Use Of Fingerprints In Forensic Science

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Fingerprinting has greatly aided in solving many cases arising from criminal activities by providing critical evidence on who committed the crime. This has been made possible by identifying the fingerprints left behind by the suspected criminal. However, the defending attorneys in the court proceedings need to assure the jury that the techniques used in retrieving the fingerprints are from a reliable scientific resource (Meloan, Lambert, 1982). There are, therefore, various techniques used in forensic science to retrieve fingerprints from various surfaces, depending on the nature of the surface. According to the study done by Forensic Science (2012), there are three different types of fingerprints which can be manifested on a given surface, including patent prints, which are easily located on the surface due to their visibility to the naked eye, plastic prints; which manifests itself when an individual touches materials such as soaps, waxes and such like materials, Latent prints, which are the most common prints are the most difficult to retrieve (Meloan, Lambert, 1982). The technique employed by the investigators to retrieve latent prints depends on the nature of the surface. The process of retrieving the fingerprint involves locating the print, photographing the print, lifting the print, and finally comparing the fingerprint with that of the suspect (Sharma, Saxena, Rathod, 2009).

Locating The Print

For non-porous surfaces such as metals, plastics, marbles, glasses, and smooth finished wood, a technique of powder is used. This technique of powder is commonly used in identifying fingerprints on nonporous surfaces (Sharma, Saxena, Rathod, 2009). The powder is evenly distributed on the surface of the object touched by the use of a brush. The powder will then adhere to the particles deposited on the surface by the touch of the finger. This will allow the investigators to easily locate the print. This technique, however, can easily corrupt the print since the use of a brush is not efficient (Sharma, Saxena, Rathod, 2009). In order to eradicate this limitation, a magnet is used to uniformly distribute the powder. This would prevent smudging the fingerprint.in order to improve the visibility of the print, the colour of the print should be distinct from the colour of the surface. For instance, when the investigators analyse a white marble, the powder should be black or grey (Meloan, Lambert, 1982).

The defending attorneys should, however, ascertain that the brush used in spreading the powder is disposable. This is to avoid the transfer of DNA evidence from one print location to another in cases when one brush is used for both locations. This can lead to inaccurate findings; hence, the defending attorneys cannot defend the victim before the jury.

Apart from using the powder technique to locate fingerprints from a nonporous material, another technique that is more efficient may be employed. This is the use of superglue fuming. This is a

chemical process that is used to reveal the fingerprints on a surface (Sharma, Saxena, Rathod, 2009). This procedure is conducted in a lab, where a fuming chamber consisting of an airtight tank is used to heat up the superglue. Through the process of this heating, some gases are released, which rapidly stick with the oily particles of the print (Sharma, Saxena, Rathod, 2009). This method, however, is very advantageous since it can be used even at crime scenes. In this case, the fume chambers in the laboratories are not used; instead, a wand may be used to heat the superglue. However, when the period of fuming the print is lengthened, then the fingerprint may be easily distorted.

In porous materials such as paper, roughly finished wood, and fabrics, the powder technique may not be much effective, hence other techniques are used to locate the print. According to a study by forensic science (2012), the following techniques can be used in locating prints on the surfaces of porous materials: Iodine fuming, silver nitrate and Ninhydrin (Giannelli, 1986). When these chemicals are applied on the surface of the 'touched surface' they adhere with the chemicals from print on the surface and hence the fingerprint becomes visible.

Iodine fuming is a process which takes place in the fuming chamber in the laboratory where the solid crystals of iodine are heated; thus, a vapour is produced, which rapidly sticks with the oily particles of the print. This adherence produces a print which is brown in colour (Giannelli, 1986). This method is very efficient in locating the print. However, the formed print will quickly fade away after it has been formed (Lyle, 2012). This would then require that a quick photograph of the print is taken as fast as it is formed. The print can also be preserved for several weeks if it is sprayed with a water solution or any starch solution (Giannelli, 1986).

Silver nitrate, on the other hand, is used in a manner that, when exposed to the print, will produce reactions with the salt molecules of chloride found in the print particles. This leads to the formation of silver chloride. This compound of silver chloride is then exposed to ultraviolet rays, where it turns either brown or black (Lyle, 2012). This then makes the fingerprint visible.

In human skin, it is incredibly very difficult to locate fingerprints. This is due to the fact that the oily particle left behind by the fingers are already present on the human skin, hence developing the contrast between the fingerprint and the skin is very difficult. The oily particle left on the skin by the finger is only visible for the first two hours, after which it is absorbed into the skin. Hence, the fingerprint becomes blurred with time (Lyle, 2012).

Photographing Of The Print

Immediately after the print has been identified and located, it is very crucial that it be photographed before it is carried to another location. Photographing the fingerprint also captures the locality from which the print was taken and even how the print was oriented. Photographing the print, especially the crime scene also serves as concrete evidence that can hardly be tampered with (Lyle, 2012).

Lifting Of The Print

Lifting the fingerprint would literally mean creating impressions of the print permanently on a flat or round surface. This is achieved by using a rubber tape with a relatively high adhesive force. This rubber tape is applied against the print; hence, a counter print is left on the tape. A flat ruler is then used to flatten the tape to ensure that no bubbles are experienced on the tape that would affect the counter print. Information on the identity of the counter print is inscribed on the back of the tape, and the tape is kept free from distraction that would bring distortion to the imprint (United States Department of Justice, 2012).

Comparison Of The Fingerprint

The final step involved in retrieving the fingerprint is the close analysis of the characteristics of the print. A system called Automated Fingerprint Identification System (AFIS) is used to match the print obtained with the fingerprint of the suspected individual. This system uses a computer database. This process, as outlined above, is used to retrieve the fingerprints of a criminal from a crime scene (GS, J Kaur, 2001).

Fingerprinting has been used for a long time in many places all over the world to bring verdicts to cases in the courts. One of the reasons why it has been widely used is that it is the only method that, for a long period of time, has been found to be accurate. It is known from the study done by forensic science (2012) that each individual has a different and distinct fingerprint pattern (GS, Kaur, 2001). These fingerprints have been stored in the computer database and can be compared against the fingerprint of the suspected criminal. This was tasted in many countries all over the world, and the many cases that were decided from this judgment have been found to be fair and full of justice. It was thus accepted globally as the best means of identifying criminals.

The credibility of the use of fingerprints, however, has been questioned due to the recent cases that have been reported on the faultiness of the system (GS, J Kaur, 2001). The accuracy of these identifications from latent prints full of dust and distorted has never been proven and tested scientifically. The fingerprint analysts have also been challenged that they are not scientists, and thus, it is not certain that the report they produce from the print is scientifically true. This was observed by Edward J Imwinkelried. The challenges, however, have not spared the authenticity of the methods of training for the examiners, arguing that some of the agencies, such as the FBI, use tougher standards compared to the Department of the Police (GS, J Kaur, 2001).

In 2004, a man called Mayfield was wrongly accused of taking part in the bombing of the Madrid Train by fingerprint experts from the department of FBI. However, the fingerprints argued that the claims were valid. However, the study by Dror Itiel proved to be different from the results of the experts. After conducting his study, he said, “I wanted to see if it is as objective and scientific as it claims to be.” He wanted to test if different experts from different countries, including the UK, US, and

Australia, would give the same result. So, the study was conducted with six fingerprint experts from these countries. At the end of the study, the different experts from these countries gave inconsistent and contradicting views, and thus, this technique cannot be exclusively reliable.

Another case study is the one for John Watkins. He engaged in sexual assault, where he was allegedly accused of raping a lady on May 26, 2003. Though Watkins denied the charges in court, he was later found guilty and sentenced to jail for sexual assault. Though a young boy was an eyewitness to the ordeal, Watkins still denied the claims. But since his shirt was captured from the crime scene, a fingerprint test was tested, and Watkin was found guilty.

In conclusion, due to increasing technology, there are various ways in which fingerprints can be retrieved from various surfaces (Devi, Joshi, 2012). The technique used depends entirely on the nature of the surface. Retrieving the fingerprint is, however, classified into four stages: locating the print, photographing the print, lifting the print, and finally comparing the fingerprint. Fingerprinting, though its credibility is being questioned, as has been seen from the highlighted reasons above, is still a more secure way of identifying criminals at a crime scene (Devi, Joshi, 2012).

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