

Elizebeth Smith Friedman, up to 1934

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2013-08-17

Abstract

An overview of some of the most significant cryptographic work of Elizebeth Smith Friedman done for the Treasury Department, up to the prohibition era. In particular, we discuss her work on the “Hindu-German Conspiracy” trial, the “I’m Alone” case, and the Conexco trial.

1 Introduction

Elizebeth Friedman was one of the best cryptanalysts in history, decrypting well over 10000 enciphered messages during the prohibition era alone. It is difficult to assess her exact strengths due to her long marriage and close relationship to William Friedman. Examining her own work, separate from her husband, can help better understand her place in history. We can also better determine to what extent William Friedman would be a cryptographer at all, if fate had not brought them together.

This note shall only concern her work up to the prohibition era and concludes with her work on the so-called Conexco Case (the Bert Morrison Trial). Much of her work in this period is omitted, but enough selections are given to give a sense of the significant contributions she made to the Coast Guard¹, the Treasury Department, and the Justice Department². Much of

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¹At the time Elizebeth Friedman worked for them, the Coast Guard was under the Treasury Department.

²Here and below, “Justice Department” refers to the United States Department of Justice.

this material is available in the unpublished works [11] (a biography written by a friend of ESF) and [2] (her incomplete memoirs), but many details were willed in using [3] (collected papers of ESF).

Elizebeth Smith born on August 26, 1892 to John Marion Smith (1848-1923) and Sopha Strock Smith (1851-1917) in Huntington, Indiana, the youngest of nine children³. Elizebeth's father was a Civil War veteran, farmer, bank director, and a local city official, proud of his Quaker heritage [16], [11]. Her mother, Sopha, was the daughter of Benjamin and Margaret Strock, born in Tuscarawas County, Ohio. As a child, Elizebeth was frail, with digestion issues in her younger years. Her parents raised their children in a traditional Quaker family, although they did not regularly attend a particular church [11]. As an adult, those who knew her described her as cautious, cool-headed, brilliant and creative. Despite her appearance in some photographs, she was a decisive (in her own words, "no one called me demure" [2], page 3) and self-confident woman.

2 Her education

Elizebeth Smith attended public schools in Huntington, and, when she was ready for college, she wanted to attend Swarthmore. She did not get her first choice⁴ and, in the fall of 1911, she entered Wooster College, Ohio as a compromise. She was the second of the Smith children to go to college⁵, and she did it on her own. She recalls in an interview [13] that "I borrowed the money from my father at six percent interest to pursue the four years of college education."

At Wooster, Elizebeth also began a literary career. One of her stories published at Wooster, which she claimed was true, involved her brother Roscoe going with two brothers of his acquaintance to see a "Madame Marchonne," a clairvoyant. The fortune teller refused to tell the fortune of one of the brothers. When the other brother demanded to know why the seer told him his brother would not be living twenty-four hours hence. The three young men left hooting the fortune teller down as a fake, but before a day and a night had passed, the younger brother had been killed by the collapse of scaffolding in the engine room where he worked. (Cue the scary music!)

³In fact, there were ten children, but, sadly, one died in infancy.

⁴Some sources say her application was rejected, some say her father disallowed it.

⁵Her older brother Raymond also went to college and became a schoolteacher.

Throughout her life, Elizebeth wanted and planned to be a writer. Although her only published book was the joint project with her husband [4], she had two other book-length projects which remained unfinished at the time of her death, her memoirs and her history of the alphabet.

She stayed at Wooster for only two years, 1911 to 1913. Different sources cite various reasons for this change - family illness, distance from the college to her home, a relationship gone sour, and so on. In any case, she transferred from Wooster to Hillsdale College in Michigan, for her junior and senior years. In June of 1915 she graduated with an A.B. degree in English Literature, having studied Latin, Greek, German, and English primarily, thus exhibiting early her interest in languages.

3 Riverbank

It was September of 1915, that William Friedman started working at Riverbank Laboratories, in Geneva, Illinois, as a geneticist. A number of articles have appeared discussing the diverse scientific activities of Riverbank Labs, and we refer the interested reader to, for example, Kruh [10].

In June of 1916, after one year as a high school principal in a small town near Wabash Indiana, Elizebeth went to Chicago to look for work. She went to Chicago to an employment agency and also to visit the Newberry Library which had an original 1623 folio of a Shakespeare play. The librarian made a phone call to George Fabyan, an eccentric but very wealthy businessman, who was looking to hire someone to look into biliteral ciphers of Bacon in the works of Shakespeare. That day, Fabyan traveled from Geneva to Chicago to meet Elizebeth at the Newberry Library. Together they returned by chauffeured car⁶ and train back to Riverbank. Elizebeth Friedman and George Fabyan are pictured at Riverbank in Figure 1. In her unfinished memoirs ([2], page 3), she recalled her first day at Riverbank.

On one side of the highway, there was a high stone wall with impressive gates. He told me that that side of the property was cut in two by the Fox River and that his own residence, swimming pool, stables, and so forth, were in that part of the estate. Our car, however, turned into the part of the estate which was on

⁶As her memoirs [2] point out, Fabyan had a chauffeured car in the city, and another chauffeured car for the country!



Figure 1: Elizebeth Smith and George Fabyan Riverbank (source: Marshall Foundation)

the opposite side of the highway. The limousine stopped in the porte cochere of a handsome, medium-sized house known as ‘The Lodge’ where I was to meet Mrs. Gallup. There she and her sister, Miss Kate Wells, resided and there they had all of their books and papers to prove their claim that Francis Bacon was the author of the Shakespeare plays and sonnets. This lodge was staffed, of course, with servants and it was there that I was to spend the night in a guest room. When we arrived at the dinner table, after I had been very briefly introduced to Mrs. Gallup’s work, I met two young men, obviously scientific or professional, who were pursuing occupations of some sort or another on the estate and who were not living in the Lodge, but who took their meals there.

One of those men she met that night was her future husband, William Friedman. That first night, Elizebeth was on the porch to The Lodge, at the entrance,. She saw William walking up the steps. “I’ll never forget his appearance . . . beautifully dressed,” she’d later recall. Elizebeth described William dressed as he would have if he was going to a very well-to-do home in a city house. That was the semi-formal atmosphere in which everything was



Figure 2: Elizebeth Smith at Riverbank (source: National Cryptologic Museum Library).

run there. Being the few really young people on the place, they got bicycles and would ride around the countryside, and they became friends very shortly. A picture of her, probably taken by William Friedman, is Figure 2.

At Riverbank, she, and the other “brain workers,” lived the life of the minor “idle rich,” as she would say. Fabyan them paid almost nothing as far as wages go, however, they had servants do their cooking and always had pitchers of ice water and fresh fruit by their bedside at night.

At first, Elizebeth was impressed with George Fabyan’s ability to sound like an expert in many fields. While Fabyan was not a studious person, he kept his “brain workers” about him all the time - they talked and he listened. He had an excellent memory - whatever anyone said to him, technical or not, he could repeat. As she would say, he could sound extremely convincing. Nevertheless, of the professors he tried to win over, some were polite, some uncommmenting, and some downright challenging if not hostile. This latter was particularly true of Prof. John M. Manly, Head of the Department of English of the University of Chicago.

In 1916, Elizebeth’s life changed - she started work as a cryptographer at Riverbank and she met William - but the world changed with her. At that time, women did not yet have the right to vote in many states, for example

in Ohio, where Elizebeth first went to college. However, the passage of the 19th amendment was only a few years away. It would be several years before congress enacted the Volstead Act, initiating the prohibition era, but World War I was being fought in Europe. However, it wasn't until the following year, in April of 1917, that the U.S. became directly involved.

4 Marriage

Late in 1916, the health of Elizebeth's mother, who had cancer, took a turn for the worst. Elizebeth left Riverbank around Christmas to care for her in the last days of her life. Sopha Smith died on February 14, 1917.

With WWI battles in Europe, Fabyan decided to form a cryptography unit at Riverbank. In March of 1917, Fabyan wrote to the Intelligence Office in Washington, offering the services of his Riverbank staff to help decode secret messages. Captain Joseph Mauborgne, Prof. John Manly, and Colonel Parker Hitt visited Riverbank within the month and, satisfied with their level of expertise, the Army began at once to forward the coded and ciphered messages it intercepted to Riverbank. William dropped genetics and Elizebeth stopped her efforts with the Gallups, and together they set to work on cryptography for the military and the Justice Department. The U.S. declared war on Germany on April 6, 1917.

A month later, on May 21, 1917, William and Elizebeth were married by a Rabbi in Chicago. Elizebeth's diary entry of August 13, 1917, indicates the love they had for each other:

Tonight my Lover-Husband and I made a tryst with the future. The goal is set; will we win? We planned it all – cheek to cheek facing the swelling power of the new moon– ‘Wonder Girl,’ he said, ‘It shall be all for you–only for You!’ As I held him close and caught my breath in the intensity of hope, he said, ‘Dear Heart! You are not crying?’ And I replied, – ‘No, Dear, only praying.’ And this was my prayer: ‘Oh, Spirit Without and Within, keep me sweet! Keep me working on and on– keep me well–keep the Fire Burning!’ To Him always I have been ‘Divine Fire’– may it always be so. — One day as we worked together, and he discussed something with Dr. Powell- -while looking at me– a bit of a note came fluttering to me a moment later–: ‘Dearest! I have been studying your face. You are perfectly beautiful!’

This was the private nickname William Friedman often used for Elizebeth: his “divine fire.” For cryptographers, it was an exciting time to be alive. This ‘fire’ between them never died.

Fabyan opened all the mail that came to Riverbank, trashing the letters to the Friedmans which were not in his best interest. The Friedmans did not know that Mauborgne in Washington had been urging Fabyan to let them have the Friedmans, and had offered them commissions and real salaries. In September of 1917 Elizebeth had written the Navy Department to see if they had need of her, saying she wished to enter Military Intelligence. William Friedman wanted to join the Army with a commission, and go to France as a code-breaker. It thus seems clear that as early as September, he and Elizebeth had desired to put Riverbank behind them. It must have seemed strange to Mauborgne that his letters to them received no reply, and strange to the Friedmans that their letters went unanswered.

In addition, Friedman began, with Elizebeth’s help, a series of cryptography monographs, known collectively as the Riverbank Publications. He continued to do so until he, as an Army Lieutenant, left for France in May⁷ 1918 to fight in WWI.

5 The Hindu-German Conspiracy Trials

In early November 1917, George Fabyan, accompanied by a gentleman from Scotland Yard⁸, asked Elizebeth for help in solving some mysterious communications.

With Britain and Germany at war, Germany was secretly backing a conspiracy by Indians in this country who were attempting to buy arms and ammunition for a revolt against the Raj ruling their mother country [17]. This would, the Germans hoped, divert Britain’s attention and energy from the War in Europe and thus give Germany an advantage. The conspirators were, for their part, taking advantage of a weakened Great Britain to make a strike for freedom. The German and Indian agents, between one and two hundred of them, had been working out of an office in Berkeley, California, and Scotland Yard knew some of their names⁹.

⁷Some references give this month as July.

⁸Hatch [5] mentions the possibility that he was actually an agent from British intelligence, posing as a detective.

⁹For example, one was Franz Bopp, the German Consul General for San Francisco,

The representative from Scotland Yard brought with him a stack of encrypted correspondence which the British postal censors had intercepted. He could tell them nothing except the names of a few of the suspects¹⁰.

The stack of papers, which he explained consisted of letters that had passed between various agents, consisted of series of figures in groups of three, such as 7-11-3, 8-5-6, 3-9-15, and so on. Parts of some of the messages were in (plaintext) English (see chapter 12 of Kahn [9]). Elizebeth assumed the major role in deciphering these messages ([11], page 11). Eventually, the Friedman's decided these triple figures must refer respectively to page, line, and position in the line of a certain "code book." That is, 1-2-3 meant page 1, line 2, 3rd letter or word in the line of this unknown book. Elizebeth would say that, as a matter of terminology, these were not ciphers, but "codes." The "key" was knowing what book the references were from, and there was an extremely remote possibility of deciphering any of these messages without having this code book.

There were two "Hindu-German" trials which the Friedman's were involved with - one in Chicago and one, a few months later, in San Francisco. Both Friedmans testified at the Chicago trial whereas only William testified at the San Francisco trial ([11], pages 16-18), where they explained their cryptanalysis:

After considerable study we finally found a place where we thought it possible to fit the name of one of the Hindu agents [Chakravarty]. From this, fragment by fragment, the plain text of the messages was constructed and not only the plain text of the messages, but we could state with reasonable certainty that on page so and so of the unknown book used, line so and so of that page, appeared the word "Germany"; on another page and line, "government"; and elsewhere, "constitution" and the like. From such evidence as that we made the deduction that the subject matter of this unknown book was political economy or history dealing with Germany or the German people.

who was arrested on April 8, 1917 [6]. Another was Baron Kurt von Reisswitz, the former German Consul in Chicago [7].

¹⁰For example, Heramba Lal Gupta (which some references record as Heramba Lai Gupta or Herambalal Gupta) is one Indian nationalist in a plot to initiate a rebellion against the British Raj during World War I. Another was Chandra Kanta Chakraverty, and others were Ghadar party members Ram Chandra and Ram Singh. Four Germans were also arrested.

As the time of the first trial drew closer, someone at the Chicago Department of Justice mentioned that it might be of vital importance to the prosecution to have on hand a copy of the code book. Otherwise, how might the Friedmans prove in court that their decipherments were anything other than wishful thinking?

The Friedmans thought the code book was most likely a book on political economy or German history. Moreover, because they had some plaintext, there were certain words they expected to appear on certain pages, and in certain lines. The key was knowing which book was used. In desperation, they wrote letters to book dealers all over the country and in England seeking such a code book, to no avail.

The “Hindu-German Conspiracy Trial,” the largest and most expensive trial in the United States up to that point, commenced in the District Court in San Francisco on November 12, 1917 [6]. The defendants include Germans, Americans, and Indians. The trial got underway and, according to her unpublished memoirs [2],

...on the second day of Mr. Friedman’s wait to be called to the witness stand, as he was walking down Clark Street and past McClurg’s, Chicago’s largest book shop, on a moment’s inspiration he walked in and went to the section on political economy and rummaged among the books there. Imagine his astonishment at picking up the very book which the previous nation-wide search had failed to produce! An hour’s labor devoted to checking up the solution we had reached without the book disclosed that we had done it correctly to the extent of over 95% !

The book used by the conspirators in the Chicago trial turned out to be Price Collier’s *Germany and the Germans*¹¹. The accused in the San Francisco “Hindu-German” trial used a different codebook. Again, the Friedman’s, and Fabyan, searched high and low for the codebook to no avail. By luck, a clerk in the Berkeley college-coop took great interest in the problem and, with William Friedman, went through piles and piles of books. Lady luck was with them. This time, the codebook was an English-German dictionary¹².

One of the last, and most remarkable, events of the San Francisco trial occurred when Ram Chandra was shot to death in the courtroom by fellow defendant, Ram Singh. The New York Times described the incident [6]:

¹¹See page 372 of Kahn [9] and page 21 of ESF’s memoirs [2].

¹²See page 19 of Kyle’s monograph [11] .

Ram Chandra arose and started across the room. Ram Singh also arose. He raised his revolver and began firing. Ram Chandra staggered forward and fell dead before the witness chair, with a bullet in his heart and two others in his body. While Singh still pressed the trigger of his automatic pistol, he, too, was shot and killed by United States Marshal James H. Holohan, who fired across the room over the heads of attorneys.

Some say Singh suspected Chandra of stealing Ghadar party funds. Others say that he suspected Chandra of cooperating with the prosecution. The exact reason is unknown. The remaining defendants were, in due course, found guilty of violating the neutrality of the United States. Some further details can be found in Kahn [9], page 372.

6 Move to DC

Several years passed as William Friedman served in the Army and Elizebeth worked either at Riverbank or stayed at home to care for her elderly father. A picture of them during this period is in Figure 3. William would sometimes write Elizebeth a love poem in cipher. During this period, Elizebeth wrote William a poem ([11], page 97). It is included to indicate the difficulty of separating their lives, personally or professionally, but also to give a feeling for Elizebeth's personality.

Life Itself, At Twenty-Six

There was a time when for my love
I did not care.
The hot wooing, the passionate kisses Left me cold.
I yielded to him
Because he was good to me.
And compassion led me to return his kisses
When his longing eyes and eager heart spoke,
'I wish you cared as I.'
And then after a time
He became my all in all.
I worshiped his very step upon the courtyard
Coming to me.



Figure 3: William, in his Army uniform, and Elizebeth Friedman (source: National Cryptologic Museum Library).

I lived for that.
My heart sang, carolling bursts of ecstasy.
My days were filled with fruition,
For they were lived for him
With his vivifying presence in my soul.
And then my love
Came no more to see me.
No more the longing cry 'I wish you cared as I.'
No more the joyous cry, 'We love.'
Oh, Heart, is it always so?

Once the war ended and William finished his military duties, the Friedmans reunited in Pittsburgh and, eventually, made their way back to Riverbank. George Fabyan was anxiously waiting for them, but they had become very skeptical of Mrs. Gallup's work and had several conditions that Fabyan had to agree: They refused to work on the Shakespeare biliteral cipher theory and they refused to live on the grounds of Riverbank. Fabyan agreed. During this time William Friedman wrote his well-known monograph *The*

index of coincidence and its applications in cryptanalysis. During this period, the military sent less traffic to Riverbank for decrypting than before, in accordance with their plan to start a crypto unit in Washington DC. Offers for cryptologic work in DC came in for both Elizebeth and William (which they received this time!). They left Riverbank in December of 1920, never to return. In January of 1921, they reported to work for the Army Signal Corps. Elizebeth very much enjoyed her new life in Washington. In particular, they loved cultural events such as the theater, attending a performance of one kind or another at least three times a week.

For about six months in 1923, Elizebeth worked for the US Navy as chief of the code building section. That year, the Friedmans moved to “Green Mansion,” a home on a five acre lot “in the country” (in what is now called the Alta Vista suburb of Bethesda, Maryland), where they stayed until 1925. However, once her pregnancy became too advanced for work, she quit her Navy job. Their first child, Barbara, was born on October 14, 1923. Tragically, after the birth of Barbara, Elizebeth’s father passed away on November 16, 1923. Before Barbara’s birth, a woman named Cassie (an African-American woman¹³ in her 30s) was hired as cook, family care-giver, and housekeeper. She was always very devoted to the children and was much loved by the Friedmans but, sadly, died in 1932 of cancer when she was only 39. Elizebeth’s faith in Cassie enabled her to travel extensively to testify at trials and do other cryptographic consultations on behalf of the government.

Although fond of Green Mansions, the two hour commute to Constitution Avenue in downtown Washington. was too much, so they had a house built in DC, one quarter mile South of Chevy Chase Circle, west of Connecticut Avenue. They moved into their new home in late 1925.

7 The Coast Guard and the Treasury Department

By 1925, the smuggling of liquor was beginning to be a big time business. The 18th Amendment to the Constitution, making the Volstead Act the Law of the land, had been in effect since 1920. To give a sense of the extent of the profits, in 1931 a tax adjustment (the estimated taxes owed to the U.S.

¹³Barbara, as a young girl, remembers Cassie singing Baptist hymns all day long.



Figure 4: Elizebeth Smith Friedman in 1928 reading to her children Barbara (5) and John (2) (source: George C. Marshall Foundation).

government) against Conexco¹⁴ was over \$119 million in 1931 U.S. dollars. It is left to the reader to imagine the gross profits made by Conexco, in today's dollars. Of course, the taxes were never paid.

Captain Charles Root¹⁵ had been working with Harry Anslinger¹⁶, who was a vice-consul from Nassau in the Bahamas. The water routes between the Florida coast and the Bahamas, and between Florida and Cuba, had become highways of liquor smuggling.

Shortly after the Friedmans moved into the Chevy Chase house, Elizebeth was called by Captain Root, Intelligence Officer for the United States Coast

¹⁴Consolidated Exporters Corporation of Vancouver, or Conexco, was the largest of the corporations illegally importing alcohol into the U.S. during the prohibition. Its directors, George and Henry Reifel, were never convicted - they posted a \$250000 bond after being arrested in Seattle in 1934 and fled ([11], p. 220). However, their "land agent," the Conexco representative in the Gulf Coast, Albert ("Bert") Morrison, was arrested and convicted, as we discuss later in a later section of this paper.

¹⁵A short biography of Charles Root can be found on the USCG website, <http://www.uscg.mil/history/people/RootCharles.pdf>.

¹⁶Later, Anslinger was made the first Commissioner of the Federal Bureau of Narcotics, http://en.wikipedia.org/wiki/Harry_J._Anslinger.

Guard. He was interested in creating a Coast Guard counter-intelligence team to support its work as one of the law enforcement agencies of the Treasury Department. Elizebeth was appointed a “special agent” of the Bureau of Foreign Control in the Department of Justice, on loan to Captain Root. Basically, she was the team. As a special agent, she did not have to conform to the requirements of office hours, but she was expected to go wherever he or she can best pursue the investigation. For this reason, Elizebeth was able to do the work at home and care for her son John, born on July 28, 1926. She would go to Captain Root’s office, pick up ciphered messages and related information, take them home and, cryptanalyze the messages, and returned the materials to Captain Root.

Besides using ciphered messages, the smugglers used other tricks. Sometimes (a) decoy boats were sent out to cruise around empty at the same time as the laden ships, (b) if a patrol vessel approached, an empty speedboat would pick up speed and run, hoping that the Coast Guard would take up the chase while the real smuggling vessel made a clean getaway, (c) cases of liquor were netted together with huge blocks of salt and glass balls and sunk at an agreed-upon pickup point¹⁷.

8 Communication methods

Up to 1928, Conexco used a general crypto-system for all the ships¹⁸. However, starting around 1930, each ship in Conexco’s fleet used a different cipher system. They had a Pacific fleet of about 40 ships (mostly motor boats, but some steamships and other types of sea vessels), about half of them active and in working condition. By combining Coast Guard surveillance with her own decryptions, the intelligence office was able to chart where each ship was at a given time. These charts and activity logs, collected over a period of time, were very useful in court testimony.

Between May 1928 and January 1930, there were 3300 enciphered messages transmitted between five shore transmitting stations and about 25 vessels. The encryption sometimes involved multiple-step methods, first enciphering using one commercial codebook, then using another. Here is an example of a message Elizebeth received, as well as her cryptanalysis. From

¹⁷Of course, the pickup boats knew just how long it would take the salt to melt and the cargo to rise to the top, and so the boats could avoid an obvious rendezvous.

¹⁸A reference for this section is the material in B4, F17 and F23, in [3].

the arrangement, she guessed they used a codebook. At that time there were hundreds of public codes might have been used, and she needed to discover which one(s) had been used. Eventually, analysis revealed code groups of the Acme Code¹⁹. No intelligent meaning could be reached from the Acme Code, indicating that further steps were necessary. It turned out, a second codebook was also used. Here is an actual message, with a brief description of the steps taken.

Message as sent:	MJFAK	ZYWKB	QATYT	JSL	QATS		QXYGX	OGTB
Cipher alphabet applied resulting								
in Acme lets	BARRY	OIJYS	where	and	when		WINUM	fuel
Acme code nos.	08033	53725					25536	
subtract 1000	07033	52725					24536	
ABC Code, 6th.	anchored							
		in harbor					are you sending	

Final message: Anchored in harbor. Where and when are you sending fuel?

Other messages she deciphered were more humorous. From one ship, she deciphered this message: “Andrew advises wife to send reserve glass eye,” and then some time later, this: “Andrew requests a pair of shoes, size 15.”

The astonishing number of messages Elizebeth Friedman deciphered is, of course, the result of hard work and persistence²⁰ However, to give a feeling for the scope of effort involved, we recall an item from one of her intelligence reports. In an off-hand comment she mentions that just before William Friedman left for an extended trip to Europe in the early 1930s, which she was planning on taking as well [1], a change was made in the codebook of the Conexco supply ship *Malahat*. It took about two months to break the new code, after which Elizebeth could leave the remaining straightforward decryptions to her assistants and leave for Europe to join her husband.

Elizebeth Friedman appeared as an expert witness on behalf of the Customs Investigative Service for cases against of smugglers throughout the United States. In addition to her consultation and aide on rum-running cases

¹⁹The *Acme Commodity and Phrase Code* was a book published in 1923 by the Acme Code Company. It contained standard condensed terms designed to shorten telegrams and save money.

²⁰Up to some time in 1931, Elizebeth Friedman was only assisted by one clerk untrained for crypto work. (See [4], B5, F6.) However, after 1931, she was, at times, helped by six trained assistants. With the exception of their book [3], Elizebeth Friedman and her husband generally kept their work separate from their home and family life. William did invent cryptographic games and puzzles for his children but, for the most part, he and Elizebeth did not help each other solve problems from work at home.

in California, she appeared in cases held in Galveston and Houston, Texas, and in New Orleans, Louisiana. One of the most important cases, from the perspective of international relations, is discussed in the next section.

9 The *I'm Alone* case

This case is clearly described in the articles by David Mowry [12], Joseph Ricci [14] and Nancy Skoglund [15].

During the 1920s, a schooner named *I'm Alone* became infamous to the Coast Guard. Equipped with a pair of one hundred horsepower engines (which was a lot at the time) and a radio with a range of about 1,000 miles, for nearly six years of rum-running, she escaped Coast Guard detection. She was finally captured in the Gulf of Mexico off the Louisiana coast on March of 1929 after a long chase involving the USCG cutters *Wolcott* and *Dexter*, but not without a fight - one crew member²¹ died and several were wounded by gun-fire. In fact, the *I'm Alone* sank because of the number of bullet holes in her hull.

The point at which Elizebeth Friedman entered the case was after the *I'm Alone* was scuttled. The issue was that this ship flew a Canadian flag and the sinking became an international incident [8]. By cryptanalyzing the ship's coded communications, Elizebeth Friedman was able to help invalidate the claim that the *I'm Alone* was a Canadian owned and operated vessel. From Kyle [11], page 151-153:

[ESF] pointed out to the Customs agent [n New Orleans], Edson Shamhart, a message addressed to MOCANA, an unregistered cable address in New York, reading YOCAJ LYNEKY-OECKMEDLO EPUJSOGARP YASAP. She felt the Moeana address was somewhere in Montreal, Canada, but the message was not in cipher, but in code. She had cracked part of the code, but not all of it. Some letter groups such as YOCAJ and YOECK had no meaning in the Private Supplement to Bentley's Code²², which she had discovered was the code used for

²¹The boatswain, Leon Mainguy, although some sources use different spellings of this name.

²²Bentley's code was a commercial Telegraph code used by Western Union into the 1930s.

the rest of the message. The other letter-groups were not transpositions or ciphers of any kind. She had, of course, checked every code book at her disposal, and finally had to assume an absolutely private code that would yield to no one but a person knowing the absolutely arbitrary meanings of YOCAJ and YOECK. So the decoded message read, YOCAJ. 700 YOECK, 1200 DOLLARS. TELEGRAPH POSITION OF YASAP. No one could have gone farther without a codebook. Another decoded message read YIZAB, ZYRLA, 400 DOLLARS. SHIPMENT OF 2000 YINOS, 800 YINRA AND THE OTHER EXPENSES. ... Within hours, Shamhart realized that the messages Mrs. Friedman had brought him jibed with known sailing and contact dates of the I'M ALONE and known cargoes. He was even able now to equate YINOS with Scotch whiskey, and so on.

According to [8], in the Joint Final Report of Jan. 5, 1935,

...the Commissioners declared that they found as a matter of fact that, from September, 1928, down to the date when she was sunk, the *I'm Alone*, although a British ship of Canadian registry, was de facto owned, controlled, and at the critical times, managed, and her movements directed and her cargo dealt with and disposed of, by a group of persons acting in concert who were entirely, or nearly so, citizens of the United States, and who employed her for the purpose of carrying intoxicating liquors from British Honduras designed for illegal introduction and sale in the territory of the United States.

As a result, no compensation was paid in respect of the loss of the ship or the cargo. The *I'm Alone* case was one of the most important ones from the perspective of international relations. According to [8],

It bears testimony to the reasonableness of the requirement that a respondent State should not, through the agency of an arbitral or other agency or commission, be subjected to the burden of paying damages necessarily accruing to the direct benefit of its own nationals.

Elizebeth Friedman's collected papers [3], contain examples of decryptions from the *I'm Alone*. One example is given in Figure 5.

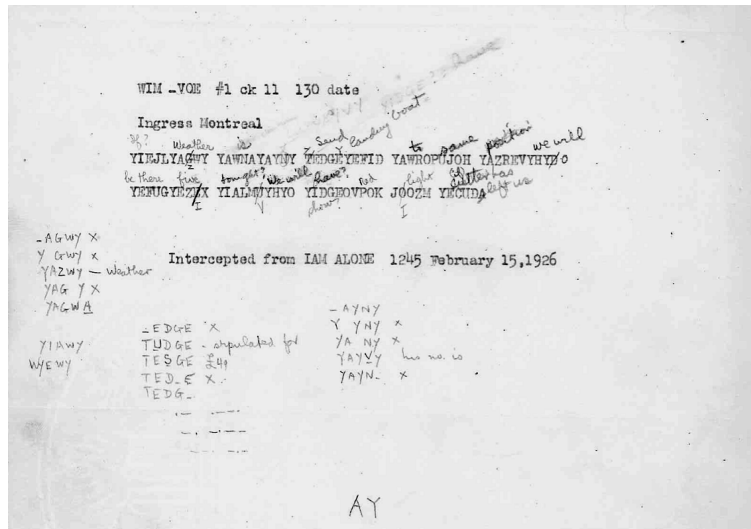


Figure 5: Elizebeth Smith Friedman cryptanalysis (source: George C. Marshall Foundation).

10 The Conexco trial

According to the *Plattsburgh* (New York) *Daily Republican*, on Monday April 13, 1931,

... federal prohibition agents struck a decisive blow at liquor smuggling through New Orleans and coast cities of Mississippi Saturday with the arrest of three alleged Capone agents, two Canadian distilleries and the owner and operator of an illegal radio transmission. Arrest of more than 100 persons was expected by prohibition officers before nightfall. Warrants were issued for several Mississippi Gulf coast county officers, some of the biggest bootleggers in New Orleans and others.

Bert Morrison of the Vancouver Consolidated Distillers, as well as three alleged Capone agents, Nathan Goldberg, Al Hartman and Harry Doe, were among those arrested in New Orleans.

During 1933, Elizebeth appeared as a witness in the Bert Morrison case, in New Orleans. Bert Morrison was the land agent for Conexco. This so-called Bert Morrison Case was considered so important that Colonel Amos W. Woodcock, Special Assistant to the Attorney General, conducted the

case himself for the prosecution. He stated at the time of the trial that the federal government had spent five hundred thousand dollars and two years in preparing the case. Elizebeth was first sent to New Orleans to testify before the Grand Jury as an expert witness after which Bert Morrison and 22 codefendants were indicted. She was also present when the case came to trial. In fact, it has been reported that seven defense lawyers rose to object when her name was called in court as an expert witness!

As described by Mowry [12]:

Convictions for conspiracy required the construction of a case connecting the ship, the illicit shore station and its operator, and the ‘bosses’ controlling the operation. The only way to accomplish this was through the encrypted messages originating in the New Orleans office of Consolidated Exporters and transmitted by their illicit radio station which would show that the defendants actually directed the movements of the smuggling vessels.

Hundreds of encrypted messages between the ‘black’ ships and their shore stations had been intercepted by the Coast Guard Intelligence Office in Mobile, Alabama, and many more were seized by the special agents when they raided the syndicate headquarters in New Orleans. All of those messages were forwarded to Coast Guard headquarters, where they were deciphered, decoded, and indexed by the Cryptanalysis Section.

During this period, the Cryptanalytic Unit consisted of Mrs. Friedman (Figure 6) and one clerk. Colonel Woodcock stated in a letter to the Coast Guard that he did not believe it would have been possible to win this case without her testimony.

I am taking the liberty to bring to your attention the unusual service rendered by Mrs. Elizabeth Smith Friedman in the trial of the largest smuggling case which the Bureau of Prohibition had made during the last two years. I prosecuted the case in the United States District Court at New Orleans. Mrs. Friedman was summoned as an expert witness to testify as to the meaning of certain intercepted radio code messages. These messages were sent to and from Belize, Honduras, New Orleans and ships at sea. Without their translations, I do not believe that this very



Figure 6: Elizebeth Smith Friedman with briefcase (source: Wikipedia).

important case could have been won. Mrs. Friedman made an unusual impression upon the jury. Her descriptions of the art of deciphering and decoding established in the minds of all her entire competency to testify. It would have been a misfortune of the first magnitude in the prosecution of this case not to have had a witness of Mrs. Friedman's qualifications and personality available.

11 Conclusion

While there is no doubt that Elizebeth Friedman shared a very close relationship with her husband William, she stands on her own as a excellent cryptographer. In the period from the late twenties to early thirties, she was the most famous cryptographer in America. Through her testimony in court, she helped win verdicts in some of the most important trials of that era.

Acknowledgements: I'd like to thank Rene Stein, of the NSA Cryptologic Museum, for providing the references [2], [13] and [11]. I'm grateful to Jeffrey Kozan of the Marshall Foundation for providing the references [3]. Finally, I'd like to thank Gregory S. Smith (son of Raymond Smith, mentioned above) for his kind encouragement, detailed reading, and helpful corrections.

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