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Impact Of Science On Evidence And Justice In Criminal Justice System

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Introduction

The accuracy and precision in scientific calculations are well acknowledged, and this applies to scientific evidence when utilised in the field of Crime Investigation. In accordance with the provisions outlined in the Indian Evidence Act of 1872 (hereafter referred to as the Evidence Act), the court may find it imperative to consider any pertinent evidence, including scientific evidence, in order to arrive at an accurate determination in criminal or other legal proceedings. The concept of scientific aid encompasses the use of scientific principles within the context of legal proceedings, wherein scientific evidence has a significant yet limited role. The utilisation of scientific methods in the field of law may be traced back to the pioneering efforts of those who devised the fundamental concepts and methodologies required for the identification and comparison of physical evidence. Furthermore, the integration of these ideas into a cohesive discipline was acknowledged as imperative by subsequent scholars and practitioners. In contemporary discourse, it is widely acknowledged that Sir Arthur Conan Doyle had a significant role in the dissemination and popularisation of scientific crime detection methodologies via his various works, most notably through the portrayal of his iconic character, Sherlock Holmes. Within the scientific and law enforcement communities, there exists a widely held idea that every perpetrator of a crime invariably leaves behind tangible evidence at the location where the offence occurred. According to Paul L[1]eland Kirk, any action taken, object touched, or trace left behind, even unintentionally, might serve as incriminating evidence against an individual. In addition to his fingerprints and footprints, several forms of physical evidence such as hairs, fibres from his clothing, broken glass, tool marks, scratched paint, and biological samples like blood or semen serve as silent testimony against him. This serves as enduring proof that is indelible. The individual does not experience confusion due to the heightened state of enthusiasm at that particular instant. The absence is not due to the absence of human witnesses. The provided information is supported by empirical evidence. Physical evidence is inherently reliable and objective, as it is incapable of providing false testimony or being completely missing. The potential for error lies only in the interpretation of the subject matter. The worth of a subject can only be diminished by the inability of humans to locate, examine, and comprehend it. The concept of Locard's Principle of Exchange, as referenced by Kirk, has established a fundamental process within the field of forensic science. This insightful discipline is increasingly influencing the realms of science, law, and medicine, with its full impact only starting to be understood and acknowledged. Currently, there is a growing level of scrutiny and questioning about the efficacy of forensic science in determining guilt or innocence within the legal system. If science is seen as the means by which truth is sought, then logically follows that the study of scientific thinking and understanding should be a fundamental endeavour for every individual seeking knowledge. The term "Forensic Science" is commonly employed to refer to the application of scientific methods and techniques in the context of criminal investigations. On the other

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hand, "Scientific Aid" encompasses a wider scope, as it allows for the utilisation of scientific principles, methods, techniques, and technology in legal matters beyond criminal investigations. The Bangalore Police have employed Unmanned Aerial Vehicles (UAVs) equipped with cameras to enhance the execution of lockdown measures during the COVID-19 pandemic. While drones are primarily associated with their utilisation by military forces in combat and armed conflicts, it is important to acknowledge their diverse range of applications in various fields of human welfare. These applications include package delivery, agricultural activities such as insecticide and pesticide spraying, environmental monitoring, aerial photography, as well as search and relief operations. Nevertheless, it is important to acknowledge that there are certain limitations associated with this type of technology. Drones, undoubtedly, have the potential to be utilised by individuals with malicious intent, such as terrorists, to achieve their aims.

Scientific Evidence

Forensic science, as defined, primarily involves the utilisation of several scientific disciplines such as chemistry, biology, medicine, metallurgy, and engineering in the process of criminal investigation and the subsequent collection of evidence. The term "Scientific Evidence" refers to the collection of evidence in a systematic and rigorous manner. The term "evidence" refers to any material or information that can be utilised to establish the occurrence of a criminal act. Nevertheless, a consensus over the definition of forensic evidence has yet to be reached. One possible inclination is to define Forensic Evidence as the application of the scientific method to analyse physical or biological elements in order to generate evidence that may be used in a court of law. Delving deeper into the comprehension of the characteristics that render a technique "scientific" frequently yields inadequate responses, such as one that emphasises meticulousness in execution. While care is a crucial aspect of forensic research, it does not fall within the parameters that constitute "Scientific Methods." The notion of "Scientific Methods" was a subject of deliberation for the U.S. Supreme Court in the case of Daubert v. Merrell Dow Pharmaceutical, Inc. The majority opinion affirmed that the subject matter under examination adequately fulfilled the criteria for the "scientific method," which was defined as a process involving the formulation of hypotheses and their subsequent testing to determine their potential for being disproven. This methodology is considered distinctive to the field of science when compared to other areas of human inquiry. The primary focus of forensic investigation is around the meticulous assembly of fragmented evidence found at a particular location, with the objective of constructing a comprehensive narrative of the events that transpired. Of equal significance is the determination of the identities of both the individuals implicated in the incident and those who were not involved. During the seventeenth century, Francis Bacon introduced a concept that continues to be widely recognised as the fundamental basis of scientific inquiry: the scientific method. The individual engaged in a discourse on the significance of alternative explanations and the process of performing tests in order to discern among them as a means to ascertain the veracity of a claim. Bacon regarded the scientific process as one characterised by the deliberate exclusion and affirmation of various elements, wherein the iterative process of experimentation and observation would ultimately yield a definitive result. Since its inception, this principal framework has served as the basis for conducting scientific research. Bacon's perspective on science was characterised by an inductive approach, wherein the process of explanation progresses from specific instances to broader generalisations. In contrast, Karl Popper presented a divergent perspective during the twentieth century. In 1959, Popper asserted that the advancement of science occurs by deduction, wherein the process involves moving from the general to the specific. Popper introduced the concept of Falsification, which establishes the criteria for determining the validity of scientific hypotheses. In essence, if a statement cannot be subjected to falsification, it does not qualify as a scientific proposal. Both Francis Bacon and Karl Popper advocate for the notion that knowledge acquisition occurs via the process of trial

and error. Popper's deductive methodology asserts that by employing logical premises in the process of reasoning, it becomes possible to generate predictions on the expected characteristics of systems. The distinguishing feature of a scientific statement is in its testability. This research study aims to evaluate the level of certainty gained by forensic sciences in the identification of consistent crime patterns. It seeks to determine if forensic sciences have reached a stage of established knowledge or if they are still in the experimental and learning phase. Nevertheless, it is an undeniable fact that a significant number of scientists often have divergent opinions regarding the interpretation and significance of certain data or observational findings in relation to a scientific theory. The source of their disagreement may pertain to empirical issues, such as the accuracy of observational data or findings, or the potential oversight of other pertinent information. However, disagreement can also emerge due to the use of incongruous ideas of evidence among scientists. As elucidated in subsequent sections of this research investigation, it is not uncommon for many scientists to hold divergent perspectives about the outcomes of a shared inquiry. It has been observed that recent advancements in the understanding of scientific evidence have led to the refutation of previously accepted scientific data, which was formerly regarded as unquestionable. The metaphor employed by Jeremy Bentham, namely "Injustice, and her handmaid Falsehood," serves as a poignant reminder that the attainment of substantive justice necessitates more than the mere existence of just laws and their commendation. It underscores the crucial role of factual truth, specifically objective factual truth, in the pursuit of justice. Consequently, the establishment of a fair legal system hinges upon the presence of objective indicators of truth, which manifest as objective criteria for evaluating the quality of evidence. Can the application of scientific methods in criminal investigation through the field of forensic science ascertain the truth to a degree that surpasses any reasonable doubt? Of more significance is the inquiry over the permissibility of employing scientific methodologies to a significant extent inside the standard procedures of law enforcement, namely in the context of investigations and legal proceedings. Moreover, it is of utmost significance to inquire if courts possess a comprehensive comprehension and unwavering trust in scientific evidence as an irrefutable benchmark of veracity.

Coalition of Science and law

The relationship between science and law has long been characterised by a complex alliance, since these two disciplines operate in distinct domains that occasionally intersect, particularly in the context of criminal investigation and trial procedures including scientific evidence. During the initial phase of the Mediaeval Period, there was a lack of consideration on the integration of legal and scientific principles. The advent of scientific evidence from the thirteenth century onwards has presented significant obstacles for the legal field. The aforementioned issues stem from inherent disparities between the legal and scientific methodologies. The legal system adopts the adversarial process as a means to ascertain "truth," with the ultimate objective of obtaining a definitive, equitable, and socially acceptable settlement of conflicts. The aforementioned legislation establishes benchmarks and endeavours to delineate the appropriate functioning of both public and private interactions. In contrast to the legal perspective on truth, science adopts an empirical approach to uncover truth via the examination of verifiable facts. Science does not prescribe the nature of the cosmos, but rather provides a descriptive account of its present state. Forensic science may be defined as the scholarly examination and practical implementation of scientific principles in relation to legal concerns. The convergence of scientific and legal disciplines offers novel tools and approaches to facilitate the pursuit of truth. Forensic law encompasses the provision of precise, prompt, and comprehensive information to decision makers at every level within the criminal justice system. The term "forensic" originates from the Latin word "forensis," which pertains to the forum, a public space in ancient Rome where senators and others engaged in debates and conducted legal processes. Forensic science is an interdisciplinary field that is employed in the examination of crime scenes and

the collection of evidence to be utilised in the legal prosecution of perpetrators within a judicial setting. Forensic science techniques are furthermore employed for the purpose of scrutinising adherence to international agreements pertaining to weapons of mass destruction. Forensic science encompasses several key disciplines, namely biology, chemistry, and medicine, while also incorporating the application of physics, computer science, geology, and psychology. Forensic scientists engage in the examination of various items, substances (such as blood or drug samples), chemicals (including paints, explosives, and poisons), tissue traces (such as hair and skin), as well as imprints (such as fingerprints or tidemarks) that are present at the location of a crime. In recent years, significant advancements have been made in the field of forensic science, particularly in the domains of DNA collection and analysis, as well as crime scene reconstruction. Nevertheless, it is worth noting that a limited number of individuals has the requisite expertise to effectively harness the capabilities of scientific advancements in the context of civil, criminal, and family law cases. Erin E. Murphy, a Professor at New York University School of Law, has made a significant observation on the significance of incorporating scientific evidence inside court proceedings. According to Murphy, forensic evidence should not be exclusively associated with either the prosecution or the defence. The foundation of sound scientific inquiry is predicated upon principles of transparency and rigorous evaluation by one's peers, hence necessitating the ability to endure critical scrutiny. The individual's statement suggests that the assertion made is that forensic evidence is capable of uncovering the truth due to its reliance on factual underpinnings. However, the validity of forensic evidence depends upon the meticulous implementation of scientific protocols throughout the course of a criminal investigation. Any shortcomings in this regard have the potential to undermine the entire basis of the evidence.

Criminalistics

Criminalistics is a field of study that falls under the broader domain of forensic science and is sometimes used interchangeably with the term forensic science. According to the American Board of Criminalistics, criminalistics is a field including the scientific and professional aspects related to the identification, collecting, recognition, individualization, and interpretation of physical evidence. Additionally, it involves the application of natural sciences to topics pertaining to law and science. Forensic science is the utilisation of scientific methodologies to gather and evaluate tangible evidence within the context of criminal investigations. Criminalistics is commonly referred to be a discipline within the field of applied science.

Justice

The notion of justice is often regarded as one of the most intricate and multifaceted constructs in existence. To yet, no jurist or philosopher has provided a definitive and clear definition of the concept under consideration. Prominent jurists and philosophers such as Socrates, Plato, Aristotle, Hobbes, and Hume hold divergent perspectives on the concept of justice. Justice, as commonly understood, is typically linked to the equitable and impartial decisions rendered by judicial bodies. However, it is important to acknowledge that judicial verdicts may not always be reasonable and fair due to several causes. These issues include the absence of sufficient evidence, incompetence on the part of criminal investigators, and occasionally, the judge's limited comprehension of scientific and technological concepts. In a statement attributed to Justice Felix Frank Furter of the U.S. Supreme Court, he emphasised the significance of the court's integrity in garnering public trust, as this trust serves as the court's ultimate foundation. Nonetheless, it is incumbent to the Judiciary to cultivate public trust in the Justice Delivery System. According to Dr. Manmohan Singh, the former Prime Minister of India, the judiciary is seen as one of the fundamental pillars of the country's democratic system, alongside the administration, legislative, and media. India has been fortunate to possess a rich heritage of jurisprudence, whereby the populace has reaped the advantages of the sagacity and equitable principles

upheld by several eminent legal scholars over different eras. Based on the aforementioned findings, it can be inferred that the efficacy of court judges plays a crucial role in the administration of justice, since the determination of truth relies heavily on the evaluation of facts and circumstances specific to each individual case, in conjunction with the evidentiary basis produced by the litigants. The complex correlation between the application of punishment on an offender of a specific offence and the concrete evidentiary standards mandated by the legal system to establish the culpability of an accused individual is an enduring and inextricable connection. In the case that a court of law is not fully convinced of the culpability of the accused individual in committing a crime, it becomes impossible for the court to impose the intended punishment onto the accused for said act. From a certain perspective, this approach to Justice can be considered the most appropriate, as it avoids the larger injustice of punishing an individual in the absence of substantial and compelling proof. The examination of evidentiary norms within a legal framework illuminates the degree to which legislative bodies strive to limit or expand the circumstances under which a certain punishment may be imposed against an individual who has committed a crime. However, the task at hand is often challenging for both the legislative and judicial branches. The efficacy of a well recognised and widely accepted judicial or legislative concept may be compromised due to the swift emergence of new societal values.

Artificial Intelligence

The Indian Criminal Justice System is facing challenges in effectively managing a significant backlog of cases, with over 3.7 million pending cases in the Taluka or subordinate courts. This situation can be attributed to the system's inefficiencies. In India, there exists a significant disparity between the number of judges and the population. There exists a pressing necessity to integrate technology such as artificial intelligence (AI) inside the Indian legal system, which now exhibits significant delays in delivering justice to individuals, occasionally even posthumously. Artificial intelligence (AI) is regarded as a branch of information technology (IT) that aims to replicate human intellect in order to develop computer systems and smart devices that exhibit human-like behaviour. The aforementioned factors, including society, medical advancements, law enforcement, manufacturing, education, and other related endeavours, are often seen as being advantageous. The notion that robots possess the potential to replicate human behaviour is grounded in the field of artificial intelligence (Sharma et al., 2020). Artificial intelligence (AI) pertains to the intelligent conduct shown by computers and robots through the utilisation of software that emulate their cognitive abilities. Artificial intelligence (AI) refers to the computational ability of a computer system to do tasks that often require human intelligence. In India, this approach finds use in addressing both relatively straightforward instances as well as more intricate matters pertaining to the fundamental rights of life and personal liberty.

DNA Fingerprinting

DNA profiling is considered to be a highly advanced and robust testing methodology within the field of quantitative research. The use of DNA fingerprinting has significantly impacted the field of forensic science, representing a contemporary approach for criminal investigation. DNA testing has shown to be a valuable tool in the resolution of many criminal cases, with a particular emphasis on the successful resolution of complex rape and assassination cases. Additional instances encompass theft, physical assault, kidnapping, vehicular collisions, coercion, and the act of demanding money or favours by threats or intimidation. Furthermore, it has demonstrated efficacy in establishing biological parentage and has been beneficial in addressing specific challenges associated with immigration. DNA testing is very reliable due to the inherent uniqueness of each individual's DNA, with the exception of identical twins (Pandya et al., 2018). The genetic material, known as DNA, is shared across individuals at a rate of around 1 in 3 billion persons, and it is inherently

resistant to modification. The information provided is deemed to be reliable and trustworthy. Additionally, this technique can be employed for the purpose of ascertaining paternity, identifying dead individuals with genetic defects, and other related applications. Deoxyribonucleic acid (DNA) serves as the hereditary material that distinguishes each individual, even in cases of genetically identical twins. In the contemporary context, the significance of this aspect is of utmost importance within the framework of criminal investigations. The use of scientific methodologies in the context of criminal investigation has evolved into a specialised discipline commonly referred to as forensic science. The scientific disciplines of fingerprint analysis, anthropometry, track mark examination, and document analysis mostly fall under the realm of forensic investigation.

References

1. Turvey, Brent E. and Crowder, Stan: Ethical Justice: Applied Issues for Criminal Justice Students and Professionals (Academic Press-An Imprint of Elsevier, Oxford, 2013)
2. Foster, Kenneth R. and Huber, Peter W., Judging Science: Scientific Knowledge and the Federal Courts (The M.I.T. Press, Cambridge, London, 1999)
3. Sharma, Dr. B.R., Forensic Science in Criminal Investigation & Trials (Fifth Edition, Universal Law Publishing Co. Pvt. Ltd., New Delhi, 2015)
4. Durston, Gregory; Evidence-Text & Material (Oxford University Press, Oxford, 2nd Edi, 2011)