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The Role of Fingerprint and DNA Fingerprinting in Criminal Investigation

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ABSTRACT

This research paper talks about how fingerprint plays an important role in a criminal investigation. With the help of introducing the fingerprint method, it not only reduced the burden of investigating agencies but also helped to solve the cases faster. Hon'ble Court accepts reports of DNA test and fingerprinting due to the scientific method used and its accuracy, but Judges does not rely completely on it; they apply their mind before pronouncing the judgement and gives fair hearing opportunity to the witnesses so that hidden facts can also be revealed. The reason behind it is scientific evidence or tests can only show the results of the test is done, but it cannot reveal hidden facts like the act done is whether the act of defence or crime. In most of the cases (especially Rape Cases), it was found that Court relies on scientific evidence's reports like DNA tests.

William E. Gladstone also says, "Justice delayed is justice denied". So, we can conclude that this test plays a vital role in the criminal investigation, along with it reducing time also.

I. INTRODUCTION

When we talk about Forensic Science, it means we are talking about crime investigation. For investigation of crime, various scientific techniques experts use to apply to come to a conclusion, or we can say to find who is the culprit. In that technique, fingerprint and DNA testing are also involved.

As we know, whenever any criminal commits a criminal act, he always tries to hide all possible evidence so that he or she cannot get caught. But he or she always leave clue or evidence of his or her presence, although unconsciously like while

leaving place footprint or hair or cloth's fibre etc. to find out expert's match suspect's fingerprint or do DNA fingerprinting by using chemicals or following DNA pattern of the suspect.

Fingerprints help to recognise the culprit easily because it was found after much research that everyone has a different unique pattern, or we can say in simple words everyone has a different fingerprint. It never matched till now with another person although sometimes it becomes very difficult to match fingerprints may be due to certain disease, but then also culprit cannot skip because DNA cannot be changed. So, both

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fingerprint and DNA fingerprinting play a vital role to reach near criminals.

II. FINGERPRINT

(A) What is Fingerprint?

The fingerprint is a print of a person's identity; it is found in the fingers and thumbs of hands and legs. It is always different; it never matches with one person to another person although they are in blood relation like child and parents.

(B) History of Fingerprint:

"In ancient Babylonia and China, thumbprints and fingerprints were used on clay tablets and seals as signatures."² At that, that time was used for the purpose of trade (to keep the record of traders). "The pioneer in fingerprint identification was Sir Francis Galton, an anthropologist by training, who was the first to show scientifically how fingerprints could be used to identify individuals. Beginning in the 1880s, Galton (a cousin of Charles Darwin) studied fingerprints to seek out hereditary traits. He determined through his studies not only that *no two fingerprints are exactly alike but also that fingerprints remain constant throughout an individual's lifetime*. Galton published a book on his findings in 1892 in which he listed the three most common fingerprint types: loop, whorl, and arch. These classifications are still used today."³

(A.) Importance of Fingerprints in Criminal Investigation:

Fingerprint plays an important in catching criminals due to following reasons –

- (1) they are unique.
- (2) they are permanent.
- (3) they are universal.
- (4) they are classifiable.
- (5) they get easily found near crime places, as evidence.

For example: at X place (crime place), Mr Z was murdered with a knife by Mr A (relative of Mr Z, who stabbed the knife to kill and hide the knife). During that act, nobody saw.

At the place of the incident, three people were found when police reached (along with Mr A), everyone said that they didn't, or they were not present at that moment. But somehow, police found the knife used and took everyone's fingerprint to match with the knife's fingerprint. It gets matched with Mr A's fingerprint.

The first time this was used at Hoodwinking was in 1882 to catch the culprit. "An Argentinean widow, with two living children, wanted to remarry. She found a husband, but he would marry her only if she did not bring the children along. She found no way to get rid of the children except by murdering them. She murdered them and raised a hue and cry that somebody else had murdered her children. Her fingerprint in blood on the door nailed her lies. She was convicted for murder."⁴

² Fingerprints: The First ID, available at: <https://www.findlaw.com/criminal/criminal-procedure/fingerprints-the-first-id.html> (last visited on 09th January, 2022 at 10:44 PM)

³ *Ibid*

⁴ B.R. Sharma, Forensic Science in Criminal Investigation & Trials 230 (Universal Lexis Nexis, Haryana, 6th edn., 2021)

So, in this way, we saw how fingerprints played an important role to catch the culprit.

1) **The uniqueness of finger:**

In our fingers, we have a different pattern of papillary ridges; it does not match with anyone, even our own hand finger. It was never found that they matched with anyone. So, this uniqueness helps in catching culprits because there is no chance of matching the pattern of fingers papillary ridges.

For example: In a case, the character of Mr A was attacked that he had been convicted earlier. He was alleged previously for an attempt to murder in another case, an investigating officer who was investigating that case identified Mr A when he denied vehemently in the present case and presented Mr A on the ground of suspicion along with two witnesses who saw Mr A near crime place. The magistrate ordered that his fingerprints be checked. The check revealed that he was not a convicted person.

So, by the above example, we can conclude that everyone has a different pattern of papillary in the finger, i.e., Unique in nature.

Exception: in case the mark is incomplete or smudged. In this situation, it may mislead to identify. For example, X, Y and Z were found near a crime place (X is the culprit). All of them do hard labour work due to that reason papillary pattern of their finger smudged. So, in this situation, due to smudging, there are chances to not reach the real culprit, or maybe the wrong person will get caught.

2) **Permanent mark:**

The finger marks of everyone's are permanent. It never changes from birth till death; even after death, also it does not disappear. It remains with the person. Although when a person is injured or partially burned, fingerprints do not disappear. So, this lowers the burden of investigating officers during the investigation. Only the thing lies on investigating officers are properly taken thumb and fingerprint. Sometimes it helps to solve the case speedily.

For example, (a) Mr X (having criminal history record) murdered Mr A, during struggle Mr X's watch broken, piece of it which was found near the crime place, was collected later as evidence (due to hidden at the corner of the place) and send to forensic expert with a proper seal. Crime investigation took two-month time, but no result was found. But after getting an examination of the broken watch's piece, it took only a few days to recognise the culprit.

So, by the above example, we can conclude that fingerprint marks are permanent, and they help to solve the frequently.

Exception: "the destruction of epidermis and under layers alone destroy the pattern. Destruction may take place through disease, amputation, burning or surgery."⁵

3) **Universal:**

"All individuals and hence, all criminals carry this medium of identification. The finger and toe digits and palmar surfaces of the hands and the feet carry the friction ridges. The fingers have

⁵ *Ibid*

more intricate patterns than other papillary surfaces. They allow easier individualisation and classification. A criminal uses his hands in the commission of the crime. He leaves marks at the scene of occurrence or on objects which his hands touch. There are, therefore, fair chances of occurrence of fingerprints in all types of crimes. If a criminal wears gloves, no fingerprints are found at the scene. However, the population in India, especially the criminal community, does not wear gloves. They, therefore, leave fingerprints in most of the cases.”⁶

4) Inimitable of fingerprint:

As we saw in the above headings, we found that two fingerprints cannot be matched because it's impossible to have a similar fingerprint (even in the case of identical twins), or we can say it is impossible to find the fingerprint of one person on others. So, this makes it easier to identify the wrongdoer.

For example, anyone who tried to do commit fraud while doing so he or she shall definitely use INTERNET either on mobile or on Computer. In that situation, an expert can trace the location, and after finding it and examining the fingerprint on the device, the wrongdoer shall be identified.

It has become easy nowadays due to biometric technology because everyone's fingerprint is available on the INTERNET.

5) Fingerprints are Classifiable:

Due to having a record of fingerprint of everyone on INTERNET, it becomes easily accessible by

the experts and due to this reason experts eliminate and find culprit frequently. This reduces the time of the expert.

6) Easily found near crime place, as evidence:

It is very easy to find fingerprints near the place of crime because it is impossible to hide every evidence. According to Edmund Locard – “with contact between two items, there will be an exchange of microscopic material.”⁷ The material here includes hair, the fibre of cloth etc.

(B.) Developed methods used to collect latent fingerprints:

Following methods are used to collect latent fingerprints –

(a) Powder Developed Method:⁸

1. The grey powder is used for all dark coloured surfaces.
2. The black powder is used against a light background.
3. The fluorescent (anthracene) powder is used for multi-coloured surfaces. Fingerprints developed by anthracene are exposed to ultraviolet rays and photographed. The prints developed with fluorescent powders need reversals. That is, the prints are prepared from the transparencies.
4. Metallic powder (aluminium, copper, brass, gold, antimony) and universal powder are also used in special

⁶ *Ibid*

⁷ Bruce R. Moran, in *Crime Reconstruction* (Second Edition), 2011

⁸ B.R. Sharma, *Forensic Science in Criminal Investigation & Trials* 239 (Universal Lexis Nexis, Haryana, 6th edn., 2021)

situations. The metallic or universal powders are useful for fingerprints on sticky surfaces.

5. The use of magnetic powders with Magna Brush facilitates developing fingerprints on large areas.

(b) Chemical Methods: Sodium Chloride, Amino Acid and oil are used to develop latent fingerprints.

(c) Wet method test

(d) Fuming Method

(e) Laser test

III. DNA FINGERPRINTING

(A.) What is a DNA fingerprint?

As we know, each person has different genes, and every genetic makeup has DNA. Everyone has different DNA. So, to identify criminals, sometimes a DNA test is done. In forensic science, this test is known as DNA profiling. This was discovered by Sir Alce Jefferys in 1985.

“Each person has unique DNA, an acronym that stands for deoxyribonucleic acid — the essential building block of the body’s cells. DNA is made up of four chemical bases: adenine (A), guanine (G), cytosine (C), and thymine (T)”⁹. “Each cell in the body has a nucleus, an inner core, which holds chromosomes. DNA molecules make up these chromosomes. The chromosome contains “markers” — points that repeat short DNA sequences again and again. Just how many times

a sequence repeats at each marker varies depending on the person. Every person has two copies — called alleles — of each marker: one from the mother’s side and another from the father’s. Forensic scientists can use so-called short tandem repeats (STRs) of DNA to identify individuals.”¹⁰

“Although over 99% of the DNA sequences in the human genome are identical between individuals, a small number of sequence differences are used to distinguish all humans. Those different sequences are usually targeted for identity testing.”¹¹ The test is made by the samples taken like saliva, blood, hair, nail, semen, swab, sweat etc.

(B.) Importance of DNA fingerprints:

DNA testing has a statutorily permitted act to identify the culprit. This is generally done in Rape cases.

Sections 53, 53A and 54 of the Code of Criminal Procedure, 1973 – talk about medical examination, which includes DNA tests also. Especially in the case of a sexual offence to find the accused.

The reason behind this test is it cannot be changed by any chemical.

IV. EXPERTS

(A.) Who are experts?

According to section 45 of the Indian Evidence Act, 1872 – an expert is a person who has

⁹ MaryVilla University, *How is DNA Profiling Used to Solve Crimes?*, available at: <https://online.maryville.edu/blog/how-is-dna-profiling-used-to-solve-crimes/> (last visited on 11th January, 2022 at 09:33 PM)

¹⁰ *Ibid*

¹¹ Rana Saad, *Discovery, development, and current applications of DNA identity testing*, available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1200713/> (last visited on 11th January, 2022 at 09:45 PM)

knowledge in foreign law or practised foreign law, i.e., skilled knowledge of foreign law, science or art.

In simple words experienced person of any specific field is known as an expert. The experience here means practical knowledge, the person on whom Court can rely or when Court asks any opinion. He can put his opinion by his examination or experience and explain to the Court by what procedure he got to the conclusion.

Opinion of experts are not needed always; it is only needed where there is a technical issue found to clarify doubts because everyone cannot have all knowledge.

(B.) Does Court bound to accept the expert's opinion?

Although experts come to a conclusion after going through various experiments, or we can say by using various techniques, they form their opinion, but Court is not bound to accept it or totally rely on it. Judges apply their prudence (mind) before delivering the judgement because an expert can give his opinion after examining the object, but there is a chance that the person who touched it was injured or deceased to protect him. So, Court does not totally rely on expert opinion due to chances of hidden facts that cannot be revealed by examination of the object. Justice Dr Arijit Pasayat also observed the same thing in the case of *Ram Swaroop v. the State of Rajasthan*.

There are various cases in which it was found that the Court rely on Ocular evidence rather expert's opinion like in cases of –

Malappa Sidappa Alakumar v. State of Karnataka

Mahmood v. State of U.P.

(C.) Does Fingerprint and DNA Fingerprinting play any role in Criminal Investigation?

Yes, both play an important role in a criminal investigation because both create conclusive proof that the person whose fingerprint or DNA is matched is accused. The reason behind considering conclusive proof is it cannot be changed anyhow from birth till death (even after death also).

With the help of a fingerprint, a barbaric murder case was solved.¹²

V. CONCLUSION

After going through the research, it was found that both fingerprint and DNA fingerprinting plays a vital role during a criminal investigation. These methods not only help Court to provide justice but also reduce the burden of the investigation officer along with Court cases. In this research, it was also found that neither fingerprint nor DNA can be changed. This is the reason it is considered as very strong evidence in itself to prove guilty if it is found on a crime scene.

Although Court does not totally rely on due to opinion that along with this evidence, the oral witness should also get a chance to put his point because evidence can only tell the machinery

¹² BA Umesh v. Registrar general

evidence which is examined, it cannot tell the hidden fact. So, Court applies its own prudence.

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