



FAMOUS CASES SOLVED BY FORENSIC DOCUMENT EXAMINATION

1. LEOPOLD & LOEB

May 21, 1924, Chicago, IL -- The victim in this case, 14 year-old Bobby Franks, son of Jacob and Flora Franks, was last seen walking home from the exclusive Harvard School. That night, kidnappers phoned the Franks home and a typewritten ransom note inside a hand printed envelope was delivered. The note asked for \$10,000. A later telephone call from the kidnappers instructed Mr. Franks to deliver the money to a specific drugstore. The kidnappers sent a cab to the Franks' residence to pick up Mr. Franks. Just prior to his departure, police telephoned Mr. Franks and told him Bobby's body had been found just south of Chicago.

A pair of horn-rimmed glasses found at the crime scene linked Frank's neighbor Nathan Leopold, age 19, to the crime. His friend Richard Loeb, age 18, was also a prime suspect. The eyeglasses were later traced by their unusual prescription to Nathan Leopold.

Forensic document examinations also provided key evidence. This evidence consisted of a ransom letter typed using an Underwood brand typewriter; and a hand printed envelope addressed to "Mr. JACOB FRANKS 5032 ELLIS AV C IT Y." An Underwood portable typewriter had been stolen from a frat house a year earlier by Leopold, and the police thought he had used it to prepare the \$10,000 ransom letter to Jacob Franks. After the crime, Loeb disposed of the typewriter by throwing it off a bridge into a lagoon in an area he later pointed out to police. The typewriter was fished out of the lagoon after eight days of dragging for it. The typewriter's typeface was compared to some school papers written by Leopold as well as the ransom letter. This demonstrated that the same typewriter was used to prepare all of the documents, and connected Leopold to the crime. Exemplars of Leopold's hand printing were also obtained and forensic document examiners identified Leopold as the writer of the hand printing on the envelope. Loeb was eliminated. Leopold thought hand printing was not identifiable.

Although only one of half a dozen items confirming Leopold's and Richard Loeb's confessions of kidnapping and murdering Robert Franks, the typewriter has been regarded as most important of the collection of material evidence.

Both suspects plead guilty and were sentenced to life in prison. Loeb died in prison in 1936 as a result of stab wounds. Leopold served 33 years of his sentence and was paroled. He died in Puerto Rico in 1971.

2. LINDBERGH BABY KIDNAPPING

Famous pilot Charles Lindbergh performed the first non-stop transatlantic flight on May 21, 1927. On March 1, 1932 his 20 month old son Charles, Jr. was kidnapped from the Lindbergh home in Hopewell, NJ. Baby Charles had been put to bed at 8PM and discovered missing at 10PM by the nurse. A handwritten demand note was found on the window sill for \$50,000. The Lindbergh family immediately began negotiations with the kidnapper, and Dr. John Condon acted as intermediary with the kidnapper. The ransom was paid in U.S. gold certificate bills. Baby Charles' body was found on May 12, 1932 not far from the Hopewell home.

Suspect Bruno Richard Hauptmann, a German immigrant with a criminal record, was arrested on September 19, 1934 after some of the ransom money that he had paid at a gas station was traced to him through his vehicle license plate, which the gas station attendant had written on one of the bills. All U. S. Gold Certificates had been ordered to be turned in by President Roosevelt in May of 1933, and Hauptmann was still spending them in Sept. 1934, when an excess of \$13,000 in gold certificates were found in Hauptmann's garage. .

There were a total of 45 items of handwriting evidence were produced in the trial, including handwriting specimens produced by Hauptmann voluntarily, nine automobile registrations with Hauptmann's handwriting, and the numerous ransom notes. Eight forensic document examiners testified at Hauptman's trial, all identifying him as the writer of the ransom notes. The forensic document examiners were: Albert S. Osborn, Eldridge W. Stein, John F. Tyrell, Herbert Walker, Harry M. Cassidy, Wilmer T. Souder, Albert D. Osborn, and Clark Sellers. A wood expert, Arthur Koehler, testified about a rung of the ladder used in the kidnap being made from the same wood as found in the ceiling of Hauptmann's residence. The trial lasted from January 3, 1935 to February 13, 1935. Hauptmann was found guilty and was electrocuted on April 13, 1936. The intense news coverage of the trail and the convincing manner in which the ransom notes were proven to have been written by Hauptmann made the world more aware of the profession of forensic document examination. In fact, during an interview in his cell, Hauptmann himself complained bitterly "Dot handwriting vaz the worstest ting against me." This kidnap case was also important in that it led to the passage of the Lindbergh Law, a Congressional Act that made kidnapping a federal crime.

3. HOWARD HUGHES AND THE MORMON WILL

(contributed by Brenda Lanners, San Diego Sheriff's Dept.)

Howard Robard Hughes, Jr., born December 24, 1905, was an aviator, movie maker, business man, ladies man, and drug addict. When he died intestate on April 5, 1976 at the age of 70, he was the richest man in America. More than a thousand people would stake claims of heirship to his fortune. As many as thirty wills were sent to the Clark County courthouse. Most were obvious jokes or flagrant forgeries. But one will, delivered in person by officials from the Mormon Church, water damaged and hand printed on yellow, lined legal paper, dated March 19, 1968, had the general appearance

of Hughes' handwriting. The three-page will was encased in a crisp, new envelope which was addressed to Spencer Kimball, the president of the church. Inside the sealed envelope was a handwritten note that read: "This was found by Joseph F. Smith's house in 1972 thought you would be interested." Contained inside the outer envelope was an older envelope. (It was later determined that the envelope had been steamed open, baked, and re-glued.) The interior envelope read, in different handwriting: "Dear Mr. McKay, please see that this Will is delivered after my death to Clark County Court House Las Vegas Nevada. Howard R. Hughes." On the back side of the inner envelope was a red Pitney-Bowes meter stamp for 6 cents postmarked MAR (for March) from Las Vegas, NV. The day of the month and the year were not visible, nor was the serial number of the Pitney Bowes machine that had made the impression. The Mormon Will, as it became known, divided Hughes' estate between ex-wives, business associates, The Boy Scouts of America, The Church of Jesus Christ of Latter-Day Saints, and his nephew Will Lummis, among others. One-sixteenth of the estate, valued at around \$156 million dollars, was designated to be given to one Melvin Du Mar [sic] of Gabbs, NV.

In 1977, the ATF released their ink analysis report on the inner envelope and the three-page will. This ink matched a Paper Mate® blue ballpoint ink formula which was first made in 1966 and discontinued in 1972. Since the ink was available in 1968, the alleged date of the will, no conclusion could be drawn regarding the authenticity. The ink on the outer envelope and the note were found to be of the same class as the ink on the will and inner envelope, however an exact match could not be made. The Pitney-Bowes stamp impression on the inner envelope was also analyzed. The ATF report indicated that the "...impression was not made with the ink Pitney Bowes uses in their meters. "

The FBI determined that a fingerprint found on the outer envelope belonged to Melvin Dummar. Dummar's fingerprint was also found in a copy of the book *The Hoax* by Clifford Irving, which contained samples of Hughes handwriting from 1970-71. In late 1968 and early 1969, Hughes had suffered a serious illness, the result of which was a permanent change to his handwriting. By 1970, Hughes had begun to print, rather than write certain letters, letter spacing became more pronounced, and letter forms became less precise due to deteriorating muscle control. The writing on the will, which was dated in 1968 prior to the illness, actually resembled Hughes' writing of 1970 and 1971, after the illness. The writing on the will simply was not contemporaneous to Hughes handwriting of 1968.

The jury trial to determine the authenticity of the Mormon Will began on November 7, 1977. The sole issue at the Las Vegas jury trial was whether Mr. Hughes had written, dated, and signed the document. If not, it was a forgery. The proponents presented four "experts" who purported that the will was genuine. These experts included two non-English speakers from France, a man from the Netherlands, and Ann Hooten, a former rug designer and graphologist from Minneapolis, MN, who once wrote a paper in which she argued that the Mormon Will was a forgery written by Melvin Dummar.

Handwriting experts Donald Doud of Milwaukee, WI, Lyndal Shaneyfelt of Alexandria, VA, and John Harris of Los Angeles, CA testified for the contestants of the will. Harris prepared over 50 photographic exhibits including enlargements of the will and envelope, flip charts, and cutouts of letters, words, i-dots and punctuation. According to Harris, there was very clear evidence that Hughes did not write the will. Harris also determined that the handwriting found in *The Hoax* and *Life Magazine*, later deemed the "Hoax Alphabet", was the model for the Mormon Will. Harris' last chart spelled out what Howard Hughes was probably screaming from his grave, "This is not my will."

Having heard the evidence and expert testimony, the jury deliberated for only 11 hours and came back with a verdict on June 8, 1978. Their verdict: Hughes did not write the 'Mormon Will'.

4. THE UNABOMBER

(contributed by Brenda Lanners, San Diego Sheriff's Dept.)

The Unabomber, so named because he originally targeted victims associated with universities and airlines, terrorized the United States from May 25, 1978 until the last known bomb on April 24, 1995. He killed three people and injured twenty-three others with a total of sixteen bombs that were sent across the country to states including: Illinois, Utah, Tennessee, California, Washington, Michigan, Connecticut, and New Jersey.

The Unabomber expressed anger and frustration at modern society because of its dependence on modern technology. In June of 1995, he wrote letters to the New York Times, The Washington Post and Penthouse Magazine insisting that his manifesto, entitled *Industrial Society and Its Future*, be published in order to prevent more bombings. In September of 1995, the manifesto was published in both The New York Times and The Washington Post. Shortly thereafter, the FBI received a tip from David Kaczynski that he believed the Unabomber was his brother, Theodore (Ted) Kaczynski. The author's manner of speech and choice of words and phrases, such as "cool-headed logician", reminded David of numerous conversations and letters in which Ted had expressed many of the same ideas and frustrations as the Unabomber.

With this new information, the UNABOMB Task Force (UTF) got a search warrant to search Ted Kaczynski's one room cabin in the woods of Montana. Seized were over 700 items, many of which pointed directly to his guilt. The list of seized items included, among other things: bomb making chemicals and parts, a live bomb ready to be mailed, rifles, 232 books, handwritten journals, carbon copies of letters mailed to university and airline executives, an incomplete autobiography, three typewriters and the original manifesto. A judge ordered Kaczynski to provide handwriting exemplars to be compared to the handwritten notebooks, logs and other documents found in the cabin. Investigators also had over 800 pages of handwritten letters from Kaczynski to his family. The letters were used both for handwriting analysis and linguistic analysis.

According to Terry D. Turchie, Special Agent of the FBI and member of the UNABOMB Task Force, "Qualified document examiners conducted comparisons of the typewriter impressions appearing on documentary evidence recovered from Device 6, 7, 9, 10, 13, 14 and 15. They have also compared the typed letters sent to Dr. David Gelernter, Dr. Phillip A. Sharp, Dr. Richard J. Roberts, Dr. Tom Tyler, the San Francisco Chronicle, Scientific American, Penthouse Magazine, Washington Post and the New York Times, Dated June 24, 1993 and April 24, 1995. They have concluded that the same typewriter was used to type all these documents." After serving the warrant at Kaczynski's cabin in which three typewriters were recovered, preliminary exams of the typewriters concluded that one typewriter was used to type letters to his family, a second was used to write letters to the local paper and telephone company, and the third, an L.C. Smith-Corona circa 1925-1930, was found to have been used to type many of the threat letters as well as the manifesto.

Ted Kaczynski pled guilty on January 22, 1998 and will spend the rest of his life in prison. Because the Unabomber case never went to trial, much of the forensic evidence found in this case may never be available to the public.

5. WEINBERGER BABY KIDNAPPING

(contributed by Brenda Lanners, San Diego Sheriff's Department
and Gerald B. Richards, retired-FBI)

When 33 day old Peter Weinberger was kidnapped from his buggy on July 4, 1956 in Long Island, New York, the kidnapper left a one-page, handwritten, ransom note. A second handwritten ransom note was found on July 10, 1956 in the blue bag at Exit 28 of the Northern State Parkway in Long Island, NY. Two notes were left by the kidnappers which were the only leads in the case. The FBI established a command post in Mineola, Long Island and brought in Forensic Document Examiners (FDEs) including Carl Lilja and Curtis Thompson from the FBI laboratory, who quickly concluded that the two ransom notes were written by the same individual. They identified individualizing characteristics in 16 letters of the alphabet. Most recognizable of these characteristics, they said, were the letter "m" which tilted so far to the side as to resemble the letter "z", and the letter "r" which was underdeveloped and resembled an un-dotted letter "i".

The experts then gave the local FBI Special Agents a crash course in handwriting identification. The agents were trained to eliminate those samples which were definitely dissimilar and to select those which warranted further examination by the experts. The agents spread out over the New York and New Jersey area and began to examine approximately 2 million handwritten public documents, including 75,000 fingerprint cards, 300,000 automobile records, voting registrations, deeds, mortgages, and other public records searching for the writing characteristics used in the kidnap notes. The search ended on August 22, 1956 when FBI agents went to the Probation and Parole Bureau of the Brooklyn Federal Courthouse and came across the probation file of Angelo John La Marca. They immediately noted the marked similarities between the handwriting in the file and the ransom note. The file was taken to the FBI's handwriting experts who quickly confirmed La Marca as the author of the ransom note.

La Marca was arrested, and when confronted with the handwriting evidence, provided a 12 page handwritten confession to investigators. Each page contained the tell-tale letter "m". La Marca admitted to writing the ransom notes, and leaving Peter in a wooded area off the Northern State Parkway, near Plainview, Long Island. La Marca was tried and convicted, appealed, and was executed on August 7, 1958.

The Weinberger kidnapping resulted in new legislation signed by President Eisenhower that reduced the FBI's waiting period in kidnapping cases from 7 days to 24 hours. Currently the "Protection of Children from Sexual Predators Act of 1998" provides that federal officials have authority to enter a kidnapping investigation before the 24-hour waiting period ends

6. MARK HOFFMAN/SALAMANDER LETTER CASE

(contributed by Brenda Lanners, San Diego Sheriff's Dept.)

Mark Hofmann, who is considered by many to be a master forger, went to great lengths to produce fraudulent documents. He used many different techniques including: handwriting and signature simulation, alterations and additions, ink washing, and artificial aging of ink and paper. He even had embossing seals and printing plates engraved to produce counterfeit seals and currency.

Hofmann's forgeries were good enough to fool many who saw them, including other document collectors and traders, historians, and officials within the LDS Church. He even fooled some document experts. It wasn't until Hofmann murdered two people and nearly killed himself in bomb incidents that the documents he had traded and sold came under intense scrutiny and many were then proven to be fakes.

William Flynn of the Arizona State Crime Lab and George Throckmorton of the Utah Attorney General's Office were the two most prominent and active document experts involved in the Mark Hoffman case. They conducted numerous tests, not only on documents bought and sold by Hofmann, but also on many others. Flynn and Throckmorton examined Hofmann documents on four different occasions between December 1985 and April 1986. They performed ultraviolet examinations, which reveal the blue haze found in documents that have been treated with hydrogen peroxide and ammonium hydroxide, tests for uni-directional running, which occurs when documents that have been "washed" are hung up to dry, and bleed-thru tests, which show a translucent characteristic found in papers that have been treated with certain chemicals.

They also examined the documents microscopically. With the aid of a microscope, such things as "alligatoring", solubility, staining, and printing flaws become apparent. Alligatoring is a distinct kind of cracking that occurs in ink that has been artificially aged. Solubility tests can be useful to determine if ink has been placed on paper at two different time periods. Rust stains on paper occur when iron-gall ink oxidizes over time. The presence or absence of these rust stains can help prove the authenticity of

documents. Printing flaws such as scratches and dots can help to identify the origin of fraudulent documents.

Seven of the documents in the Hofmann case were also examined with the Scanning Auger Electron Microscope (SAMM) by Roderick J. McNeil. The SAMM "...measures ion diffusion of inks in paper and determines the age of a document with an accuracy of 15± years for inks made with heavy metals," such as iron gall. (Throckmorton)

"During the one-and-one-half-year investigation into the Mark W. Hofmann documents, more than 6,000 documents, reportedly dated between 1792 and 1929, were examined. Of that total, 443 documents came from Hofmann. Of these, 268 (or 60 percent) were found to be authentic-mostly public court records and other historically insignificant items. Another 68 documents (or 15 percent) could not be proven either genuine or forged. However, 107 documents (or 24 percent) were found to be forged." (Throckmorton)

Most notable of the forged documents are the Anthon Transcript, the Joseph Smith III Blessing, the Salamander Letter, Deseret Currency and Oath of a Freeman I and II. It is not known how many documents in total Hofmann forged. It is thought that some might still be in existence.

7. JON BENET RAMSEY

JonBenét Ramsey, age 6, was murdered in her own home in Boulder, CO on December 25, 1996. A three page hand printed ransom note, which demanded \$118,000 in exchange for the safe return of the little girl, was found on the kitchen stairwell. During the course of what was thought to be a kidnapping investigation, JonBenét was found dead in the basement wine cellar approximately 8 hours later by her father, John Ramsey. Investigators were later criticized for failing to secure the crime scene and allowing many friends and family members to enter and leave the scene after the kidnapping was reported.

The results of the autopsy revealed that JonBenét was killed by strangulation and a skull fracture. A garrote made from a length of tweed cord and the broken handle of a paintbrush had been used to strangle her; her skull had suffered severe blunt trauma; there was no evidence of conventional rape, although sexual assault could not be ruled out. The official cause of death was asphyxiation due to strangulation associated with craniocerebral trauma.

DNA and a palm print were found at the scene, but even now, many years after the murder, neither source of evidence has lead to a suspect or a conviction. However, the DNA and palm print were used to exclude all members of the family, family friends, and family associates.

The ransom note, which is one of the longest ever seen by the FBI, served as another type of evidence in this case. The three page note was written on a note pad with a

Sharpie pen, both of which were found in the Ramsey's kitchen. The ransom note was certainly not ideal for handwriting analysis. Broad, fiber-tipped pens, such as the Sharpie pen used in this case, distort and mask the finer details of handwriting. The direction of the strokes, the construction of letters, hesitation marks and pen lifts are all qualities that can be lost with a felt-tipped pen. According to *Scientific Examination of Documents*, 2nd Edition, felt-tipped pens generally produce a wider, more solid, ribbon-like stroke.

Handwriting experts including Howard Rile, Richard Dusak, Edwin Alford and Lloyd Cunningham, among others, examined the ransom note and effectively eliminated both John Ramsey and Burke Ramsey as the writer. Few experts were able to conclusively exclude Patsy Ramsey, although every document examiner knows it is much more difficult it is to conclusively exclude a writer as the author of a document.

However, most experts asserted that it was unlikely that Patsy Ramsey wrote the ransom note. For Patsy to have written the note, she would have had to disguise her own writing habits for three entire pages of writing. "To execute a successful disguise, the writer has to focus complete attention on deviating from his or her natural writing. Writing habits are neurologically fixed, and it is very difficult to override this biological setting to maintain the disguise." (*Scientific Examination of Documents*, 2nd)

In December 2003, forensic investigators extracted enough material from a mixed blood sample found on JonBenét's underwear to establish a DNA profile.^[9] The DNA belongs to an unknown male. The DNA was submitted to the FBI's Combined DNA Index System (CODIS), a database containing more than 1.6 million DNA profiles. The sample has yet to find a match in the database, although it continues to be checked.

JonBenét's mother, Patsy Ramsey, died of cancer in 2006. Unfortunately, there are still no real answers in this case. It currently sits with the Colorado Bureau of Investigations as a cold case file.

As a side note to this case, on August 16, 2006, 41-year-old John Mark Karr, a former schoolteacher, confessed to the murder while being held on child pornography charges from Sonoma County, California. Authorities reportedly tracked him down using the internet after he sent e-mails regarding the Ramsey case to Michael Tracey, a journalism professor at the University of Colorado. Once apprehended, he confessed to being with JonBenét when she died, stating that her death was an accident. When asked if he was innocent, he responded, "No." However, Karr's DNA did not match that found on JonBenét Ramsey's body. On August 28, 2006, prosecutors announced that no charges would be filed against him for the murder of JonBenét Ramsey.

No real evidence has ever come to light that placed the then-married Alabama resident Karr near Boulder, CO during the Christmas season of 1996. Yet, self-proclaimed "handwriting expert" Curtis Baggett, reportedly said he "is 99.9 percent certain that John Mark Karr wrote the JonBenét Ramsey ransom note." According to a 2006 article in the *Rocky Mountain News*, "Georgia Federal District Court Judge Clay Land wrote that

analyst Curtis Baggett was not certified by several industry groups, had not undergone proficiency tests and had not authored texts in the field of handwriting analysis." Judge Land also said Baggett's qualifications "are clearly paltry." The same article reported, "in 2004, a federal magistrate in Maine also challenged Baggett's credentials and excluded his testimony in a civil case there." It is important to note here that neither Curtis Baggett nor his son Bart Baggett (president of Handwriting University) are considered to be colleagues of Osbornian forensic document examiners and they would not be eligible for certification by the ABFDE.

8. THE ALGER HISS CASE

Alger Hiss was a central figure in a post-World War II scandal that became emblematic of political differences within the United States during the Cold War. Hiss was a graduate of John Hopkins University (1926) and Harvard Law School (1929). He clerked for Supreme Court Justice Oliver Wendell Holmes, was in the State Department under President Franklin D. Roosevelt and was a key administrator in the founding days of the United Nations.

Hiss was accused in 1948 of having earlier been a Soviet agent, a charge made by former acquaintance Whittaker Chambers, a journalist and repentant former communist who named Hiss during testimony before Congress's House Committee on Un-American Activities (usually abbreviated HUAC). Hiss denied it and sued for libel. When all was said and done the evidence was against Hiss -- dramatic details included microfilm hidden in a pumpkin and the concept of "forgery by typewriter".

It had always been taken for granted that the typing of a particular typewriting was identifiable as a fingerprint. The accepted principal was that typing could be traced to the one machine on which it was done, and such a thing as "forgery by typewriter" was not considered possible. All that changed, however, when Hiss claimed to be the victim of "forgery by typewriter." Forgery by typewriter is committed by obtaining a typewriter of the same make and model as the one used on the questioned document. The forger then alters the keys to create the same defects and imperfections as are on the known document.

There was a great deal of work done on the Alger Hiss to show that the Woodstock typewriter bearing serial number 230,009 was not the typewriter on which the Baltimore documents, or the documents known to have been typed by Priscilla Hiss, were typed. It took Martin Tytell over two years to successfully "forge" Woodstock typewriter bearing serial number 230,009, but through his dedication to his assignment and with the hopes of serving justice in mind, he proved that it could be done. It should be noted that Tytell produced the forgery by viewing documents only and without ever seeing the typewriter itself. To accomplish the forgery, Tytell basically had to look at the letters typed on the typewriter and produce specimens with the same characteristics of typewriter habits, type-face design, deviations and flaws.

Tytell first obtained specimens from the Woodstock numbered 230.009. Specifically he asked for "...single-spaced pages of typing with whole lines of capital A's, then whole lines of small a's..." and every other symbol on the machine. Additionally he asked for each symbol to be aligned with capital letters N and H as those letters "...act as guides against which other letters can be properly aligned." Tytell then selected Woodstock bearing serial number 231,195 from his own collection of typewriters. He compared specimens from both machine with a magnifying glass and microscopically and saw that the specimens taken from 230,009 had far more inconsistencies than those from his own machine. Next, Tytell worked to create the same regular or irregular alignment pattern and the same shading that was found in 230,009. He enlisted a master engraver to match all the type-face defects and characteristics of 230,009. After some time, the engraver fell ill and Tytell was forced to take up the engraving himself. He found that "...the engraving process called for the use of three tools: diamond-tipped chisels for cutting into the hard steel type faces, a triangular India stone for rubbing down chisel marks, and a superfine dental buffing tool to finish surfaces." Once he had completed the type-face defects, he worked on mechanical adjustments. He aligned the letters and adjusted "...the typewriter so that the spacing between lines was exactly like the Hiss machine to within a thousandth of an inch." He has thirty different rollers ground to different specifications in order to duplicate the spacing found in 230,009. He also had to successfully match the "creep" (tendency to crowd letters toward the right-hand edge of the paper) found in the Hiss typewriter. To accomplish the "creep" Tytell had to adjust a combination of parts referred to as the escapement which control the spacing from one letter to the next.

By 1949, the statute of limitations on espionage had expired, but Hiss was tried for perjury that year, and after two trials, convicted in 1950. Shortly afterward, Senator Joseph McCarthy famously announced a list of communists within the State Department, launching an era of hysteria over the threat of Soviet spies in the U.S. Hiss served 44 months in prison, while his chief antagonist in the House of Representatives, Richard Nixon, became Vice President.

In 1952, in preparing a motion for a new trial, Hiss's attorney Chester Lane deposed Evelyn Ehrlich, a document expert with the Harvard University's FOGG Museum of Art. In her deposition, Erlich stated that Tytell had created "an amazingly faithful reproduction of the so-called Hiss machine...". "...Microscopic variations on one machine had been duplicated on the other so faithfully that I might not have believed it possible if I had not been informed that two machines were involved."

For many decades, the American left saw Hiss as an innocent victim of anti-communist hysteria and the political ambitions of Nixon, while the American right saw Hiss as proof that educated liberals were closet communists. Hiss maintained his innocence up to his death in 1996. Documents released in the 1990s by the U.S. and the former Soviet Union indicated otherwise, although true "smoking gun" evidence was never found. The consensus has shifted to accepting that Hiss was a spy for the Soviet Union, but there are still just enough ambiguities in the case, and a surfeit of invested political ideologues, to keep the argument alive.

9. THE HITLER DIARIES

(contributed by Brenda Lanners, San Diego Sheriff's Department)

The Hitler Diaries, sixty-three volumes in all, were written by Konrad Kujau to simulate the handwriting of Adolf Hitler. It is extremely difficult to simulate another person's handwriting for more than a few words, yet Kujau in a "...fluent and spontaneous way, lacking the typical consequences of imitated writing..." was able to prattle off volume after volume in this way. (Michel) This fluency was one quality of the diaries which helped to fool experts such as Hugh Trevor-Roper into believing that the diaries were authentic.

Kujau began forging Hitler memorabilia in the early 1970's. Many of these forgeries ended up in the Federal Archives where they were believed to be authentic Hitler documents and were eventually used as known standards with which to authenticate the Kujau-Hitler diaries.

Three handwriting experts, including most notably Ordway Hilton, examined the handwriting in the Kujau-Hitler forgeries against these "known" standards that were provided by the Federal Archives. All three experts determined that the diaries were written by the same person who wrote the standards. Unfortunately for the examiners, all of the documents were Kujau forgeries, so while technically correct, they were considered by many to have failed.

In 1983, Stern relinquished three volumes of the diaries to the Federal Bureau of Criminal Investigation (West Germany's national forensic laboratory) for forensic testing. The diaries were examined for typewriter characteristics, binding techniques, paper, and ink. The testing determined the following:

- The labels on the volumes, although covering a span of seven years, were all typed by the same typewriter and most likely at the same time.
- Pages of the books were examined with UV light and were determined to contain optical brighteners which were not in use until after 1955.
- Polyester fibers in the binding of the volumes were not available until after WWII.
- The ink was subjected to thin layer chromatography and determined to be a mixture of Pelikan Blue 4001 and Pelikan Black 4001, neither of which was in use during WWII.
- The age of the writing on the volumes dated 1941 and 1943 was determined to be less than 2 years old (in 1983) by a test which measures the migration of chloride ions.
- Glue on the books' labels was not produced until after WWII.

Faced with all this evidence, Luis-Ferdinand Werner of the Federal Bureau of Criminal Investigation held a press conference and pronounced that all sixty-three volumes of the Hitler Diaries were "obvious fakes".

10. THE ZODIAC KILLER

(contributed by Brenda Lanners, San Diego Sheriff's Department)

The stories of the "Zodiac Killer" hit the San Francisco headlines in the summer of 1969. Though he claimed to have 37 victims in a letter postmarked January 29, 1974, he has only been positively linked to attacks on David Faraday, Betty Lou Jensen, Michael Mageau, Darlene Ferrin, Bryan Hartnell, Cecilia Shepard, and Paul Stine. Only Mageau and Hartnell survived the attacks. There were another three murders (Robert Domingos, Linda Edwards, and Cheri Jo Bates), a missing person case (Donna Lass), and an abduction (Kathleen Johns and her infant) that are believed to have been committed by the Zodiac, but police have not been able to confirm his involvement.

As many as twenty letters are believed to have been written by the Zodiac in which he claims responsibility for victims, describes his motives, warns that he cannot stop killing, and taunts the police. The first three letters were received on August 1, 1969 by the Vallejo Times-Herald, the San Francisco Chronicle and the San Francisco Examiner. Each letter contained one-third of a 408-symbol cryptogram which the killer claimed would reveal his identity. On August 8, 1969, school teachers Donald and Bettye Harden were able to crack the code, but found that the cipher did not contain the writer's identity.

Numerous other letters were received and examined, including three which contained ciphers more elaborate than the first which have yet to be decoded. Most of the letters were hand printed, though at least one, believed by FDE Sherwood Morrill to have been written by Zodiac, was typed. The Zodiac Killer became silent in 1971 (at least as far as his letters were concerned) and no further letters were received until 1974. Between 1974 and 1978 at least five more letters suspected to have been written by the Zodiac Killer were received by the San Francisco Chronicle.

FDE Lloyd Cunningham, who trained with the USSS and then worked for the SFPD, and FDE Sherwood Morrill, who was Chief of Questioned Documents at the State Bureau of Criminal Investigation, were two well known handwriting examiners involved in the case. Cunningham noted the writer's low-crossed 't', a saddle between the legs on the lower case 'm', and mentioned that the letters were written fluently.

Police believed that the killer may have had ties to the military and/or to the local college, so in a search similar to that of the Weinberger baby kidnapping, Morrill examined more than 9,000 handwriting samples including college applications and military records. Morrill believed that the writer deliberately misspelled words to mislead investigators, and noted that the writer had excellent punctuation and paragraphing. The killer wrote with ballpoint pen on cheap paper that contained no watermarks, and was careful enough so that he didn't leave any fingerprints on the letters or the envelopes. Morrill pointed out the writer's three-stroke 'k' as an important characteristic.

In looking at copies of some of the Zodiac letters available today, an FDE can see not only the three-stroke "k", but also a very distinct lower case 'r' that looks more like a

lower case 'v', a lowercase 'u' that many times looks like a lower case 'n', and a very strong right slant to the lowercase letter 'd'. This is particularly true of the "Stine Letter" known to be authentically sent by the killer, due to the piece of the victim's bloody shirt that was included with it.

Unfortunately, this case remains unsolved. There have been many suspects over the past 40 years but all have been ruled out through good detective work, DNA, fingerprints, or handwriting examination.