

# Document Examination

Handwriting Analysis  
And  
Typewriter Comparison

# Handwriting Analysis

- **No two people write exactly the same**
  - There can be similarities but not exactly the same
- **Individual variations are caused by mechanical, physical, and mental functions of the individual.**
  - Extremely unlikely these factors can be exactly reproduced by two individuals.



# Handwriting Comparison

- **Comparisons occur in the following categories:**
  - **Angularity, slope , speed, pressure, letter and word spacing, dimensions of letters, connections, and diacritics.**
- **Compare several known writing samples to the questioned sample**
- **Need a sufficient number of similarities between the known and questioned sample.**

Chart 1: Signature Comparison with Differences Denoted in Red

*Lina Hamilton*  
Questioned Signature



*Lina Hamilton*  
K1

*Lina Hamilton*  
K2

~~*Lina Hamilton*~~  
K3

~~*Lina Hamilton*~~  
K4

Sample Signatures

# Difficulties Can Occur When

- 1. Not enough known samples to use for a comparison**
- 2. Questioned writing contains only a few words**
- 3. Writing is deliberately disguised**
- 4. Drugs or alcohol alter writing habits**

# Tracing a signature is a sure sign of forgery!

## Chart 1: Illustration Showing that the Q1 Signature is a Reproduction of the Q2 Signature

Image 1: Q1: December 5, 1996

*Francis Mc Neil*  
Signature of Life Insurer Annuitant

Q2: October 6, 1992

*Francis Mc Neil*  
SIGNATURE OF MEMBER

Image 2: The Q1 signature has been enlarged by 107% to account for differences in size that result from facsimile transmission. The signatures have been off-set slightly to demonstrate the similarities between the original and the facsimile.

*Francis Mc Neil*  
Signature of Life Insurer Annuitant  
SIGNATURE OF MEMBER

Image 3: The Q1 signature registers perfectly with the Q2 signature. Note that even the pre-printed signature lines align.

*Francis Mc Neil*  
Signature of Life Insurer Annuitant  
SIGNATURE OF MEMBER

## **Collection of Handwriting Exemplars**

- **Known samples should be as similar as possible to the questioned document.**
  - Including the writing implement, paper and words written.
  - Time and age of the document must also be considered
- **Several known samples should be collected to show the whole range of natural variations**

# To Eliminate Deception

1. Require several pages of writing
2. Write from dictation
3. Do not show the suspect the questioned document or give direction on spelling or punctuation
4. Write the desired text at least three times
5. Combine signature with other writing

# Supreme Court Cases

## **Gilbert v. California**

- Court upheld the taking of handwriting exemplars before counsel.
- Determined handwriting lies outside of the 5th Amendment protection

## **U.S. v. Mara**

- Court ruled that taking of handwriting samples did not constitute an unreasonable search and seizure (4th Amendment)

# Typewriting Comparisons



# Identification of Typewriting

- A reference library can be used to identify a make or model of a typewriter.
  - The two most common typeface are pica (10 letters to an inch) and elite (12)
- Wear and defects in the typewriter will give it unique traits
- Compare a questioned sample to several known samples
- Examination of a ribbon may provide evidence of what has been typed

Chart 2: Comparison of Dot Matrix Printing Characteristics

Character	Q1	Q2	Q3	K1	K2	K3
g	ng	ogr	nge	age	ing	agi
j	o.je	o.je	.jec	lju	njo	jus
p	mpo	par	prc	mpl	r pr	pas
q	equ	equ	equ	equ	qui	equ
y	you	ity	you	you	kly	ity

The descender strokes of letters in the questioned documents exhibit a printer defect that is not found in sample documents from the same printer executed over the same period of time.

Pg 2



05 / 21 / 98

450%

Pg 3



05 / 21 / 98

450%

Pg 4



05 / 21 / 98

450%

Note the difference in image quality between the page 3 TTI and those from pages 2 & 4.

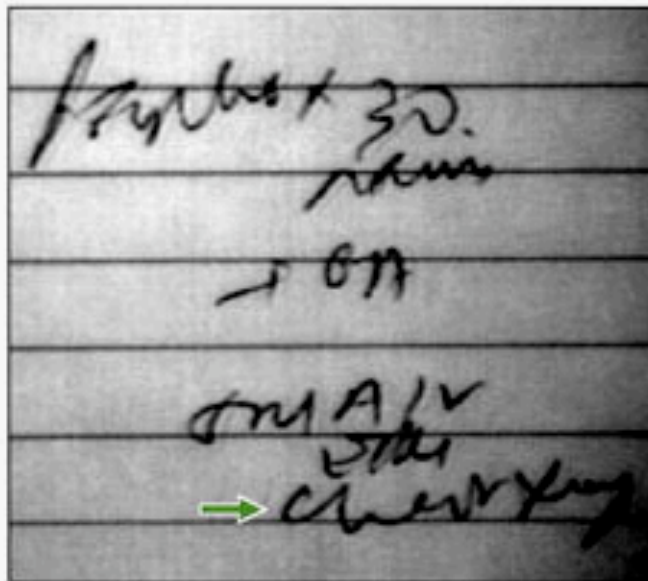
# Alterations, Erasures and Obliterations

- The most common ways to alter a document is to erase, sandpaper, or use a razor blade or knife to remove writing or typing.
- This creates a disturbance in the upper fibers of the paper and is apparent under a microscope
- The original writing may not be visible but ink might still remain on the paper

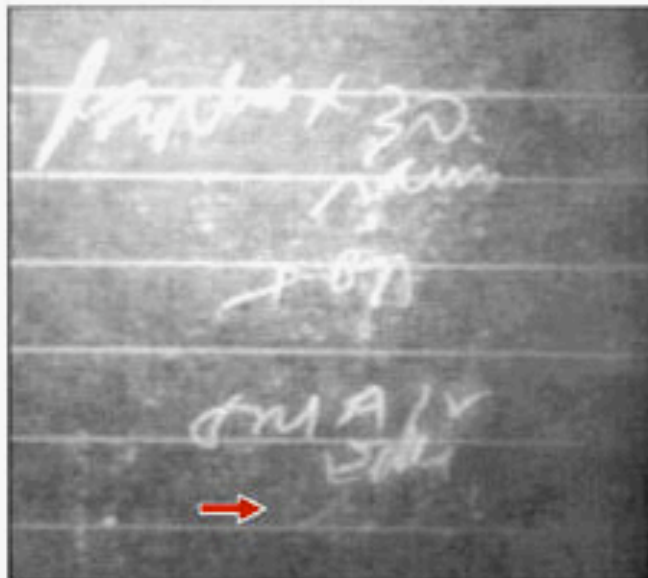
# Inks - Infrared Luminescence

- Some inks when exposed to blue-green light, will radiate infrared light
  - If an alteration is made with a different ink than the original, it can be detected
  - Used to reveal erased writing
  - Used to view what might have been written and then crossed out (if the pens are different inks)
  - Used to recover writing from a burned or charred document

### Chart 1: Portion of an Entry in a Medical Chart



As seen under normal lighting conditions.

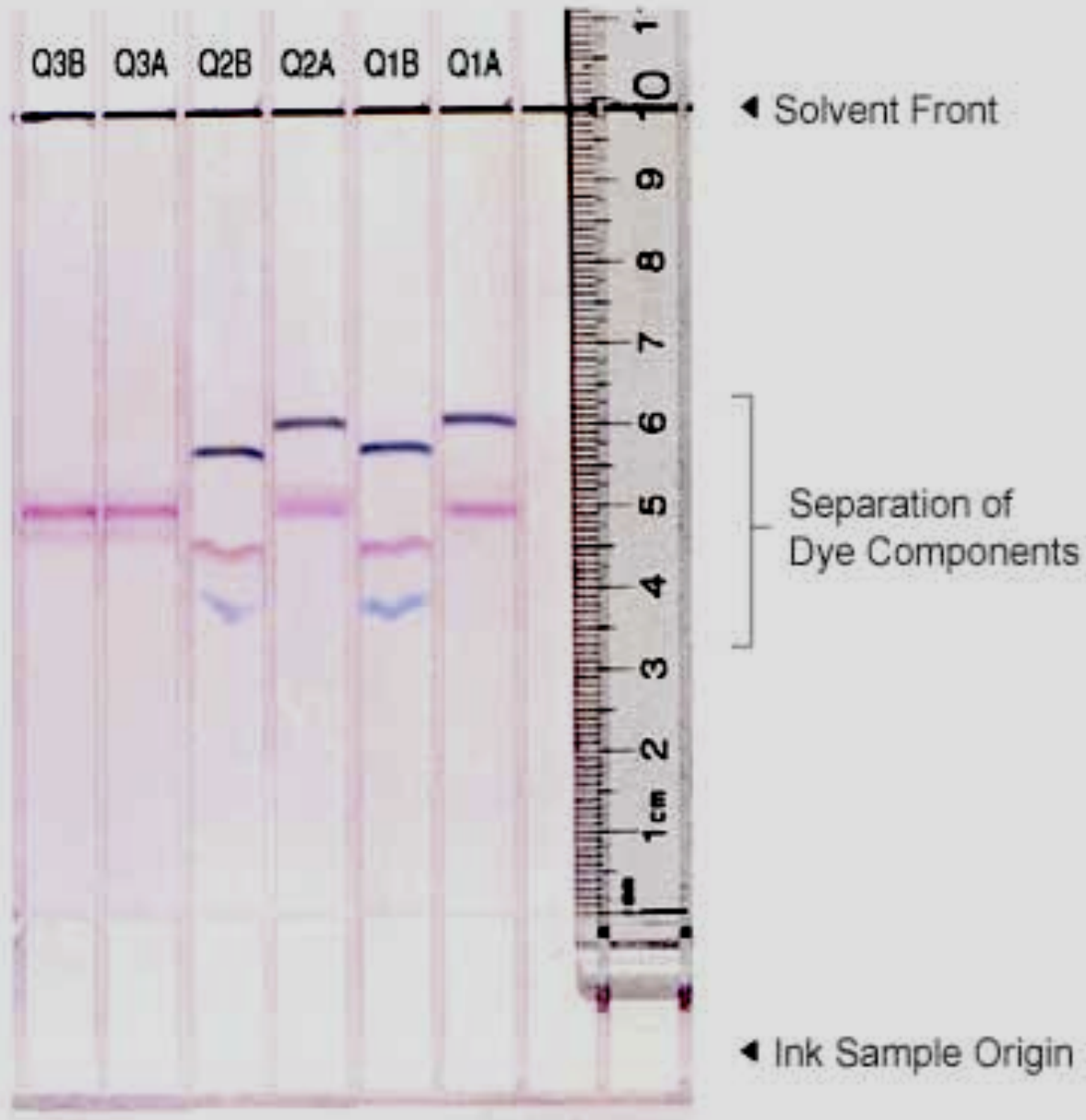


The same entry shown using the Video Spectral Comparator under Infrared Luminescence Excitation shows that the final line, "Chest Xray", was executed using a different pen.

# Inks - Thin Layered Chromatography

- Inks are made up of different compounds and the mixtures are often copyrighted so each company has its own recipe.
- When inks of the same color are put on a TLC the compounds will separate and leave a unique pattern for each ink

Chart 1: Chemical Comparison of Ink



# Impressions

- Impressions on sheets of paper under the original writing can also be used to determine what has been written or removed from a document