The Fingerprinting Evidence As Part Of Testimony

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Types, Detection, and Collection of Fingerprints

Fingerprints are easy to find. They can even be located on a human body. The fingerprints are classified into three different categories due to the location they were found and whether they are visible to the naked eye or not. Firstly, there are three-dimensional plastic prints. They are found on soft surfaces, such as fresh caulk, wet paint, wax, soap, and the like. Fingerprints are also found on a hard surface; they can either be latent or patent prints. The latter can be found on a variety of hard surfaces, such as rough or smooth, porous like wood, cloth and paper or non-porous like plastic, glass, and metal. They are formed when a liquid material such as paint, ink, dirt, and blood are transferred from one place to another, i.e., from a finger to a solid surface.

The latent fingerprints, on the other hand, are formed by the natural oils and sweat on the skin of a human body. Due to the deposited materials, the prints are transferred from the skin to the surface. However, it is not possible to see these fingerprints with the naked eye as they are not visible. They can be found on a variety of surfaces. They are detected using a variety of materials, such as chemical reagents, fingerprint powders, and alternate light sources. There are greater chances of finding and developing a latent fingerprint if the surface is less porous and smoother.

The most common method of finding and collecting a latent fingerprint is by dusting the non-porous or smooth surface with the fingerprint powder. There are several types of fingerprint powders that can be used in this regard, such as black magnetic, aluminium flake, black granular, and others. The prints are made clear by dusting the powder; on clearance, the print must be photographed. Afterwards, they are lifted from the surface using adhesive tape. To preserve the fingerprint, the lifting tape is placed on a latent lift. These latent fingerprints are later examined as a part of the evidence in criminal cases and criminal profiling.

Techniques for Developing Latent Fingerprints

However, it must be kept in mind that dusting powder onto latent fingerprints can destroy or contaminate the source of the fingerprint. The opportunity to perform other techniques on the expression is also lost; these techniques could have provided the researchers and examiners with additional information or a hidden print. Therefore, methods other than dusting fingerprint powder must be used to preserve the mark (Wilshire, 1996). The researchers have developed several other methods in this regard, such as cyanoacrylate, i.e., superglue, which can be applied before powders

are used. Moreover, the examiners can use alternate light sources to examine the area.

Alternate light sources have become one of the researchers' first choices when examining any surface, such as railings, windows, doorknobs, doors, etc. These are the LED or laser devices that emit a particular spectrum or wavelength of light. Some of these alternate light-emitting devices can also use different filters to provide a variety of spectra. These variety of spectra are important because they can be further processed with dye stains or powders and can also be photographed. For example, latent prints can be discovered from the computer equipment, chairs, desks or other objects at the crime scene with the help of blue light with an orange filter. It allows the fingerprint to appear clearly so it can be documented. It also enhances the appearance of the fingerprint.

Another option, other than dusting the latent fingerprint with either black magnetic, aluminium flake, black granular or others, is the use of cyanoacrylate, i.e., superglue that can be applied before using the powders. Similarly, fuming of the surface can also be performed before applying dye stains or powders. It involves exposing the surface to cyanoacrylate vapours. It is typically performed on the non-porous surfaces. The fumes (vapour) adhere to any prints present on the surface, which can later be viewed with either a white or an oblique ambient light source. Similarly, chemical developers such as physical developers and ninhydrin are used on a porous surface such as paper to reveal latent fingerprints (Herod & Menzel, 1982). These chemicals react with the latent print residue, which includes inorganic salts and amino acids. Ninhydrin turns the latent fingerprints blue when in contact with them, which makes them easier to photograph. DFO, another chemical, turns the fingerprints into fluorescent images that are then illuminated using blue-green light. Other collection methods include staining the surface with Amido-Black – a non-specific protein. It particularly develops or enhances the bloody finger stains on a human body. In the future, methods such as vacuum metal deposition with the help of zinc and gold will give hope to examiners and investigators.

Fingerprint Comparison and Forensic Examination

Once the fingerprints have been collected, in criminal justice cases, they are examined for potential matches on the local, state and national databases such as Automated Fingerprint Identification System using computerized systems. These systems provide a value indication about the closeness of the fingerprint with the match found in the database. A fingerprint examiner then examines the fingerprint and potential match to make a final determination. The examiners include police officers, technicians, and forensic scientists. However, proper training and experience are prerequisites for examiners in this regard. The analysis is carried out by the crime laboratories and law enforcement agencies. If there is a need, the casework can be sent to private companies for high-profile handling cases, verifying results, and reducing backlogs.

The process of fingerprint examination includes looking at the quantity and quality of the information gathered from the source to find agreement or disagreement between the potential matches, i.e., known prints from the database and unknown prints from the crime scene. A small magnifier called a

loupe is used to conduct the examination; it views minute details of the print. The experts count the friction ridges with a ridge, which is a pointer. The ACE-V method is used to determine the points of analysis, comparison, evaluation, and verification by the fingerprint examiners.

A print is assessed to determine its utility for comparison with the help of analysis. If the features are of inadequate quality or quantity, then the print is not suitable for comparison. On the other end, if the print is suitable, the features and their tolerances are indicated by the process of analysis, which are later used in comparison. Tolerance is the amount of accepted variation. The analysis also uncovers physical features, including creases and deltas, that provide the examiners with the starting point for comparison, where an analyst compares the suspect and known prints. Minute locations and characteristics are compared to determine if there is a match. Suspect prints are collected from the victims, persons of interest and other relevant people, whereas known prints are taken out of the fingerprint database. The Automated Fingerprint Identification System is the largest database in the world and holds more than seventy-two million print records.

On comparing the two prints and performing a detailed analysis of the potential matching characteristics between the two, the examiner evaluates the results to ultimately decide whether the prints are from the same source or different sources. It results in individualization or identification in the first scenario and exclusion in the second. Sometimes, the results are inconclusive as well. There are several reasons behind these results, such as dissimilar features to be certain, insufficient number of corresponding, lack of comparable areas, and poor quality samples. The results of the first examiner are verified by another examiner by analyzing, comparing and evaluating the prints. The verification process either refutes or supports the conclusions of the original examiner.

Judicial Admissibility and the Pollack Decisions

There is a long history of admissibility of fingerprints as evidence in legal cases in the United States. The 1910 trial of Thomas Jennings for the murder of Clarence Hill was the first case in the country to use fingerprints as a part of the evidentiary support to the plaintiff’s side of the argument. The plaintiff had his house freshly painted when the incident occurred, and an impression of four fingerprints in the wet paint was found in the backyard railing of the house. The examination of the fingerprints held Thomas Jennings accused of the murder. In 1911, the Daubert test was formed for the admissibility of expert testimony in the context of fingerprint evidence in a legal case. Daubert test invites judges to examine (I) if the evidence from the proffered expert was adequately tested, (II) if it had been subject to meaningful peer review, (III) if it had techniques and standards that controlled its operations, (IV) if it had a known error rate, and (V) if the results are accepted by the relevant community of experts. Before the Dauber test, there was the Frye test, which questioned the admissibility of the fingerprinting technique by the relevant scientific community. However, the Daubert test identified the importance of a logical and reasonable assessment of fingerprint evidence in legal cases by the judges and jurors.

In 2002, Judge Pollack made a surprising ruling on the admissibility of fingerprints as evidence in a legal case. The former academic and distinguished judge issued a lengthy conclusion in United States v. Llera Plaza and found that fingerprinting was not a method of scientific evidence. It came as a shocking thought because fingerprints are scientific, and conclusions of such examinations have previously been admissible in the courts (Melendez-Diaz v. Massachusetts, 2009) for nearly a hundred years. They are often considered an indisputable and powerful form of evidence.

However, six weeks later, Judge Pollack made another surprising ruling when he denied his statement from a few weeks ago after a second evidentiary hearing in a blunt manner, “I disagree with myself.” He concluded in the United States v. Llera Plaza case that latent fingerprint examination has some defects, but the opinions of the fingerprint identification experts are admissible evidence. By giving this statement, Judge Pollack rejected the challenges to the admissibility of the fingerprints and, thus, preserved the status quo. Almost forty judges have considered whether fingerprint evidence meets the Daubert test, which is the Supreme Court standard for accepting expert evidence on fingerprint examination in legal cases. Every single judge of them, given Judge Pollack’s about-face, has concluded that fingerprinting passes the test.

Scientific Reliability and the Use of Fingerprint Testimony

However, some of the researchers and practitioners might argue that Judge Pollack’s first opinion was better due to the lack of research in testing and characterizing the fingerprinting identification techniques as scientific. He also found this technique hard to square with the Daubert test; the expert opinion used in the examination must be reliable and valid. Judge Pollack found that fingerprinting only meets one of the criteria of the Daubert test, i.e., general admissibility by the relevant community of experts. Judge Pollack’s judgment was correct despite being surprising due to the lack of careful empirical examination of the key claims made by the examiners. However, it retains considerable cultural authority.

Although the successful and routine use of fingerprint evidence by the police suggests that it is a powerful form of identification of criminals, there are challenges at two points. Firstly, fingerprinting has not been challenged in the courts much frequently. Defence experts in fingerprint analysis were almost never used despite the presence of adversarial testing in theory. Experts do not receive vigorous cross-examination either. Instead, the prosecutors and defendants alike take the accuracy of identification for granted. Secondly, Judge Pollack, in his first statement, indicated that the Daubert test should not be the only criterion for the judges to use the evidence of fingerprinting without adversarial testing.

Therefore, fingerprinting evidence as part of testimony in legal cases must carefully and empirically be tested and validated. Meaningful and difficult proficiency tests must be developed for the practitioners. The courts have not contested the idea that fingerprints can provide definite matches.

In the early cases, some defendants argued that the method was not legitimate. However, they did not introduce experts from their side in the cases. Thus, there has been no spectacle of clashing experts on both ends of a legal case. The evidence concerning finding fingerprints of the defendant on the crime scene has rarely been challenged. Thus, the evidentiary value of fingerprinting grew to have cultural authority. Even the Frye test failed to question the long-lasting admissibility of the fingerprinting technique by the relevant scientific community, and now, there exists a hundred-years-long acceptance of the method after the Daubert test. Therefore, the chances of the expert's claims of infallibility were far surpassed.

References

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