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DNA PROFILING AS A FORENSIC SCIENCE TECHNIQUE USED IN CRIMINAL JUSTICE SYSTEM IN INDIA: AN OVERVIEW

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Abstract

Crime has always existed in the society since the dawn of human civilization and it has never been on halt. The commission of crime and the techniques used have evolved with the advent of science and technology. Because criminals have become sophisticated and leave no evidence behind, forensic science has found its prominent place in dealing with criminal activity. So, in resolving crimes biological evidences are implicated and they can be traced only with the help of forensic science technique. The essential *"building block of inheritance"* is DNA, or Deoxyribonucleic Acid. DNA is an organic component found in every cell of human body giving every person a unique genetic blueprint. It can be traced through bones, blood, hair, saliva, sperm, or any other parts of the body. DNA Profiling being an innovative and groundbreaking technology have paved out its way in dealing with smallest of biological evidence with utmost certainty. DNA profiling as scientific evidence is significantly faster, more precise, reliable, and definitive than any human evidences, and it can withstand the scrutiny of the court to ascertain guilt or innocence of an accused or suspected person. DNA profiling is used to ascertain criminals and/or suspected persons with "incredible accuracy". DNA technology is having a stronger impact in making sure that the criminal justice system is fair and accurate. In this paper, a brief introduction is given relating to DNA, its use and application and the significance of DNA evidences in criminal judicial system in India. The existing legislation on recognition and admissibility of DNA evidences have also been briefly discussed. And lastly, how the Indian judiciary has showed its creativity in admitting or allowing for DNA evidences has also been discussed through various prominent case laws. The need for specific legislation on DNA technology in India is need of an hour. The uniform mode of citation has been used throughout the paper following *Indian Law Institute* mode of citation.

Keywords: Forensic science, DNA Profiling, DNA analysis, genetic code, chromosomes, DNA Technology and Criminal justice system.

Introduction

Crime has always existed in some form or another since the dawn of human civilisation. Moreover, the concept of crime and the techniques used by criminals to perpetrate such crimes have evolved dramatically throughout time. Both crimes and criminals have evolved as the science and technology have advanced, and now the investigation cannot rely on old-age techniques of solving crimes such as questioning, collecting information and electronic eavesdropping to find criminal activity, etc. Even the harsh and dehumanising approach of criminal detection has no place in a civilised society. Forensic sciences, being one of the scientific technique or method which helps the investigating authority in resolving crimes has gained a significant supremacy in the last few decades. "*It is in this framework; Forensic science has found its existence and has developed as a potent tool in the hands of the judiciary and law enforcement agencies. The forensics has developed not only its own technique but also its own branches, which are more or less exclusive domains of forensic science. The science of fingerprints, anthropometry, track marks, documents and forensic ballistics essentially belongs to*

forensic science alone. More advances that are significant have been made in serology, voice analysis, and odour analysis and in studies to pattern recognition through computers".[1]

DNA profiling, on the other hand, is a relatively new forensic science tool. DNA profiling is a method of identifying a person based on his genes. DNA profiling is an innovative and groundbreaking technology that has been created and is being used in forensic laboratories around the world. DNA profiling can be used to identify whether the biological evidence collected at the crime scene came from the perpetrator, the victim, or both. DNA profiling is one of the most dependable and conclusive ways of personal identification known to scientists today. The goal of DNA analysis is to compare the genetic information present in human biological material that is exclusively distinct between two people, except if they are identical twins.

A British geneticist, **Sir Alec John Jeffreys**,[2] developed the technique for DNA fingerprinting. In the case of *R v. Colin Pitchfork*[3], DNA profiling was utilised for the first time in UK in 1986 to give significant evidence. The essential *"building block of inheritance"* is DNA, or Deoxyribonucleic Acid. The DNA of an individual can be found practically in every cell of the human body. *Polymorphism* is a term used to describe variations in human DNA. Individuals can be identified using these polymorphic regions of the DNA molecule. DNA is a person's genetic code, *"the blue print which makes you what you are".* Development of DNA analysis has been very crucial in most of the civil litigation, including paternity or maternity claims, baby exchange cases, as well as the scientific identification of offenders in criminal cases.

Early medical examination, through body fluid sample, and outstanding forensic analysis can provide indisputable evidence in criminal cases like rape, murder, etc., avoiding the need for prolonged argument in court. A scientifically explainable and recreated sequence of events helps in corroborating the eyewitness evidence. The relevant facts acquired from physical evidence can be used to verify the accuracy of eyewitness testimony, especially when the witnesses turn hostile. If the crime scenario is recreated using this cutting-edge forensic science approach, the truth behind the statements can be revealed.[4]

DNA profiling as scientific evidence is significantly faster, more precise, reliable, and definitive than any human evidences, and it can withstand court scrutiny to determine guilt or innocence of the accused or suspected person. DNA profiling is used to ascertain criminals and/or suspected persons with "incredible accuracy" when scientific material is available on the crime scene. It can also be used to exonerate suspects and acquit persons who have been wrongfully accused and/or convicted of crimes. In general, DNA technology is having a stronger impact in making sure that the criminal justice system is fair and accurate. This paper is an overview on the functioning of biological evidence, particularly DNA Profiling, which has gained momentum in crime detection in many developing countries like India. The paper briefly deals with the significance, use and application of DNA evidences and later on emphasizes the need for specific legislation on DNA technology in India. The paper has also discussed the various existing legislations in India which broadly deals with DNA evidences.

What is DNA?

DNA is an abbreviation for Deoxyribonucleic Acid. "It is an organic component contained in all living cells that provides an individual with a unique genetic blueprint. Blood, saliva, sperm, hair, bones, and [other organs of the body][5] can all be used to extract it. The DNA method is now widely accepted across the world."[6]

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[1]B.R.Sharma, *Forensic Science in Criminal Investigation & Trials*, 03 (Universal Law Publishing, New Delhi, 15th ed., 2016)

[2]Alec J. Jeffreys is the pioneer as far as the discovery and development of DNA Profiling is concerned. He was accorded Knighthood by Her Majesty, the Queen of England for his work in this field. The US Scientists have also made equally commendable contribution in this field. See: Paul J. Hangerman (1990), "DNA Typing in the Forensic Arena", Volume 47 *American Journal of Human Genetics*, 876-82 (1990)

[3][2009] EWCA Crim. 963

[4]Dr Tabasum Ara, "DNA Profiling in Criminal Justice System of India: Relevance and Importance", Volume 7, Issue 8, *IJRTI* 117 (2022), *available at:* https://www.ijrti.org/papers/IJRTI2208020.pdf (last visited on December 21, 2022).

[5]DNA is contained in every living cell of our bodies and may thus be extracted from a wide range of materials, a list of which is provided below:

a) Blood and bloodstains
b) Semen and semen stains
c) Hair and hair roots
d) Finger nail pairings
e) Saliva
f) Body tissues and body organs
g) Bone and bone marrow
h) Urine
i) Faecal matter
j) Tooth canal root pulp
k) Foetal material

"The human body is made up of numerous cells, each one of which contains a complete set of chromosomes. In every cell there are number of components like *Ribosome, Golgi Bodies* and every cell, except *Red Blood Cell,* contain within it a structure or component called "Nucleus". Each cell's nucleus contains an identical duplicate of the individual's genetic material, known as DNA or Deoxyribonucleic Acid".[7] The nucleus of every cell has a protein and DNA molecule, which is coiled into string-like structure called "chromosomes" and the chromosomes are composed of DNA which is tightly coiled around proteins called "histones" which ultimately supports the structure. Many genes are found in each chromosome. As a result, it defines the human behaviour, character and physical traits of the offspring that are passed down from their parents.

DNA is a molecule that has the shape of a long tangled ladder-like structure known as "double helix" and is composed of four nucleotides, viz.,: "*adenine, cytosine, guanine*, and *thiamine".* The organisation of the nucleotides results in a "code", and these codes form a *gene* of an individual when they are sequenced in chromosomal DNA.

"There are 46 chromosomes in humans, one pair of sex chromosomes (two X chromosomes for females, X and Y chromosomes for men), and 22 pairs of autosomes. This is known as the human karyotype. Except for identical twins, every human cell has 23 pairs of chromosomes, one from the mother and the other from the father, and each pair is unique in each individual."[8]

"This uniqueness makes DNA evidence very valuable in investigations as it is almost impossible that someone else may have DNA identical to that of an individual".[9] The previous samples of a person can be used to match the new ones discovered at the crime scene because a person's DNA does not change over time or with age.

Significance of DNA as Evidence

DNA is one of the significant ways in determining the crime committed by someone because of its potential value, accuracy and indefinite behaviour of ascertaining the suspect. The DNA of a person remains same throughout his lifetime. It does not undergo any change with the age of a person. No matter from which tissue of the body the DNA is extracted, all gives the same DNA fingerprinting pattern of an individual.

There is no stable material on Earth than a DNA of a person. As per Robert Pollack[10] *"...the planet's surface has changed many times over, but DNA and the cellular machinery for its replication have remained constant... no stone, no mountain, no ocean, not even the sky above us have been stable and constant for this long; nothing inanimate, no matter how complicated has survived unchanged for a fraction of the time that DNA and its machinery of replication have co-existed".*

DNA is an extremely consistent substance. DNA has the ability to be heated, boiled, and denatured. Due to its stability, it can be separated from millions of years old fossils and/or from thousands of years old bones.[11] Even in difficult circumstances where all other investigation procedures, such as interrogation have failed or eyewitnesses have become hostile, DNA evidence proves to be helpful in resolving the case. Even when no witnesses are available, the scientific evidence left behind can be used to build circumstantial evidence. The use of DNA evidence minimises the frequency of false arrests and forms the way for the identification of the true perpetrator. As a result, even the smallest scientific material is sufficient for DNA profiling, making it one of the most effective tools in resolving crime.

DNA Profiling: Use and Application

DNA Profiling or DNA Typing refers to the comprehensive examination of DNA. DNA profiling is a method that has been used by forensic scientists for over a decade or so to establish a person's identify in criminal or civil matters. DNA analysis is a biological technique that enables the scientists to examine DNA samples. Forensic scientists utilise DNA profiling to identify people based on their DNA profiles, so maintained. As previously said, exception being of identical twins, each individual's DNA is diverse and distinctive, and therefore, DNA profiling is a helpful tool in investigating crimes. DNA profiling provides for a person's genetic profile. When DNA profiles of accused or suspected persons are matched with the samples taken from the crime scene, or in cases of confirming the paternity of child, with another person's sample, it offers a conclusive or

l) Post-mortem materials
m) Blood samples in blood relationship cases
n) Other body fluids

[6]Aditya Pratap Singh, "Admissibility of DNA in Indian Legal System", *available at:* http://jlsr.thelawbrigade.com//index.php/2017/06/16/admissibility-of-dna-in-indian-legal-system/ (last visited on April 18, 2019)

[7] *Supra note* 4

[8]Dr. R. Kumudha, *DNA Technology Under The Criminal Justice System In India: A Critical Analysis*, 08 (International Society for Green, Sustainable Engineering and Management, Kolkata, 1st ed., 2017)

[9]Usha R. Rani , "DNA Evidence and the Courts", Volume 1, *Karnataka Law Journal* 2 (2008).

[10]V.R. Dinkar, *Justice in Genes (Evidential Facets of Forensic DNA Fingerprinting),* 13 (Asia Law House, Hydrabad, 1st ed. 2008)

[11]*Supra note* 8, at 13

undisputable proof of relation and/or connection. Thus, this technique is known as *"justice through advanced science"*.

A DNA profile is an alpha-numeric number generated by a computer from the visual output of the DNA analysis process. In criminal investigation, DNA profiling is useful as an intelligence technique to recognize, confirm, or reject suspected person. It may also be used to ascertain crime victims or victims of natural catastrophes, and also to connect several offences by analysing DNA profiles from multiple place of crime. If DNA of an accused and/or suspected person from one crime scene matches the DNA from an accused and/or suspected person's existing profile, the match may be used to prove guilt.

DNA testing is used as an accurate and potent forensic tool in a variety of methods across the world to analyse crime scenes. It has gained credibility in the criminal justice system for being trustworthy and useful in demonstrating the innocence or guilt of the accused and/or suspected person. DNA testing is useful in post-mortem cases where identifying a deceased person's body is problematic, such as in cases of drowned, cremated, or full/partial disintegration of a body. It is utilised when odontology and radiography, the more popular techniques, are ineffective. Investigations into crime involving several fatalities or serious injuries benefit the most from it. By determining the source or cause of a bloodstain at a crime site, the investigative authority may identify those who were there during the occurrence of crime and track their movements around the crime scene. When investigating crimes like long-term abuse, DNA profiling helps the police by convincingly proving that the tiny bloodstains dispersed about the crime scene are from the victims. DNA Profiling capacity to resolve old cases is one of its most crucial and valuable features. DNA technology enables the analysis of samples from very old cases that were never solved. Even years after the offence was committed, this might land in the arrest of the suspect.

Most biological samples, including "blood, tissue, bone, sperm, skin, urine, bone marrow, faeces and cells in saliva, perspiration and tears", can be used to generate DNA profiles. "The improved sensitivity of DNA technology has meant that profiles can now be obtained from contact traces even after minimal contact between a person and the object. Examples of contact traces are fingerprints, ear-prints, facial contact smudges, saliva on drink cans, material expelled from coughing and sneezing. The potential for recovering DNA trace evidence must be borne in mind when investigating all incidents of criminal activity. In cases of missing persons, mass disasters or unidentified bodies, DNA offers the opportunity of body identification."[12]

Realising the importance of DNA profiling, many developed countries are developing DNA Data Base, so that they could easily compare the DNA evidence recovered from crime scene with those available in data base and may ascertain the identity of the perpetrators. The FBI now maintains the Combined DNA Index System (CODIS), a DNA testing database of convicted offenders. Additionally, each State keeps a database of criminals who have been found guilty. As part of an FBI programme, it is suggested that these databases be connected to one another to form a huge national DNA database.

The Relevant Legislations on DNA in India

The use of DNA or any other biological evidences is something which is not new in India. Although there is no proper legislation directly dealing with these biologically evidences, specifically DNA Profiling, but time and again we have found these evidences of much relevance in solving many crucial cases. DNA profiling is not only used in criminal investigation but it is also helpful in ascertaining parentage, legitimacy of child, missing persons and discovering unknown deceased bodies. The relevant legislations are Criminal Procedure Code, 1973 [herein after referred to as Cr.P.C.] (Section 53, 53A, 54, 164A, 173(8) and 293(2) & (4)); Indian Evidence Act, 1872 (Section 45 and 112); and The Prevention of Terrorism Act, 2002 (Section 27(1)). There are certain Articles in the Constitution of India, which is law of the land, dealing with DNA. They are Article 20(3), Article 21, Article 51A (h) & (j), and Article 246 (entry 65 & 66).

- **The Code of Criminal Procedure, 1973**

In accordance with Section 53[13] of Cr.P.C., a police officer may request that a registered medical professional examine an accused individual if they have reason to believe that doing so may provide for the evidence of the

[12]Modi, *A Textbook on Medical Jurisprudence and Toxicology*, 65 (LexisNexis Butterworths, Wadhwa, Nagpur, 22nd ed., 2001)

[13] **The Code of Criminal Procedure Act, 1973, S.53: Examination of accused by medical practitioner at the request of police officer.**

(1) When a person is arrested on a charge of committing an offence of such a nature and alleged to have been committed under such circumstances that there are reasonable grounds for believing that an examination of his person will afford evidence as to the commission of an offence, it shall be lawful for a registered medical practitioner, acting at the request of a police officer not below the rank of sub-inspector, and for any person acting in good faith in his aid and under his direction, to make such an examination of the person arrested as is reasonably necessary in order to ascertain the facts which may afford such evidence, and to use such force as is reasonably necessary for that purpose.

conduct of a crime. Section 54[14] deals with the arrestee's request for a medical examination by a certified medical practitioner. In the event of an arrest made in compliance with Section 438 of Cr.P.C., even after the offender has been granted bail, Section 53 of the Cr.P.C. may be used. On the request of the counsel or the police officer for an effective investigation, the Magistrate can order for the collection of blood samples for DNA testing.

In case of *Pokar Ram v. State of Rajasthan*[15], the Supreme Court held that, "the release of a person on bail did not appear to make any difference, if the examination is found to be necessary by the court for effective investigation becuase he did not cease to be an arrested person or accused person for the purposes of Section 53 of Cr.P.C."

Fazl Ali, J., of Supreme Court of India observed that[16],"...the term 'anticipatory bail' is really a misnomer, because what the section contemplates is not anticipatory bail, but merely an order releasing an accused in the event of arrest." Individuals who are granted bail do not cease to be arrested or accused persons under Section 53 of the Cr.P.C.

The Code of Criminal Procedure (Amendment) Act, 2005 revised Section 53 of the Act and introduced two new provisions, Section 53A[17], which allows for medical examination of a person who is accused of rape and Section 164A[18], which provides for medical examination of a victim of rape.

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(2) Whenever the person of a female is to be examined under this section, the examination shall be made only by, or under the supervision of, a female registered medical practitioner.

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[1][*Explanation*.--In this section and in sections 53A and 54,--

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(a) "examination" shall include the examination of blood, blood stains, semen, swabs in case of sexual offences, sputum and sweat, hair samples and finger nail clippings by the use of modern and scientific techniques including DNA profiling and such other tests which the registered medical practitioner thinks necessary in a particular case;

(b) "registered medical practitioner" means a medical practitioner who possesses any medical qualification as defined in clause (h) of section 2 of the Indian Medical Council Act, 1956 (102 of 1956) and whose name has been entered in a State Medical Register.]

[14]**The Code of Criminal Procedure Act, 1973, S.54: Examination of arrested person by medical practitioner at the request of the arrested person.**

When a person who is arrested, whether on a charge or otherwise alleges, at the time when he is produced before a Magistrate or at any time during the period of his detention in custody that the examination of his body will afford evidence which will disprove the commission by him of any offence or which will establish the commission by any other person of any offence against his body, the Magistrate shall, if requested by the arrested person so to do direct the examination of the body of such person by a registered medical practitioner unless the Magistrate considers that the request is made for the purpose of vexation or delay or for defeating the ends of justice.

[15]AIR 1985 SC 969: (1985 Cri LJ 1175)

[16]Balchand Jain v. State of Madhya Pradesh; 1977 AIR 366: (1977 Cri LJ 225)

[17]**The Code of Criminal Procedure Act, 1973, S.53A: Examination of person accused of rape by medical practitioner –**

(1) When a person is arrested on a charge of committing an offence of rape or an attempt to commit rape and there are reasonable grounds for believing that an examination of his person will afford evidence as to the commission of such offence, it shall be lawful for a registered medical-practitioner employed in a hospital run by the Government or by a local authority and in the absence of such a practitioner within the radius of sixteen kilometers from the place where the offence has been committed by any other registered medical practitioner, acting at the request of a police officer not below the rank of a sub-inspector, and for any person acting in good faith in his aid and under his direction, to make such an examination of the arrested person and to use such force as is reasonably necessary for that purpose.

(2) The registered medical practitioner conducting such examination shall, without delay, examine such person and prepare a report of his examination giving the following particulars, namely :

(i) the name and address of the accused and of the person by whom he was brought;
(ii) the age of the accused;
(iii) marks of injury, if any, on the person of the accused;
(iv) the description of material taken from the person of the accused for DNA profiling; and
(v) other material particulars in reasonable detail.

(3) The report shall state precisely the reasons for each conclusion arrived at. to

(4) The exact time of commencement and completion of the examination shall also be noted in the report.

(5) The registered medical practitioner shall, without delay, forward the report of the investigating officer, who shall forward it to the Magistrate referred to in section 173 as part of the documents referred to in clause (a) of sub-section (5) of that section.

[18]**The Code of Criminal Procedure Act, 1973, S. 164A: Medical examination of the victim of rape-**

(1) Where, during the stage when an offence of committing rape or attempt to commit rape is under investigation, it is proposed to get the person of the woman with whom rape is alleged or attempted to have been committed or attempted, examined by a medical expert, such examination shall be conducted by a registered medical practitioner employed in a hospital run by the Government or a local authority and in the absence of such a practitioner, by any other registered medical practitioner, with the consent of such woman or of a person competent to give such consent on her behalf and such woman shall be sent to such registered medical practitioner within twenty-four hours from the time of receiving the information relating to the commission of such offence.

With the assistance of a certified medical practitioner, the investigating authority can therefore get a DNA sample from the person suspected of rape as well as from the victim of rape. Furthermore, if the police officer believes that further inquiry is required after the end of the investigation, he may file an application with the Magistrate under Section 173(8)[19] of Cr.P.C. Under Section 293(4)[20] of Cr.P.C., the report of certain Government Scientific Expert may be used as evidence in an enquiry, trial or other proceedings and the court may "summon and interview any such expert as to the subject-matter of his report" if it sees proper under Section 293(2)[21] of Cr.P.C.

- **The Indian Evidence Act, 1872**

In India there is no prohibition in any statute for admitting DNA evidences in the court proceeding but because of the absence of specific legislation in this regard, the discretion lies in the hands of judges to whether allow or disallow these evidences.

Apart from the above-mentioned provisions of Cr.P.C., the Indian Evidence Act, 1872 provides for Section 45 which deals with "opinion of experts". It is stated that when a court is required to form an opinion as to a matter of foreign law, science, art, or handwriting (or finger imprint) identification, the opinion of individuals who are exceptionally knowledgeable in such foreign law, science, art, or handwriting (or finger imprint) identification are relevant facts. Such an individual is known to be an expert.

In *Kunhiraman v. Manoj*,[22] there was a dispute regarding paternity, where upon the assurance of marriage the boy slept with the girl and the girl got pregnant. On her being pregnant, the boy denied to marry her. However, after the birth of the child the girl claimed for maintenance but the boy denied. The court ordered for DNA tests. Through the test it got proved that he is the father of the child. The court agreed to admit evidence under section 45 of Indian Evidence Act, 1872. Later, the Kerala High Court upheld the lower court's decision, ruling that the results of the DNA testing alone are conclusive evidence in determining paternity.

To determine the child's legitimacy or parentage of a child, Section 112 of the Indian Evidence Act of 1872 states that, "any person born during the continuation of a valid marriage between his or her mother and any man or within 280 days after the dissolution of marriage, the mother remaining unmarried, shall be conclusive proof

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(2) The registered medical practitioner, to whom such woman is sent, shall, without delay, examine her person and prepares report of his examination giving the following particulars, namely :
(i) the name and address of the woman and of the person by whom she was brought;
(ii) the age of the woman;
(iii) the description of material taken from the person of the woman for DNA profiling;
(iv) marks of injury, if any, on the person of the woman;
(v) general mental condition of the woman; and
(vi) other material particulars in reasonable detail.
(3) The report shall state precisely the reasons for each conclusion arrived at.
(4) The report shall specifically record that the consent of the woman or of the person competent to give such consent on her behalf to such examination had been obtained.
(5) The exact time of commencement and completion of the examination shall also be noted in the report.
(6) The registered medical practitioner shall, without delay, forward the report to the investigation officer who shall forward it to the Magistrate referred to in section 173 as part of the documents referred to in clause (a) of sub-section (5) of that section.
(7) Nothing in this section shall be construed as rendering lawful any examination without the consent of the woman or of any person competent to give such consent on her behalf.
Explanation — For the purposes of this section, "examination" and "registered medical practitioner" shall have the same meanings as in section 53.

[19]**The Code Of Criminal Procedure, 1973, S. 173(8)**
(8) Nothing in this section shall be deemed to preclude further investigation in respect of an offence after a report under sub- section (2) has been forwarded to the Magistrate and, where upon such investigation, the officer in charge of the police station obtains further evidence, oral or documentary, he shall forward to the Magistrate a further report or reports regarding such evidence in the form prescribed; and the provisions of sub- sections (2) to (6) shall, as far as may be, apply in relation to such report or reports as they apply in relation to a report forwarded under sub- section (2).

[20]**The Code Of Criminal Procedure, 1973, S. 293(4)**
(4). This section applies to the following Government scientific experts, namely:-
(a) any Chemical Examiner or Assistant Chemical Examiner to Government;
(b) the Chief Inspector of- Explosives;
(c) the Director of the Finger Print Bureau;
(d) the Director, Haffkeine Institute, Bombay;
(e) the Director[1], Deputy Director or Assistant Director] of a Central Forensic Science Laboratory or a State Forensic Science Laboratory;
(f) the Serologist to the Government.

[21]**The Code Of Criminal Procedure, 1973, S. 293(2)**
(2). The Court may, if it thinks fit, summon and examine any such expert as to the subject- matter of his report.

[22](1991) 3 Crimes 860 (Ker.)

that he is the legitimate child of a man, unless it can be shown that the parties had "no access" to each other at any time when the child could have been begotten."

The only exemption of disproving the 'legitimacy of child' under section 112 is to prove "no access". In *Krishnappa v. Vennkatappa*[23], the Madras High Court interpreted the phrase "no access" of section 112 which means merely the possibility of no sexual intercourse and not effective access. In the case of *Geeta v. State of Kerala,*[24] again related to paternity dispute, blood sample of the petitioner and the child were sent for DNA tests. It was cleared by the report that the child was not found to have been fathered by the petitioner. On challenging the admissibility of report it was ruled by the court under section 293 of Cr. P.C., that the report of the DNA Finger Printing & Diagnostic Centre, Hyderabad, a Central Government undertaking for performing the DNA test, might be admitted as evidence without the expert's examination.

DNA testing in paternity situations should not be ordered as a matter of course or routine by courts of law. The courts must always rely on the "presumption of section 112 of the Indian Evidence Act, 1872", and only in cases of "eminent need" DNA testing may be approved if the Court cannot acquire the truth without being assisted by the biological evidences.

- **The Prevention of Terrorism Act, 2002**

Section 27[25] of the Prevention of Terrorism Act of 2002 impliedly allows for the use of DNA technologies. When a police officer conducting the investigation submit a written request to the Court of Chief Judicial Magistrate or to the Court of Chief Metropolitan Magistrate for having a sample of the accused voice, blood, saliva, sperm, hair, fingerprints, or photos of an accused or suspected person. It shall be lawful for the above-mentioned courts to order that such samples be delivered to the police officer by the accused individual, either through a medical practitioner or otherwise, depending on each case. The court would withdraw an unfavourable inference against the offender if he refuses to produce the sample.

- **The Constitution of India**

Part IV of the Constitution of India connotes 'fundamental duties'. According to Article 51A, every citizen is required to undertake certain obligations known as fundamental duties. Article 51A (h) and (j) states, every citizen shall have a fundamental obligation "to develop scientific temper, humanism and the spirit of enquiry and reform" and "strive towards excellence in all spheres of individual and collective activity so that nation constantly rises to higher level of endeavour and achievements". In *Shri Rohit Shekhar v. N.D. Tiwari,*[26] Division bench of Delhi High Court clearly explains, "...that when modern tools of adjudication are at hand, must the courts refuse to step out of their dogmas and insist upon the long route to be followed at the cost of misery to the litigants...the courts are for doing justice, adjudicating rival claims and unearthing the truth and not for following age-old practices and procedures when new, better methods are available."

As stated in Article 246, entries 65 and 66 of the Union List, the Parliament has the right to create legislations. Parliament also has the power to enact legislation regarding the Union's agencies and institutions for higher education; for research in scientific or technological institutions, for the promotion of specialised study or research, or for scientific or technical aid in the investigation or detection of crime. Any new scientific method that is used in criminal proceedings must adhere to the constitutional requirement that it should not violate any of the fundamental rights mentioned in the Constitution. DNA technology shall not violate the right to privacy inherent in Article 21[27] or the right against self-incrimination enshrined in Article 20(3)[28].

The 0rissa High Court observed in *Thogorani alias K. Damyanti v. State of Orissa,*[29] that the court should balance out the public interest with the accused person's right provided under Articles 20(3) and 21 of the

[23]AIR 1943 Mad. 632

[24]AIR 1993 SC 2295

[25]**The Prevention of Terrorism Act, 2002, S. 27**

27.Power to direct for samples, etc.—

(1) When a police officer investigating a case requests the Court of a Chief Judicial Magistrate or the Court of a Chief Metropolitan Magistrate in writing for obtaining samples of hand writing, finger-prints, foot-prints, photographs, blood, saliva, semen, hair, voice of any accused person, reasonably suspected to be involved in the commission of an offence under this Act, it shall be lawful for the Court of a Chief Judicial Magistrate or the Court of a Chief Metropolitan Magistrate to direct that such samples be given by the accused person to the police officer either through a medical practitioner or otherwise, as the case may be.

(2) If any accused person refuses to give samples as provided in sub-section (1), the Court shall draw adverse inference against the accused.

[26]2011 (121) DRJ 562(Delhi)

[27]**The Constitution of India, 1950, Art. 21**

"Protection of Life and Personal Liberty: No person shall be deprived of his life or personal liberty except according to procedure established by law."

[28]**The Constitution of India, 1950, Art. 20(3)**

"(3) No person accused of any offence shall be compelled to be a witness against himself."

[29] 2004 Cri. LJ 4003

Constitution, while it issues a directive for collecting blood samples from the accused for DNA testing. In *Bhabani Prasad Jena v. Convener Secretary, Orissa State Commission for Women,*[30] the High Court ordered for DNA testing of the appellant and the child. The Supreme Court has expressed its perspective as "when there is apparent contradiction between rights to privacy of a person and not to submit oneself forcibly for medical examination, the court must exercise its discretion only after balancing out the interests of the parties".

In another case of *Shri Rohit Shekhar v. N.D. Tiwari,*[31] the court relied on international human rights instruments and stated that a child has the right to know who his or her biological father is as enshrined under the Universal Declaration of Human Rights and Article 7[32] of the Convention on the Rights of the Child, 1989.

In *Anil Ananthorav Lokhande v. State of Maharashtra,*[33] the court emphasises that, "collecting blood sample of the accused for comparison does not amount to testimonial coercion. As a result, there is no infringement of Article 20(3) of Indian Constitution".

The preceding decisions have clearly shown that, under Indian Constitution, obtaining blood samples or bodily samples from the accused for DNA testing in accordance with the approved method does not infringe the right to privacy or right against self-incrimination of the accused.

However, *Inayath Ali & Anr.v. State of Telengana & Anr.*[34], the Apex Court while setting aside the decision of High Court allowing DNA testing to determine the parentage of two children in order to verify the claim made by wife against her brother-in-law held that, "merely because something is permissible under the law cannot be directed as a matter of course to be performed particularly when a direction to that effect would be invasive to the physical autonomy of a person. The consequence thereof would not be confined to the question as to whether such an order would result in testimonial compulsion, but encompasses right to privacy as well. Such direction would violate the right to privacy of such persons subjected to such tests and could be prejudicial to the future of two children who were also sought to be brought within the ambit of the Trial's Court direction."

Furthermore, in the case of *Smt. Selvi & Ors. v. State of Karnataka,*[35] the Supreme Court of India, while discussing the constitutionality of forcible administration of some scientific procedures, such as the Brain Electrical Activation Profile (BEAP) test, Narco Analysis and Polygraph Examination, it was stated:

"DNA profiling technique has been expressly included among the various forms of medical examination in the amended explanation of Section 53, Section 53A and 54 of Cr. P.C. It must also be clarified that a 'DNA profile' is different from DNA sample which can be obtained from bodily substances. A DNA profile is a record created on the basis of DNA samples made available to forensic experts. Creating and maintaining a DNA profile of offenders and suspects are useful practice since newly obtained DNA samples can be readily matched with existing profiles that are already in the possession of law enforcement agencies. Hence, the taking and retention of DNA samples which are in the nature of physical evidence does not face constitutional hurdles in the Indian context." As a result, if DNA technology is enhanced and utilised for "testimonial reasons," that use of it may face legal concerns in the future.

Conclusion

The law has to evolve in order to keep up with science and technological improvements, especially in areas where these developments have proven to be extremely helpful in detecting crimes and resolving legal disputes. In this regard, DNA technology has had a significant impact and enhanced ways for establishing various types of criminal and civil cases. The DNA testing is used not only to ascertain the true offender, but also to liberate innocent people from the legal rope that has been placed around their necks. Scientific evidence will continue to be crucial in resolving cases in both civil and criminal matters in the future. Other nations have taken note of this fact and incorporated it accordingly by including DNA evidence and testing measures in their current legislations.

Furthermore, several countries, such as Canada, have adopted distinct DNA legislation. Unlike UK, USA or Canada, today India lacks an explicit legislation on DNA. In fact apart from this, unlike other emerging countries where forensic technology and new scientific approaches have improved the administration of justice, India's procedural statutes stand non-amended or unmodified to include DNA as a evidence. Up till now only few parts of Cr.P.C. were changed in 2005 to bring "DNA Profiling" within its scope.

[30] AIR 2010 SC 2851

[31] 2011 (121) DRJ 562(Delhi)

[32] **The Convention on the Rights of the Child, 1989, Art. 7**

1. The child shall be registered immediately after birth and shall have the right from birth to a name, the right to acquire a nationality and. as far as possible, the right to know and be cared for by his or her parents.

2. States Parties shall ensure the implementation of these rights in accordance with their national law and their obligations under the relevant international instruments in this field, in particular where the child would otherwise be stateless.

[33] 1981 CriLJ 125 (Bom.)

[34] 2022 LiveLaw (SC) 869

[35] (2010) 7SCC 263

Despite a lack of specific law, our Indian judiciary recognises DNA as circumstantial evidence in criminal proceedings. Almost every case decided by the Apex Court or any of the High Court, demonstrates that "DNA evidence plays a crucial role in identifying the offender with extraordinary accuracy".

No legislation on DNA Technology has seen the light of the day in India but various steps have been taken since the year 2007 for drafting a proper legislation on DNA Profiling. Recently in the year 2017, The DNA Technology (Use & Regulation) Bill, 2017 was prepared and introduced in Parliament, yet that Bill also did not become the law of land. It is difficult to comprehend why this is the case, but it is undeniable that our country lags far behind in the significant use of DNA technology for civil and criminal issues. While the judicial system has demonstrated its creativity by allowing DNA testing or analysis in investigation of crime and paternity inquiries, but still not having proper legislation on DNA Technology is a question of an hour. Thus, our Parliament needs to understand the importance of scientific evidences and shall formulate a definite law on DNA testing at the soonest.