

FORGERY



GENUINE ARTICLE



OUTWITTING THE NAZIS ▲

British intelligence services faked these stamps for the French Resistance in World War II, adding a deliberate mistake (see arrow). Used on letters arranging rendezvous, the stamps enabled the resistance fighters to distinguish genuine invitations from the letters of Nazi spies luring them into traps.

CASE STUDY



One of the most audacious US con-women forged identity documents and checks in order to steal a fortune in Manhattan's swankiest districts in 1992. In her boldest sting, Lilly Schmidt "bought" an impressionist painting with a cashier's check for \$70,000. Since it was a public holiday, verifying the check was impossible, but the gallery owner was reassured by Lilly's credit and ID card. The check bounced. When police finally caught up with Lilly, she was found to be carrying nine ID cards with different names (one of them is shown above). All were forged with a laser printer and an embossing machine. Lilly was jailed for a week, but released when her lawyer posted \$30,000 bail—with a check that turned out to be forged.

CASE STUDY

Document analysis

From fine calligraphy to ballpoint scrawl, the lines of our handwriting are unique and personal—and more difficult to disguise than you might think. But handwriting analysis is not essential in detecting a forged letter, form, or passport: clues in the paper, ink, and printing style can also help document examiners identify it.

Writing habits that we learn at school are hard to shake off. We get used to a particular way of holding a pen, shaping letters, and spacing words and lines. These and other persistent qualities are what makes handwriting such a useful diagnostic tool in questioned documents. This is the branch of forensics concerned with comparing and verifying ransom notes, forged contracts and wills, fake passports and ID, and numerous other kinds of written and printed material—mostly on paper. Handwriting analysis is most often used to confirm that the same person wrote two documents.

of written—or printed—documents highlights similarities of punctuation, grammar, spelling, phrasing, and vocabulary. Computer analysis of long documents, for example, can create "scores" for factors like word frequency and compound word hyphenation that help verify the provenance of questioned texts. Although writers may change these attributes over the years, we usually use them consistently over shorter periods.

Harrison's family didn't want his place of death to become a fans' shrine, so they listed a false address.

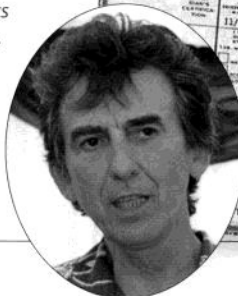
Looking at handwriting

Document examiners looking for individual characteristics in handwriting concentrate on four areas: form, line quality, arrangement, and content. The form of the writing is the shape of individual letters: their slant, relative sizes, and how each is connected to the next. "Trademarks"—the use of unusual characters, such as the plus sign or the ampersand (&) instead of "and"—are also examined.

Analyzing the content

GEORGE IS DEAD

Even genuine documents are not above suspicion. When George Harrison died in Los Angeles in 2001, relatives bent the truth on his death certificate.





PASSPORT SCRUTINY ▲

Multispectral video microscopes help border police to verify passports and ID. High magnification and UV illumination quickly show up altered information and tampering with security features.

Making the comparison

Typically, document examiners compare an unknown sample, such as a ransom note, with a "standard"—the handwriting of a suspect. A requested standard is a handwriting sample that a suspect produces under supervision. Since it can have the same text as the unknown sample, a requested standard makes an exact comparison possible—but gives the suspect the opportunity to disguise his or her handwriting. Collected standards, on the other hand, are casual examples of a suspect's writing. Although undisguised, they can only be compared with the unknown sample where words match, or letter-by-letter.

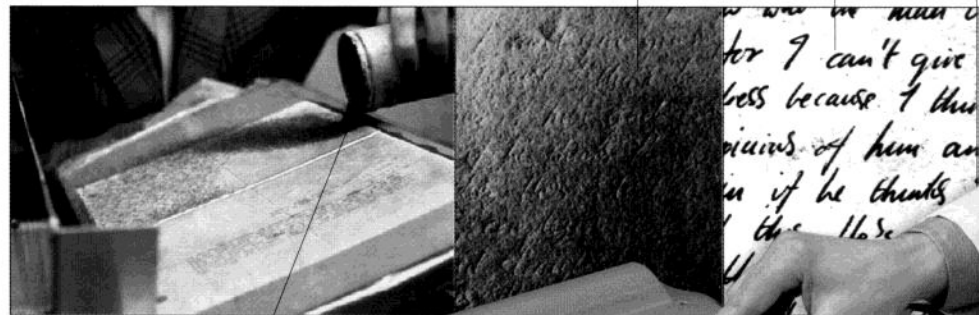
Examiners make initial comparisons of handwriting with the unaided eye or a hand lens, possibly a low-power stereo microscope. Special lighting helps reveal useful details about how a document was created or altered. Oblique light shows heavy indentation, perhaps suggesting a signature was forged by tracing, and it highlights the roughness that some erasers produce. Backlighting turns erased areas light, and darkens correction fluid. Spectroscopic examination can reveal whether inks of the same color are in fact different by giving each one a unique spectral fingerprint. Forensic examiners may use an infrared microscope to carry out this examination.

Other clues

Analysis is not confined to handwritten documents. Typed, printed, photocopied, and even faxed documents also carry marks of value to examiners. Worn typewriter letters that incriminate a blackmailer are the mainstay of hackneyed crime-novel plots but, perhaps surprisingly, modern technology has not entirely eliminated the identifying characteristics of individual business machines. A laser printer, for example, accumulates "trash" marks on its light-sensitive drum that appear as tiny black dots on every page printed. Photocopiers, which work in a similar way, also duplicate the marks, and additionally record dirt on the copier glass. Fax headers reveal details of the sending and sometimes also the receiving machines. Even if the information in the header is falsified, the font can be compared with a library of similar headers to narrow down the make and model.

Paper and ink

Testing the composition of paper, ink, glues, and fastenings can demonstrate the similarity of some questioned documents, and makes the dating of others possible. The pigment titanium dioxide, for example, which was not used in paper until the 20th century, has been discovered in a so-called medieval document.



The document is "developed" by pouring toner beads over the plastic sheet.

ESDA MACHINE

Writing on a pad of paper impresses a faint copy into the second sheet. The electrostatic detection apparatus (ESDA) makes this copy visible. A static charge, applied with a wand to a plastic cover sheet, sucks toner into the indentations.

IT'S IN THE SQUIGGLES

Document examiners look for distinctive letter formations that appear on both questioned and standard documents. They study the sequence and direction of letter strokes, and note any departures from conventional letter and word construction. The first case in which handwriting analysis played a major part was the kidnapping of wealthy aviator Charles Lindbergh's two-year-old son in 1932. The kidnapper left a note demanding a \$50,000 ransom and, 30 months later, Bruno Hauptmann was caught spending the money. Similarities between his signature and the ransom note helped convict him. The example below compares his signature with a composite constructed from letters of the ransom note.

HAUPTMANN'S SIGNATURE

COMPOSITE SIGNATURE

Embossed writing is scarcely visible in oblique light ...

... but ESDA makes it crystal clear, even when there is also printed text on the page.

