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Distinguishing Between Natural Variation and Fundamental Differences

According to Albert Osborn in his book, *Questioned Documents*, “It needs to be emphasized that two writings are identified as being by the same writer by an absence of fundamental divergences as well as by a combination of a sufficient number of similarities. The process is always a double operation, positive and negative, and if error is to be avoided neither part of the process should be overlooked. In order to reach the conclusions of identity of two sets of writings there must not be present significant and unexplained divergences. These divergences must, however, be something more than mere trivial variations that can be found in almost any handwriting.”

How does a document examiner distinguish natural variation from fundamental divergences? Natural variation consists of the subtle differences that appear in everyone’s handwriting. Fundamental divergences are major structural differences. Examples of natural variation include slight differences in letter forms, spacing, size, slant or any of the characteristics of writing.

A fundamental divergence is an irreconcilable divergence. Fundamental divergences in handwriting that are significant include: differences in line quality, pressure patterns, method of construction, skill level, pen strokes, or subtle subconscious handwriting characteristics. Differences in letter forms are also significant but not always fundamental differences.

A forger must choose between maintaining good line quality and adhering to the letter forms of a model. If the forger concentrates on the line quality, the writing will not adhere to the model. If the forger adheres to the model, the line quality will suffer. Therefore, poor line quality or lack of adherence to the model writing indicates a different writer. Poor line quality looks drawn or tremulous and frequently is drawn and not written. Drawn writing will have a different pressure pattern than natural writing.

Since writing is a habit, a difference in the method of construction is a fundamental difference. Conscious attention to the act of writing usually represents a writer trying to imitate someone else’s writing.

Subtle characteristics are small inconspicuous habits of the writer that go unnoticed by most people. Examples of inconspicuous habits would be hooks or ticks in the writing or unusual connecting strokes.

A single fundamental unexplainable characteristic of writing is sufficient to eliminate a writer as the author of handwriting in question regardless of the number of similarities. One does expect to find similarities whenever an attempt is made to imitate another’s handwriting.

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Traumatic Events and Their Effects on Handwriting

By Jeff Chadney, CQDE

Abstract:

According to research, a person's handwriting is a psychomotor skill involving a thought process, memory of learned behavior, and hand and eye coordination. The combination of that process allows a person to place their thoughts into a format which can be communicated or transferred to others in a material form.

Therefore, one can make the assumption that things that affect the brain should inevitably affect and would be transferred into an individual's handwriting. The purpose of this research study is to determine how much or to what extent traumatic events affect a person's handwriting, and if so, are those effects that can be readily observed.

Purpose of this Study:

The purpose of this research study is to determine if traumatic incidents in a person's life would cause a change in an individual's handwriting. For this research study, several factors were combined; one person was advanced in age, and had led a full and relatively happy life, was mentally stable, and had been exposed to significant amounts of recent traumatic events, which significantly altered her life.

So, if the above information was true, one should be able to detect significant observed changes in the individuals handwriting over a designated period of time.

Hypotheses:

Hyp.1: Personal writings in the journal will be in the natural hand of the writer and should be consistent with normal handwriting. We should find that the initial entries in the journal are not yet affected by the trauma and related stress and will be the standard for which to compare the later journal entries. Those entries should not show any of the indicators of stress that will be found in the later entries.

Hyp.2: After each writing evolution one should see more pronounced indicators of stress and writer's emotional mindset due to the traumatic events and should be evident and observable in the actual writing.

Participant:

For this study there was one participant, who is female, eighty-nine years old, and resides in Southeast Texas. There is no knowledge or indications of any mental illness or medical conditions that effect the brain, or the ability to write. The individual voluntarily participated in this study and signed a letter of consent to participate and to have the results submitted and reviewed by others for the purposes of this course.

Our research individual was recently widowed, and resides alone. In August 29, 2017, Hurricane Harvey hit the Southeast Texas coastal area, and all of the participant's personal belongings were lost with the flood waters which completely devastated her home of twenty plus years. The participant was displaced, and due to not having family support was moved into an assisted living facility. She suffered mental trauma having lost the comfort of her surroundings, friends, and activities which her home and neighborhood provided and she enjoyed and took a very active role.

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Additionally, this same individual then had major hip replacement surgery, which required being hospitalized, for a specified amount of time then moved to a rehabilitation facility, then relocated again back to her room in the assisted living facility.

Method of Research:

This study was voluntary, and “journaling” was used as the medium to record any observations, which would also have a positive and beneficial effect on the writer, by allowing a process for an individual to release their anxiety related to the traumatic event. (Murnahan, Briana, “Stress and Anxiety Reduction Due to Writing Diaries Journals, E-mail, and Weblogs”) (2010 EMU), (Pennebaker, James, “Putting Stress into Words: Health, linguistic, and therapeutic implications) (July 1993)

In this research study, the participant’s observations and writings about the past, present and future would be placed on paper, along with emotional links which one would recognize as coming from those memories.

A journal with pen and paper was used because that is the medium that the participant is most comfortable with, and would allow for the collection of exemplars which could be readily compared. Pages were numbered to allow reference to a specific journal entry, where observed changes were present and noted.

The research was done in three parts, for just under a year, and the journal was returned to the researcher at the completion of each part for review and examination.

Part 1:

The participant was asked to write in her own handwriting, a summary of her life story, recent traumatic events and her thought of the future in a journal. The instructions given to her were; for her to write in her own words, introduce herself, give a brief biography.

Part 2:

The subject of the research study was asked to journal any traumatic events that she felt had impact in her life or the lives of others close to her. These entries were about her marriage and her move from her home where she had raised her family.

Part 3:

She was also asked to provide details of her thoughts during the initial displacement after the devastating hurricane, and her emotions. Also, during her recent major surgery involving hip replacement, the participant was asked to again make journal entries. She was asked to record her feelings after the surgery, during the rehabilitation. The individual was asked to record her return to her new home in the assisted living community, her outlook and any comments on the future.

Discussion:

The journaling took place from early September 2017 until August 2018. The journal was reviewed, and the following observations were made:

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1. The subject with whom the research was conducted has a high skill level of writing which is observed in the exemplars of the journal entry.
2. During several interviews with the author of the journal she made it known that she was and still is emotionally affected by the traumatic events, which was readily apparent by the content she recorded in her journal entries. By reading her journal, it can be confirmed that “handwriting like speech, is directly connected with our thought process.” (www.ijmnds.org) (January 2016) (see exemplars from the journal)

Findings and Observations:

The journal was reviewed and there is evidence that the journal writings did support the hypothesis that handwriting is affected by the traumatic events which our research individual was exposed to. Although expectations were of more pronounced differences in the writing from the beginning of the journal to the end.

It was observed that the writing at the beginning of the journal entries appear to be smooth, and free flowing, but entries towards the journal’s end seem to become less smooth, cramped, with larger spacing and letter form. One could attribute this to increased amount of stress related to the recent occurring events. Research has shown that “The emotional state of the writer alters the appearance of his or her writing.” (Koppenhaver, K.M., “Forensic Document Examination Principles and Practices”) (2007)

Her writing in Part 1 is very smooth and flows easily. Writing in Part 2 appears to be less smooth, and words and letters appear to be cramped. Pen pressure appears to be stronger. In Part 3 writing are not as smooth, and letter form is not as distinct as in Part 1.

There was little or no evidence of tremor but there were more occurrences of write-overs and crossed-out words for misspellings and there appeared to be some change in the left-hand margin alignment. The entries appear to have no significant amount of tremor and the same writing instrument was used throughout the journal.

The research did not take into effect other factors which might have affected this study. These factors being the age and physical well-being of the writer, writing surface, any environmental distractions, the use of prescribed medications and any developed health conditions brought on by the elective surgery. One or any of those factors, one would expect to have a significant impact and effect on the writings. (Koppenhaver, K.M., “Forensic Document Examination Principles and Practices”) (2007)

References:

1. **Koppenhaver, K.M., “Forensic Document Examination Principles and Practices” (2007)**
2. **Murnahan, Briana, “Stress and Anxiety Reduction Due to Writing Diaries Journals, E-mail, and Weblogs” (2010 EMU)**
3. **Pennebaker, James, “Putting Stress Into Words: Health, linguistic, and therapeutic implications” (July 1993)**

Counterfeit Documents

By Katherine M. Koppenhaver, CQDE

INTRODUCTION

Counterfeit documents are documents that have been fabricated in the image of legal and financial documents with a view to defraud by passing the false copy as genuine. In addition to documents that are completely non-genuine, some documents are altered to raise the amount or change the payee. We will address all of these issues.

Many counterfeit documents are poorly constructed. Documents may be altered. Signatures may be cut and pasted. The amount of the check may be increased as seen here.

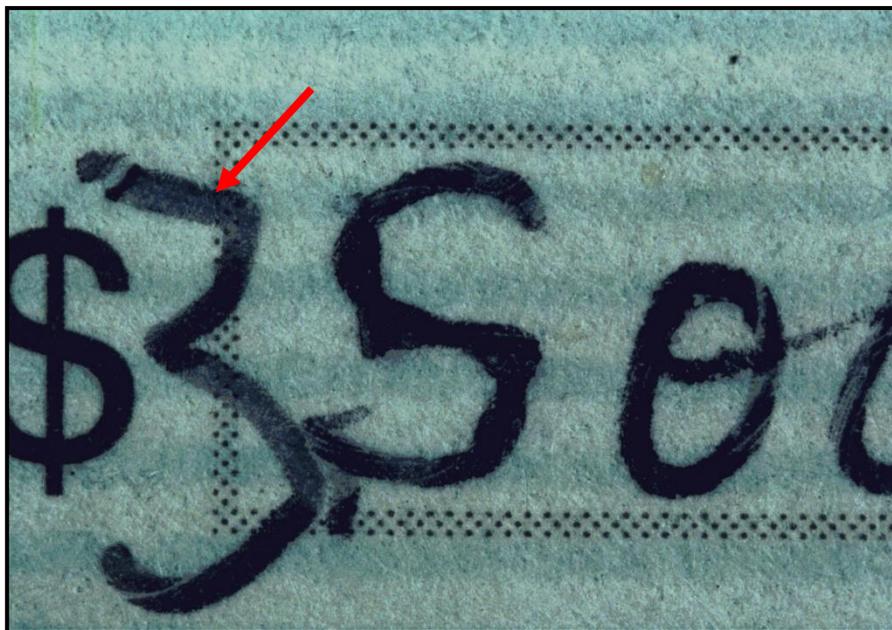


Figure 1: 3 changed to a 5 raising amount of the check by \$3100

In the past decade the proliferation of computer equipment has simplified the method of creating counterfeit documents. What used to be available to only a few skilled and unscrupulous people is now within the range of many without the need for special skills. Desktop publishing is making it easy to create counterfeit documents, from letters of credit to spurious checks. Documents that used to require expensive equipment to create can now be done on a personal computer with a scanner and a laser printer in a relatively short period of time.

TYPES OF COUNTERFEIT DOCUMENTS

What can be created on a modern home computer system? Business records, expense account receipts, diplomas, and phony letterheads used in business transactions are a cinch for modern day counterfeiters. Bank records including cashier's checks, certified checks, letters of credit and similar financial instruments are easily falsified. Other documents such as property records, insurance claims, passports, birth records and college transcripts are subject to counterfeiting.

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Many companies are printing their business documents on computers and printers. Computers are creating checks using check kits that include software and safety paper. Genuine documents cannot be distinguished from counterfeit ones when the same method is being used to create both kinds of documents.

CREATING COMPUTER GENERATED FORGERIES

Desktop forgers start with a computer system that includes a scanner, a laser-quality printer and appropriate software. Software consists of a word processing system and a graphics package such as Photoshop

The perpetrator scans the document into a pict file. A pict file is a digital representation of a picture. When a scanner passes over a document, the computer converts the image into a series of numbers that describe the color density for each part of the image. Then he uses graphics commands to magnify the image and clean up any fuzzy edges. He erases any information he does not want, and replaces it using a word processor. He matches the font to the original, retypes the information and the date. He prints everything out on his laser printer.

DETECTING COMPUTER GENERATED FORGERIES

How can you spot a computer forgery? It is usually easy when you have a genuine document for comparison. However, if you suspect a forgery, there are several steps you can take to spot a fraudulent document.

First check out the alignment of the printing and any signatures and signature lines. While it is easy to replace material on computer-generated documents, it is difficult to align them perfectly. You can check alignment by placing a grid over a document to see if everything is perfectly aligned.

Look at the edges of the document. Has the paper been cut by hand? Some documents contain information that needs to be removed and it is often easier to cut the edge off the paper than to remove material. If any of the edges of the paper have an irregular cut edge, the document may not be genuine.

The exhibit on the next page is an example of a document that has been cut and pasted. A grid has been placed over the document so that the misalignment can be seen. The last line of the contract was added after the contract was signed. Notice how the words start directly on the line at the beginning of the line but gradually rise above the line as they progress across the page. All of the other lines are consistent from beginning to end. When this case went to court, the judge agreed that the document had been fraudulently altered.

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May 7, 2001

I agree to have SBS Technology deduct from my commission all costs associated with the sales trip scheduled May 17, 2001 through May 24, 2001. Costs to be deducted from commission include: one Retriever polo shirt, TWA round trip airline ticket, lodging at Embassy Suites, car rental for one week, and, if purchased, phone card.

Should I fail to meet SBS' training requirements, May 14, 2001 through May 17, 2001, I acknowledge I will be unable to participate in the sales trip scheduled May 17, 2001 through May 24, 2001, but that due to advance reservations restrictions, I will still be liable for all above noted trip charges.

As an Independent Sales Representative (ISR), I agree to hold harmless and indemnify SBS Technology for any and all claims arising out of any injury, disability or death during the performance of any duties under our agreement. ISR further agrees to hold SBS Technology free and harmless from any and all claims arising from any negligent act or omission while acting as Independent Sales Representative for SBS Technology.

It is understood, and agreed to, payment for this sales trip and expenses or any other sales trip and expenses fronted by Linda Bell (paid personally by Ms. Bell rather than from SBS Technology funds) is to be reimbursed to Linda Bell directly not SBS Technology.

Should commissions not cover costs, I acknowledge I will be personally liable for all expenses incurred.

Name [Signature] Date 5/14/01

John Franklin

Figure 2 – Altered Contract

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PASSPORTS

The International Civil Aviation Organization (ICAO) issues passport standards that are treated as recommendations to national governments. For example, the size of passports is normally 125 × 88 mm (4.921 × 3.465 in). As a result, rough standardization exists in the types of passports used throughout the world, although passport types and the number of pages can vary by country.

The standard passport format includes the name of the issuing country on the cover, a national symbol, and a description of the document such as passport, official passport, or diplomatic passport. There is a title page inside that also bears the name of the country. The following page contains information about the bearer and the issuing authority, although some European members provide that information on the inside back cover. There are blank pages available to affix visas, and to stamp entries and exits. Passports have numerical or alphanumeric designators called serial numbers, assigned by the issuing authority.

Passports frequently contain a message, usually near the front, requesting that the passport's bearer be allowed to pass freely, and that the bearer be granted assistance when necessary. The message may be written in more than one language, depending on the policies of the issuing authority.

For example, in a United Kingdom passport, the passport reads:

Her Britannic Majesty's Secretary of State Requests and requires in the Name of Her Majesty all those whom it may concern to allow the bearer to pass freely without let or hindrance, and to afford the bearer such assistance and protection as may be necessary.

the English message in a Philippine passport meanwhile reads:

The Government of the Republic of the Philippines requests all concerned authorities to permit the bearer, a citizen of the Philippines, to pass safely and freely and in case of need to give him/her all lawful aid and protection.

and the English message in a South Korean passport is:

The Minister of Foreign Affairs and Trade of the Republic of Korea hereby requests all those whom it may concern to permit the bearer, a national of the Republic of Korea, to pass freely without delay or hindrance and, in case of need, to afford him(her) every possible assistance and protection.

Other passports such as those of the United States bear similar messages. However, Switzerland, Finland, and Austria do not have such messages.

The ICAO recommends that passports be issued in English and French, or in the national language of the issuing country and either English or French. Many European countries used their

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national language and additionally the three most spoken languages in Europe: French, German, and English.

Passports issued by members of the European Union contain all the official languages of the EU. These are not printed in each location, however. Two or three languages are printed at the relevant point, followed by numbers which refer to the passport pages on which translations into all the remaining languages appear.

Some language combinations are:

Country	Language
United States	English, French and Spanish
Barbadian	Dutch, French, and German and English
Belgium	Dutch, French, and German and English
India	Hindu and English
Iraq	Arabic, Kurdish and English
Macau SAR	Chinese, Portuguese and English.
Maldivia	Dhivehi and English
New Zealand	English and Maori
Norway	Bokmal and Nynorsk and English
Pakistan	Urdu, English, Arabic and French
Switzerland	German, French, Italian, Romansh and English

Immigration officials of many countries stamp passports with entry and exit stamps. A stamp can serve different purposes. In the United Kingdom, an immigration stamp in a passport includes the formal leave to enter granted to a person subject to entry control. Otherwise, a stamp activates or acknowledges the continuing leave conferred in the passport bearer's entry clearance.

IDENTIFYING FRAUDULENT PASSPORTS

Passports use safety paper to help prevent fraud. Safety paper is paper with an image imbedded into the paper. This image is produced during the paper-making process. Watermarks are made by impressing a wire stamp into the paper during manufacture while it still contains a lot of moisture. You can see the watermark by back-lighting the paper. Hold the paper up to the light to see the watermark.



Figure 3 - Watermark

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Also review the binding holding the passport together. It is usually sewn into the booklet. Counterfeit documents may be stapled instead of sewn or stitching may be uneven.

Passport photographs are head shots only. Fraudulent passports often contain a photograph that is more than a head shot or that is offset. Sometimes photographs are substituted on passports. Look for evidence of tampering around the photograph.

Make certain that the passport contains all of the required information. Some counterfeiters leave out important information.

FRAUDULENT CHECKS

It is necessary to learn about the make-up of an authentic check in order to be able to spot the fraudulent checks. Checks contain security measures such as safety paper and microprint to prevent them from being counterfeited or altered. Safety paper contains watermarks that can be seen by holding the check up to the light.

Genuine checks contain the name and logo of the bank on which they are drawn. They contain the name on the account and the address and the date the account was open printed next to the name. It lists the month and the year. This information is useful since most check fraud occurs shortly after an account is opened. There is a routing line at the bottom of the page directing the check to the proper clearing house. The routing line contains information found on other parts of the check such as the bank number and account number.

Here is an example of a check with the name removed for privacy purposes.

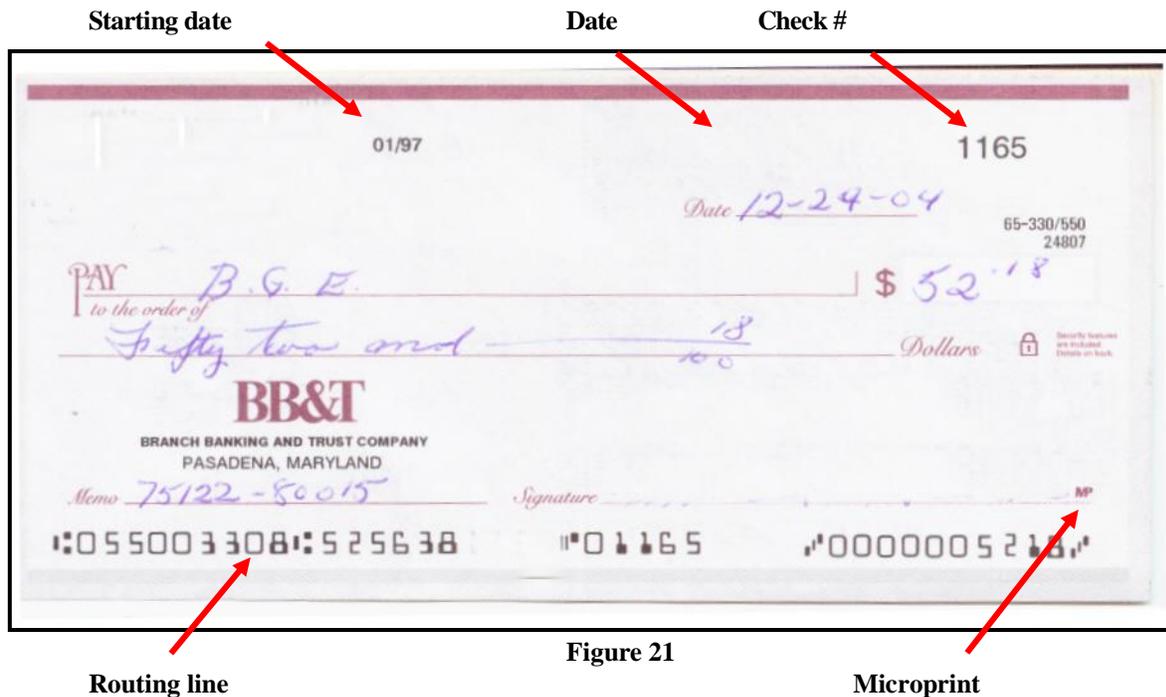


Figure 21

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The routing line at the bottom of the check is printed in magnetic ink so that the check can be read and sorted by machine.

Fugitive inks are used to prevent the check from being photocopied and made into multiple checks. Fugitive inks will appear when a copy of the check is made. They usually have the word, “Void” repeated across the check.

Microprint is used to create the signature line because it cannot be copied. The letters “MP” appear at the end of the line to let you know that the checks contain this feature.

Even though check manufacturers use special safety paper, it is easy for people to create fraudulent checks. Mail order check companies make it possible for fraudsters to obtain blank checks. Check kit software is available so that companies can print their own checks on regular paper, giving swindlers ready material for counterfeiting checks.

Check Washing

Some crooks are taking legitimate checks and washing away the information that they don't want. They do this by covering the signature with tape and washing the check in a solution that dissolves ink. Then they add different information and cash the check. Checks that have been treated by chemicals are greasy when you touch them.

IDENTIFYING COUNTERFEIT CHECKS

Taxpayers may produce counterfeit checks to support their deductions. Banks no longer return checks to their owners so original checks may not be genuine. Look at the routing line at the bottom of the check. That line contains valuable information about the check. It contains the bank number, the account number of the owner, the check number and once a check has gone to the bank, the amount of the check.



Figure 3

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Modern checks (except government checks) have up to three sizes perforated. Fraudulent checks may not have any perforations. Lack of perforations could indicate counterfeit documents.

In addition, checks are usually printed on safety paper. Safety paper contains an image that is disturbed if the check is altered. Many checks contain a list of the security features found on checks. This can include holograms, emblems, fugitive inks and microprint. Fugitive inks appear if the check is altered or photocopied. Microprint appears as a fine line that can be read under magnification. Microprint cannot be copied. Microprint looks like this, only smaller.

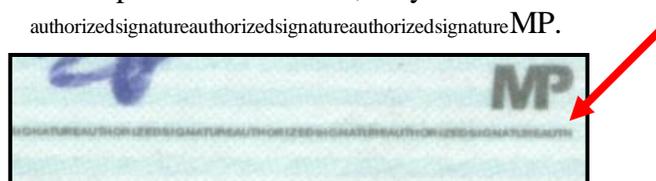


Figure 4

The MP at the end of the line identifies the fact that it is microprint. You can see the MP at the end of the signature line indicating that the line is microprint.

ALTERATIONS

Checks are altered to change the amount, the name or some other component. Erasures and/or additions may be made to increase the amount of the check. The existence of any changes on checks should be easily detected under ultraviolet light.

IDENTIFYING COUNTERFEIT CHECKS

Inspect the check to see if the amount has been raised. Do the numbers look crowded? Is the spelling crowded or corrected? Look for a different color ink on the amount of the check.

CHECK SAFETY PAPER

Are there signs of erasures? Check safety paper has been in use for over 50 years to protect against erasures. Erasing disturbs paper fibers so that ink placed over an erasure will spread into the paper. The new writing will appear to be fuzzy or feathered. The continuous design of the paper makes it difficult to alter without detection as erasing may also affect the background color or design.

Chemicals leave a residue on the paper which is easily detected by close scrutiny of the check. Fugitive ink reveals the word "VOID" when chemicals are applied to the paper. Alterations are detected when a chemical eradicator is applied to some safety paper leaving an obvious white area void of the design pattern.

Some safety paper contains invisible fluorescent designs which help to thwart counterfeiting of duplicate checks. Ultraviolet light is needed to detect the identifying features. Watermarks may also be applied to prevent counterfeiting.

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OTHER SAFETY PAPERS

Check for microprint on the signature line. The signature line itself is composed of the words, AUTHORIZED SIGNATURE, which are printed so small that it can only be seen with a magnifying glass. When anyone attempts to copy the check, the line of microprint breaks up and does not copy properly. Microprint contains the letters, MP, at the end of the line to draw attention to this feature.

Some checks contain a foil emblem or a hologram and most checks now contain a band listing the safety features of the check such as "Microprint and foil emblem."

Modern forgers have an arsenal of weapons on hand to create the "perfect forgery." Safety paper for checks is readily available. Forgers can print fool-proof checks using their computers and laser printers. With the advent of color copiers, forgers can duplicate checks so that they appear to be originals.

INDICATORS OF FORGED CHECKS

Forged or fictitious checks cannot always be identified. However, there are indications of forgery that can alert you to the fraudulent nature of the check.

Place both the check and the card under a strong light; by this means blemishes caused by an ink eradicator will show plainly. A blemish on any check or identification card is usually a danger sign.

Magnetic ink has a dull finish. If the magnetic strip contains a shiny surface, the check is fraudulent. Hold the check up to the light. Magnetic ink is opaque. If you can see through the ink, the check is fraudulent.

If the ink peels off when the check is creased, it may be a colored copy of an original check. Look at the back of the check to see if the watermark shows through. Is the back plain paper or safety paper? Safety paper is usually printed on both sides of the paper.

If the check does not have perforations on one side, it may be fraudulent. All current checks, except some government checks, contain perforations on at least one side.

Compare the handwriting and the signature with that of the endorsement. Does the handwriting appear to be the same? Are there any indications that the same person wrote both names?

Checks with low account numbers indicate a newly opened account. A high percentage of bad checks are numbered between 101 and 150.

CHECK SYMBOLS

We are all familiar with the check number in the upper right-hand corner of the check. These numbers are sequential. The corresponding number can be easily spotted at the bottom of the check.

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Misalignment may indicate counterfeiting, especially when material is cut and pasted. Counterfeiters take short cuts that enable us to recognize the fraudulent documents. Logos that lack crisp details may have been scanned from a copy of the image. If a document doesn't look like a genuine document, it probably isn't.

Companies are using tamper-proof paper or special ink to prevent forgeries. Offset-printed forms are harder to duplicate than computer-generated forms. Papers are being manufactured with artificial water marks that can be seen at an angle but cannot be copied by a scanner.

COLORED COPIES

Color photocopiers are a large part of desktop forgeries. Colored copies can usually be identified by the different-colored dots under magnification although modern copiers are improving, making it difficult to identify computer-generated documents.

Document examiners need to be prepared to recognize and handle counterfeit documents.

The Autopen **By Dr. Doug Shuler**

INTRODUCTION

For all intensive purposes, any signature not handwritten/signed by the actual person whose name appears is a forgery. Merriam Webster (2018) defines a forgery as the act producing a false copy and or copying a document, signature, or any other work and passing it off as genuine, whereas a forger is someone or something that attempts to copy or imitate the writing of another. There are so many ways that a writing or signature can be manipulated by means other than that of an original signator, that is, the actual signature of a person that makes that person subject to all the ramifications thereof. Forgeries of all kinds have been around since the dawn of time, when unscrupulous people attempt to gain something that belongs to someone else. Generally, most all forgeries revolve around monetary gain or gain of some physical property.

With regard to this document, it is meant to show the history and use of the Autopen. The Autopen has more than one name; it also goes by pantograph, polygraph, robot pen, and signascript, not to mention use of digital and other computer-generated writing and signing instruments. Whatever name it goes by and whatever the use it is still considered a simulated writing and realistically has no business in genuine writing. The technology is so advanced that it takes an experienced and skilled forensic document/signature examiner sometimes to weed out the real from the fake. Robotic or mechanical methods of writing create challenges for forensic document examiners since many government, corporate and private individuals use these devices to produce their signatures based off mimics of original signatures...careful examinations reveal and produce opinions of not genuine (Dumitra et al., 2018).

HISTORICAL USE

The first mechanical writing devise was developed in and ultimately patented in the United States by John Hawkins in 1803. Initially called the polygraph, not to be confused with lie-detection equipment of today, this devise was designed to mimic the writing motion(s) of the specific user of the machine in predominately producing facsimile signatures. Limited production of the polygraph began in 1804 with President Thomas Jefferson being one of the first purchasers of the unit, purchasing two units, one for his home and another for the presidential office. Thomas Jefferson was the first political icon to discover the Autopen and purchased two of them in the year 1809, although they were popular with other presidents, Presidents Jefferson and Obama though distanced by years were the primary users of this device (Resnick, 2013).

It was not until the 1930's when the Robot Pen was redesigned and placed into commercial production using a redesigned version based off the original patent and consisted of using vinyl records to store writing samples of the intended user. In a May 1937 Popular Mechanics Magazine article, research stated that the Robot Pen machine would faithfully copy a person's signature in microscopic detail, with the exact detail of any original signature (p. 657).

In 1942, Robert DeShazo Jr., using the technology at the time, created the Autopen devise, subsequently calling it the Autopen. This Autopen devise was commissioned and funded by the United States Navy, which ultimately became the exclusive devise used by almost every facet of the United States government, such as congress, senate and executive branches, with an

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estimated 500 units being bought by the United States during the 1940's. To date, United States government employees rely on the Autopen to sign official and unofficial documents on behalf of elected officials, this includes congress, senate and presidential figures such as Presidents Truman, Kennedy, Johnson, Ford, and Obama. President Obama signed multiple documents and bills into law using the Autopen such as provisions to the U.S. Patriot Act and extensions to the Bush tax cuts. Although the Autopen was used throughout many presidential terms, it was not until President Reagan's term that many in the Whitehouse observed and questioned why the President's signature was being used unscrupulously on many items and documents, subsequently causing issues (Hosenball, 1987).

During President G.W. Bush's terms in office, President Bush was not against the use of the Autopen, but never utilized it to sign any formal documents. In fact, President G.W. Bush commissioned the U.S. Department of Justice to investigate the constitutionality of the Autopen; a 29-page opinion was rendered stating that the Autopen is a legal form of signature, although President Bush never used the machine when signing legislation (Cirilli, 2013). President Bush's National Security Advisor Donald Rumsfeld was excoriated for his use of the Autopen to sign condolence letters to family members of fallen service personnel during the Iraq and Afghanistan military engagements, ultimately stopping this practice and signing these letters personally (Abramovitch, 2011).

Many congressional members have refused to use and are adamantly against signing any formal document with the Autopen because they believe that all formal documents should be personally signed. Many in congress believe that the president should sign any bill personally and forego the use of any mechanical means when signing any document. Many believe that the use of the Autopen is unconstitutional and makes any signed document a forgery (National Review, 2011).

MULTI-INDUSTRIAL SIGNIFICANCE

The fact that not only human forgers exist, now the use of technology has created another form of forgery with the advanced uses of the Autopen, Signascript and other digital writing facsimile methods. What is more financially viable than that of a good human forger is the use of mechanical forgery machines that can mimic a writing or signature with precision. What is meant by multi-industrial significance is that many businesses thrive financially on the genuineness of the products they sell, specifically written signatures on their products real or simulated.

We have known for years that other countries and businesses steal the proprietary and intellectual property of others and then make a product that is similar in every way to that of the original, but even in these simulations exist glitches that only an expert can distinguish. In the business of forensic/questioned document examination (FDE)(QDE), the job of the examiner is to attempt to distinguish between what is real and basically what is simulated, rendering a decision/opinion of the matter, whether the opinion is genuine, not genuine, or inconclusive based on the facts and examples presented. FDE's and QDE's can be beneficial when using their expertise related to signatures: art, memorabilia/collectables, banking, legal, expert witness, just to name a few.

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The signature and authentication business are huge, especially in the art, memorabilia and collectables trade. Autographed sports memorabilia alone is a three hundred seventy billion-dollar industry with regard to the worldwide collectors' market, spanning over sixty-seven million collectors (Heitner, 2016). Since sports collectables and memorabilia is an unregulated market, forgery and fraud is an ever-increasing problem where unscrupulous sellers are passing along fraudulent products to novice and experienced buyers (Belson, 2017). This created the need for authenticators, people trained and certified in the art of forgery detection, to create a sense of consumer confidence and the manifestation of higher collectable prices. Some of these authenticators are either undertrained and or create issues whereas they authenticate fraudulent items through their inexperience or authenticate forged items to purposefully drive prices up (Belson, 2017).

Although most of these forged memorabilia items are completed by talented forgers, many of these forgeries are completed using digital computer graphics and from the use of the Autopen and Signascript devices. Signatures generated by machine or completed by staff have no auction value compared to those actually signed by the actual writer (Antiques Road Show Insider, 2012). According to the Steiner Sports Memorabilia Company (n.d.) approximately five hundred million dollars in losses are tabulated each year as a result of forgery and or fraud related to traded sports memorabilia (p .1). This does not take into account other industries where signatures and designs are subjected to fraudulent activities.

The other point that should be addressed is the need for educated, trained, skilled, certified, and experienced authenticators. The use of the terms forensic document examiners, forensic signature examiners and questioned document examiners are used loosely in this market and should only be used by those who actually have taken the time to study and become certified by reputable certifying agencies. Most all the sports memorabilia authenticating companies claim they employ only authenticators who are higher trained in autograph and signature verification. According to Rossen (2014) today, few autographs are bought or sold without the blessing of either Professional Sports Authenticators or its competitor, James Spence Authentication, and they have to use garbage cans to hold all the money they generate from their reviews (p .1).

Since that time, the only other authentication company with the same clout is Beckett Authentication Services. All of these aforementioned companies certify celebrity signatures from a wide variety of genres including sports, art, music, movies, television, politics, and other notable areas. For example, certifications from any of these companies on a typical Babe Ruth signed card or document averages about \$2900 compared to an uncertified version that sells for \$250. Therefore, you need the blessing of one of these companies to capitalize on the profits. Thus, may lie the problem (Rossen, 2014). It can be seen that there exists a value of a mechanical or digital signature devise to oftentimes place a signature on a product to fool the unsuspecting buyer. It has been noted by many sources many people do not place a value on either man or machine to authenticate a product. Many of these so-called authenticators manipulate their biographies and resumes to promote themselves and have neither the credentials to prove or disprove any type of signature at all whether machine or man-made.

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Conclusion

There might be a place for auto-signed and auto-signature generators for use in multi-production where the seller/buyer is aware that the signature is generated by machine and is not genuine, or where an authentic signature is not required. This happens very often when and where mechanical or digitally signed documents are allowed. The fact of the matter is that the disclosure needs to be made, and made very clearly. It is hard to fault the mechanical or digital signature machines for the legitimate purposes they are designed to perform; it is only when this equipment is prostituted for illegitimate reasons where the fault lies, where the fraud perpetuates a loss for the buyer and profits for the seller.

In 1998, the Damilic Company acquired the Autopen Company, by redesigning the original Autopen and creating a more functional and accurate simulated signing machine and renaming it the Signascript. According to Brick (2011): This small company has created a computer program that replicates a person's signature, from software to one of their Autopen/signascript mechanical machines. The company states that it would take a very skilled forensic document examiner to see any obvious differences in an actual signature compared to their machine-generated signature. Basically, duplicating handwriting is easier than replicating a signature. Their products write signatures of famous people on all different types of merchandise. They claim that members of the United States Homeland Security come to them for training and observation because their replication process is so good. This company works with approximately 1000 clients per year whereas their machine can produce an accurate signature in about two hours at a median cost of \$200 per signature (p. 1).

The question would be why do we need a machine to create the signature of another whereby we would need the services of an FDE or QDE to validate its authenticity. This sounds like a prelude to fraudulent activity. This is why there exists a need for qualified and certified FDE's and QDE's to make these determinations of possible unscrupulous activities. One of the problems is that our own government has validated the use of such devices for use and apparently for training purposes.

As stated previously, there exists a place for digital and mechanical signing devices, maybe for making facsimiles of multiple items or for documents that are not purported to be genuine. When it comes to documents of national interests, importance, items of value, or anything that should have a genuine signature, a machine should not be used at all. We cannot blame the machine; we have to blame the user, the person(s) who actually authorized and or made this facsimile possible. Simplifying the issue, any document or item that is signed by facsimile and made to make the end-user believe it is genuine, whether by digital or mechanical means is a simulation and therefore a forgery, this is true if a human hand forges, manipulates or simulates the signature or writing of another person. The underlying goal in any forgery or fraud mechanism is to gain something from the situation. It should be therefore stipulated that forgery is forgery in any instance where the signature of anyone is replicated by another human or via mechanical means for the purpose of deception or otherwise.

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MY OBSERVATIONS

A simulation is not always a forgery. Forgery is a legal term. The elements of a crime are the specific conditions that must occur for an act to be classified as a specific type of crime. They are defined by each jurisdiction so that there may be some differences from state to state.

The following elements must be present to support a charge of forgery: falsely creating or passing a negotiable document with a fraudulent or fictitious signature (false making) which imposes a legal liability with the intent to prejudice, damage, or defraud. The victim or a witness must be able to identify the forger. The author of the spurious check and the person who attempts to pass it are both guilty of forgery although the person passing the check is usually charged with uttering which is an attempt to pass a forged document.

Therefore, while duplicate signatures are used on various legal documents, they are not guilty of forgery unless they contain all of the elements of forgery. Since we cannot know the disposition of the person duplicating the signature, we cannot opine that the duplicate signature is a forgery. Many such signatures are authorized and do not impose a legal liability with the intent to prejudice, damage, or defraud.

For the above reasons, we can not opine that a signature is a forgery. We can only state that it is a simulation. The intent to defraud must be demonstrated. The suspect must know that the document is fraudulent. He must intend to cheat another out of what is rightly his. The making or altering of a fictitious check is sufficient evidence to show intent.

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Case Study – Questioned Signature of Bill Michel

Literature about document examination states that the examiner should get 20 to 25 known signature specimens for comparison purposes. But every case does not require 20 to 25 known signatures. In fact, there are some cases that do not require any known signatures for comparison. The signature of Bill Michel falls into this category. The method of construction shows that the signature was created in 9 separate sections.

Exhibits were created to show the method of construction. Numbers were placed at the beginning and end of each line segment. Changing the color of each line segment clearly shows the individual segments.

