EQUIPMENT
Tips and Techniques

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Forensic Document Examiners

EQUIPMENT

- Most work is completed using strong lighting and magnification.
- Grids and graphs can also be useful.



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- Lighting comes from visible lights, infrared lighting and ultraviolet lighting.
- Sunlight can be used to examine documents as well.

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- Magnification consists of various size magnifiers and low-power microscopes.
- Microscopes have a small viewing area when examining documents.
- Use a stereoscopic microscope with two views enabling you to see in 3-D.

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- Computers can also be used for the examination of documents.
- Documents can be manipulated to place handwriting side by side for examination or superimposed.
- Handwriting can be cut and pasted to exhibits.

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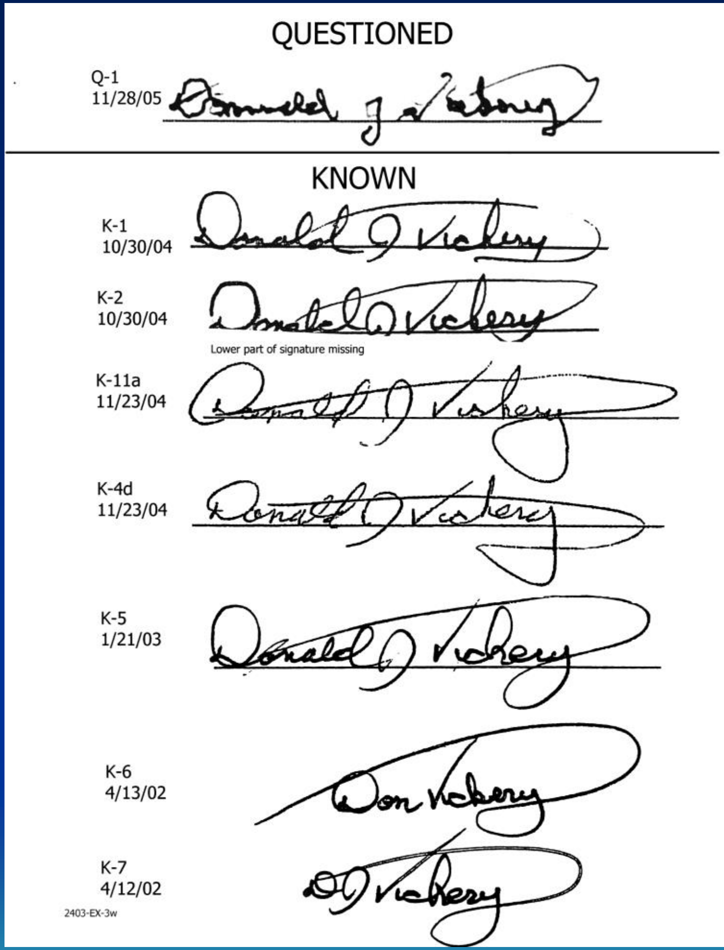
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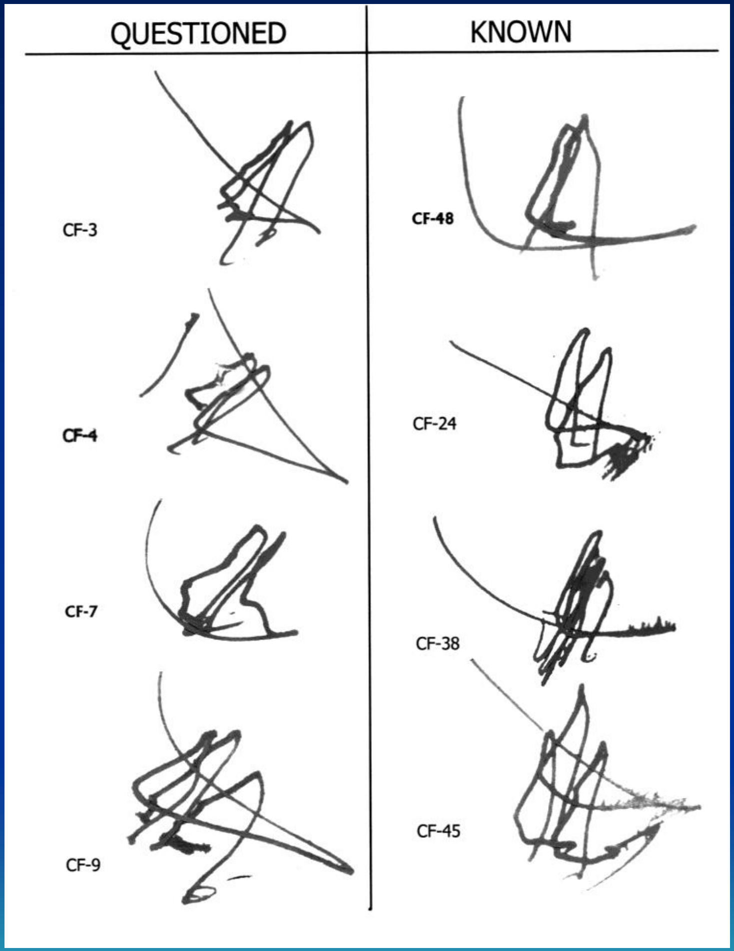

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- Another useful tool is the Celestron microscope. It enables one to view enlarged documents on your computer and to capture a frame for making exhibits.
- The Myscope is similar but more expensive.

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- Grids and graphs can be made on your computer or you can use graph paper.
- Some manufacturers have grids and graphs that are clear glass or plastic.
- The downside is that glass is breakable and plastic can stretch out of shape.

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You can make your own graphs on your computer or use graph paper.

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- Measuring devices are useful to forensic examinations.
- Standard ruler can be used.
- Grids contain measuring information.
- Calipers measure the thickness of paper.

EQUIPMENT

- Special lighting
  - Infrared
  - Ultraviolet
  - Transmitted light
  - Side lighting

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- **Infrared** radiation (**IR**), sometimes called **infrared** light, is electromagnetic radiation (EMR) with longer wavelengths than those of visible light, and is therefore generally invisible to the human eye

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- Infrared has a wavelength just greater than that of the red end of the visible light spectrum.
- Infrared radiation has a wavelength from about 800 nm to 1 mm, and is emitted particularly by heated objects.

EQUIPMENT

- **Infrared** radiation (**IR**), or **infrared** light, is a type of radiant energy that's invisible to human eyes but that we can feel as heat. All objects in the universe emit some level of **IR** radiation, but two of the most obvious sources are the sun and fire.

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- Infrared light can reflect, transmit, or absorb radiation enabling one to read under blacked-out documents if the top entry is absorbed by IR and the bottom is reflected.
- Infrared lighting can be used to read under white-out.

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- **Ultraviolet** (**UV**) designates a band of the electromagnetic with wavelength from 10 nm to 400 nm, shorter than that of visible light but longer than X-rays.

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- UV radiation is present in sunlight and contributes about 10% of the total output of the Sun. It is also produced by electric arcs and specialized lights, such as mercury-vapor lamps, tanning lamps, and black lights.

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- Long-wavelength ultraviolet can cause chemical reactions and causes many substances to glow or fluoresce. Thus, ultraviolet lights can be directed to paper to determine if the same paper has been used for an entire document.

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- Care must be taken with examining documents using ultraviolet lighting since it can damage your eyes. You need protective glasses to view ultraviolet.

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- Transmitted light is also called back-lighting. Light is reflected through the document by having the light source behind the document.
- Transmitted light enables one to photograph watermarks on a page of writing.

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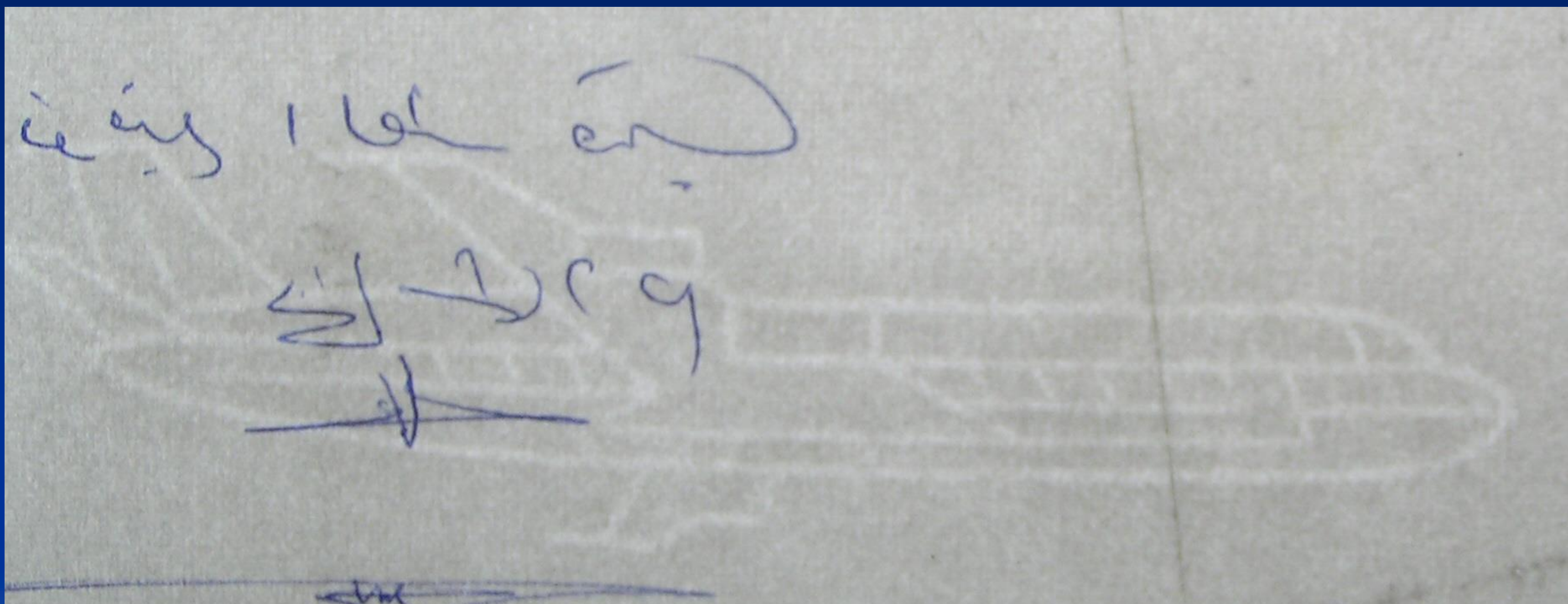

What is written under whiteout?

Video Spectral Comparator

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- The VSC consists of a computer attached to a box. Inside the box are various types of lighting that can be directed onto a document. The computer shows the results.

Light Table

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- Forensic Document Examiners also use photographs to assist in making determinations about documents.

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- Photographic enlargements reveal evidence not seen otherwise.
- These enlargements can show differences in burr striations of ball point pens.
- They also reveal pen lifts and other anomalies of a document.

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- Photographs make good exhibits for court.


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- While my husband had state-of-the-art cameras, I find I can get adequate photographs with my cell phone.
- Use a tripod to keep the cell phone camera steady.

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- Some cases involve special equipment.
- The Electrostatic Detection Apparatus (ESDA) reads indented writing.

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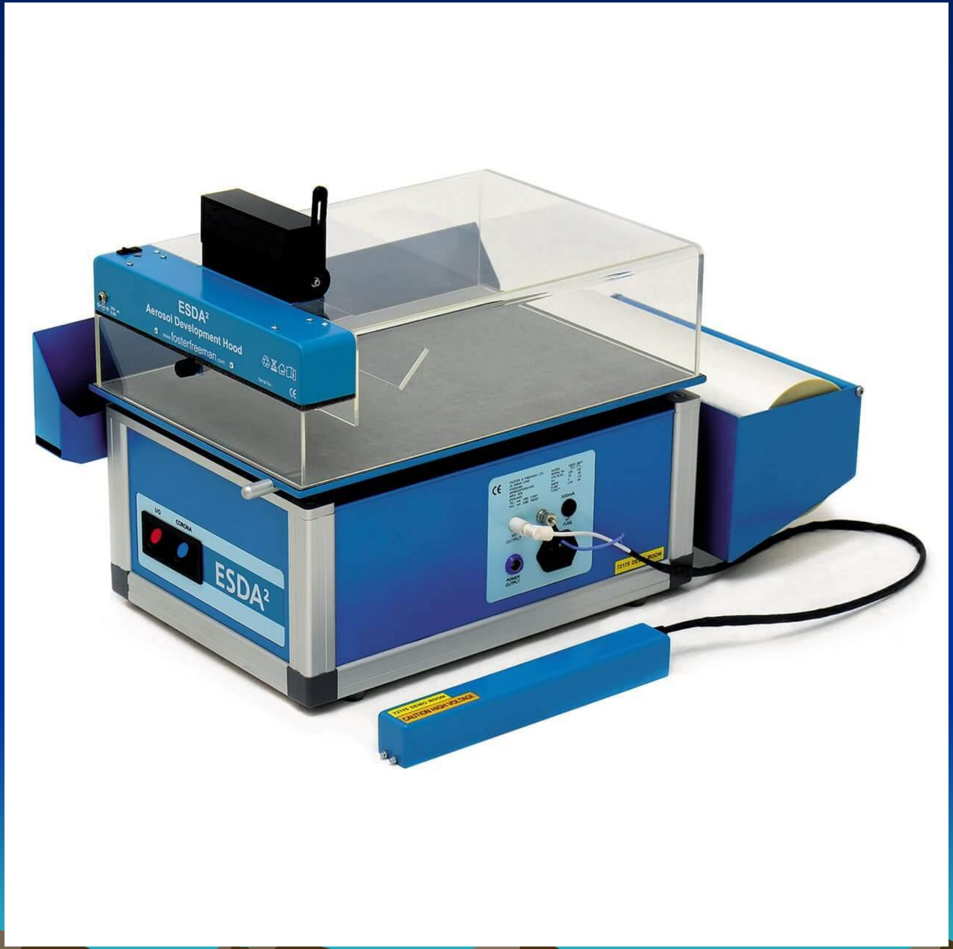

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- An ESDA consists of a vacuum base with a corona that consists of a highly-charged wire. A thin film is placed over the document.
- The corona passes over the film giving it an electrical charge.
- The area where the paper is indented has a stronger charge than the rest of the document.

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- Once the corona has passed over the film, the plate is tilted and toner powder with small beads is added.
- The toner then adheres to the areas of greatest charge and the indentations can be read.

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- The KinderPrint Company makes a machine similar to the ESDA and is less expensive.

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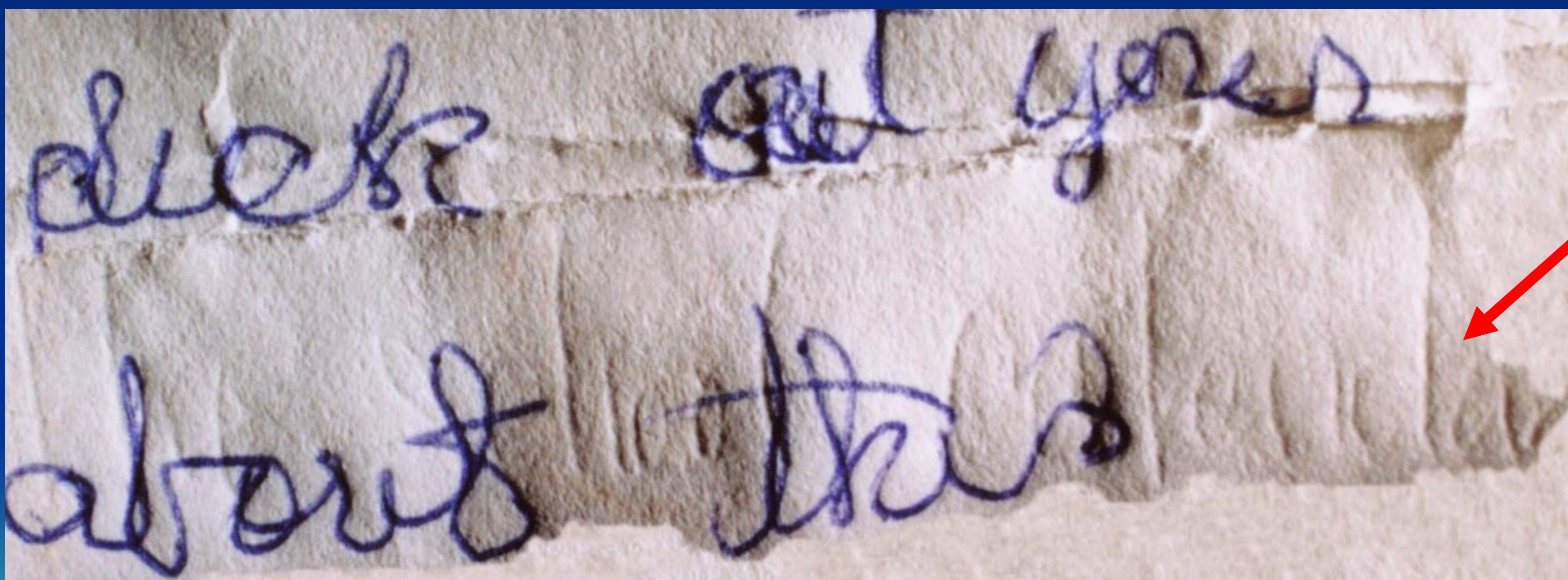
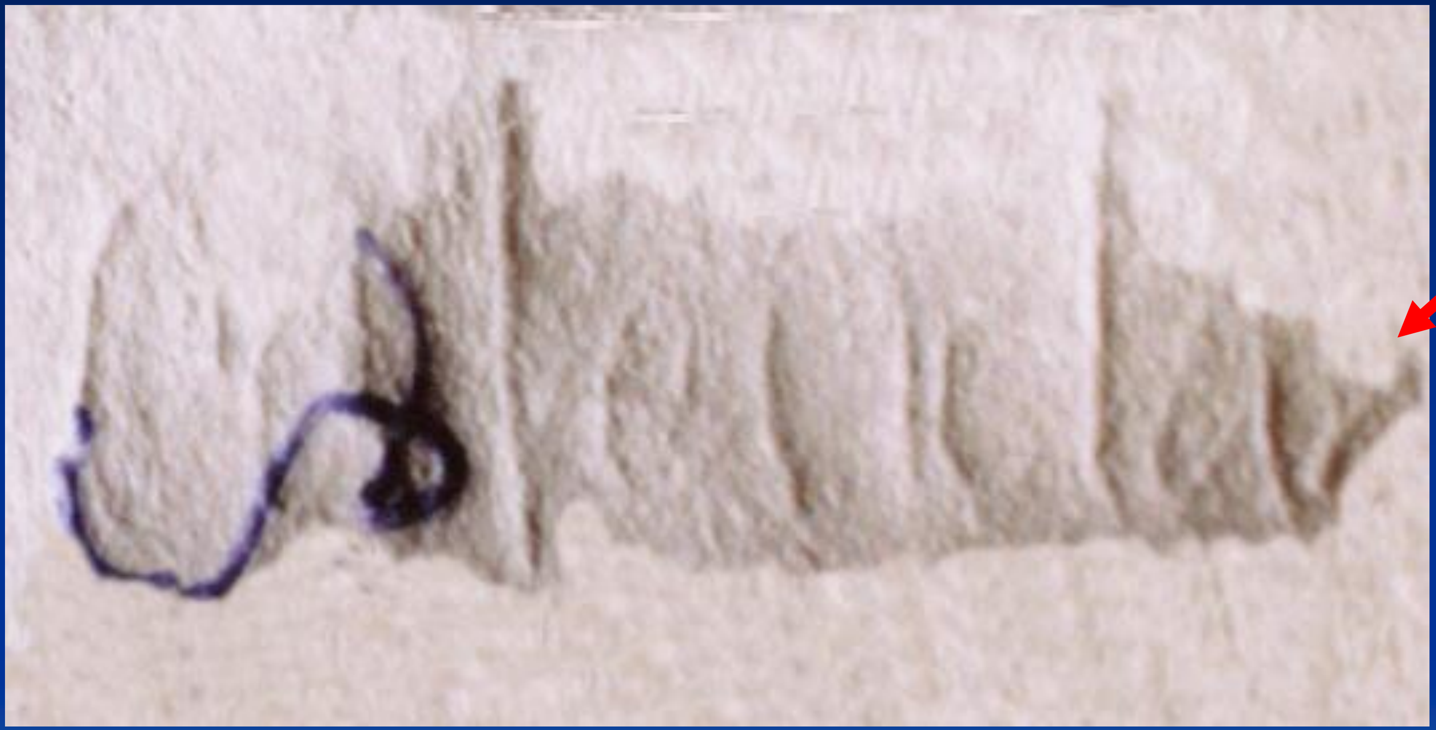
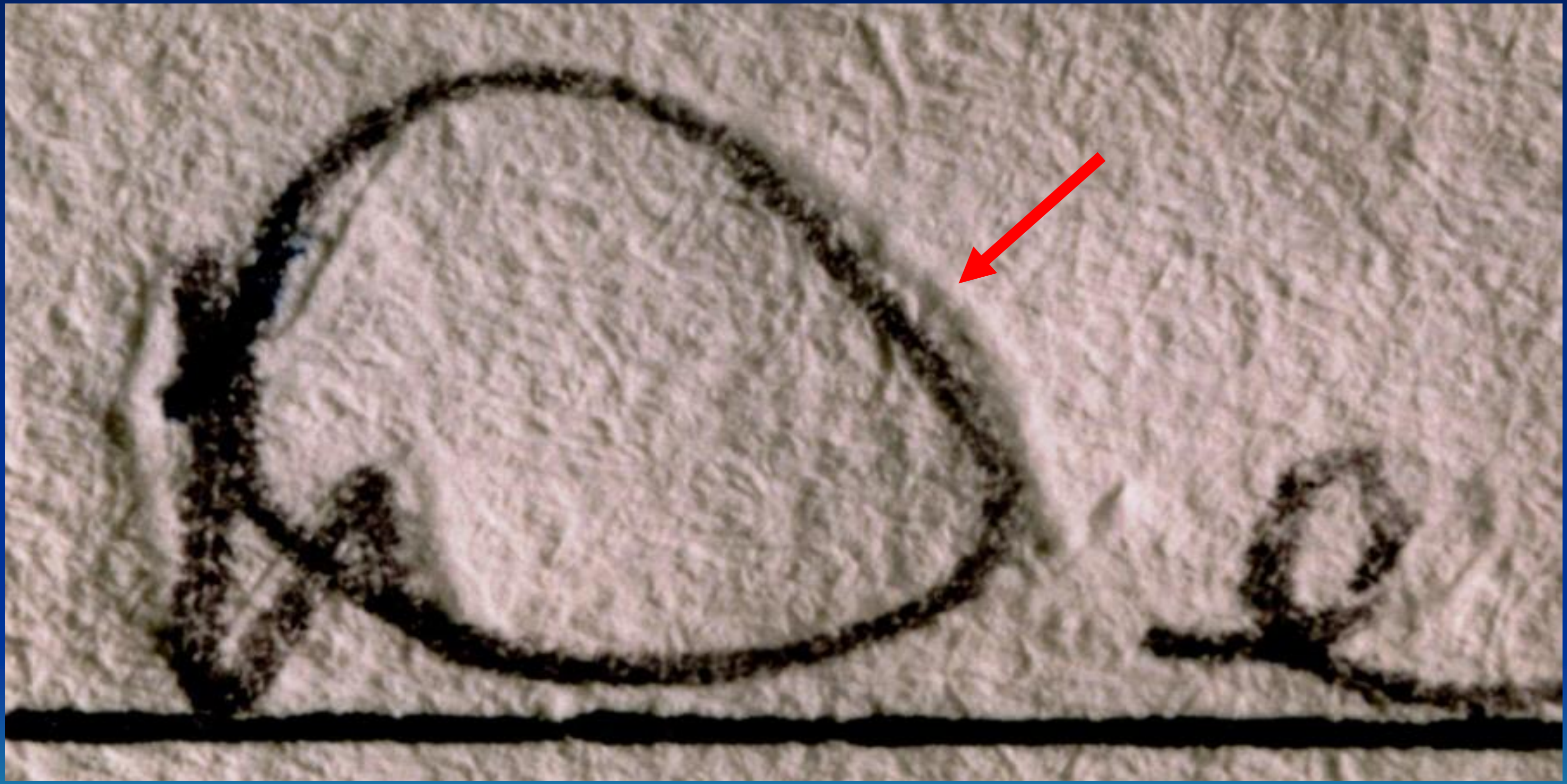
- Side lighting also enables us to read obliterated or indented writing.



Who wrote the anonymous letter?



TRACING



Useful Equipment

- Document examiners use computers to review documents and to write reports.
- Exhibits can be created on computers and printed to copiers.
- Some document examiners create exhibits using power point presentations.

Useful Equipment

- One can record documentation written under white out.
- Use an acetate paper on your copier.
- Place the document face up.
- Bring your contrast all the way up and copy.
- The acetate sheet will have the whited-out material visible.

Useful Equipment

- Thin layer chromatography (T LC) is a chromatographic technique used to
- separate the components of a mixture using a thin stationary phase supported by an inert backing.
- It is used to identify ink.

EQUIPMENT

You must have the capabilities to examine documents using strong lighting and magnification in order to operate a business as a forensic document examiner.