Forensic Science and its Application in the Criminal Justice System: An Assessment

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Abstract: Forensic Science, indeed has several ethical concerns, but still can bring revolutionary changes in the field of rendering justice through the Criminal Justice System. This field comes up with huge potential in order to make changes in the society by setting exemplary notions by using the scientific tools and technologies. For assisting and rendering justice in a criminal investigation, forensic science acts as a boon to the criminal justice system in order to admission of the authentic evidences. With the growth of science and development forensic science has widened the scope of newly emerged scientific divisions which includes Mobile Forensics, Forensic Anthropology, Forensic Odontology, Forensic DNA Analysis, Computer Forensics, etc. Modern revolution in India has metamorphosed it from a dictating colony to an elected representative republic and with that transformation the Indian society has undergone far-reaching changes at a rapid speed. At present time, where the rate of science is expanding, the implementation of scientific techniques under the purview of forensic science is changing dramatically. Therefore, forensic science is a wider field which includes different branches like forensic serology, forensic chemistry, forensic biology, forensic physics, forensic ballistics, forensic toxicology, forensic psychology, forensic photography, voice analysis and uses of tools like microscopy, holography, uses of ultraviolet rays, chromatography, spectrography, electrophoresis, spectrophotometry, laser microprobe, etc. This paper deals with the different fields of forensic science and its application in the field of law following the laboratories being used all over the India. Further, the authors added a clear insight on the principles and ethics of forensic science and judicial paradigm in criminal justice system to support the whole assessment.

Keywords: Forensic Science, Criminal Justice System, Judicial System, Crime, Criminal Law, Evidence, Forensic Laboratories, Application.

Introduction:

Forensic Science is one of the greatest gifts given by the science to the Criminal Justice System. The sciences of fingerprints, anthropometry, trace marks, document verifications, and forensic toxicology or ballistics are fundamentals of forensic science

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alone.[3] On one hand the forensic scientists has to rely upon the investigation officer for carryout genuine examinations and operations of the technologies of forensic science, similarly on the other hand, for its successfully implementation and transmission of justice depends on the advocate as well as judges through criminal justice system. In modern era, crime became a part of human society with the rise in science and technology. Crime being a societal phenomenon varies with the changes in time. With the development in the society the criminals are using various new methods of committing crime by exploiting scientific technology. In present scenario, similarly, the investigation agencies are also using different scientific techniques and tools to collect the evidence and use it in the criminal justice system. Earlier, in order to get confessions during interrogations the hardened criminals were tried with third degree tortures by police found a replacement to new scientific methods of investigation. Therefore, the application of Forensic Science found its place as an integrated segment of criminal legal system. Forensic Science is the implementation of science which deals with the medico-legal aspects of a crime committed during an investigation and hence, it plays a significant role by applying systematic approach of science and technology through analyzing material proof in the criminal reform system. Forensic Science fills the absence of link between the crime and the criminal. Therefore, a forensic scientist must have the knowledge of science and technology along with the legal background. Medical and law professions are noble professions[4] and these two professions have always overlapped each other due to areas of mutual concern. Both of these areas require application of legal and medical knowledge for welfare of the society.

Meaning and Origin of Forensic Science:

The expression 'Forensic' procured from the Latish adjective 'forensis' which stands for 'of or before the forum'.[5] In Rome, a colloquy was used to be the venue where each and every single affair related to law was assessed and analyzed with the persons carrying public responsibilities. In Layman's terms, forensic science is a branch of knowledge practiced by a forensic investigator to resolve any unlawful act or misdemeanor.

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References

1. Sharma, B. R (2022).Lexis Nexis Universal. Forensic Science in Investigation & Trials.
2. [4]Mohod, Vanita (2022).Dr. D. Y. Patil Law College Blogs. Significance of Law in Medical Profession.
3. [5]Tsatsakis, Aristidis M (2008). The Open Forensic Science Journal, Editorial vol.1, 2008, p.26.

According to the Midwest Forensics Resources Centre at the United States, Department of Energy, "Forensic science is the application of natural sciences to the procedures of law. In practice the subject of forensic science draws its Principles and Methods from the subjects like physics, chemistry, biology and other science objects".[6] Even the meaning of forensic science has been elucidated by California Criminalistics Institute as "Forensic Science is the application of the methods and techniques of the basic sciences to legal issues. Forensic Science is a very broad field of study. It includes Crime Laboratory Scientists, sometimes called Forensic Scientists or, more properly, Criminalists, work with physical evidence collected at scenes of crimes."

Forensic Science is not a new subject. The genesis of forensic science found its roots as early 3000 BC when the Egyptian Civilization used to perform autopsy by practicing religious activities and thereby removing and examining internal organs of the human body after death which was also known as 'mummification'. However, the ancient utilization of forensic science can be notably seen during the period of primeval Greek and Roman civilizations that procreate outstanding benefactions in the branch of therapeutics particularly in pharmacology. Over the centuries, autopsies are counted as one of the basic gifts of medical advancement. The foremost recorded necropsy was condemned on Julius Caesar in 44 BC[7] where he was bayoneted with twenty three wounds, ironically none turned out to be mortal in the opinion of the physician Antistius, except the second one in the chest.[8] In 1247, an instruction manual was written by Song Ci in the book named 'Hsi Yuan Lu or The Washing Away of Wrongs' on how to perform medico-legal investigations, conduct examinations on corpses, deduce the exact time of death, real cause of death and a way forth evaluation illustrated under forensic issues like poisoning, decomposition, wounds from various weapons, strangulations, and fake wounds.[9]

Different Fields of Forensic Science:

Forensic Science is a broad field and acts like an umbrella for the sub-branches under it. It is multi-disciplinary in nature and hence it is portrayed from a number of scientific departments which is well focused on the recognition, identification, and evaluation of material evidences. The advanced science technologies and innovations

4. [6]Khan, Gowsia Farooq, and Sheeba Ahad (2018). International Journal of Advance Research in Science and Engineering. Role of Forensic Science in Criminal Investigation: Admissibility in Indian Legal System and Future Perspective, 7(4):1124-1138.
5. [7]Blagev, Denitza P., and Michael J. Lanspa (2020). The Lancet Respiratory Medicine. Autopsy Insights from the EVALI Epidemic, 8 (12): 1165-1166.
6. [8]Hirt, Miroslav, and Peter Kovac (2005). Soudni Lekarstvi. History of Forensic Medicine. First Part: General Sources of Forensic Medicine in Europe from Ancient Times, 50: 23-35.
7. [9]Campbell, Maude, and Henry Robertson. "The Entire History of the Autopsy." Popular Mechanics, 2020.

in forensic science have made this field a highly developed science where numbers of disciplines are allowed forensic scientists to be specialized in either of any divisions. Therefore, forensic science is organized into different fields, they are as follows:

- **Trace Evidence Analysis:** Trace evidence can be often referred to the diminutive segments of physical evidence such as fibrous material from clothes, samples of glass, paints, hairs, bloods, or even skin etc. sometimes fingerprints too, collected from a crime scene are analyzed and used to establish a link between the offender and the crime committed. This evidences basically acts like a puzzle and when linked all together can help in formulation of a story needed for solving the case.

- **Forensic Toxicology:** It deals with the analysis of harmful effects of composite chemicals on the human body which involves the identification and determination of the quality and the quantity of the drug, poison or any other chemical found during the examination of the deceased's body.

- **Forensic Psychology:** This field of forensic science deals with the study of the mind and behavior of an individual. This field usually helps in determining the circumstances behind the criminal's behavior and the pattern of committing crime.
- **Forensic Podiatry:** This discipline deals with the examination of the impressions of footprints found from the crime scene. As footprints can also help in apprehending the perpetrator of the crime, hence this is widely used and accepted by the criminal investigating officers.

- **Forensic Pathology:** The medico-legal death examinations of the corpses are determined under this department of forensic science. Generally, it is also known as 'autopsy'. This field helps in determination of the cause of the death of the deceased person.

- **Forensic Palynology:** It is the novel field of forensic science which specifically deals with the research of a plant's reproductive parts such as pollen, spores, grains, seeds, etc. which can be pollinated through air, water or any other medium. This branch of knowledge can be used to recognize an individual's whereabouts by analyzing the place of the pollination. So far scientists had not developed any analogous technologies to assemble and contrast these traces and utilize them as evidences as the pollen and spores were so minute that it cannot be detected open eyed.

- **Forensic Odontology:** It is a subdivision of forensic science that concerns with the knowledge of dentistry with the legal background. The experts of this field called as Forensic Odontologists are the trained dentists who use their expertise to identify the injuries caused through bite marks. The age of the teeth, etc. In

forensic recognizance, the maw permits for a myriad of possibilities.[10] One of the biggest achievements found in the history of the forensic odontology is that of Cheiloscopy, which came from a Greek word 'cheilos' elucidates lips and 'e skopein' connotes to see[11]. Cheiloscopy is the forensic investigation tool that negotiates with singling out a member of human race on the basis of lip traces.

- **Forensic Linguistics:** It is the field of forensic science where a written or recorded document is analyzed on the basis of language and interpreted in order to solve the crime.

- **Forensic Geology:** Forensic geology deals with the study of trace evidences accumulated ted from the crime site in the form of any kind of soil, mineral and petroleum.

- **Forensic Entomology:** It is the area of a scientific knowledge which considers with the study of insects and other kinds of arthropods with respect to criminal investigation in order to determine the time since death with the help of study of insects that infested on the human body.
- **Forensic DNA Analysis:** It includes all certain of techniques which involve DNA profiling, and DNA fingerprinting. The DNA analysis is done in order to identify the unique genetic information of a person. For the purpose of DNA analysis, blood, semen, hair, and even skin scraping samples are used to analyze and match with the samples collected from the crime scene.

- **Forensic Botany:** It is the combination of botany and forensics where use of any plant or any plant product as evidence help in solving crimes like kidnapping, murders, etc.

- **Forensic Archeology:** This field used with the combination of archaeological techniques as it can help in gathering information related to the buried bodies.

- **Forensic Anthropology:** This knowledge domain deals with the examination of the decomposed human remains or skeletons to identify the age, gender and to determine the time of the death. This field offers useful leads on the identification of the deceased body, specifically in the cases where the body has undergone beyond recognition due to decomposition.

8. [10]Venkatesh, Rashmi, and Maria Priscilla David (2011). Journal of Forensic Dental Sciences. Cheiloscopy: An Aid for Personal Identification, 3 (2): 67-70.
9. [11]Kapoor, Neeti, and Ashish Badiye (2017). Saudi Journal of Biological Sciences. A Study of Distribution, Sex Differences and Stability of Lip Print Patterns in an Indian Population, 24(6):1149-1154.

- **Digital Forensics:** The nomenclature 'digital forensics' and 'cyber forensics' are often brought in to play synonymously for computer forensic science.[12]
- **Criminalistics:** Criminalistics involves the application of the scientific methodologies in detecting and solving up crimes by determining the perpetrator.
- **Forensic Accounting:** This field is used to determine and analyze the financial transactions of a person or in any business. Now-a-days, the white-collar crime has been increased. In order to investigate the corruption, embezzlement and financial fraud this field is extensively is in demand.
- **Forensic Ballistics:** Forensic ballistics deals with the evidences related to fire arms weapons and ammunitions and explosive materials.
- **Forensic Photography or Videography:** One of the coolest inventions in the tools to capture photographs of the deceased body is Alternative Light Photography which helps to see the damage caused even before it is visible in the skin. Earlier Omichrome camera with blue light and orange filters used to clearly show bruising below the skin's surfaces. Moreover, Ballistic Specialists often uses high-speed cameras in order to understand the gunshot wounds, from how far the bullet has been fired and so on, which is termed as High-Speed Ballistics Photography.

Application of Forensic Science:

The use of technology and the knowledge of science have made forensic science applicable nearly in all cases. Hence, it has vast scope and demand in the criminal legal system. For the purpose of enforcement of law, in both the cases whether it is civil or criminal, forensic science plays an indispensable contribution in solving the cases. With the advancements in the forensic science, it is used in almost every criminal case and hence it became a necessary part of the criminal investigation. Due to ability of providing accurate and objective information about the substantiations gathered from the place of the crime committed, the law enforcement agencies are fully dependent on the forensic scientists for their technical support in monitoring the investigation. The tools used in forensic science needed a lot of different skills like observation skills, evidence collection and their analysis, fingerprint recoveries, etc. Being a broad field, forensic science acts like an umbrella term form the various areas under it. There are various experts who cover these specialized fields and play their roles when a crime is committed and forensic team was called. These forensic scientists have their own areas to work like field officers who visits the crime scene and collects physical evidences, lab officers who analyses and examines the collected

10. [12]Lutkevich, Ben. Tech Target. Computer Forensics (Cyber Forensics).

evidences in the laboratory, crime scene investigator who find, collect and protect the evidences and send them to crime lab, latent print examiners who exclusively work on fingerprints or footprints, firearms examiner are the experts who specifically work on ballistic reports, document examiner are the experts who collects and examines any documents found in the crime scene, and the photographers who take photos of the crime scenes, etc. In criminal justice system, forensic science contributed remarkably by providing accurate information recognized and recovered from the crime site to the court which associates the criminal and the victim. Most of the times in order to narrow the number of suspects in crime committed and to apprehend the real one, forensic science gives a clear and correct perception based on the collected evidences. Until something concrete is proven every person remains the suspect and, in that view, to reach the correct criminal forensic science provides with a healthy skepticism which is an important part of the criminal investigation.

Interconnection of Forensic Science with Law:

The nature of committing crime is progressively changing according to the changes in the society. Similarly, the law is changing with the time in order to apprehend the culprit. Even a crime scene also undergoes rapid changes within a sphere of 24 hours, the weather, living beings specifically human beings change extensively. As soon as the crime is reported, the crime scene should be examined otherwise after a long period even the crime scene may become unrecognizable. For example, if any accident took place on a busy road, the evidentiary clues will be lost if not collected or protected immediately. Everything changes with the passage of time, so it is necessary that the culprit must be apprehended in time as sometimes they cannot be recognized because of their different appearances perhaps the advanced techniques of forensic science had made it possible through fingerprints, any cut marks or bone fractures, or any kind of character which is permanent in nature. Now-a-days, Law and Forensic Science go hands in hand as the new technology of forensics called as DNA profiling is one of the finest modes of identification of a person.

There's an immense impact of forensic science on law. As the declared evidences of forensic science has become a reliable element of various civil and criminal cases on the basis of purely scientific facts. In several cases, when the evidences collected doesn't matches the accused with the crime scene as well as the victim it saved the innocent too. At present, with the advancement in the technologies, the Indian Courts have asked for the expert evidence of forensic experts in number of cases, which is also known as expert opinion. One way or the other forensic science is interconnected to each other whether it is paternity test in the civil cases or ballistic reports used in the criminal cases, the use of tools and techniques of forensic science can be clearly recognized in the Indian legal system.

Principles in Forensic Science:

The field of forensic science is so vast that in order to guide the disciplines and methodologies of science certain principles are enumerated. These principles particularly help in criminal proceedings from the point of investigation of the occurrence of the crime till the end of the conviction of the. The principles of forensic science are significant in the criminal proceedings are as follows:

- **Locard's Principle:** Coming next after the nineteenth century in position, Dr. Edmond Locard, a French forensic science pioneer formulated the theory which states "Every contact leaves a trace". Trace evidence analysis works on this principle which is still extensively used in the criminal investigations.

- **Law of individuality:** This principle states that every individual whether it is natural or man-made has different qualities and characteristics which can be duplicated in any other form like the fingerprints and DNA of a human being.

- **Law of exchange:** This principle based upon the circumstantial evidence according to which when a criminal or any of his instrument comes in a close contact to the victim or the objects in the surrounding must leave some traces behind which further helps in apprehending the exact culprit.

- **Law of progressive change:** This principle is based on the maxim 'Change is inevitable' as everything changes with the time. In the field of forensic science, a crime scene of occurrence undergoes rapid changes due to the Indian weather; it decomposes the body and degrades the sample marks. Even the criminals became unrecognizable after a certain period of time if not caught in time.
- **Law of comparison:** This principle is based on 'only the likes can be compared' which emphasizes on the necessity of providing the similar samples as well as replicas for collation with the canvassed articles.[13]

- **Law of analysis:** This principle specially denotes the collection of the samples and their preservation without tempering and destruction for better analysis.

- **Law of Feasibility:** Each and every discerning whether it is explicit or implicit is formed, deliberately or accidentally, on the grounds of probability. This law of feasibility or probability is based on the mathematical expression, $P_s = N_s / N_s + N_f$, where 'P' signifies the probability, 'N_s' denotes the number of course of action in which the phenomena can be successfully happen with tantamount facilitation and 'N_f' depicts the numerous methods in which it can fail with equal facilitation.

- **Law of circumstantial facts:** This principle is based on 'Facts do not lie, Men can and do'. Sometimes the testimonies of eye-witnesses are modified because the circumstantial evidences are material evidences which can be manipulated in

11. [13]Singh, Archana. Forensic's Blog. Laws and Principles of Forensic Science.

various ways. More often, it is found inaccurate. "True belief only becomes knowledge when backed by some kind of investigation and evidence" as believed by Karl Marx.

Ethics in Forensic Science:

In every professional field, ethics acts as a soul, the connotation of any field of profession is indistinct and ambivalent without it. In order to institute quality, validity and authenticity in any profession ethics is required. Perhaps, sometimes it is found that something which may be ethical to one individual may be unethical to some other. The field of science and technology always crosses the path of ethics and due this reason in multiple situations, scientists and researchers are perplexed due to ethical concerns. The scientific tests or techniques used in connection with the detection of crime deals with the legal characteristics and may assist in laying foundations of the guilt or exonerating the suspect.[14] It must be kept in mind to the forensic experts that their fault can lead an innocent to the imprisonment and the real culprit to be scot free. Therefore, it is compulsory to have legal moral principles for every forensic institution which shall shape up the forensic scientists to carry-out their responsibilities with devotion and affection.

Forensic science laboratories:

The formation of forensic science laboratories found its place during the 19th century when the law enforcement agencies felt the need of specific place to examine the cases of death due to poisoning for isolation, separation, identification and evaluation of the various kinds of hazardous substances absorbed in the human body. In 1910, Prof. Edmond Locard of University of Lyons, also known as 'the Sherlock Holmes of France' introduced the first police crime laboratory in France. In India, the foremost Chemical Examiner's Laboratory established at Chennai, at that point in time Madras Presidency, under Health Department, amidst 1849.[15] Afterwards, in other states like Calcutta in 1853, Agra in 1864 and Bombay in 1870, these laboratories were set up. But with the emerging crime, these laboratories were found inadequate due to which many of the culprits got free without punishment. Therefore, the first ever Forensic Science Laboratory in India brought in to light at Stately level on 1st July, 1952 at Calcutta, West Bengal under the famous idealist, Dr. B. C. Roy, the then Chief Minister of West Bengal and the laboratory begin to workable under the counseling of the Dr. N. K. Sen as Director, State Forensic Science Laboratory. The Medico-legal division of the Chemical Examiner's Laboratory was entirely relocated to this laboratory and formed completely serviceable in the year 1953. Similarly, in Central

12. [14]Yadav, Praveen Kumar (2017). Egyptian Journal of Forensic Sciences. Ethical Issues across Different Fields of Forensic Science, 7(10).
13. [15]Tewari, R. K., and K. V. Ravikumar (2000).Journal of Postgraduate Medicine. History and Development of Forensic Science in India, 46 (4): 303-308.

level, the Central Forensic Science Laboratory (CFSL) was settled at Calcutta in the year 1957 followed by Hyderabad being the second Central Forensic Science Laboratory established in the year 1965. However, in the year 1933, the Central Forensic Science Laboratory was founded at Lahore which was shifted to Chandigarh in the year 1961. At present day, there are seven Forensic Science Laboratories are established in the central level in India at Hyderabad, Kolkata, New Delhi, Chandigarh, Bhopal, Pune and Guwahati and termed as Central Forensic Science Laboratories. Earlier, the establishment of forensic science laboratories was built without any proper planning and there were very few people who were properly trained. So, for the first time a Central Detective Training Institute was settled in India in 1956 at Calcutta with an aim of imparting training related to scrutinizing any methods based on principles of science like terrorization, explosions, violent and heinous crimes committed on women and other basic uses of tools and technologies needed for investigation, followed by Hyderabad in 1964 and Chandigarh in 1973. The function of this forensic science laboratory is to examine the vindications gathered from the site of crime and to submit valid and reasonable report to the Court in order to render justice through criminal justice system. Earlier there were few scientific divisions were provided to the investigating officers in order to questioning and perform examinations to collect evidences like ballistics division, toxicology divisions, document divisions, biological divisions, serological divisions and photography etc. To combat this problem, in the year 1959, the Union Government nominated two Committees with the motivation of establishment of new forensic science laboratories in all the States as well as upgrading the current one and to improve the research and learning's of science and technology. These two committees are:

- Central Forensic Science Advisory Committee, to solve the matter in question associated to the domain of forensic science. Subsequently, it was remodeled to Steering Committee on Forensic Science in the middle of 1972, eventually operating still dynamically; and
- Central Medico-legal Advisory Committee, for rendering suggestions to the Central as well as State Governments on the issues of medical-legal mechanisms and applications, however, this committee was discontinued.

With the growth of science and development various forensic science laboratories were setup in other States and Central levels with widened scope of newly emerged scientific divisions which includes Mobile Laboratories, Forensic Anthropology, Forensic Odontology, Forensic DNA Analysis, Computer Forensics, etc. From the view of training institutes and academic facilities still it's a challenge to introduce Criminology and Forensic Science at the University level as the course of study in India. During 1950, this question was grasped in front of the Vice Chancellors of numerous universities but the result was fail. In 1967, the Central Advisory Committee on Forensic Science under the guidance of the then Director of Central

Bureau of Investigation, Shri D P Kohli, came up with the need of academic training of criminology and forensic science in several yearly meetings, as a result Dr. D S Kothari, the then Chairman of University Grants Commission introduced Criminology and the Forensic Science as University education by framing high a sky-scrapping level committee and recommended universities to encourage together with initiating subjects in criminology at undergraduate level and criminology and forensic science at postgraduate level. These academic activities like research work and practical trainings in the education system give immense help to prove the findings from the collected evidences and to build a strong justice system. Since the last two decades, the academic institutions as well as research institutions are improved and facilitated with better versions of equipment needed to perform the techniques.

Judicial Paradigm of Forensic Science in Criminal Justice System:

According to the time, the pattern of committing crime is also changing, whether it is infamous Bangalore's Jnana Bharati Gang-rape Case'[16] of 2012, Jammu & Kashmir's 'Kathua Rape Case'[17] or Uttar Pradesh's 'Unnao Rape Case'[18] rape on girl children below eighteen years of age which led to made Criminal Law Amendments Act in the year 2018 and increase the punishment for rape and gang rape to minimum twenty-years which may be increased to penal servitude for lifetime, Delhi's 'Nirbhaya Rape and Murder Case'[19] which led to amend Criminal Law Amendment Act in the year 2013, Delhi's 'Tandoor Murder Case'[20], the unsolved Noida's 'Arushi Talwar-Hemraj Double Murder Case'[21], or even Karnataka's 'Beena's Murders Case'[22] of 1988 of dismembered body parts, the advancement of forensic science came as a rescue weapon to give aid the inquiry bureaus in addition to rendering justice by punishing the culprits in such cases. Recently, in the case of Uttar Pradesh's 'Hathras Gang Rape Case'[23], the Supreme Court ordered for forensic experts to undergo scientific tests such as polygraphy, brain mapping as well as narco-analysis test of suspects in order to get circumstantial evidences for the committed crime. The brutality and the cold-blooded murders are increasing where the usual criminal investigations by the Polices takes too much time still unable to find the proof. During the British period, the people used to fear police which is now vanishing with the upcoming generation. However, the use of third degree is still continuing even after many directions and guidelines

14. [16]State by Jnanabharathi Police v. Raja. Sessions Case No. 29/2014.
15. [17]Mohd. Akhtar v. State of Jammu & Kashmir. Writ Petition (Criminal) No. 85/ 2018.
16. [18]CBI v. Shashi Singh & Anr. RC No. 08 (S) / 2018.
17. [19]Mukesh and Anr. v. State (NCT of Delhi). (2017) 6 SCC 1.
18. [20]Sushil Sharma v. State (NCT of Delhi). Criminal Appeal No. 693 of 2007.
19. [21]Dr. Rajesh Talwar and Another v. CBI. 2013 (82) ACC 303.
20. [22]State of Karnataka v. M. V. Mahesh, Criminal Appeal No. 1678 of 1995.
21. [23]Satyam Dubey & Ors. v. Union of Indian & Ors. Writ Petition (Criminal) No. 296 of 2020.

have been provided via highest judicial court of the country. In contemplation of establishing the guilt of a culprit, the principle of 'proof beyond reasonable doubt' is shall be kept in mind. Otherwise, if any reasonable doubt exists, then the accused will get its benefit from such doubt as a result acquittal from the charges. Even in the heinous crimes the culprit gets scot free due to lack of evidences. Therefore, in order to give valid decision through the legal mechanism the Court plays a vital role with the cogent evidences presented before him to serve better justice.

With the drastic social changes in the society and the patterns of committing crime the science and technology is a boon to the Indian legal system. In developing countries, the forensic science acts as an advantage to the society as the time is changing the way of committing crime is becoming inhumane, brutal and evil in nature which often keeps the society from thinking a better future. From the traditionally committed crimes like murder, serial killings, rape, sexual assault, kidnapping or abducting, robbery or dacoity, mentally sick, drink and drive, domestic violence or dowry deaths, etc. to the crimes committed in the modern era like food adulterations, manufacturing of medicines, poisonous substances, copyright infringements, environmental issues like pollutions, consumption of polluted water, global illicit trades of timber, animal laws like large-scale elephant and rhino poaching in order to trade illicitly, medical malpractices, abortions, custodial tortures, terrorism, cybercrimes, ingesting drugs, use of firearms, etc. needs the proper use of scientific techniques to solve the cases related to them. At the international level, forensic data such as DNA, fingerprints, etc. can be used to link a series of transnational crimes, like if a suspect is crossing border.[24] Most of the cases are solved by using the knowledge of science which moulded up to the field of forensic science along with legal background. With the advancement in the crimes, the science is also developing and thereby to combat this crime everyday one way or the other new techniques as well as tools are inventing. Imparting justice through the substantive evidences, the court always finds crucial to pronounce a judgment. In Older times, the evidences were based primarily on the eye-witnesses who were brought forth through first-hand information. But with the advent of new means of technologies in the field of forensic science, cogent and reliable evidences are produced before the courts with the assistance of forensic experts which has been proved to play a pivotal role in decision making of the court.

The earthborn inhabitants are the concoction of divergent civilized communities.[25] From the scientific point of view, each variant of Homo sapiens has unprecedented features that differentiate them from other variant which can be

22. [24]INTERPOL.Forensics - How We Work.
23. [25]Rehman, Hifz Ur. Forensic's Blog. Importance of Forensic Science in Developing Nations.

clearly identified from the unique pattern of DNA and fingerprint of a person. DNA analysis and the use of fingerprinting is one of the famous methods of solving crime with the help of forensic science experts. This study precisely dealt on the meaning and origination of forensics, its applicability in the criminal reform system specifically in India, the various different techniques used in order to collect the evidences, issues in the implementation of these scientific techniques in the Indian legal system and its constitutional validity as well as evidentiary values is elaborately discussed. Further this study focused on the guidelines furnished by the National Human Rights Commission (NHRC) in order to conduct these techniques to collect prima facie evidences and to support all these topics a number of cases has been discussed.

Conclusion:

From the above study, it is easily concluded that the study of forensic science is the insinuation of comprehensive elaboration of knowledge of science to answerable investigation to a law-abiding framework inquisitively. This can be related to the civil as well as criminal actions. Just as the logical rate of the progressive awareness penetrated the humankind in the antebellum, forensic investigation happened to be more demonstration based analytical methodologies similar to the maneuver of torture for compulsion of confessions primarily suspended to dominate the discretion of the Court. The homicide scene provides with the evidences related to culprit whereupon the course of action may be accompanied by the crime scene examiner like rebuilding of the murder scene, specification of the doubtful person and significant corroborations which produced before the Court. The help of forensic science minimize the number of suspects. So, one can easily deduce that the administration of forensic science under the criminal legal system acts as a powerful tool in the hands of the crime investigating officers and hence such can be called as the boon to the society to apprehend the hidden culprit.