Chapter 16 Notes Part 2: Document Examination

Alterations, Erasures, and Obliterations

- Documents are often altered or changed after preparation, to hide their original intent or to perpetrate a forgery.
- One of the most common ways to alter a document is to try to erase parts of it.
- Erasures can be done using:
  - A rubber eraser
  - Sandpaper
  - Razor blade
  - Knife
- Erasing a document by any method disturbs the upper fibers of the paper.
- These changes are apparent when examined under a microscope.
- Although microscopy may reveal that an erasure has been made, it does not necessarily reveal the original writing that was present.
- If enough of the upper fibers of the paper have been removed, identifying the original contents is impossible.
- Writing may also be obliterated with chemicals.
- Strong oxidizing agents can be placed over ink, creating a colorless product.
- Chemical obliteration is not visible to the naked eye.
- Examination under the microscope may reveal discoloration on the treated area of the paper.
- Examination of documents under UV light may also reveal fluorescent ink markings that go unnoticed in room light.
- **Infrared luminescence** is the process by which some inks reradiate infrared light when exposed to blue-green light.
- Infrared luminescence can be used to prove that a document was altered with ink that differs from that used in the original document.
- In this process, a document is illuminated with blue-green light and pictures are taken of the document using infrared-sensitive film.
- Any differences in luminescent properties of the ink indicate that different inks were used.
- Infrared luminescence can also be used to reveal writing that has been erased.
- Intentional obliteration of writing by overwriting or crossing out is seldom used for fraudulent purposes because of its obviousness.
- Obliterations are still frequently encountered in document examination for various reasons.
- If an obliteration is done with the same ink as was used to write the original material, recovery is usually impossible.
- If the two inks differ, however, photography with infrared-sensitive film may reveal the original writing.
- Infrared photography can also be used to reveal the contents of a charred document.
- Charred documents can also be deciphered by reflecting light off the paper’s surface at different angles in order to contrast the writing against the burned background.
- Digital image processing can also be used to improve or enhance the visual quality of a document.
- **Digitizing** is the process by which the image is stored in memory.
- Once the document has been digitized, an image-editing program such as Adobe Photoshop is used to adjust the image.
A document may be enhanced through:
- Lightening
- Darkening
- Color adjustment
- Contrast adjustment

Other Document Problems

- **Indented writings** are the partially visible depressions on a sheet of paper underneath the one on which the visible writing was done.
- These depressions are due to the application of pressure on the writing instrument.
- When paper is studied under oblique or side lighting, its indented impressions are often readable.
- Indented writings can also be visualized by applying a polymer film to a questioned document and exposing the film to an electrostatic charge.
- When a toner powder is applied to the film, the indented writing appears.
- This technique has produced clearly readable images from impressions that could not be seen or were barely visible with other methods.
- A study of the chemical composition of writing ink present on documents may verify whether known and questioned documents were prepared by the same pen.
- A microspectrophotometer can be used to compare ink lines without destroying the writing sample.
- Thin layer chromatography can also be used to conduct ink comparisons.
- Most commercial inks are mixtures of several different organic dyes.
- The various dyes used in one ink can be separated using thin layer chromatography.
- Thus, two ink samples can be compared by comparing their distribution on a thin layer chromatographic plate.
- Thin layer chromatography can also be used to specifically identify the type of ink used on a document.
- The U.S. Secret Service and the IRS together maintain the U.S. International Ink Library.
- This library contains records of more than 8,500 inks, dating back to the 1920’s.

Review

1. Suppose you are examining a document in which the original words have been covered with a different ink than was used to compose the original. How would you go about recovering the original writing?
   A. Photograph the document with infrared sensitive film.
   B. Examine the document under UV light
   C. Reflect light off the paper’s surface at different angles to contrast the writing with the background.
   D. Try to wash off the second layer of ink.