section 299: Crimes culpable At-fault manslaughter is managed in this section.

Whoever causes death by performing a demonstration that is proven to cause death, or fully intends to cause such substantial injury with no guarantees that it will cause death, or with knowledge that he is reasonable to cause death by such demonstration, submits the offence of guilty homicide,¹ the statement reads. Like that In addition to conventional weapons of attack, poisonous materials are used in demonstrations.

Section 300: Assassination

This section addresses the fear of homicide and is essentially the same as the definition of Guilty Homicide under IPC \ 299; however, it ⁸³authorized the goal and intention of the offender more. The punishment for chargeable murder can range from any length of imprisonment up to a life sentence, while the punishment for homicide might include the inconvenient death penalty.

The minimum penalty is life in prison. But one of the hardest things to identify and address in cases of hurting someone else is the place of aim.

Section 304A: Causing death via negligence

Whoever causes the demise of any individual by doing any impulsive or careless demonstration not adding up to punishable murder, will be rejected with detention as long as two years, or fine, or both¹. It handles passing brought about by a rash or careless demonstration. This type of reckless ⁸³authoriz might include not only the irresponsible use of a vehicle or equipment but also the handling or possession of hazardous materials. For example, if a researcher leaves a storage room with hazardous drugs accessible and a child inadvertently takes those pills, out of his

curiosity, which led to his demise. In that case, this Section will hold the scientist accountable. In addition to Section 304A, these situations may also give rise to Section 284 of the IPC.

Subsections 324: intentionally harming others using dangerous tools or techniques

This section controls the infliction of injuries using any potentially dangerous tool or technique (including the use of toxic substances). It says, —Whoever willfully causes harm by means of any weapon that can be used to shoot, wound, or cut, or by means of any weapon that, when used as an offensive weapon, is likely to cause death, or by means of fire or any heated substance, or by means of any toxin or destructive substance, or by means of any substance that is harmful for a person to inhale, swallow, or come into contact with go into the blood or through any creature, you risk being punished with a fine, three years in jail, or both.

Section 326: Willfully inflicting terrible harm by dangerous tools or techniques It reads as follows:

Whoever, except in circumstances allowed by Section 335, willfully causes horrifying harm by means of any weapon used for shooting, wounding, or cutting, or by means of any weapon that, when used as an offensive weapon, is likely to cause death, or by discharge or any warmed substance, or by means of any toxin or destructive substance, or by means of any unstable substance, or by means of any substance that is harmful to the human body to breathe in, swallow, or enter the bloodstream, or through any creature, will be met with permanent detention, or with one or more terms of detention for a term that could extend up to ten years, and will also be liable to a fine. With the exception of the method in which it is phrased, this Section and Section 324 are nearly identical. That the harm inflicted should fall within one of the eight categories listed in area 320, more especially,

1. Weakening
2. An extremely resilient loss of vision
3. Auditory
4. Any joint or portion
5. The incapacity of any joint or portion to exert force

6. Profoundly persistent facial or head deformity
7. Any fracture or separation of a tooth or bone
8. Any injury that puts the victim's life in danger or puts them in terrible actual suffering, or unable to engage in his usual activities for a minimum of 20 days.

Section 328: Using poisoning or other harmful substances with the intent to commit an offence

This Section controls harms, just like Section 284 does. It says, "Anyone who gives someone access to a poisonous substance, or a visually appealing, intoxicating, or unhealthy medication with the intent to harm that person will be met with up to ten years in jail and fined accordingly." As a procedural rule, the Code of Criminal Procedure controls official action at various stages of investigation and inquiry.

Section 39: Data on specific offences to be made public Assistance to the Magistrates and the Police is covered in Section IVB of the CrPC. Within this division, Area 39 states that, in accordance with Section 39 (1) of the Criminal Procedure Code. If he fails to do so, he will be held accountable in accordance with section 176 of the Indian Penal Code.

Sub-Section (1) begins as follows: Every person, aware of the commission of, or the intent of another person to submit, any offence punishable under any of the corresponding sections of the Indian Penal Code (45 of 1860), particularly (iv.) sections 272 to Sections 302, 303, and 304 (i.e., offences affecting life) and the two comprehensive (i.e., offences related to contaminated food and pharmaceuticals, etc.) are included in (v.). Area 174: Police should inquire about and furnish information about self-destruction, and so forth. It states that:

(1) When the person in charge of a police headquarters, or any officer specially authorized by the State Government for that purpose, receives information indicating that a person has committed suicide, or has been killed by someone else, by a creature, by hardware, by accident, or under circumstances raising a reasonable doubt that someone else has committed an offence, he will promptly report the information to the closest Executive Magistrate authorized to conduct investigations. Additionally, unless otherwise directed by any State Government

standard or by a specific or widespread request from the District or Subdivisional Magistrate, he will proceed to the location of the deceased person's assortment and, while in the presence of at least two respectable local residents, will conduct an examination and prepare a report detailing the apparent cause of death, including wounds, fractures, and distinct physical marks that may be present on the body, along with information about how, by what weapon or instrument (if any), or how the stamps appear to have been caused.

(2) The report will be approved by the police and other individuals, or by the majority of them who concur, and it will be sent right away to the District Magistrate or the Sub-divisional Magistrate.

(3) When—

(I) the case involves a woman who destroys herself within seven years of getting married; or

(ii) the case relates to a woman's death within seven years of her marriage under circumstances that reasonably raise the possibility that someone else committed a crime analogous to that woman; or

(iii) The case relates to a woman's death within seven years of marriage, and any family member of the woman has requested assistance for this purpose;

(iv) There is any doubt regarding the cause of death; or

(v) the police believe it is practical to do so for any other reason, in which case he will forward the body, subject to any guidelines the State Government may recommend for this purpose, to the nearest Civil Surgeon or other qualified party for analysis. Clinical man assigned by the State Government for this purpose, provided that the weather and distance allow it to be conveyed without risk of rotting everywhere that would render such an assessment unnecessary.

(4) Any District Justice or Sub-divisional Magistrate, as well as any other Executive Magistrate infrequently appointed for this purpose by the State Government or the District Magistrate, are authorized to conduct investigations alongside the accompanying Magistrates.

Area 176: The magistrate's investigation into the cause of death

(1) where a person dies while in the custody of the police or where the matter is of the kind mentioned in sub-Section (3) of Section 174's provision (I) or statement (ii), the nearest magistrate authorized to make decisions in that situation any Magistrate so engaged may hold a request into the cause of death either in lieu of or notwithstanding the police examination; if he does so, he will have all the powers he would have in conducting an investigation into an offence. To hold investigations will, and in some other case referenced in sub-Section (1) of Section 174.

(2) The magistrate who grants such a request shall record the evidence he has gathered in connection with it in any manner thereafter advised by the facts of the case.

(3) The Magistrate may order the body to be removed from the ground and examined if they believe it would be prudent to examine the deceased and determine the cause of death for any person who has already been buried.

(4) In the event that a request is made under this section, the magistrate will, to the extent that it is feasible, notify the surviving family members of the deceased whose names and residences are known and allow them to attend the request.

4.5 THE POISON ACT, 1919

This Act was repealed in 1960 after being modified in 1958. It controls the entry of toxic materials into India, issues permits for the possession of particular compounds that have been found to be toxic, and sets restrictions on the sale of these materials which are typically synthetics—as poisons needs to be figured out.

4.6 MEDICATIONS AND COSMETICS ACT, 1940

This Act is now referred to as the Medicines and Cosmetics (Amendment) Act, 2008, having undergone changes in 1964 and as recently as 2008. It oversees the production, distribution, and sale of a variety of drugs, including Allopathic, Ayurvedic, Unani, Siddha, and so forth, aside from cosmetics. As per the Act, any restricted or licenced restorative arrangement must display the holder's name along with the particular equation or a list of the fixings. The amended Act has increased the severity of punishment for a number of offences, such as providing false prescriptions, tampering with pharmaceuticals and cosmetics, defiling harmful substances, and so on.

4.7 THE DRUGS AND COSMETICS RULES, 1945

This is a section of the Drugs and Cosmetics Act of 1940 and, in addition to exercising control over the preparation, distribution, and disposal of pharmaceuticals and cosmetics, it deals generally with the standard and type of medications. 1988 saw revisions, and it is now presently mentioned as the 1988 Drug and Cosmetic Regulations (Eighth Amendment).

All categories of drugs used in medicines have been covered, including homoeopathic, 88uthoriz, unani, siddha, and allopathic. It is required that all pharmaceuticals and cosmetics be presented in an appropriate manner. To urge the State and Central Boards that assist governments on certain topics related to drug control have been established:

1. The Technical Advisory Board on Drugs The committees for Ayurvedic and Unani medicine,
2. The Drugs Consultative Committee.

Established in 1962, the Central Drugs Testing Laboratory (CDTL) was designed to make it easier to examine or test medicine tests in order to assess their quality. Drug Control Laboratories have also been established by individual states. Strict guidelines have been established for the packaging, loading, and distribution of subpar or dishonest drugs.

CHAPTER-5

UNDERSTANDING THE EXTENT OF ADMISSIBILITY OF FORENSIC EVIDENCE

5.1 UNDERSTANDING THE CONCEPTS ASSOCIATED WITH RELEVANCE OF FACTS

This section would outline the extent to which the evidence acts allows forensic science and considers the same to be an integral part of investigatory evidence. The discussion here will include summarized literature signifying the major concepts understood.⁹⁴ This part would also describe how the study's objectives are being served by the interpretation of the data that has been gathered. The Indian Evidence Act, which establishes the scope of gathered facts that may be introduced in court during trial and litigation, is closely related to the forensic investigative features. In order to increase the use and breadth of forensic inquiry in criminal investigations and research, the Indian government has implemented a number of initiatives. Early in 2020, the National Forensic Sciences University Bill was passed. One of the main benchmarks that is in charge of 89authorized89 the use of forensic investigation principles and trials is the criminal justice system. The extent of forensic Science is enormous, especially when it comes to areas like criminal investigation and major legal infractions, which may involve crimes like rape and murder. The main goal of this branch of research is to give the authorities—the courts and police, for example—information that they may use to verify the veracity of later-produced evidence. Technology from fields like physics, biotechnology, computer science, and forensic molecular component analysis is used in evidence analysis approach. It's also critical to comprehend.⁹⁵ It's critical to know the boundaries of what forensic evidence can be admitted into a court of law. It is essential to 89authorize the advantages of the same and comprehend how these would also aid in determining the extent to which these proofs can be accepted by judicial authorities. The method by which forensic There are also a lot of arguments about evidence. Determining the

⁹⁴ J.S. Sehrawat and D. Sankhyan, —Forensic Anthropology in Investigations of Crimes Against Humanity: Global Dimensions and the Mid-19th-Century Ajnala (India) Massacre|33(1) Forensic Science Review 37-65 (2021).

⁹⁵ M. Elavarasi and N.M. Elango, —Analysis of Cybercrime Investigation Mechanism in India|10(40) Indian Journal of Science and Technology 682-684 (2017).

extent to which forensic evidence admissibility may not be viewed as a breach of constitutional rights is essential. It is imperative to comprehend the extent to which the admissibility of certain offences contributes to an understanding of individuals' rights. It is critical to comprehend how these elements support the further advancement of forensic research and technology. The degree to which evidence is admissible in this regard is an important consideration. Testimonials and witnesses may be admitted in court before a judicial magistrate under the Indian Evidence Act. It's critical to comprehend how these elements would support the procedure of collecting and using the data from the investigation. It's also critical to comprehend how these actions contribute to making sure that different laws and requirements are taken into account when presenting evidence in court. Assessing how situations involving the presentation of forensic evidence have to be looked into in different trial courts is equally crucial. It's also critical to evaluate how these data can be collected and admitted into evidence in a court of law. The way the evidence should be presented for proper judicial examination and analysis is equally crucial to consider⁹⁶. Comprehending the degree to which these elements ought to be 90authorized90 and 90authorized90 is crucial to guarantee suitable evaluation and interpretation in legal proceedings via appropriate rulings. Understanding the phenomena surrounding the admissibility of witnesses and evidence in a court of law and how it might guarantee a high level of immediate efficiency is crucial. It's critical to comprehend the degree to which different judicial system management processes influence the recognition and acceptance of evidence in legal proceedings.⁹⁷ It is also essential to comprehend how the Indian Evidence Act's implications relate to acceptance in cases involving judicial review; this feature would also make it possible to acknowledge these evidences in an appropriate manner. Finding out the rules governing admissibility of evidence in a court of law and the degree to which such rules are 90authorized there are vital. Given this, it has also been noted that these elements may allow a plaintiff or witness to assert the benefit of the doubt; hence, consideration of these elements of evidence-based theories should be given due consideration. Additionally, It's critical to comprehend how these elements may facilitate the act of acknowledging evidence. Understanding

⁹⁶V. Prasad and S. Lukose, —Role of nanomaterials for forensic investigation and latent fingerprinting—a review165(1) *Journal of forensic sciences*26-36 (2020).

⁹⁷ G.Sujatha and J. Muruganandhan, —Determination of reliability and practicality of saliva as a genetic source in forensic investigation by analyzing DNA yield and success rates: A systematic review”31(3) *Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology*218-227 (2019).

the elements that could lead to a suitable source of inquiry is also crucial because of the elements that make it possible to create petitions and appeals based on these facts. It's also critical to comprehend how these elements might be taken into account for things like how the Indian Evidence Act is applied to support the admissibility of evidence.⁹⁸ It is imperative to evaluate additional issues, such as the possibility of several trials in cases where the forensic evidence may be unpalatable or skewed in the decisionmaking process. It's also critical to comprehend how these features have aided forensic specialists in their efforts to obtain and compile evidence for research purposes. To obtain adequate evidence for the study, it is critical to ascertain the degree to which forensic evidence involving fingerprints, blood, and fluid is used. Comprehending the admissibility of non-identifiable objects is important to comprehend the process by which a criminal authoriz transpired. Understanding the criminal procedural code as it relates to the forensic procedure is equally crucial. Research. It also covers things like how investigative sections are examined in different clauses and how much these might aid in the right actions being made to put an end to such incidents. The elements pertaining to the examination of different sections and clauses that must be reviewed in accordance with the Indian Evidence Act must also be taken into consideration. Determining the kinds of evidence that can be successfully submitted in court for trial and litigation reasons is also crucial.⁹⁹ It's also critical to take into consideration elements like trial and courtroom improvisation when presenting evidence. To guarantee that documents are properly admissible, it is crucial to comprehend how evidence might be presented and assessed. To prevent improper evidence presentation and accumulation, it is also essential to assess the track record and prior case histories of criminal acquittals. It's also critical to comprehend how the gathering and presenting of evidence would empower a court of law to present reliable proof. Recognising the extent to which these can be admitted in court under the Indian Evidence Act is also crucial. It's also crucial need to mention that thorough analysis is necessary for forensic inquiry in India.¹⁰⁰

Gathering and presenting evidence is another crucial component that needs to be

⁹⁸ S. Mishra and G. Singh, —Forensic accounting: An emerging approach to deal with corporate frauds in India 9(2) Global Journal of Enterprise Information System 104-109 (2017).

⁹⁹ S. Basu, —Forensic Science and Scientific Measures of Criminal Identification in British India 54 Indian Journal of History of Science 189-201 (2019).

¹⁰⁰ D.M.A. Bhinder, M.Y. Zahoor, et.al., —SE33 locus as a reliable genetic marker for forensic DNA analysis systems 48(3) Turkish journal of medical sciences 611-614 (2018).

taken into account in this context. Significant provisions are still needed for the admissibility of the same in trial and lower courts in order to impart just and fair decision-making. As per the provisions of the Indian Evidence Act, it would also assist candidates in understanding the nature and statute of laws relevant to forensic inquiry. Any call plate incident involving two people is subject to legal action in court.¹⁰¹ A dispute often arises when the two parties involved are unable to come to a consensus on a matter and both feel that they are correct. Both criminal and civil court cases are the final results of legal disputes that wind up in court. When it comes to civil court issues, one of the two parties engaged in the dispute has a right or a duty, while in criminal court cases, the parties are either guilty or not. Any of the two distinct categories of court cases begin with a fact, namely a primary fact around which customs can be formed. Factual elements can also be classified into two categories. The two distinct categories There are two types of facts: psychological and material.

When the term “material fact” is used in a court case, it refers to any fact that can be experienced by all five senses. For example, in a criminal case, a material fact may be the mother of the defendant. However, certain facts—known as psychological facts—are distorted to support the position of the party involved in the trial. If not, any psychological disorder or condition that we experienced that affected the truth of the fact can be called a psychological fact.¹⁰² However, the full fact-checking procedure is carried out in court and is supported by testimony or other forms of evidence. As stipulated by the Indian Evidence Act, evidence is anything that must support the facts presented by the parties in a legal proceeding in order to guarantee the veracity of the claims made by the parties. A testimonial statement, on the other hand, is a declaration made by an eyewitness that is also used to support any allegations made by any of the parties in the case.

When it comes to criminal proceedings, the accused may be found guilty or innocent by the court, and the evidence pertaining to a criminal act has the power to drastically alter the trajectory of the court’s case. Any individual who is being tried in court for a criminal crime is presumed innocent until and until the law and the prosecution

¹⁰¹ M.S.A. Samad, G.K. Varghese, et.al.,—Fitness Evaluation While Using Contaminant Transport Models For Environmental Forensic Investigation|119 Energy Procedia792-800 (2017).

¹⁰² P. Kacker and A. Pandya, —Forensic Psychology for Prevention of Crime and Rehabilitation of Offenders: Public Health Perspectives| 1(1) Gap Indian Journal of Forensics and Behavioural Sciences 5-6 (2020).

establish otherwise the law and requires sufficient proof in order for the guilty to face punishment.¹⁰³

However, there are also cases where someone is set up to commit crimes, in which case sufficient proof is needed to refute the accusations made in order to establish the accused's innocence. And the most reliable evidence that can prove someone guilty or innocent when it comes to forensic evidence is that which supports the former theory. A crucial component of both criminal and civil law, forensic science—also referred to as criminalistics—is used to collect forensic evidence. When someone is charged with a crime in a legal proceeding, a forensic investigation obtains proof or specifics of the offence during a criminal inquiry.¹⁰⁴ Forensic investigators gather concrete evidence of the crime throughout that time of inquiry, which is more useful than any general evidence presented in court. The 93authorized93 of forensic evidence in legal proceedings is regarded as a means of ensuring equitable justice for all parties concerned. The evidence gathered through forensic investigations has consistently proven beneficial in numerous cases by assisting in the identification of the real offender and bringing about justice for the impacted parties.

There are four categories of evidence that may be offered in court, and forensic evidence is among the most potent forms of genuine evidence that courts are now aware of. Genuine evidence may include a bloodstained article of clothing, any object found at the crime site, DNA evidence pointing to the perpetrator, etc.¹⁰⁵ True proof may only be obtained by use of forensic evidence. Nevertheless, the court system also 93authorized three additional sorts of evidence: demonstrative, documentary, and testimonial evidence. When an eyewitness who was there at the site of a crime or occurrence provides testimonial evidence, it is said to be include information about criminal activity that is provided to the court of law or a testimony attesting to the veracity of the account given by any of the parties engaged in the legal dispute. Alternatively, demonstrative evidence is presented in court 93authorize graphics such as maps, animations, infographics, and the like methods.¹⁰⁶

¹⁰³ P. Nema and P.K. Nema, An Autopsy based Study About Bisexual Variation for Determination of Age from the Fusion of Manubrium with the Body of Sternum in the Central India Indore Region (MP) 13(3) Indian Journal of Forensic Medicine & Toxicology84 (2019).

¹⁰⁴ H.F. Villar-Vega, L.F. Perez-Lopez, et.al., —Computer forensic analysis protocols review focused on digital evidence recovery in hard disks devices1418 Journal of Physics: Conference Series 012008 (2019).

¹⁰⁵ M. Gangwani, —Suitability of forensic accounting in uncovering bank frauds in India: an opinion survey128(1) Journal of Financial Crime 284-299 (2020).

¹⁰⁶ S. Prerna, C. Parekh, et.al.,—Advancing Automation in Digital Forensic Investigation11 8(3) International

Demonstrative evidence that depicts the forensic details of the actual incident that may have occurred can be presented in court as actual evidence, for instance, if there is an ongoing legal case involving a person's suicide and the question of whether the person was murdered or committed suicide. However, the efficiency of demonstrative evidence can only be achieved if it is created by a subject matter expert in the field. Lastly, there is documentary evidence, which consists of visual recordings of the actual incident and can establish someone's guilt or innocence. For instance, in the event that If there is video footage of a robbery that was recorded and shows the thieves' faces clearly, it can be used as evidence against the robbers who are being tried and found guilty.

Confessions are a different type of evidence that is also possible. In criminal trials, confessions are considered the most credible type of evidence that may be used to support an accused person's case when they are being held accountable for their actions.¹⁰⁷ The truthfulness of the confession itself benefits the person who was accused when it comes to conditions in court because it makes sense for someone who is charged with a crime to testify against themselves and risk spending as much time in jail as the judge sees fit. The conclusiveness of the confession itself, however, is determined by the statement given to the police, which might be used as evidence against the confession presented by the accused in court. Confessions can support the evidence presented by forensic investigations as well as the forensic investigations themselves is regarded as genuine evidence, or to put it another way, hard evidence that is challenging to refute and that, in the event that the forensic evidence is insufficient, nonetheless grants the accused party the benefit of the doubt.

However, when it comes to the legitimacy of forensic science, the Indian court system places a higher priority on crime scene investigation. The criminal justice system in India handles any 94authorize, structured crime that affects members of the public who are viewed as abnormal, upsetting, difficult, indecisive, or disruptive. India's criminal justice system is entirely dependent on the police, courts, jails, and prosecution of the case.

Because of the widespread corruption in the nation, even the police's forensic investigation can be contested by the accused, and it is not uncommon for someone

Journal of Scientific Research in Science, Engineering and Technology 378-382 (2021).

¹⁰⁷ V. Chauhan, V. Singh, et.al., —Applications of nanotechnology in forensic investigation‡3(3)

International Journal of Life-Sciences Scientific Research 1047-1051 (2017).

to be falsely accused of a crime they have never committed. In order to successfully make the entire process more legitimate and ensure that justice is served and the evidence generated can be authorized correctly in a court of law, extra focus is placed on the crime scene investigation when it comes to the creation of forensic evidence.

5.2 INDIAN EVIDENCE ACT JUSTIFICATION OF ORAL EVIDENCE IN FORENSIC SCIENCE

Regarding our legal disagreement, there are two opposing parties voicing their objections and each side insisting that it is correct. In the event of a disagreement or when someone is charged with a crime, the court has no means of knowing if the charges were made against the defendant or not.¹⁰⁸ The idea that someone may have been falsely accused of a crime in court is not implausible, because the foundation of the legal system is the determination of whether or not charges filed against an individual are true. Evidence is the only thing that may establish a person's guilt or innocence for the facts put forth by both sides in a court of law dispute or for the facts put forth when someone is accused of a crime. When it comes to criminal justice, guilty or innocent. One of the most crucial and essential elements that can either prove or prevent the proof of a conflicting subject in a court of law is evidence.

In regards to the evidence issue, there are four distinct kind of evidence that may be brought up in court to support the prosecution's case against an accused individual or to establish their innocence. The factual aspect of the evidence is what gives it such tremendous relevance in a court of law, along with other sorts of evidence like genuine evidence that may be acquired via forensic investigation itself. Facts obtained at a crime scene constitute the true nature of forensic evidence, which is independent of any psychological influences. A person may be sentenced to prison time or released from prison if they are accused of a major crime and they refuse to provide forensic evidence.

Nevertheless, three more forms of evidence are also considered by the legal system: testimonial, documentary, and proved evidence. Evidence that demonstrates conclusions drawn from a criminal investigation, such as facts derived from the

¹⁰⁸ N. Monusha Chowdari, B.R. Rohit, et.al., —Extent of road traffic accidents in Mangaluru city, Karnataka, India||11 Journal of Forensic Sciences & Criminal Investigation, 55518 (2019).

case's scientific assessment, is presented as demonstrative evidence in court.¹⁰⁹ Conversely, documentary evidence, which is another type of hard evidence presented in court, is any type of evidence that provides an audiovisual depiction of the occurrence as it actually happened.

What about the testimonial, which is a type of oral evidence in which a witness is someone who provides an oral statement about an occurrence that has occurred? Finally, where is this testimonial? Any person who was present during the introduction of any legal activity is considered a witness and is able to provide the court with an objective account of what they personally witnessed. The court will take the witness's statements seriously and will consider them to be oral evidence. The Indian Evidence Act has made it clear that the term "oral" shall be regarded as distinct from the word verbal as verbal simply means "by words," which does not imply that the words were uttered. For oral evidence to be deemed inappropriate in a court of law, it must be given by a witness during testimony.¹¹⁰ The Indian Evidence Act of 1872, including sections 59 and 60, addresses the issue of oral evidence admissibility. The statute states that as verbal can mean many different things, it is forbidden to use the term "verbal" to describe a particular type of evidence when the evidence is spoken. However, section 119 of the Indian Evidence Act of 1872 also specifies oral evidence for non-intelligent corporations. In the context of this provision, "Dum" refers to a person who is unable of speaking. The act states that in cases where a witness is mute, the evidence may be presented in court in any way that the judge can comprehend legislation.¹¹¹ Put differently, in the event that an individual lacks the ability to speak, the evidence must be provided in writing or through sign language. It will still be regarded as oral evidence even if the witness fails to meet the requirements outlined in the definition of the term, which pertains to verbal expression.¹¹² According to section 59 of the Indian Evidence Act of 1872, oral testimony is not admissible in support of written evidence that has already been

¹⁰⁹ G. Damodar, and N.A. Sheikh, —Estimation of Stature from Footprints Measurements by Linear Regression Analysis in South India Population 13(1) Indian Journal of Forensic Medicine and Pathology 94 (2020).

¹¹⁰ N.T. Moorthy and A. Rasvini, —Determination of stature from dynamic footprint anthropometry in Malaysian Malayalee for forensic investigation 9(1) Journal of South India Medicolegal Association 1-7 (2017)

¹¹¹ G. Shrivastava, K. Sharma, et.al., —Role of Cyber Security and Cyber Forensics in India In I. Management Association (eds.), Cyber Law, Privacy, and Security: Concepts, Methodologies, Tools, and Applications 1349- 1368 (IGI Global, 2018).

¹¹² H. Hyderabadwalla, —Forensic Psychology in India—where are we and where are we going 5(2) Indian Journal of Mental Health 256-259 (2018).

used in court to establish the truth of a fact. When there is genuine evidence in a court of law, no type of oral testimony is admissible. This is prohibited by law because it would be pointless to produce written evidence in the first place if oral testimony had the authority to supersede factual conclusions reached via the presentation of documentation. Furthermore, it is asserted that if oral testimony was to be provided so With that much authority, oral testimony would be the only evidence that a court of law would have to consider.

The Indian Evidence legislation of 1872 states that there are several exceptions to the rule regarding the presentation of oral evidence in court. Specifically, the legislation states that oral testimony will not be accepted as genuine evidence if the witness did not utter the statements themselves. In the event that testimony given in court is not provided by the witness in question, the testimony loses all of its value and credibility, and the court forbids this from occurring since it implies that the witness's statements are not their own person throughout the testimony who is ambiguous and pertinent. Anything that cannot be proven in court is seen as important and ambiguous. The legal system is where justice is administered via the presentation of evidence.¹¹³ However, there are several exceptions to the general rule of hearsay, such as Res Gestae, which translates to “things done” in Latin. An example will help to clarify the exception made possible by the Res Gestae circumstance. For example, let's imagine there was a domestic abuse case in court. Hearsay testimony from witnesses might be admitted into evidence if it corroborates and supports previously presented information. When it comes to domestic violence, a lot of things happen outside the home, and individuals who live nearby are vulnerable to them. If certain patterns are identified by Witnesses in domestic abuse cases are said to be a type of oral evidence presented in court since they support the claims made in the case, which is also strongly supported by other evidence.

However, the Indian Evidence Act of 1872 recognises additional exceptions, such as admission and confession, wherein a confession given by the accused individual is considered hard evidence. One must comprehend what admission in a court of law implies in order to comprehend how confession is an exception to the hearsay rule in the context of oral evidence. Admission is seen as consent to a statement made by

¹¹³ A. Sharma, M. Bala, et.al., —Five case studies associated with forensically important entomofauna recovered from human corpses from Punjab, India 7(5) Journal of Forensic Sciences & Criminal Investigation 555721 (2018).

another individual, and since that is done in accordance with the law, it is regarded as oral evidence since it makes sense for someone to agree to another party engaged in the dispute.¹¹⁴ A confession is considered by the legal system to be an acknowledgment made by the accused person. The deathbed declaration is one of the many exceptions to the hearsay rule that are established in legal proceedings. A person who makes a “dying declaration” before they die away is said to have done so during their latter stages of sickness, and it is regarded as testimonial speech. When evaluating a person’s deathbed statement, the court determines that it makes sense for someone to falsely accuse someone of a crime they did not commit in writing before they pass away. Evidence in the legal system is a crucial component of any instance. Evidence is authorized by the court to determine a person’s guilt or innocence when they are accused of a crime and seek justice. The law cannot administer justice if accusations made against someone are not substantiated by actual proof. The law of evidence, according to British academic Taylor, is a technique of argumentation used to support or refute any claim or assertion. The data and information provided for a court investigation. It is possible to falsify or abuse evidence. The Latin phrase “Evidens Evidere,” which means “the state of evidence,” is where the term “evidence” originates. Each legal chamber has an evidence act of its own. During British administration, the Imperial Legislative Council first issued the Indian Evidence Act on March 15, 1872. It offers a specific body of laws and rules governing the admission of evidence in Indian courts. September 1, 1872, marked the official start of the act.¹¹⁵ The definition of evidence is merely the quality of being obvious. Documents containing facts and numbers that are presented to the court as proof of anything are known as evidence. The term “evidence” can be used by eyewitnesses or written documentation that is produced in court, according to British law. These numbers and facts were selected as reliable evidence of the truth over other arguments. Evidence can also serve to highlight a certain point or fact that is more significant than others when it comes to the topic at hand. Evidence must be pertinent to the investigation.

Following independence, the Indian penal law expanded the concept of evidence and

¹¹⁴ R.N. Jha, K.K. Badiadika, et.al., —Knowledge and Perceptions Regarding Medico-legal Postmortem Examination among the Arts and Commerce Stream Students of Mangalore, India|13(3) Indian Journal of Forensic Medicine & Toxicology 34-37 (2019).

¹¹⁵ D. Mittal, A Two-Year Prospective Study from Punjab Region of India. 19(1) Medico Legal Update 20-25 (2019).

gave it greater weight. Right now, it's limited to its literal meaning. According to that definition, facts, statistics, papers, and other items that are pertinent and appropriate for the case that is brought before a court of law as proof of truth can be referred to as evidence. It is to support the court's decision-making process in light of such evidence.¹¹⁶ This implies that during a trial, not only may eyewitness oral testimony be given, but also examined papers, confessions, and statements from any accused party. Another point to note is that, in accordance with Indian law, objects other than documents—such as tools, stolen property, or weapons—will not be accepted as evidence when someone is testifying as an eyewitness, even though they may have been a suspect before local investigators' negligence turned them into eyewitnesses. The definition of “proved” and the definition of “evidence” must be studied in tandem, under Indian evidence law. The court frequently took into account the aforementioned facts as evidence. When reaching a decision, the court considers taking a lot of factors into account. For example, a statement recorded under section 164 of the Act does not meet the Act's definition of evidence.¹¹⁷ Moving forward, even when all the other papers point to the accused, a confession from the accused will not be taken into consideration as proof of their crime. They will be found not guilty by the law. But compared to the conduct itself, the court of law has far greater authority. Even when the accused denies committing a crime, the court has the authority to consider all of the evidence and punish the accused if they find it to be true. Evidence is defined as follows under Section 3 of the Evidence Act of 1872.

Everything that the court has allowed or that the attorney or witnesses must bring up in court. The statesman must have some connection to the case. These claims are accepted as verbatim testimony. The evidence will be regarded as documentary evidence if the inspectors or witnesses produce papers or other digital facts that are pertinent to the court cases. There are two primary categories into which evidence can be placed, as shown by the Indian Evidence Act's definition of evidence. Oral evidence and documentary evidence are the two types of this.¹¹⁸ Note that there are two types of evidence: documented and oral. In court, witnesses may submit

¹¹⁶ M.M. Rohith, W.R. Belcher, et.al., —Tattoo in forensic science: An Indian perspective174 Journal of Forensic and Legal Medicine102022(2020).

¹¹⁷ S.K. Pal, A. Sharma, et.al., —Diagnosing death with diatoms: a retrospective study of forensic cases in Himachal Pradesh, India17(2) International Journal of Medical Toxicology and Forensic Medicine124-137 (2017).

¹¹⁸ P. Santra, —An Expert Forensic Investigation System for Detecting Malicious Attacks and Identifying Attackers in Cloud Environment16(5) International Journal of Scientific Research in Network Security and Communication1-26 (2018).

electronic or video recordings as proof of their testimony. Oral and documentary evidence were divided into two categories by the Indian Evidence Act. 1) Direct, also known as primary, and 2) Indirect, also known as hearsay or secondary. 'Real or substantial evidence' is another category of evidence. Items that can be used as evidence in court, such as stolen goods or weapons of crime, are referred to as material evidence. Oral evidence consists mostly of oral statements made by local inspectors or eyewitnesses and is submitted in court. There is no documentary proof to back up these statements and demonstrate their veracity. Other forms of oral evidence include recorded facial expressions and gestures.¹¹⁹ The words said by a victim or an eyewitness to the incident firsthand are considered primary oral evidence site of crime. This is referred to as direct evidence under Section 60 of the Indian Evidence Act. For instance, when a rape victim testifies in court, her statement would be regarded as direct oral evidence. As hearsay or indirect testimony is not verified by a victim or real eyewitness, it is often not taken into consideration by a court in a criminal prosecution. When it comes to hearsay evidence being admitted in court, there are, nonetheless, certain exceptions. The Indian Evidence Act's Sections 32 and 33 outline the extraordinary circumstances for hearsay testimony.

Evidence that has been produced in court and is supported by facts and statistics is known as documentary evidence. Another way to put it is that documentary evidence is defined as tangible artefacts such as letters, papers, digital recordings, and video footage. Original papers and actual dwellings are regarded as primary documentary evidence, as specified under Section 62 of the Indian Evidence Act.

However, Xerox copies of the original papers that have been submitted to the court are considered secondary documentary evidence. Nonetheless, secondary documentary evidence may be regarded as main documentary evidence in some extraordinary circumstances. The following constitutes trial evidence: 1) the things that have been admitted into evidence. 2) The testimony of both sides' witnesses during direct and cross-examination. 3) Aspects and information that both sides concur on. It should be mentioned that since attorneys are not witnesses, their claims and declarations are not accepted as proof. They speak for both the suspects and the victims. What they managed to salvage from the opening remarks or the closing

¹¹⁹ J. Iqbal and B.M. Beigh, —Cybercrime in India: trends and challenges—6(12) International Journal of Innovations & Advancement in Computer Science187-196 (2017).

defence won't be regarded as proof. "The science of the dead" is forensic science. No stories are told by the dead. But we can determine who committed the crime, when it was committed, and how it was perpetrated with the aid of forensic science. It's a science with legal purposes. All of the material evidence is gathered, preserved, and examined with the aid of forensic science. For example, engineering is used to analyse any building construction, biology is used to detect DNA, and chemistry is used to identify explosives. Experts in any of these technological domains, forensic scientists can assist in presenting evidence in court. They verify the veracity of oral and documentary evidence by authenticating it for authenticity and provide evidence in favour of the actual ones. The definition of forensic evidence is used in the course of looking into and prosecuting criminal or civil cases. It can benefit the while the court is deciding who is guilty or innocent.¹²⁰ In court, forensic evidence may be used to establish a connection between one crime and another. DNA evidence, for example, might demonstrate that a single individual has been involved in many crimes or has visited multiple crime scenes. It also aids in reducing the number of suspects so that the true offender may be quickly identified by the investigators. In order to support law enforcement and detectives conducting crime scene investigations, forensic scientists develop innovative technology. Forensic science has developed in step with technology. Numerous state-of-the-art technologies are available that can accurately and quickly identify the perpetrator.¹²¹

Professionals who operate alone or in teams typically do forensic reports. It takes careful laboratory studies to analyse any forensic evidence. Both government-run and privately owned chemical and biology labs that are exclusively designed for forensic analysis may be found throughout India. When authenticating evidence, forensic scientists have access to a variety of techniques. Any oral or written testimony can be supported by forensic evidence. The court typically assigns forensic teams to look into the evidence in unusual criminal procedures. Tests for DNA and fingerprints, postmortem reports, bloodstain patterns, physical matching, forensic pathology, and other related fields are examples of forensic evidence.

The term DNA is an acronym for deoxyribonucleic acid. It is an organic material that is present in all living cells. One may argue that DNA and RNA make up the bodies

¹²⁰ A. Johnson, A. Pandey, et.al., —A comparative study on human and domestic animal bitemark patterns: An aid in forensic investigation 27(2) Indian Journal of Veterinary Research 1-6 (2018).

¹²¹ J. Iqbal and B.M. Beigh, —Cybercrime in India: trends and challenges 6(12) International Journal of Innovations & Advancement in Computer Science 187-196 (2017).

of all living things, including humans. Similar to fingerprints, each person's DNA is unique. Each individual has a unique DNA composition. We refer to these as genetic blueprints. These blueprints may be removed from the human body with the use of forensic technology, and they can subsequently be examined in a biology lab to assist identify offenders.¹²² DNA may be extracted from a variety of human bodily tissues, including bones, organs, urine, saliva, semen, hair, and blood. Frederick Miescher, a Swiss scientist, made the initial discovery of DNA in 1869. Sir Alec J. Jeffreys discovered a means to assist the legal system in using DNA samples for forensic analysis later in 1984. The historic Enderby case, involving two girls who had been raped and killed in England, marked the first instance in which DNA was employed by law enforcement.

Each person has a unique DNA sample. DNA samples are subject to exceptions solely in cases when identical twins have identical twin DNA. Nobody is able to alter or tamper with DNA samples. The sample itself cannot be changed, however the DNA reporting documentation can be altered. DNA tests are typically used to identify criminals and murderers, as well as a child's parentage. It is admissible in a court of law as main documentary evidence. Additionally, it can aid in the resolution of legal matters like succession and inheritance.

DNA testing obtained from oral regions, such as the mouth, saliva, or teeth, may be used as oral evidence in court. DNA testing is now a standard component of all criminal trials, and reports including DNA are now considered admissible evidence. While DNA testing has shown to be an excellent tool for forensic evidence in the identification of offenders, its true potential in detecting lawbreakers and wrongly accused individuals remains untapped. Forensic science technology advancement can help achieve this. Then, a lot of opportunities for gathering and examining evidence will become available. DNA testing for forensic purposes has developed into biological evidence kinds. DNA extracted from saliva, teeth, and bones can also be regarded as forensic evidence, in addition to semen and blood in DNA testing. Since DNA is also included in these components. In order to learn more about DNA and how to extract it from various human body parts, forensic experts are doing studies. DNA blueprints may also be found in fingerprints and hair skin sales.

¹²² M. Elavarasi and N.M. Elango, —Analysis of Cybercrime Investigation Mechanism in India|10(40) Indian Journal of Science and Technology 1-4(2017).

While there are several places to get DNA samples, there is a limited use for DNA evidence because technological advancements are still being made. For example, in situations of sexual assault where the collection of DNA samples is required by law, not all victims' samples are obtained. Merely 50% of the samples are submitted for DNA analysis, and only 20% of those samples are further processed. In the Indian context, law enforcement is weak and incompetent in gathering and retrieving evidence.¹²³ The majority of labs in India are underfunded or lack adequate equipment. The results of the DNA test are not obtained quickly. There is often a deadline for submitting the results to the court, and within that window Therefore, a high accuracy rate cannot be achieved by 103authorize every feature of DNA material.

In the past, the only forensic evidence that was produced for a court of law was fingerprint testing. It will be feasible to obtain faster DNA findings if the technology is developed. The scientists anticipate achieving it in the upcoming years. We have shortened the length of the RFLP (Restriction Fragment Length Polymorphism) Analysis. It can be enhanced much more. The technique based on PCR (Polymerase Chain Reaction) will shortly replace RFLP. Thus, DNA testing will be completed in a single day. Finding and apprehending the culprit will be much quicker.¹²⁴ Hearings in rape cases, for instance, take far longer. In the worst cases, the victim passes away before they are ever brought to justice. They can receive justice in less than a week thanks to advancements in DNA testing. The Indian Evidence Act has several legal considerations regarding forensic and medical evidence. The Indian Evidence Act, Section 45, requires the court to construct and make a decision based on foreign law, science, or the arts. The expert in this area of international law, science, will provide the opinion in cases involving handwriting or fingerprint identification. Additionally, according to Section 46 of the Indian Evidence Act, formerly irrelevant information may now be regarded as facts provided they are supported by of the opinion of an expert. First, as stated in sections 45 and 46, the court may trust the abilities of an expert who possesses expertise on that specific issue in situations like these when the views of experts are required. Second, an expert's bona fide statement of proof might

¹²³ V. Prasad, S. Lukose, et.al., —Role of nanomaterials for forensic investigation and latent fingerprinting—a reviewl65(1) Journal of forensic sciences26-36 (2020)

¹²⁴ G. Sujatha, J. Muruganandhan, et.al., —Determination of reliability and practicality of saliva as a genetic source in forensic investigation by analyzing DNA yield and success rates: A systematic reviewl31(3) Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology218-227 (2019).

serve as the foundation for the court's decision-making.¹²⁵ Finally, any evidence that was previously deemed irrelevant may now be regarded as primary evidence provided it is backed by the opinions of experts. In hearings, expert opinions can aid in reaching a decision. Indian courts took DNA testing into consideration while determining the parent of a kid. The court will award custody of the kid to the parent whose DNA samples match the child's true parent 99% of the time. In several instances, the court has mandated DNA samples in order to determine the parents' identities. Examples of these instances include *Gautam Kundu v. State of West Bengal* and *Vasu v. Santha*, 1975 (Kerala).¹²⁶ The court in each of these instances offered some certain rules on DNA testing and whether or not they can be used to determine a child's parent. First off, blood testing cannot be ordered by Indian courts. Secondly, the court will reject any applications that were submitted to require blood tests. Thirdly, the argument needs to be compelling enough to fall under Evidence Act Section 112. The court needs to understand the ramifications of requiring the blood test. Whether or whether the child would be badly impacted by the blood test and 104uthori as a bastard. Finally, the court alone has the authority to mandate blood testing.¹²⁷ As a result, it has been demonstrated that DNA testing is far more successful in determining a child's parentage. Blood tests have frequently resulted in situations where the blood was altered or manipulated. DNA testing are unchangeable and unhackable. Therefore, they are more important in the hearing scenario.

DNA testing taken from the mouth cavity have typically been favoured by Indian courts. Due to the fact that DNA samples taken from the human mouth have a greater accuracy rate. Additionally, there is a reason why DNA samples taken from other body parts may not always yield reliable results in Indian forensic laboratories. It has been demonstrated that samples taken from lips, teeth, and saliva have a greater accuracy rate. The samples can be examined very quickly. Additionally, they have demonstrated trustworthiness in their courtroom presentations. If DNA samples are taken from oral regions, it becomes simpler to identify parentage or homicides. On the other hand, DNA samples taken from the victim's semen have a higher chance of

¹²⁵ S. Mishra and G.Singh, —Forensic accounting: An emerging approach to deal with corporate frauds in India9(2) Global Journal of Enterprise Information System104-109 (2017).

¹²⁶ D.M.A. Bhinder, M.Y. Zahoor, et.al., —SE33 locus as a reliable genetic marker for forensic DNA analysis systems1 48(3) Turkish journal of medical sciences 611-614 (2018).

¹²⁷ M.S.A. Samad, G.K. Varghese, et.al., —Fitness Evaluation While Using Contaminant Transport Models For Environmental Forensic Investigation1 119 Energy Procedia 792-800 (2017).

identifying the offender in rape cases.¹²⁸ Without a question, forensic and medical evidence are extremely important in a court of law. They assist the court in coming to a reasoned decision. Thus, it is also impossible to dispute the significance of medical professionals and experts. Forensic experts should be supported by Indian legislation to enable them to do their duties even more effectively. In order to expedite the establishment of forensic evidence, the Indian government ought to inspect the forensic laboratories and increase funding. In this manner, the criminal justice process won't go on for ages. Another problem is that forensic experts are not well educated in the field. There aren't many excellent establishments in India offering forensic medical instruction. It may cause a chasm to open up between experts.

This may also have a detrimental impact on the hearings since a single error might overturn the court's verdict and prove the guilty parties not guilty. More qualified specialists are required in the forensic division. Law enforcement can be strengthened by tackling these problems.¹²⁹ Nevertheless, the forensic department has made some progress in light of all of this. A committee has been constituted by the Indian government's home ministry to assist in reforming the criminal justice system. Dr Justice V.S. Malimath is the committee's chairperson. The criminal justice system is to be changed. The committee has previously recommended that forensic science be used extensively in criminal investigations. Additionally, the committee has declared that the courts of Only the experts on DNA named in section 293(4) of the Cr. P.C., 1973 should be taken into consideration by India. This section would describe the circumstances under which forensic testimony can be used as evidence in a court of law¹³⁰. The appropriate sections and subsections pertaining to admissibility would likewise be evaluated in this section.

5.2 INDIAN EVIDENCE ACT JUSTIFICATION OF ORAL EVIDENCE IN FORENSIC SCIENCE

Any type of evidence that is documented and deemed to be very factual is referred to as documentary evidence under the code of law. Audiovisual evidence that

¹²⁸ P. Kacker and A. Pandya, —Forensic Psychology for Prevention of Crime and Rehabilitation of Offenders: Public Health Perspectives‖ 1(1) Gap Indian Journal of Forensics and Behavioural Sciences 5-6 (2020).

¹²⁹ P. Nema and P.K. Nema, An Autopsy based Study About Bisexual Variation for Determination of Age from the Fusion of Manubrium with the Body of Sternum in the Central India Indore Region (MP) 13(3) Indian Journal of Forensic Medicine & Toxicology 84 (2019).

¹³⁰ H.F. Villar-Vega, L.F. Perez-Lopez, et.al., —Computer forensic analysis protocols review focused on digital evidence recovery in hard disks devices‖ 1418 Journal of Physics: Conference Series 012008 (2019).

unequivocally demonstrates that a person accused of a crime is either directly involved in the crime or has nothing to do with it can be authorized as documented evidence. However, documented evidence also includes any type of written record that the accused party has signed. This type of evidence is typically helpful in establishing the guilt or innocence of an individual in cases of financial fraud.¹³¹ Documentary evidence can even take the form of an agreement between two parties that has been signed by both of them and legally notarized, proving that one of them disregarded the terms and conditions and rules outlined in the agreement. In the event that a legal issue arises regarding any kind of agreement that was made between two parties, then documented evidence has the power to completely alter the trajectory of a legal case.

The Indian Evidence Act of 1870 allows for the production of evidence in a variety of methods. Section 62 of the act specifies that two types of evidence fall under the category of documented evidence and can be submitted in a court of law.¹³² Primary and secondary evidence are the two categories of documentary evidence that can be presented in a court of law. The Indian Evidence Act states that primary evidence is information that is produced directly by the court through inspection, where several documents are created using a single, authorized procedure. The court of law produces all of the materials that are present in the primary evidence as well as the standard procedure authorized in the printing, lithography, and photographing of those documents. While primary evidence is a type of documented evidence that is directly created by a court of law, many copies of an identical original document that the court of law produces are also regarded as primary forms of evidence of proof. A cheque signed by a draw is regarded as primary evidence against him, and an account file signed by the person who is meant to pay the draw the cheque is seen as primary evidence against the payee. These are two examples of primary evidence.

However, secondary evidence is defined by the Indian Evidence Act of 1872 as the contents of written instruments that are not permitted to be presented in court. In order for secondary evidence to be produced in court, a legitimate reason for the nonproduction of the original must be provided. The Indian Evidence Act of 1872 also established a rule in section 63 of the act that states that secondary evidence to

¹³¹ M. Gangwani, —Suitability of forensic accounting in uncovering bank frauds in India: an opinion survey, 28(1) *Journal of Financial Crime* 284-299 (2020).

¹³² S. Prerna, C. Parekh, et.al., —Advancing Automation in Digital Forensic Investigation, 8(3) *International Journal of Scientific Research in Science, Engineering and Technology* 378-382 (2021).

be presented in court will not be deemed relevant if the primary evidence was filed with the court prior to the The secondary evidence's submission is invalid in and of itself. Otherwise, there would be no need in attempting to present secondary evidence in a court of law if the original evidence is deemed invalid, as it would not be allowed.

It is also explicitly stated in section 68 of the Indian Evidence Law of 1872 that an attesting witness is not required to be present in court during the filing of documentary evidence. The witness must be present in the court of law in order for other types of evidence to be presented, such as oral testimony from witnesses who were there when the dispute was occurring.¹³³ Conversely, though, all forms of paperwork that are allowed to be produced in court must be authenticated. Proof of the legitimacy of a document presented in court can be obtained through any type of signature provided by both parties engaged in the matter. As a result, the witness's presence is not necessary for the filing of documented evidence. A signature from each party and registration under the Indian Registration Act of 1908 should be included in the documentary proof that is to be presented in court. Given that there is concrete proof that the materials provided in The execution of the court cannot be disputed because of the signature and registration sign. An attesting witness must be present if there is any kind of challenge to the validity of the documentary evidence. The paper itself cannot be used as evidence unless at least one of the witnesses was still alive, as stated in Section 68 of the Act. The document must also be attested by a lawyer.¹³⁴ For the court to examine the documented evidence, it was imperative to demonstrate the witness's execution if they were still alive. When it comes to determining the validity of papers that are brought to a court of law as evidence, the attesting witness is crucial.

In addition to documentary evidence, electronic evidence may be presented in court under sections 65a and 65b of the Evidence Act of 1872. These sections offer resources for electronic evidence and its records, which a court of law may accept as admissible evidence in a particular case. According to Sections 65a and 65b, an annual statement must be included in the information found in a computer, and the officer in charge of overseeing relevant operations that involve the examination of

¹³³ V. Chauhan, V. Singh, et.al., —Applications of nanotechnology in forensic investigation‖ 3(3) International Journal of Life-Sciences Scientific Research 1047-1051 (2017).

¹³⁴ N. Monusha Chowdari, B.R. Rohit, et.al., —Extent of road traffic accidents in Manguluru city, Karnataka, India‖ 11 Journal of Forensic Sciences & Criminal Investigation, 55518 (2019).

the authenticity of electronic data found in the computer must be able to view it. The information generated by the owner can be readily manipulated due to the immediately accessible electronic records stored in the computer. There should be an electronic record that is consistently fed into the computers that are used into the laptop.¹³⁵ Any type of electronic record can be readily obtained, and in accordance with sections 65a and 65b of the Evidence Act, if there are only one or a small number of pertinent electronic records on the computer and no other records exist that can support the authenticity of those records, then the records themselves will not be admitted as evidence in a court of law. Additionally, the provisions stipulate that for the simplicity of data extraction, the computer containing the information must be used properly or accurately. The Evidence Act's Sections 65a and 65b additionally stated clearly that the recording procedure authorizes to create documentary evidence from the data stored on the computer need to be authentic and unaltered.

However, there are also certain rules provided by the Indian Evidence Law of 1872 about the necessary authentication procedure for digital evidence. For whatever reason, it is required by law to declare that electronic evidence is stored on a computer or other electronic device that may store digital, invisible data. A court of law has lax laws and regulations on the retrieval of electronic evidence from digital devices, and in many circumstances, the device has data that might be used as documentary evidence in the code of law.¹³⁶ According to the Evidence Act, the retrieval of the data from Digital devices need to be correctly recorded, saved, and retrieved. The Evidence Act also acknowledges that electronic recordings are readily lost and that safeguards must be taken to prevent tampering with them. Additionally, the legislation specifies that the study of electronic evidence must be conducted using particular instruments, gadgets, and record-keeping files.

There are two types of papers that might be encountered in a court of law while presenting documentary evidence: public documents and private documents. Regardless of their differing legal standing, both public and private papers may be

¹³⁵ G. Damodar, and N.A. Sheikh, —Estimation of Stature from Footprints Measurements by Linear Regression Analysis in South India Population| 13(1) Indian Journal of Forensic Medicine and Pathology 94 (2020).

¹³⁶ G. Shrivastava, K. Sharma, et.al., —Role of Cyber Security and Cyber Forensics in India In I. Management Association (eds.), *Cyber Law, Privacy, and Security: Concepts, Methodologies, Tools, and Applications* 1349- 1368 (IGI Global, 2018).

used as documentary evidence in a court of law. The court of law also believes that all documents submitted as evidence must be attested.¹³⁷ The court-produced material needs to be affirmed since even a document might be readily falsified, thus attesting witnesses who were present throughout the attestation procedure should help with the attesting process. These are steps that the code of law has taken to prevent tampering with the evidence itself. The document that is placed before the court as documentary evidence must be produced in certified copy, under section 79 of the Indian Evidence Act. This is due to the fact that it may be challenging to present the original document in court and that any harm done to it would likewise be harm done to the proof. A certified copy of the evidence might potentially save someone's life, and a court of law claims that damage to the evidence. A court of law will accept the presented original document as the authentic copy of the original evidence, and it must be authenticated.¹³⁸ However, the copy itself would not be authorized in court unless it was certified by a federal, state, or local government official and was presented in a proper manner. The court considers a copy of a document to be significant enough to be admitted into evidence if it is signed by an officer, who is presumed to be a real, certified officer.

The power of attorney can also have a big impact on the admissibility of documentary evidence presented in court. A power of attorney confers the authority to act in accordance with the principle of confirming the authenticity of any document produced in court by having it executed and authorized in front of the court by a notary public, a magistrate or judge, any representative of the Central Government, and any member of the Indian council. These people can approve documentary evidence produced in court by using a power of attorney, and the Indian Evidence Act specifies the circumstances in which a power of attorney is acceptable. When a notary public authenticates a power of attorney on behalf of someone the court deems eligible, the document is considered genuine. However, the power of attorney may also be authorized in cases where the notary public or the board of directors performs the attestation.

Special conditions apply to papers that are 30 years old or older that are produced as

¹³⁷ H. Hyderabadwalla, —Forensic Psychology in India—where are we and where are we going? 5(2) Indian Journal of Mental Health 256-259 (2018).

¹³⁸ A. Sharma, M. Bala, et.al., —Five case studies associated with forensically important entomofauna recovered from human corpses from Punjab, India? 7(5) Journal of Forensic Sciences & Criminal Investigation 555721 (2018).

documentary evidence in a court of law, as stated in section 90 of the act. Any copy of a document prepared after the original will not be accepted as evidence by the court of law when it is thirty years old. Instead, the original document must be submitted in the court of law. But section 90 of the Act also states that the person who has signed and attested the document, as well as every other portion of the document submitted in court, is tied to the signature or carried out by the document 47 Section 90 of the Indian Evidence Act of 1872 stipulates that in order for a document to be subject to these special conditions, it must be at least thirty years old, in proper custody, have a presumption of signature, have no presentations of certified copies of the original document, and—above all—be original.¹³⁹ Section 90 establishes the phrase “shin document” for physical papers that are thirty years old. Similarly, there is another presumption mean for electronic data that are five years old. Section 90a of the Evidence Act of 1872, which states that if electronic records are presented in court and are produced from legal custody or submitted to the court regarding their authenticity, they will be deemed to be the original digital record, applies to Samsung’s creation of records that are at least five years old.¹⁴⁰ The court would not consider a to be valid evidence if the digital signature of the legal authority who conducted the electronic record’s documentation was not present in the document itself. In order for evidence to be considered legitimate under section 90a of the Evidence Act of 1872, it is imperative that the records be in a digital format and no older than five years. Additionally, records must be produced from the custody and not from any other source, and the original must be conducted by an 110authorized legal person.

The list of requirements for creating documentary evidence is extensive, encompassing all the laws, regulations, and standards established by the Indian Evidence Act of 1872.¹⁴¹

The entire process of gathering evidence, including determining what types of documents can be accepted as proof and which should not, the process of Every facet of the documentary evidence, including attestation, is covered in great depth. The

¹³⁹ R.N. Jha, K.K. Badiadika, et.al., —Knowledge and Perceptions Regarding Medico-legal Postmortem Examination among the Arts and Commerce Stream Students of Mangalore, India 13(3) Indian Journal of Forensic Medicine & Toxicology 34-37 (2019).

¹⁴⁰ D. Mittal, A Two-Year Prospective Study from Punjab Region of India. 19(1) Medico Legal Update 20-25 (2019).

¹⁴¹ M.M. Rohith, W.R. Belcher, et.al., —Tattoo in forensic science: An Indian perspective 74 Journal of Forensic and Legal Medicine 102022 (2020).

Indian Evidence Act has a crucial guideline for documentary evidence that is referred to as the best evidence rule. The best evidence rule states that both the original document and its contents must be shown to be authentic when the document is being shared with the court. It won't be necessary to produce a significant quantity of evidence in court if the material that is provided is appropriately pertinent to the issue. When it comes to the production of documentary evidence, the primary goal of the best evidence rule is to avoid fraud and supporting the legal system and, if appropriately implemented, preventing the need for a supplementary rule. The extent to which documentary evidence may be presented in addition to forensic reports is described in this section. In order to arrive at a conclusion, the main conclusions derived from the body of available literature will be provided here.

CONCLUSION

The prosperity and advancement of a society are impacted by criminal behaviour. Proactive criminal investigations and successful prosecutions have the power to end these kinds of activities. Scientific and physical evidence play a minor role in criminal inquiries in this process. Numerous kinds of evidence have been utilised to solve crimes since antiquity. The public's understanding of criminal suspects' human and constitutional rights is expanding quickly in this day and age of science and technology, underscoring the value of forensic science as an investigative tool.

Forensic science is a scientific field that works inside the legal system. It assists with both criminal and civil investigations and gives the courts accurate information on every facet of criminal identification. Actually, new developments in contemporary biology have redefined forensic science and had a big impact on the management of the judicial system. With the emergence of DNA testing in the modern era of science, forensic science has assumed a major role in the legal system, replacing its previous role as an observer. FS is crucial to the CJS in India. The primary goal of FS is to gather sufficient information, and skilled forensic scientists and medical examiners provide this need by determining whether or not the evidence can fairly portray the case.

The advantage of FS is that it may be used to any criminal case; nevertheless, as scientific proof is necessary to support any criminal case in a court of law, investigations into homicide, murder, rape, and other crimes benefit the most from it.

And the Indian CJS has accepted FS to facilitate this responsibility. Therefore, it seems sense to draw the conclusion that forensic science is essential to criminal investigations. The number of crimes has risen in the contemporary era, and as technology has developed, so too have the kinds and methods of crimes. As a result, it's imperative that law enforcement and investigative equipment use FS to identify criminal activity and that they stay current with emerging technology.

and many kinds of criminal activity. On the other hand, police investigators can no longer depend only on their innate intelligence since clever criminals have quickly adapted science to their criminal purposes. Brutal and harsh methods of criminal detection have no place in a civilised society. Because of this, FS needs to be used in criminal investigations to determine the kind, type, and detection of the crime. To

feel good about ourselves, we ought to reach out and maintain social order and harmony. To see the magnificence of the sky and to arrive at a bright future, lamps of consciousness must be lit. It is hard to dispute that forensic science has advantages as well as disadvantages.

FS must approach it positively as it is one of the most crucial elements of justice administration. In order to preserve a high standard of quality and precision in the results, There will be an introduction of advanced technology and methods. Moreover, as a fundamental component of the concept of 'Natural Justice,' inquiries and trials ought to be impartial and just. Things that prevent the efficient running of In order for victims to truly gain from the justice delivery system, it must be abolished. There are situations where protecting the privacy of criminal and victim data is necessary. Finally, and perhaps most importantly, it is now necessary to closely monitor whether victims are getting fair justice—the very point of our Constitution. The information revolution of this century has led to technical improvement, which in turn has caused India's crime rate to rise sharply and quickly. After then, the goal to enhance the judicial system emerged, which prompted the development of forensic science to offer scientific explanations for crimes. As a result, forensic science is now able to supply the scientific proof needed to demonstrate a suspect's guilt or innocence, assisting in the issuance of court judgements.

FS is the term for the application of science to the legal system. It is interdisciplinary and multiprofessional by nature. India is a nation that is rapidly changing, and the long-term development of the nation depends on having a comprehensive and excellent education. There is now a youth bulge in the nation. It has the most noticeable phase of ballooning. With more than 600 million youth under 25, it has the largest youth population in the world. In order to guarantee productivity and relevance as a worker in the domestic and international labour markets, persistent investment in education, Infrastructure development and regulatory frameworks are needed to provide pupils with the newest knowledge possible. Moreover, although diversity is India's greatest asset, constructing a unified education system with democratic and research-driven elements, an ethos, and demonstrated outcomes that can fulfil the demands of the emerging new India is an equally essential endeavour. Stay up to date on the latest technological developments in this industry to take on new challenges. The number of forensic institutions in the private sector has significantly increased in recent years. The size of the infrastructure and the number of teachers have not increased in tandem

with the enrollment of pupils. It is simplified to just turning up to enrol.

for tests as well as degrees. Because of this, the great majority of graduates do not meet the criteria of their field. Given the current situation, it's imperative to concentrate on creating and keeping an eye on the calibre of forensic education and resolving associated professional issues in order to use the benefits of forensics for the benefit of humanity and to support forensics in criminal investigation and justice administration. Creating course syllabi, conducting frequent academic audits, organising a Forensic Council of India, establishing institutions under state and federal government according to a clear set of guidelines, and offering fellowships are a few of the ideas that have been proposed. Even though forensics first appeared in India, it was there that they were used in ancient times for both personal safety and crime investigation.

Since almost two millennia ago, there hasn't been any significant progress in the subject of forensics in India, according to historical accounts found in ancient literature. A nationwide forensic science education system and curriculum that satisfies international standards must be developed and put into place. An evaluation technique for pinpointing areas in need of development is equally as crucial as certification. Prompt adjustments are needed for both the administrative design of the forensics and the recruitment needs. With an eye towards the future, the suggestions were developed following a careful analysis of the grey areas to make sure that only the best candidates join the field. It is anticipated that putting these suggestions into practice will not only greatly improve the quality of forensic education in India but also to improve forensic laboratory' standards. Such technology is increasingly being used in criminal trials and cases in India. The Commissions on Criminal Justice Reform assert that increasing the use of technology in crime detection can boost the effectiveness of the system. Laws that permit the use of forensic technology in criminal investigations and prosecutions have frequently been changed. It is possible to counter that there are issues with the law that need to be fixed. Courts are also reluctant to rely on scientific findings because of their narrow methodology or certain inherent defects in the evidence when it was developed.

They are discouraged from relying solely on the judicial system. The main objective of the CJS is to provide equitable treatment for all individuals. It is obvious that forensic evidence is more trustworthy than eyewitness accounts. The

offender

Since forensic science uses scientific evidence, it aids the legal system. We have to take care of the current flaws before we can proceed.

Restrictions on the application of FS must be seen as impediments to the defence of human rights. From the outset of the inquiry, forensic science and contemporary instruments must be used. To preserve crime scenes, a corps of crime scene officers should be formed to gather concrete evidence. It is possible to fortify the nation's network of CFSs and FSLs to provide the best forensic coverage for inquiries.

The rights of those who are accused may be significantly defended by forensic science. It is possible for forensic scientists to influence public opinion in support of reform. Through the implementation of suitable regulatory strategies and legislative limitations, the government may effectively utilise the forensic specialists' skills to achieve the dual objectives of protecting the innocent and prosecuting the guilty.

Locard's theory of exchange, according to which "Whenever two entities come into contact, mutual exchange of traces occurs," has obvious relevance since, no matter how small, something is always left behind, and it is the criminal's responsibility to locate it. Although the victim is unable to talk about what happened, the evidence the perpetrator left behind paints a full picture of the site of crime. A crime scene investigation is useful when reconstruction starts at the site in the early stages of the investigation, during the investigation, and during the adjudication process. The forensic expert might be able to identify the criminal over the course of the interviews.

Knowing the events as rebuilt could help the I.O. conducting the interviews spot fraud or inconsistencies in the Crime Scene Reconstruction as reported by Forensic Experts. This information may be a powerful tool in the hands of a skilled investigator.

It's evident that the FS issue is making people more anxious. Because of the intricacy of the ecosystem, this problem can take many different forms, and figuring out its underlying causes is yet an ongoing project. But in order to Depicting not just the myriad elements of the problem but also compelling solutions, it's critical to communicate the role of forensic science in that ecosystem. Even if funds and resources have been scarce, The significance of identification in forensic science (and the implications of a contested identity) cannot be overstated, and this has been a major aggravating factor.

As such, it is critical to embrace a wide yet precise definition of forensic science and its purposes. As a field that integrates many disciplines, FS is well-suited to navigate the intricate matrix in which it operates. It will be crucial to the development of FS, the difficulties it can overcome, and the flexibility with which it can meet the difficulties that are only beginning to emerge, such as coming to an understanding of its identity and communicating it in a way that is both relevant to a variety of audiences and consistent throughout the legal system. The goals for both technological advancements to address the questions "what?" and "who?" and fundamental research to address the questions "how?" and "when?" may be established by FS as a single, cohesive discipline. In addition, it may take into account ambiguity, context, evaluative interpretation, and human decision-making. Applying science's full range and potential to the vast and intricate ecosystem of the legal system may also stimulate the creation of novel concepts and establish the groundwork for the innovations required to solve current and upcoming issues. Think of FS's characteristics as a By maintaining this level of rigour, you'll be well on your way to establishing a shared understanding of what forensic science "is" and,

more crucially, "for." A general idea of FS method needs to take into account both legal research and the supply of science's services' to the legal system. It should also cover the research methodology used to create novel instruments and concepts that tackle every phase of the FS process while maintaining the pipeline's integrity. The state of forensic science in India right now is far from perfect. Future administration paradigms should take into account the formative requirements of labs, drawing from extensive scientific research. A public-private strategy that acknowledges and encourages laboratory independence.

Before a forensic expert may review any evidence, the following primary need must be satisfied:

- It is necessary to store evidence in a secure location.
- The evidence package's marketing and labelling are easily observable on the exterior.
- It's critical to understand the type of bags we used to package the evidence.
- All of the evidence, including drawings, films, and photos, has to be preserved.
- Every detail is carefully documented.

- A substantial volume of evidence ought to be sampled.
- Appropriate gloves, equipment, and crime scene attire were employed in the collection of evidence.
- After it has been gathered, all evidence is sent right away to the lab for further analysis.

SUGGESTIONS

Examining officers and questioners can benefit from using investigative tactics, thus they should resort to them after all other options have failed. These officers should be careful how they use their authority and should must fully understand the physical, emotional, and valid importance of controlling the narco-analysis test and administering the polygraph. Today's crooks are more skilled and knowledgeable than ever before. To break the law and stay under the radar, they are heavily relying on investigation procedures. The lack of easily accessible evidence has made it more challenging to find and apprehend offenders. Given a righteous concern for justice, it would be totally intolerable in such a situation if law enforcement officials were prohibited from acting for an unknown legal reason.

To prosecute the guilty by using inquiry evidence. Such strategies provide advantages that should not be disregarded. The most crucial aspect is that it may be utilised to successfully concentrate on the accused's innocence, which is one of the CJS's main objectives.

Furthermore, evidence gathered using these technologies may be promptly identified in the event that alternative kinds of proof are not accessible. Actually, these ought to be permissible under the fullest definition of social order. Prior to such evidence being acknowledged; enough shielding are needed. Research institutions must to have a reliable quality control mechanism in place, and their results ought to be completely verifiable. The accused should be given the opportunity to review and refute the validity of the examination and report. Based on the source's explanation, adherence to the accepted inquiry methodology, and the accuracy of the result, the court may accept such proof. An expert can help the court create a presumption or conclusion using his knowledge, expertise, experience, preparation, or advice. The opinions of the masters derived from exploratory method needs to be acknowledged by the academic

community, be error-free, deductively sound, and pertinent to the current problems. A comprehensive and specific legislation pertaining to the tolerability of experimental techniques will address any doubts regarding acceptability. However, such legislation needs to be surrounded by the constant verification of all the experimental and genuine points of view by the experts in these domains. Immediately after, the SC rendered a detailed ruling to support the argument.

The court has outlawed the use of the Lie Detector, Narco Analysis, and Brain Mapping tests. Investigative bodies that have been prohibited from "intruding" into an individual's near-home freedom saw the verdict as a setback. The court has supported and maintained the long-standing and established declarations, preserving the accused person's right to choose between speaking and staying quiet, or protection from being forced to testify against themselves. Certain shortcomings in the accused's testing protocol were found by the researchers. The author claims that these tests can be an effective weapon in the toolbox of investigative authorities for enforcing justice if our system resolves these issues.

Among the recommendations are the following:-

1. Lawmakers have to undertake the required steps to enact a unified, national statute on DNA testing and its acceptance in legal proceedings. because the absence of official acknowledgment leaves investigating agencies and lower courts in a condition of uncertainty.
2. Make changes to the law to permit the creation of DNA profiles through blood testing.
3. Forensic laboratory practices ought to be governed in order to increase the reliability of reports produced by these labs.
4. Regularly use the dividing technique and a single norm for DNA testing in proficiency exams.
5. The establishment of a national commission is necessary to oversee and control DNA profiling facilities. Indian law ought to include the acceptance and procedure
6. DNA samples ought to be obtained only in cases where details on a specific occurrence are required, and not on a routine basis. Suspects should not have their DNA samples obtained unless a court or magistrate has given their permission.

7. Appropriate training is provided to investigating agencies to resolve the environmental issue.
8. It is important to establish an appropriate chain of custody. The legal fraternity must have the right instruction and training in order to handle issues like the prosecutor's fallacy.
9. There are not enough forensic science facilities in the police department.
10. There are significant delays in getting the results of forensic examination, even when physical clue samples are sent to forensic science labs.

BIBLIOGRAPHY

1. The 1872 Indian Evidence Act
2. The Indian Constitution
3. United Kingdom's Prevention of Terrorism Act, 2002

4. Evidence from Police and Criminal Cases Criminal Justice and Public Order Act 1994.
7. Criminal Procedure and Investigation Act 1996
8. The Criminal Justice and Police Act 2001
9. Serious and organized crime and police act 2005
10. Counter Terrorism Act, 2008
11. Crime and Security Act 2010
12. Protection of Freedom Act 2012
13. The Criminal Justice (Northern Ireland) Order 2004. United States of America
14. Violent Law Enforcement and Crime Control Act of 1994
15. The 1994 DNA Identification Act
16. The 2000 Backlog Elimination Act for DNA Analysis
17. The 2004 Justice for Everyone Act
18. The 2004 Innocence Protection Act
19. The 2006 Violence Against Women Act

BOOKS

1. Abhijeet Sharma, Guide to DNA Tests in Paternity Determination and Criminal Investigation (A Lawyers Hand Book), 1st Edition 2007.
2. Andrei Semikhodskii, Dealing with DNA Evidence: A Legal Guide, published by Routledge-Cavendish; 1st Edition 2007.

3. Bhuvaneshwar Singh, Scientific Investigation of Death Cases (A Medico_Legal Investigation relating to unnatural deaths-Bhuvan's), Prayag Publishing company, Faisal Warsi, Allahabad, 1st Edition 2008.
4. David E. Newton, DNA Evidence and Forensic Science, Infobase publishing, 2008
5. Dinkar.V.R, Justice in Genes (Evidential Facets of Forensic DNA Fingerprinting), Asia Law House, Hyderabad, 1st Edition 2008.
6. Dr. Gupta & Dr. Agarwal, Medical Jurisprudence and Toxicology (Practise and Procedure), Premier PublishingDr. Gupta & Dr. Agarwal, Medical Jurisprudence and Toxicology (Practise and Procedure), Premier Publishing Co, 1st Edition 2011.
7. Dr. Mathiharan.K & Amrit.K, Medical Jurisprudence and Toxicology, Lexis Nexis, Nagpur, 23rd Edition 2005.
8. Dr. Pandey.J.N, Constitutional Law, Central Law Agency, Allahabad, 44th Edition 2007.
9. Dr. Subramanyam.B.V, Medical Jurisprudence and Toxicology, Law Publishers (India) Pvt Ltd, Allahabad, 2011.
10. Dr. Sharma.B.R., Forensic Science in the Criminal Investigation and Trials, Universal Publishing Company, 2003.
11. Jhala.R.M & Kumar.K, Jhala & Raju, Medical Jurisprudence, Eastern Book Company, Lucknow, (Revised Edition), 1997.
12. Jothirmoy Adikari, DNA Technology in the AdNabar.B.S, Forensic Science in Crime Investigation, Asia Law House, Hyderabad, 3rd Edition, Reprint 2007.

ARTICLES

1. Abhinav Kumar, Garima Singh, —Importance of DNA in Crime Investigation: An Analysis of Legal aspects of DNA Forensics|, Helix Vol.
- 2: 112-115 (2012). 2 Ambika Singh & Tanya Aggarwal, —The Double Helix Unravalled : Evidentiary aspects of DNA Fingerprinting|, Criminal Law Journal, Volume 1, 2006.

- 3 Dilip Kataria, —DNA Databanks and its Impact on Right to Privacy‡, Criminal Law Journal, Volume 1, 2008.
- 4 Dr. Bhavani Prasad Panda, —Neurogenetic Evidence in Criminal Trial – A Case Analysis, Need for DNA Informatics Regulatory Agency‡, Criminal Law Journal, Volume 3, 2005.
5. Dr. Durga Pada Das, —DNA Fingerprinting and its Impact on the Administration of Criminal Justice‡, Criminal Law Journal, Volume 4, 2005.
6. Dr. Paramjit Kaur, —DNA Fingerprinting and its Evidentiary Value‡, Criminal Law Journal, Volume 2, 2006.
7. Dr. Rao.G.V, —Deposing Evidence as a DNA Expert Witness‡, Criminal Law Journal, Volume 2, 2010.

