



Forensic Examination Of Handwriting And Signatures

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Abstract:

Documents are not always what they are represented. A forger tries to show as if the Documents he is presenting is a Genuine one. But it is the job of an expert to drag out the truth from a small clue. Crime of forgery is as ancient as writing. Writing is a discriminatory process; its comparison is one of the major aspects of Questioned Document examination. Comparison of Handwriting and Signatures is dependent on class and individual characteristics of an individual. Handwriting is a learning process, so the pictorial appearance of the writing can change from childhood till adolescence but the individuality will not change. Therefore the document examiner concentrates on the characteristics such as initial and final strokes, slant, alignment, t-crossing, i-dots, spacing etc and tries to analyze handwriting or signatures. In the light of the above aspects an attempt has been made to describe the characteristics involved in examination of Handwriting and Signatures.

Key words: Characteristics, Comparison, Handwriting, Signatures, Copybook, Gross Features, Individuality, Strokes, Spacing.

1.Introduction

1.1.Handwriting

Languages are system of symbols; writing is a system for symbolizing these symbols. Writing may be defined as any conventional system of marks or signs that represent the utterances of a language Handwriting is taught to and learned by a person using either a copybook letter form or observing and adopting a letter, combination of letters or symbols as written by someone else. Hilton defines copybook form as “the design of letter that is fundamental to a writing system”. This term is derived from the old methods of teaching handwriting from copybook containing engraved script printed on each page for the student to imitate¹. Writing is a conscious act, through repeated use, the actual formation of each letter or word becomes almost automatic, so that the experienced writer concentrates most on his conscious thought on the subject matter rather than on the writing process itself. Thus writing comes to be made up of innumerable subconscious habitual patterns which are much a part of the individual assembly of his personal habits or mannerism²

Writing is a function of the conscious and subconscious mind and of the motor, muscular and nerve movements of the body. When a person writes, he is conscious of the subjects matter but not usually conscious of the way letters are formed or put together with years of writing experience; the writing becomes automatic and is therefore a product of the sub consciousness. It is dynamic i.e. It changes. It is affected by state of mind, health, age and other factors. In general the more writing a person does, the greater the range of variation and he more it will change with time. It is a set of subconscious habits. It is a mechanism of muscles and nerves which is influenced by a mental picture and sometimes modifies by writers individual interest and ability to imitate³. Handwriting can be described as the formation of letters, characters or symbols using writing implement according to a recognizable patter which is designed to communicate with another person⁴. Handwriting is an acquired skill and clearly one that is a complex perceptual motor task, sometimes referred to as a neuromuscular task.

1.2.Signatures

A Signature is a combined result of cumulative effect of a number of factors such as muscular control, co-ordination, health, age, frequency of writing, temperature etc.

1.3. Clases Of Signatures

- Formal Signatures- Used on wills or other important documents.
- Informal Signatures- used on routine documents and personal corresponding.
- Careless Scribble- used for signing credit cards, mail deliveries, autographs, or hotel registration forms.

1.4. Authentic Signature

Is the combination of writing characters which are consistent with natural conditions surrounding the signed document. These characters are totally incompatible with the state of mind of forger. The genuine signature reveals lack of attention to the writing process. Authentic writer has no fear of being accused as a forger does. He writes freely and subconsciously because he has been signing his signature for years.

1.5. Characteristics Of Authentic Signatures And Writing

- Written rapidly.
- Have Rhythm when written by experienced writer with proper health.
- May miss certain information.
- Introduce certain other forms.
- End Strokes Flourish.
- Smooth.
- Natural free flowing Appearance.

1.6. Forged Signatures

The signatures which are practiced illegally are not genuine are termed as forged signatures.

1.7. Characteristics Of Forged Signatures And Writing

- Appearance of being slowly written.
- Lack of Rhythm and Individuality.
- Unnatural Appearance.
- Appearance of being drawn.
- Attention towards formation of letters.

1.8.Types Of Forgeries

- Simple Forgery: Here the forger does not imitate the signature of the other person but he simply signs his own signature without any intention to imitate.
- Traced Forgery: Here the forger traces the original signature on the other document. This may be done with the following methods
 - Carbon tracing.
 - Simple tracing.
 - Using transmitted light.
- Simulated or Freehand Forgery: Here the forger practices the genuine signature and tries to imitate the same signature on the other document.
- Transplanted forgery- it is usually done on the stamps.

2.Theory Of Handwriting

The hand is extremely complex and delicate mechanism containing some 27 bones controlled by more than 40 muscles. Most of the muscles all situated in the lower arm and connect to the fingers by an intricate set of tendons. Their ability in manipulating a writing instrument is precisely co ordinate by a timing system under a neural controls of movements of the arm the hand and the fingers. The precise ordering and timing of the movements determines the structure of the pattern i.e. recorded with the pen or pencils⁵. Think back about the early days in school when we spent a period learning how to write. There are many books available in the market which demonstrates cursive handwriting style. During this early learning process all the concentration was focused on how to write the alphabet correctly. As the individual matures, his or her writing tends to deviate from the copybook style of writing and emphasis shifts to what is being written rather than how the letter are formed. Neuromuscular co ordination and visual perception differ from one individual to another. Individuals may incorporate shortcuts from the copybook style or add an extra flair to their writing perhaps because they saw it in someone else's writing. By the late teenage the persons writing is matured to a point where his or her writing style is unique. Handwriting is an acquired skill therefore it is habitual as well as individualized, this individualization is basic principle in document examination⁶.

3.Questioned Document Examination

When a question is raised about the authenticity of a document or a part there of, that document becomes a questioned document, which is sometimes also referred to also 'disputed' or contested' document.

The cases regarding questioned documents examination fall under the following category.

- Documents with Questioned Signatures.
- Documents with Questioned Handwriting.
- Documents containing alleged Fraudulent Alterations.
- Documents attacked on the question of materials used in their production.
- Documents attacked on the question of their age and date.
- Documents investigated on the question of Typewriting.
- Anonymous writing.
- Secrete writings.
- Documents investigated on the question of Printed and Photocopied matter.
- Examination of Forged Currency.
- Examination of Passports.
- Examination of Stamps and Seals.

The examinations of questioned documents consists of all the above things but the most common or the most frequent type of examination which is registered in the court of law is the examination is the examination of Signature and Handwriting and examination of Fraudulent Alterations in the document. Following types of identification are regularly done in handwriting and signatures

- Is the handwriting Genuine or Forged
- Is the signature Genuine or Forged
- Authorship of the Handwriting and Signatures
- Is the A Handwriting Disguised
- Is the Handwriting transplanted

4.Basic Principles Of Handwriting And Signature Identification

The basic philosophy behind Handwriting Identification is comparison of class and Individual characteristics of the given handwriting sample. The first step in any legal handwriting examination is to observe the general appearance of the questioned writing

as compared with the genuine standard writing. By this method the conspicuous characteristics are determined. There are some major principles of handwriting which the practitioners and Forensic Document examiners have established.

- No two persons write exactly alike because no two persons have the same experience in life and therefore their writing will always vary. Normally it is said that writing is influenced with experience, environment, mental condition, physical and emotional make up.
- No one person writes exactly the same way twice
- A writer is to able to imitate all the features of another person's handwriting while simultaneously writing at the same relative speed and skill level as the writer he is seeking to imitate.
- In simulating another's writing, the simulator will try to imitate those features that are most striking to his eye. He frequently either disregards those features that are less conspicuous to him or fails to imitate them successfully
- For those writing where the writer successfully disguises his normal handwriting habits or where he imitates or traces, the writing habits of another writer while learning, it is virtually impossible to identify the imitator.

5.Forensic Handwriting And Signature Identification

Handwriting Identification is a discriminatory process that derives from the comparison of writing habits and an evaluation of significance of their similarities or differences. Handwriting comparison is the most frequently requested type of document examination. It occurs in many phases of human activity throughout life. As children, we are taught a system of handwriting. Initially we are urged to copy the system as closely as possible. During the later stage we tend to move away from the standard form and consciously or subconsciously experiment with new letter forms and unique combinations of designs. When we become mature individuals we pay less attention to the letter formation and more attention to the content of the message. Throughout the process of development of writing personal habits contribute their own characteristics, and writing becomes as individualistic as speech and mannerisms⁷. Identification of handwriting is dependent on the assumption that certain deeply set characteristics which a writer develops in him over his lifetime are consistently and consciously reproduced in a person's handwriting. Even if he tries to disguise, the peculiarities come out unknowingly.

When a particular piece of handwriting is called into question the handwriting expert will examine the writing I question visually, with the aid of the hand held magnifiers and with a microscope⁴. A document examiner compares questioned handwriting or signatures side by side to the known standards. Every normal individual when looks at writing and signatures first notices the appearances and slant of writing or signature, but a document expert tries to think beyond the most obvious characteristics and studies the writing in depth in a conspicuous way.

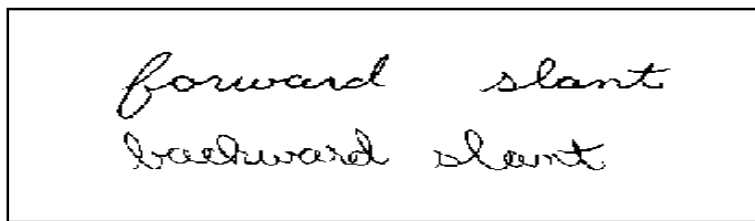
Handwriting Identification is completely based on the comparison of class and individual characteristics. It is similar to that of fingerprint Identification. Characteristics such as bifurcation, Island, Dot, Short ridge, Core, Delta etc are compared in fingerprint identification. Similarly there are class and individual characteristics in handwriting comparison.

The gross features of writing are class characteristics. Ordway Hilton defines class characteristics as “Not all characteristics encountered in a document examination are peculiar to a single person or thing and one that is common to a group may be described as class characteristics². Morris defines it as “Class Characteristics belong to the system or style of writing the person learned. They may also be forms or features added to letter by environmental or cultural influence”¹.

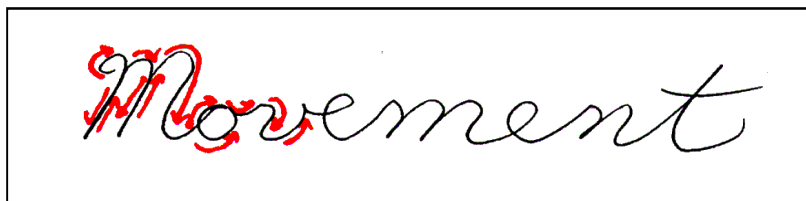
Individual characteristics are those less conspicuous special features in writing. Hilton defines individual handwriting characteristics as more or less peculiar to specific writer, constitute the backbone of identification². Any character in writing or any writing or any writing habit may be modified and individualized by different writers in many different ways and in many varying degrees and the writing individuality of any particular writer is made up of all these common and uncommon characteristics and habits⁸.

The comparison of handwriting and signatures is done with the assistance of the following characteristics.

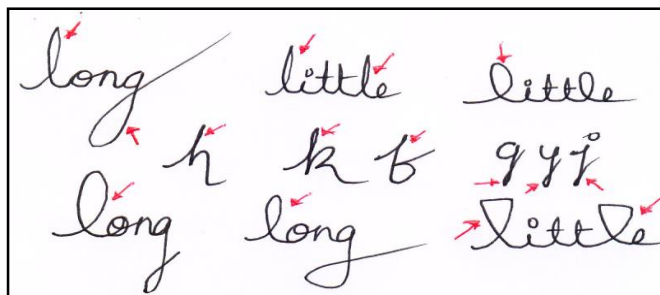
- **SLANT:** This is the angle of writing and can be forward or backward. Slant in writing is characteristic that becomes highly significant under certain conditions because it is one of the most fixed habits. A slight slant in two handwritings of considerable length may be evidence that the writings are by different writers. While a prominent difference might be the result of intended disguise.



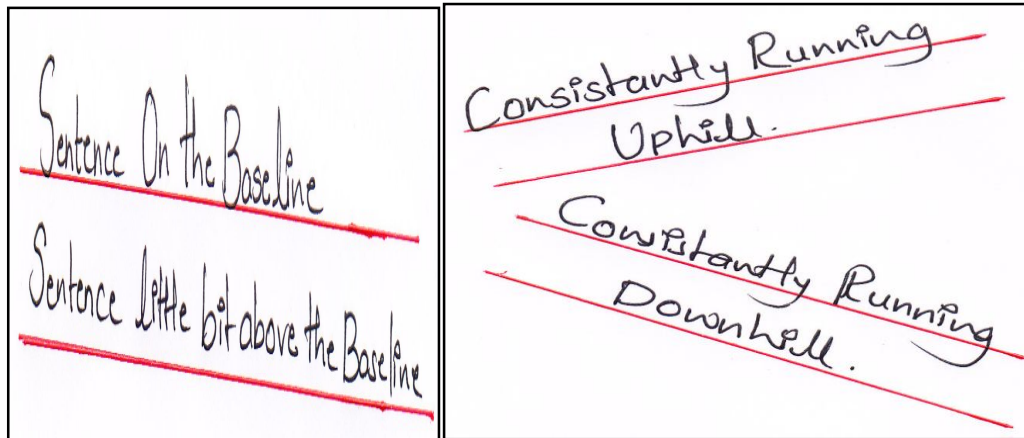
- **MOVEMENT:** The writing is executed with the movement of fingers, the wrist, the whole arm or the combination of some of these. Movement is the way a pen moves in order to form a letter. This can help distinguish the difference in the form. 2 letters can be same but made in a different way.



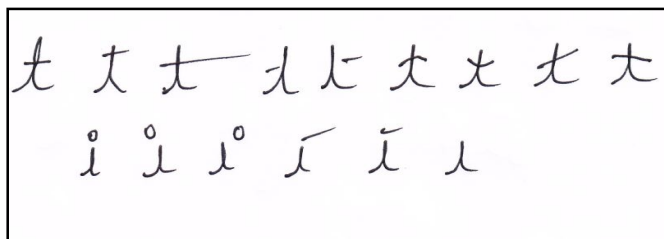
- **LOOPS:** Loops curved strokes combined to form a circle or an oval. It is the closed oblong curve in the letter, such as the upper parts of 'l' or of 'h' or the lower parts of 'y' or 'g'.



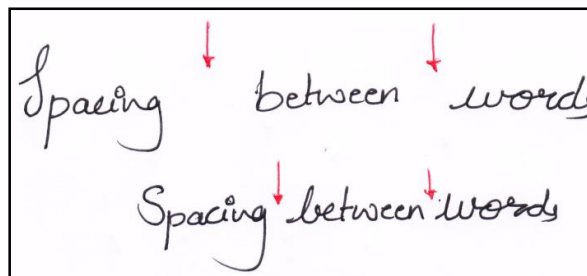
- **ALIGNMENT:** Alignment is the baseline of writing in Roman Scripts. In English the base line is at the bottom. The letters and words sit on a line which may be actual or imaginary. The relation of letters or words or a signature or a written line with this actual or imaginary baseline is alignment. The alignment may be ascending, descending, even, irregular, uneven, and wavy.



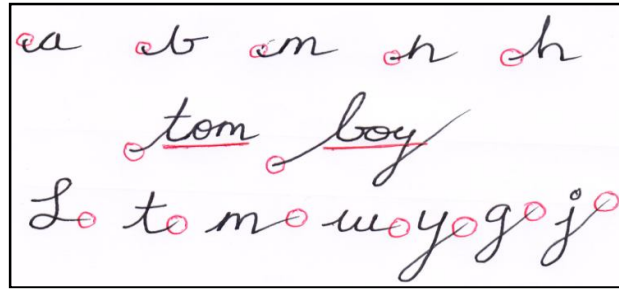
- **T- CROSSING AND I- DOT:** One of the most telltale strokes which will give away the forger is the t- crossing and another is i- dot. No matter how careful the imitator may be, he will have a hard time not leaving his own characteristics behind in making these strokes.



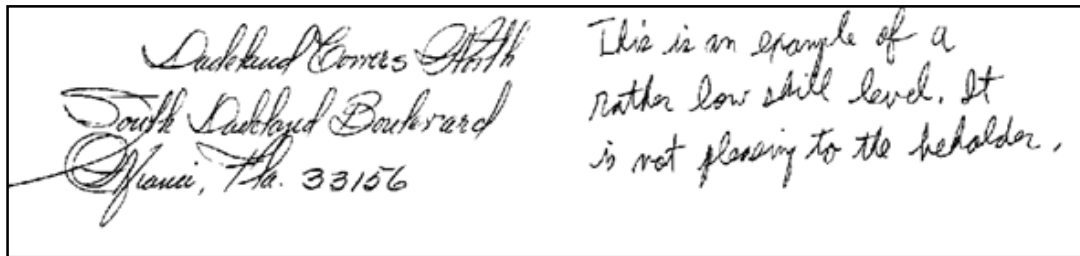
- **SPACING:** Spacing is the distance between letters in words between words in the sentences between two lines. Spacing is the very important factor in matter of traced forgeries when he disputed and model signatures are superimposed on each other. But in traced forgeries usually the spacing and size of alphabets remain mathematically same. Spacing may be Average, narrow or wider.



- **STROKES:** These are perhaps the most inconspicuous characteristics and the most difficult for forger to duplicate and are found in initial or final writing of handwriting. The end strokes are called spur. The systematic comparison of each of these strokes will give the examiner revealing evidence.



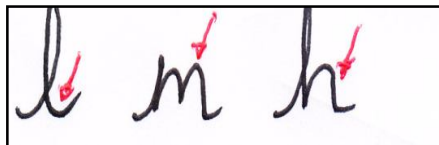
- **SKILL:** The Skill acquired by a person depends upon his Initial training, writing experience and emotional and intellectual personality. He cannot improve upon it. A person with inferior skill cannot simulate the writing of a person with superior skill. He can thus be easily eliminated as suspect.



High Skill Level of Writer

Low Skill Level of Writer

- **ARC:** it is a curved line in a letter specially found in the handwriting of an individual who writes cursive handwriting.



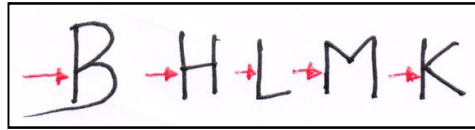
- **BUCKLE:** a small knot shaped loop or oval specially found in the letter A or K or F sometimes. this is a kind of improvisation in an individual's handwriting which develops with practice.



- **HOOK:** it is small embellishment found in the form of hook at the beginning or sometimes at the ending of the letters.



- STAFF: the longest straight stroke in specially capital letters is known as staff.



- RHYTHM: Rhythm is found in the writing of educated persons with ample writing experience only. Rhythm is indicated by the flow of writing, correct line quality and punctuation and proportionate formation of letter and figures. It is the product of writing and reading experience and cannot be imitated.
- PEN PRESSURE: Pressure or Force applied by the fingers in the process of writing. It is an unconscious act. Some persons put pressure on certain words or certain letters. The heavy pressure applied on the paper cause indentations behind the paper. Those who write with heavy pressure are slow writers. Illiterate persons ordinarily write with heavy pressure.
- PEN PAUSE: Experienced and well trained writers do not ordinarily pause in the writing the letters of a word. Pen pause is natural in the writing of illiterate persons who find difficult to execute the writing. The pen pause from the forger's pen is different from the pause of an illiterate person though the reasons of pause are same. The pen pauses in a forgery are in starting stroke, ending stroke, embellishment at difficult formation and connectives.
- PEN LIFTS: Certain writers lift their pen when certain letter formations are met with. Eg: some writers lift pen to put a dot, to cross a t complete a incomplete letter. When the genuine signature does not contain any pen lifts consistently, pen lifts in the questioned signatures indicate forgery.
- HESITATIONS: The Starting and Ending Strokes in the forgery show Hesitations through the tremors of lack of firmness. These hesitations in the starting strokes occur because the forger is not certain whether he will be able to do the job efficiently or not. In the Ending stroke he fears whether he has been able to forge the signature well or not. In genuine these strokes are done rather more freely than rest of the writing.
- Identification System of Questioned Documents (ISQD) ⁹ has decided 12 standard points for the comparison of handwriting and signatures. The following method of making a scientific comparison stroke by a stroke of a questioned writing with the genuine handwriting identification on the same basis as

fingerprint identification. No matter in which laboratory the test is made or by which trained technician it is made the conclusion will hold true.

The following are the 12 points of comparison.

- Uniformity.
- Irregularities.
- Size and Proportion.
- Alignment.
- Spacing.
- Degree of Slant.
- Weight of Strokes.
- T-bars and I-Dots.
- The Needle, The Wedge, The Round, The Flat.
- Loops.
- Initial and Final Strokes.

6. Discussion And Conclusion

Writing is taught from a model system. The act of consciously repeating a written character fixes the form of that character in the mind of the writer, normally during childhood, until the production of this form becomes automatic. From the movement people start learning to write, they introduce deviations from the model writing systems taught. The extent of these deviations increase as he writing style becomes more personalized, resulting in a style which is the product of many factors including the model system, artistic ability, muscular control, nature of employment, frequency of writing and exposures to the writing of others, this results in an individual writing style, the development of which occurs throughout the childhood and adolescent years and often beyond. Present paper is an approach to characterize handwriting and signature in the forensic point of view. The characters based on which the analysis of the handwriting and signatures is done are discussed in detail. These details are essential to eliminate a suspected signature or handwriting or to prove that the forgery is been done. The alterations made in the documents are also a kind of forgery so their examination and detection also becomes a very major aspect of forensic examination and it also comes as a challenge to the forensic examiner. The forensic handwriting examiners have ample knowledge about the class and individual characters used to identify handwriting. Hence

a forger must now think twice before he damages the document. Therefore it can be said that it is a fair war between the criminal and the forensic expert.

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